

STAFF MEMO

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HOW DO DIFFERENT BANK
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FUNCTION IN BAD TIMES?

Henrik Andersen, Charlotte Høeg Haugen, Jama Johnsen, Lars-Tore Turtveit and Bent Vale¹

Use of capital buffers can dampen the risk that banks amplify downturns. But other requirements could prevent banks from using the buffers countercyclically, especially if the consequences of breaching other requirements are more serious than breaching buffer requirements. In this Staff Memo we analyse how the buffer requirements function in bad times when banks must also satisfy the leverage ratio (LR) requirement and the minimum requirement for own funds and eligible liabilities (MREL). The results show that the portion of MREL that the largest Norwegian banks may have to use the most Common Equity Tier 1 (CET1) capital to satisfy is risk-based subordinated MREL calculated using the prudential formula. According to our calculations, banks must use a substantial share of their buffer capital to satisfy this requirement, at least if banks' non-preferred debt issuance is small. This implies that a number of banks could breach only portions of the buffer requirements without breaching MREL. The analysis also shows that this overlap between the buffer requirements and the prudential formula could increase in bad times. If the countercyclical capital buffer (CCyB) requirement and other buffer requirements are reduced, risk-based subordinated MREL will be reduced accordingly, so that the buffers function as intended. If banks' non-preferred debt issuance is substantial, they could also dip into a larger share of their capital buffers without breaching MREL.

Key word: banks, capital buffers, capital requirements, MREL

1. Introduction

Following the global financial crisis in 2008, the authorities introduced a number of buffer requirements beyond the minimum requirements for bank capital. The capital buffers are intended to make banks more resilient and function as shock absorbers against increased losses, enabling them to maintain lending and other activities in bad times without breaching minimum requirements. The capital buffers can thus mitigate the risk that banks will amplify downturns by tightening lending.

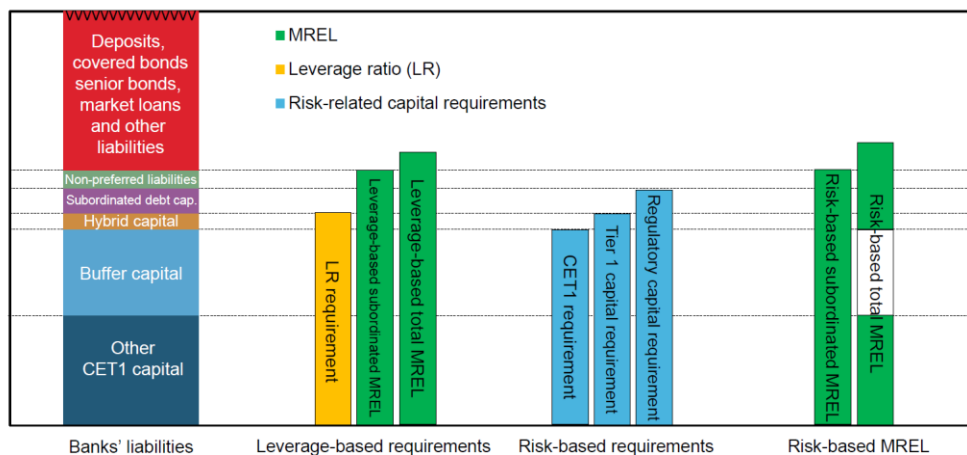
The capital adequacy rules enable banks to use the capital buffers in periods of high losses. If banks breach the minimum capital requirements,

¹ The views and conclusions expressed in this publication are the authors' own and do not necessarily reflect those of Norges Bank. This paper should not be reported as representing the views of Norges Bank. The authors would like to thank Monique Erard, Torbjørn Hægeland, Petter Jacobsen, Sverre Mæhlum, Ylva Søvik and Sindre Weme for useful input and comments as well as Kaja Dørum Haug for her kind assistance with background information and charts. Any errors or omissions are exclusively the responsibility of the authors.

Finanstilsynet (Financial Supervisory Authority of Norway) is empowered to impose restrictions on banks and revoke their licences, whereas breaches of buffer requirements result in automatic restrictions on dividend distribution and some other payouts. When banks breach buffer requirements, we refer to this as “dipping into” the capital buffers. Some of the buffer requirements can also be reduced in crises, so that banks can absorb higher losses and continue to extend credit without breaching buffer requirements.²

Other requirements for loss-absorbing capital can prevent the capital buffers from functioning as intended. In addition to risk-weighted minimum capital and buffer requirements, banks must satisfy a leverage ratio (LR) requirement and minimum requirement for own funds and eligible liabilities (MREL)³. The buffer requirements must be satisfied with Common Equity Tier 1 (CET1) capital. Banks are allowed to satisfy the LR requirement with the same CET1 capital that the use to satisfy risk-weighted capital adequacy requirements (Chart 1). The same CET1 capital may, with some important exceptions, be used to satisfy MREL. When banks use the same CET1 capital to satisfy different requirements, we call it “overlap”.

Chart 1 An Illustration of capital and liabilities banks can use to satisfy different capital requirements.¹



1) The bar at the far left illustrates banks' liabilities, ie funding. The bars at right illustrate the capital requirements banks face. The chart is not to scale and therefore does not present an exact picture of liabilities and the relative proportions of the requirements. The length of the bars is intended to show which capital types banks can use to satisfy different requirements. The transparent area in the middle of the bar at the farthest right illustrates that risk-based MREL may not be satisfied by capital used to satisfy buffer requirements. The same applies to the risk-based subordinated MREL requirement of 13.5 percent. This is not illustrated in the chart, because the prudential formula will be a more binding risk-based subordinated MREL requirement for Norwegian banks. The bars for leverage-based and risk-based total MREL extend only into the portion of the red area that is represented by senior bonds.

Source: Norges Bank

² For example, the CCyB can be reduced during a downturn with large bank losses.

³ MREL is the minimum requirement for loss-absorbing capital and liabilities and for liabilities that can be converted to equity in a bank resolution.

If banks use considerable CET1 to satisfy LR and MREL, they will not necessarily be able to dip into their risk-weighted capital buffers without breaching LR and MREL. In such cases, the capital buffers will not function as shock absorbers, because banks must maintain capital levels to satisfy LR and MREL. This assumes that banks consider the consequences of breaching LR and MREL to be more serious than the consequences of breaching buffer requirements. Whether such overlap problems are relevant for Norwegian banks therefore depends on the consequences of breaching different requirements and which requirements banks use the most capital to satisfy. An alternative for banks is to satisfy LR with hybrid capital and MREL with hybrid capital, subordinated debt capital and senior non-preferred liabilities. If banks opt to do this, MREL and LR will not prevent use of the capital buffers.

It is mainly central banks and macroprudential authorities that have analysed how different capital requirements function as a whole, and most of these analyses have assessed how LR can affect banks' ability to use the risk-weighted capital buffers. Analyses of banks in Sweden, Denmark and the Czech Republic show that LR may require more capital than risk-weighted capital adequacy requirements (see Financial Supervisory Authority (Sweden) (2016), Danmarks Nationalbank (2018) and Pfeifer et al (2016)), which can limit the scope for using the capital buffers. For example, Pfeifer (2020) finds that LR can prevent Czech banks from drawing on the capital buffers in extreme situations. On the other hand, Brei and Gambacorta (2016) find that LR is most binding in good times. This suggests that the ability to draw on the buffers increases in periods when banks may have a need to do so.

Danmarks Nationalbank has performed one of few analyses of how risk-weighted capital adequacy requirements, LR and MREL function as a whole. The analysis shows that most of the largest Danish banks may need to use more CET1 capital to satisfy MREL than the risk-weighted capital adequacy requirements (see Danmarks Nationalbank (2020)). However, the Danish analysis primarily pertained to the Danish MREL rules before the revised Bank Resolution and Recovery Directive (BRRD II) was implemented in Denmark.

Even if other capital requirements do not prevent banks from using their capital buffers, banks may not wish to use their buffers in certain circumstances. Banks may prefer to avoid the consequences of breaching buffer requirements, ie restrictions on dividend distribution. Moreover, banks' funding costs may rise if capital ratios fall below market expectations, referred to as "stigma effects". In addition, expectations of large future losses may prompt banks to maintain or increase capital adequacy.

In this *Staff Memo*, we analyse how the different requirements for loss-absorbing capital function together and how they affect banks' ability to use their capital buffers in bad times. We do not analyse other factors that may influence banks' incentives to use their buffers, eg restrictions on dividend distributions and stigma effects. Section 2 describes different capital requirements, and Section 3 explains situations where the capital requirements overlap. Section 4 describes the dataset that we use. Section 5

calculates capital requirements for banks in Norway and projects the requirements under various assumptions for key variables in bad times. Section 6 discusses other possible procyclical effects, and Section 7 discusses measures to improve bank's ability to use their capital buffers in bad times. Section 8 concludes.

2. Description of different capital requirements

Banks play a key role in the economy. They provide services that are crucial for economic growth, such as loans to firms and private individuals.⁴ The availability of such services is often impaired during banking crises, which are therefore costly to society.

More equity capital improves banks' loss absorbing capacity and reduces the risk of crises. The authorities therefore set requirements for banks' loss-absorbing capital. Along with other regulations, this helps enable banks to weather periods of higher losses without recourse to taxpayer funds.

The rules contain three categories of capital requirements that banks must meet simultaneously:

- Risk-weighted capital adequacy requirements are intended to ensure that banks' capital is sufficient relative to loss risk.
- The leverage ratio (LR) requirement is intended to ensure that banks fund loans and other assets with a sufficient share of Tier 1 capital regardless of the risk of losses and how this risk is calculated.
- The minimum requirement for own funds and eligible liabilities (MREL) is intended to ensure efficient bank resolution without recourse to taxpayer funds.

Banks are allowed to satisfy LR with the same capital they use to satisfy risk-weighted capital adequacy requirements. The same capital may, with some important exceptions, be used to satisfy MREL.

2.1. Risk-weighted capital adequacy requirements

The risk-weighted requirements need to correspond with banks' loss risk, so that banks with risky exposures are required to hold more capital than banks with safer assets.

Banks' risk-weighted capital ratios are calculated as bank capital as a percentage of the total risk-weighted assets (RWA):

⁴ Banks extend credit, receive deposits, execute payments and help customers manage risk.

$$\text{Capital adequacy} = \frac{\text{Capital}}{\text{RWA}}$$

The numerator in the capital adequacy ratio, ie capital, may comprise different types of capital. The authorities set capital adequacy requirements measured by Common Equity Tier 1 (CET1) capital, Tier 1 capital and regulatory capital. Even if all the requirements should be met, it is most common to calculate and report capital adequacy using CET1 capital, which is equity capital with some deductions⁵. Tier 1 capital differs from CET1 capital in that it also includes hybrid capital⁶, while regulatory capital includes both hybrid capital and subordinated debt capital⁷.

The denominator in the capital adequacy ratio, RWA, is calculated by risk-weighting banks' exposures. The higher the risk of loss on an exposure, the higher the risk weight should be and the more capital the banks must hold to cover that exposure.

Credit risk, ie risk of credit losses, accounts for most of RWA. In addition, banks must calculate capital requirements for market risk and operational risk. These requirements account for a small share of banks' capital requirements.

The capital adequacy rules permit banks to use different approaches for calculating risk weights. The largest Norwegian banks are subject to individual MREL, and most of these banks use internal ratings-based (IRB) models for calculating risk weights. The other Norwegian banks use the standardised approach. Under the standardised approach, the risk weights are standardised and set out in the regulatory framework.

The risk-weighted capital adequacy requirement comprises several parts. Banks are subject to a minimum CET1 capital requirement of 4.5 percent, Tier 1 capital requirement of 6 percent and total capital requirement of 8 percent.

In addition to the minimum requirements, banks are subject to a number of buffer requirements:

- The **capital conservation buffer** is fixed at 2.5 percent. It is intended to cover losses resulting from cyclical systemic risk and ensure that capital adequacy does not fall below the minimum requirement in severe downturns.
- The **systemic risk buffer** is 4.5 percent.⁸ This buffer is intended to guard against systemic risk not covered by other instruments. The level of the

⁵ Including assets that will not necessarily have a value in a loss situation, ie goodwill and deferred tax assets.

⁶ Hybrid capital is a combination of liabilities and equity. Hybrid capital pays a coupon but can be written down or converted to equity. In addition, the bank can choose not to pay interest on hybrid capital. Examples of hybrid capital are preferred capital securities and contingent convertible securities (CoCos).

⁷ Subordinated debt has many of the same characteristics as hybrid capital, but the restrictions on, for example, maturity are not as stringent and subordinated debt covers losses after hybrid capital.

⁸ The systemic risk buffer rate was increased from 3 to 4.5 percent from end-2020 for banks applying the advanced IRB approach. For other banks, the increase applies from end-2022.

buffer is determined on the basis of long-term structural systemic risk, such as when banks are closely interconnected and have poorly diversified loan portfolios. The size of the buffer is to be assessed at least every other year, and Norges Bank is tasked with advising the Ministry of Finance of the level of the systemic risk buffer.

- The **buffer for systemically important banks** is 1 or 2 percent. Problems in systemically important banks can inflict more severe consequences on society than similar problems in other banks. Systemically important banks must therefore hold an extra capital buffer. Finanstilsynet annually advises the Ministry of Finance as to which financial institutions in Norway are systemically important. Banks with total assets of at least 10 percent of mainland GDP or at least 5 percent market share of the lending market in Norway are deemed systemically important and subject to an additional 1% buffer requirement. The buffer requirement increases to 2 percent if their total assets and/or exposures amount to at least twice that of the threshold values. DNB and Kommunalbanken AS are now designated as domestically systemically important and are subject to buffer rates of 2 percent and 1 percent, respectively. From the end of June 2022, Nordea Eiendomskreditt AS will also be classified as systemically important and be subject to a 1 percent buffer requirement.
- The **countercyclical capital buffer (CCyB)**, which is now at 1 percent⁹, is intended to help banks build capital in good times when financial imbalances are building up or have built up. Banks will thus have more capital to draw on in bad times with high losses. In an economic downturn that results or could result in high credit losses and markedly reduced credit availability, the buffer rate can be lowered to increase banks' lending capacity. Norges Bank sets the CCyB rate each quarter.

The total of the above-mentioned buffer requirements is called the "combined buffer requirement". The buffer requirements and the minimum capital requirements described above are referred to as Pillar 1 requirements. Pillar 2 requirements, which come in addition, are intended to cover risks not sufficiently covered by the other requirements, including market risk in the banking portfolio, concentration risk and risk associated with the institution's pension obligations. Pillar 2 requirements are individual and depend on Finanstilsynet's assessment of the risk in the bank in question. Pillar 2 requirements consist of a formal requirement set as an individual decision and a capital margin requirement (Pillar 2 guidance), of which Finanstilsynet notifies the bank. The capital margin requirement is not a formal requirement but is intended to enable banks to maintain normal lending activities and access to wholesale funding in bad times. Currently, Norwegian banks must satisfy Pillar 2 requirements with CET1 capital, but Norwegian banks will be able to use other types of capital when the new EU Capital Requirements

⁹ It was decided to increase the CCyB rate to 1.5 percent with effect from 20 June 2022. In September 2021, Norges Bank's Monetary Policy and Financial Stability Committee announced that based on its assessment of economic developments and prospects for bank losses and lending capacity, the buffer rate will be raised to 2.0 percent in December, with effect from 31 December 2022. The Committee also expects that the buffer rate will return to 2.5 percent somewhat further out.

Directive (CRD V)¹⁰ is introduced in Norway. Under CRD V, Pillar 2 requirements are to be covered with the same capital quality as the minimum requirement, ie at least 75 percent of the capital must be Tier 1 capital and 75 percent of Tier 1 capital must be CET1 capital.

2.1.1. Consequences of breaching risk-weighted capital adequacy requirements

The buffer requirements are placed on top of the minimum requirements and the formal Pillar 2 requirement. This means that banks will breach the buffer requirements before they breach the formal Pillar 2 requirement and after that the minimum requirements. The buffer requirements are therefore to be satisfied with CET1 capital, ie capital that absorbs losses first.

Breaches of buffer requirements, the formal Pillar 2 requirement and the minimum requirements empower Finanstilsynet to impose various restrictions.¹¹ These may be orders to limit bonus payments or not to distribute dividends or pay interest on the capital. Finanstilsynet can also require changes in a bank's operations, ie changes in its organisation or a reduction in the risk associated with its activities. In addition, the capital adequacy rules¹² empower Finanstilsynet to revoke the licence of banks that breach capital requirements.

The capital adequacy rules enable banks to use their capital buffers in periods of high losses. The consequences of breaching buffer requirements are therefore to be milder than the consequences of breaching minimum requirements. Under the Basel III framework, this is intended to enable banks to maintain their activities in bad times (see Basel Committee (2010) and Basel Committee (2019)).

Banks that do not satisfy buffer requirements are automatically subject to a restriction on the maximum distributable amount (MDA) of payments for employee bonuses, dividend, interest on hybrid capital and share buybacks (Section 10 of the Norwegian CRR/CRD IV regulation).¹³ According to Basel III, the automatic restriction "would be minimal" for banks that only dip into their buffers slightly. The reason is that the buffers are meant to be used and are not to be "viewed as establishing a new minimum capital requirement" (see Basel Committee (2010) and Basel Committee (2019)). In the rules, the automatic restrictions are calculated according to how much of the total buffer requirement banks do not satisfy. If the breach is below 25 percent, ie a bank with a total buffer requirement of 8 percent has dipped into the buffers by less than 2 percentage points, the bank may still distribute up to 60 percent of after-tax profit as a dividend. This corresponds roughly to Norwegian banks'

¹⁰ Directive (EU) 2019/878 of the European Parliament and of the Council of 20 May 2019 amending Directive 2013/36/EU as regards exempted entities, financial holding companies, mixed financial holding companies, remuneration, supervisory measures and powers and capital conservation measures.

¹¹ See Section 14-6 of the Financial Institutions Act.

¹² See Article 18, point (d) of CRD IV.

¹³ This section reflects Article 141 of CRD IV and CRD V.

dividend level in periods when they have satisfied the buffer requirement by an ample margin.

Under the CRR/CRD IV regulation, banks that do not satisfy buffer requirements must submit a recapitalisation plan to Finanstilsynet within five business days. Among other things, the recapitalisation plan shall contain a time frame for when the bank will again satisfy the buffer requirements.

Since the capital margin requirement is not a formal requirement, banks without a sufficient capital margin requirement will normally only be subject to stepped-up supervision, ie milder consequences than if buffer requirements, the formal Pillar 2 requirement and minimum requirements are breached. In this *Staff Memo*, we therefore treat the capital margin requirement as a part of banks' surplus capital.

2.2. Leverage ratio (LR) requirement

Following the financial crisis, the authorities introduced a leverage ratio (LR) requirement. LR is intended to ensure that banks fund their assets with a minimum share of equity capital, regardless of the assets' estimated risk.

Risk-weighted capital adequacy requirements will not always ensure that banks' capital is sufficient relative to their loss risk. The calculation of risk-weighted capital requirements is largely based on historical loss and default data. Since actual risk cannot be directly observed in historical data, risk-weighted capital requirements will not capture all changes in risk. If banks underestimate their risk and their risk weights are too low, their risk-based capital ratios will indicate that banks' loss-absorbing capacity is better than it actually is.

Prior to the financial crisis, banks' risk weights fell. This enabled banks to satisfy risk-weighted capital requirements, even if their equity ratios fell. Following the crisis, the authorities therefore introduced LR as a backstop for the risk-weighted requirement.

LR is calculated as Tier 1 capital as share of the total exposure measure (TEM), which primarily corresponds to banks' exposures, both on- and off-balance sheet¹⁴:

$$LR = \frac{\textit{Tier 1 capital}}{\textit{TEM}}$$

LR sets an absolute limit for the size of a bank's total exposures with a given capital stock. Currently, the minimum LR requirement is 3 percent. In addition, systemically important Norwegian banks are subject to a 3 percent LR buffer requirement. Other Norwegian banks are subject to a 2 percent LR buffer

¹⁴ Off-balance sheet exposures include derivatives and unutilised lines of credit.

requirement. These two buffer requirements will not be continued in the Norwegian rules when the EU banking package from 2019 (CRR II¹⁵ and CRD V) are incorporated into the EEA Agreement and implemented in Norway, probably during 2022.

2.2.1. Consequences of breaching LR requirements

The consequences of breaching LR are similar to the consequences of breaching risk-weighted capital requirements. Banks in breach of the LR buffer requirement must submit a recapitalisation plan to Finanstilsynet within five business days.¹⁶ Breaches of both minimum LR and LR buffer requirements empower Finanstilsynet to impose restrictions and operational changes.¹⁷ Finanstilsynet can also revoke the licences of banks in breach of capital requirements.¹⁸

2.3. MREL

The financial crisis demonstrated the importance of being able to continue core functions of systemically critical¹⁹ banks without recourse to taxpayer funds, referred to in the rules as resolution. It is an important principle for the authorities that a bank's shareholders and creditors, as the bank's risk-takers, are to bear the losses when a bank is failing. This must apply to all banks. Moreover, for failing banks deemed systemically critical, the bank's creditors must contribute new equity capital during the resolution, so that systemically critical banks are recapitalised and their core functions continue. The authorities have therefore introduced a new minimum requirement for own funds and eligible liabilities (MREL) that can be written down quickly or converted to new equity (referred to as a bail-in). The purpose of MREL is to enable banks and the authorities to forestall or resolve crises effectively and in a timely manner without the taxpayers having to bear the losses. Timely intervention is intended to ensure that the recovery of important banks can proceed without operational disruption. MREL reduces the risk of bail-outs and increases the likelihood of bail-ins.

Since the bank's shareholders and creditors bear the losses in a bail-in, it is another important principle that no creditor or shareholder is left worse off from a bank resolution than they would have been from an insolvency, ie closure of the bank. This is referred to as the "no creditor worse off" (NCWO) principle.

¹⁵ Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 May 2019 amending Regulation (EU) No 575/2013 as regards leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements, and Regulation (EU) No 648/2012.

¹⁶ See Finanstilsynet (2017b) and Section 8, fourth sentence, of the CRR/CRD IV regulation (in Norwegian only).

¹⁷ See Section 14-6 of the Financial Institutions Act.

¹⁸ Article 18 point (d) of CRD IV (see Directive 2013/36/EU of the European Parliament and 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).

¹⁹ A bank is deemed systemically critical if its failure poses a systemic risk.

Smaller banks, which the bank resolution authorities intend to wind up if they fail, do not need to hold capital and liabilities that can be converted to new equity. For these banks, it is sufficient to satisfy the capital requirements.

The current MREL rules entered into force on 1 January 2019 and are based on the original BRRD from 2014²⁰ and a Commission Delegated Regulation from 2016. Under these rules, all capital and liabilities used to satisfy MREL must be subordinated by 1 January 2024, ie have lower priority than senior liabilities and non-preferred liabilities. The EEA countries are in the process of implementing the new EU banking package from 2019, which contains new MREL rules. The directive of the banking package pertaining to recovery and resolution is referred to as BRRD II²¹. The Ministry of Finance will likely lay down new regulations relating to MREL in accordance with BRRD II during 2022. When Finanstilsynet issues individual decisions on MREL to the most important Norwegian banks in December 2021, the decisions will be based on the provisions of BRRD II.²²

2.3.1. Current Norwegian MREL rules

Under the current Norwegian rules, MREL is the sum of requirements for loss-absorption and recapitalisation amounts:

- The **loss-absorption amount** applies to all banks and is intended to cover the losses of shareholders and creditors so that taxpayers are not forced to bear the losses. The loss absorption requirement is the larger of the LR requirement and total capital adequacy requirements (minimum requirement, Pillar 2 requirement and the buffer requirements).
- The **recapitalisation amount** is intended to ensure that banks with large losses are able to continue operations by swiftly converting liabilities to new equity. The requirement for the size of the recapitalisation amount is the same as the loss absorption requirement less the size of the CCyB if risk-based total MREL is greater than leverage-based MREL.

If risk-based MREL is greater than leverage-based MREL, under current Norwegian rules MREL is:

$$\text{Risk based MREL} = 2 \cdot (P1 + P2 + CBR) - CCyB,$$

where $P1$ and $P2$ are Pillar 1 and Pillar 2 requirements, respectively, CBR is the combined buffer requirement and $CCyB$ is the countercyclical capital buffer requirement.

²⁰ Directive 2014/59/EU of The European Parliament and of The Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms.

²¹ Directive (EU) 2019/879 of the European Parliament and of the Council of 20 May 2019 amending Directive 2014/59/EU as regards the loss-absorbing and recapitalisation capacity of credit institutions and investment firms and Directive 98/26/EC.

²² See Finanstilsynet (2021): "Nærmere om etterstilt gjeld" [More about non-preferred liabilities], 16 September 2021 (in Norwegian only).

At end-2020, Finanstilsynet had set MREL for the 14 Norwegian banks deemed systemically critical.²³ With some important exceptions, MREL can be satisfied with capital used to meet the capital adequacy requirements and senior non-preferred liabilities. Senior non-preferred liabilities are a new debt class that absorbs losses before ordinary senior debt, but after subordinated debt. In the period to 1 January 2024, ordinary senior debt may also be used to a diminishing degree, as long as it satisfies maturity requirements, among others. Banks are required to phase in the missing non-preferred liabilities on a straight-line basis over the years 2021, 2022 and 2023, so that the expected need for non-preferred liabilities is fully satisfied at 1 January 2024.

At end-2020, the loss-absorption amount and recapitalisation amount calculated with risk-based requirements were higher for Norwegian banks than when the amounts were calculated with leverage-based requirements. Since the CCyB is included in the loss-absorption amount calculated with risk-weighted capital adequacy requirements, Norwegian banks' MREL falls with reductions in the CCyB and vice versa. This does not apply if leverage-based MREL should be binding.

2.3.2. MREL after BRRD II

In BRRD II, MREL consists of a subordination requirement and a total amount requirement. The requirements depend on banks' size and systemic importance. Banks with total assets greater than EUR 100 billion that are not globally systemically important (G-SIIs) are referred to as "top-tier" banks. Among Norwegian banks, only DNB has total assets greater than EUR 100 billion. Banks with total assets less than EUR 100 billion, but that nonetheless would pose a systemic risk if they fail, are referred to as "fished" banks.

2.3.2.1. Subordinated MREL

BRRD II introduces rules for how much of MREL must be subordinated to ordinary senior liabilities, called subordinated MREL. More subordinated liabilities reduces the risk that the bank resolution authority will breach the NCWO principle and thus reduces legal uncertainty when recapitalising a failing bank.

The new rules contain a number of absolute minimum requirements for *subordinated MREL*. Subordinated MREL must at the outset be at least 8 percent of a bank's total liabilities and own funds (TLOF)²⁴, at least 5 percent of TEM and at least 13.5 percent of RWA. Subordinated MREL based on TEM or TLOF may be satisfied with all regulatory capital, including capital used to satisfy the buffer requirements, and liabilities that are subordinated to ordinary

²³ DNB, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør, SpareBank 1 Østlandet, SpareBank 1 Nord-Norge, Bank Norwegian, OBOS-banker, Sbanken, SpareBank 1 BV, Sparebanken Møre, Sparebanken Sogn og Fjordane and Sparebanken Øst.

²⁴ The bank resolution authority may not draw on the bank resolution fund until at least 8 percent of TLOF has been subject to a bail-in. The 8 percent minimum subordination requirement may be reduced somewhat for some banks if certain criteria are met, including if it is unlikely that there will be problems with the NCWO principle. However, for a top-tier bank, this 8 percent requirement shall not result in a total subordinated MREL that exceeds 27 percent of RWA.

senior liabilities. Capital used to satisfy the buffer requirements may not be used to satisfy risk-based subordinated MREL of 13.5 percent.

For “fished” and top-tier banks, the bank resolution authorities may calculate subordinated MREL using a prudential formula that is two times the total minimum requirements under Pillars 1 and 2 plus all buffer requirements, that is:

$$\text{Risk based subordinated MREL (prudential formula)} = 2 \cdot (P1 + P2) + CBR,$$

where P1 and P2 are Pillar 1 and Pillar 2 requirements, respectively and CBR is the combined buffer requirement.

Unlike risk-based subordinated MREL of 13.5 percent, the prudential formula may be satisfied with buffer capital. In principle, the prudential formula may only apply to 30 percent of banks that are “fished” or top-tier, but the bank resolution authority is empowered to increase this percentage if it wishes to address country-specific conditions in the banking sector. Based on the Ministry of Finance’s consultation document for the EU banking package from 2020, between 30 and 100 percent of such banks in Norway will be subject to a requirement according to the prudential formula.²⁵

2.3.2.2. Total required amount

In addition, the new rules continue to require that MREL is calculated as the sum of a loss absorption amount and a recapitalisation amount, plus a market confidence buffer. These are referred to all together as the total required amount or total MREL. In most cases, total MREL will be higher than subordinated MREL. This means that most banks will be able to use some ordinary senior liabilities to satisfy total MREL.

Total MREL is calculated according to a risk-based method (risk-based total MREL) and a leverage-based method (leverage-based total MREL), which must both be satisfied at all times:

- Risk-based total MREL is calculated as two times the total minimum capital requirement under Pillars 1 and 2, plus the combined capital buffer requirement, less the CCyB), ie:

$$\text{Risk based total MREL} = 2 \cdot (P1 + P2) + CBR - CCyB$$

In addition, the new rules introduce an absolute minimum risk-based total MREL for the most important banks²⁶ of at least 13.5 percent of RWA.

²⁵ See Ministry of Finance (2020) “Consultation – Implementation of the banking package etc” (in Norwegian only).

²⁶ Banks classified as top-tier or “fished”. For global systemically important financial institutions (G-SIFIs), the risk-based total MREL is 18 percent of RWA. There are no G-SIFIs in Norway.

- Leverage-based total MREL is calculated as two times the leverage ratio requirement. The absolute minimum leverage-based MREL under the new rules is 5 percent of TEM for the most important banks.²⁷

Risk-based total MREL will be lower under the new rules than the risk-based loss absorption and recapitalisation amounts under current Norwegian rules, because the CCyB does not count.²⁸ In addition, the other buffer requirements count only once under the new rules. Risk-based total MREL may not be satisfied with capital used to satisfy the buffer requirements.²⁹ This does not apply to leverage-based total MREL. Since leverage-based total MREL may be satisfied with buffer capital, the ability of banks to use buffer capital is restricted more if leverage-based MREL is binding.

2.3.3. Consequences of breaching MREL

MREL is a minimum requirement.³⁰ Under Article 45k of BRRD II, the authorities are obliged to impose, or at least assess, measures to address a breach of MREL. The article permits a broad spectrum of measures. For example, the authorities may order the bank to implement parts of its recovery plan or in the worst case, assesses whether the bank is failing. Banks that satisfy the risk-weighted buffer requirements but are still in breach of the prohibition against using buffer capital to satisfy risk-based MREL are not subject to automatic restrictions on dividend distributions and other payouts. However, the bank resolution authorities must consider imposing such restrictions. If the breach lasts for nine months or more, such restrictions are to be imposed under certain conditions under Article 16a (3) of BRRD II.

On the other hand, banks that do not satisfy risk-weighted capital buffer requirements are subject to automatic restrictions on payouts (see Section **Error! Reference source not found.**). These restrictions' automatic nature may give the impression that MREL is a more lenient requirement than risk-weighted capital buffer requirements. But since the bank resolution authority is empowered under Article 45k to impose a number of other measures on a bank in breach of MREL, it is not obvious that MREL is, overall, a more lenient requirement than the buffer requirements.³¹

Which requirement banks perceive as the more stringent may have consequences for how they will act if they breach one of the requirements. If the bank perceives MREL as more lenient than the buffer requirement, it is not obvious that the bank will be worried about breaching MREL at the same time as it breaches the capital buffer requirements. Even though it is uncertain which measures the bank resolution authority will impose for a breach of

²⁷ Banks classified as top-tier or "fished". For G-SIIs, the leverage-based total MREL is 6.75 percent of TEM.

²⁸ Under the current rules, MREL is to be satisfied with non-preferred liabilities after 2024. Under BRRD II, total MREL may be satisfied with higher priority ordinary senior liabilities under certain conditions. Capital quality requirements thus differ somewhat between the current rules and forthcoming total MREL.

²⁹ See Article 128, fourth sub-paragraph CRD V [Directive \(EU\) 2019/878 of the European Parliament and of the Council of 20 May 2019 amending Directive 2013/36/EU as regards exempted entities, financial holding companies, mixed financial holding companies, remuneration, supervisory measures and powers and capital conservation measures](#).

³⁰ Under Section 20-9 of the Financial Institutions Act, MREL shall be satisfied at all times.

³¹ The provisions of Article 45k concern breaches of MREL beyond double use of buffer capital.

MREL, we assume in this *Staff Memo* that the consequences of breaching MREL will be more serious than the consequences of breaching buffer requirements.

3. Overlap between risk-weighted capital buffer requirements, LR and MREL (EU banking package from 2019, including BRRD II)

If banks use more CET1 capital to satisfy LR and MREL than the risk-weighted capital adequacy requirements, banks will not necessarily be able to draw on surplus capital or dip into buffer capital without breaching LR and MREL. There will then be an overlap between the buffer requirements and LR and MREL. In this situation, a reduction in buffer requirements will not always give banks lower total capital requirements. This applies if banks have a smaller margin above LR and MREL than above their risk-weighted capital buffer requirements. The problems with overlap are most relevant if LR or leverage-based MREL is binding, and banks consider the consequences of breaching these requirements as more serious than the consequences of breaching buffer requirements. The same applies if risk-based MREL is binding, and banks satisfy this requirement with no or very little margin (see Sections 3.3 and 3.4).

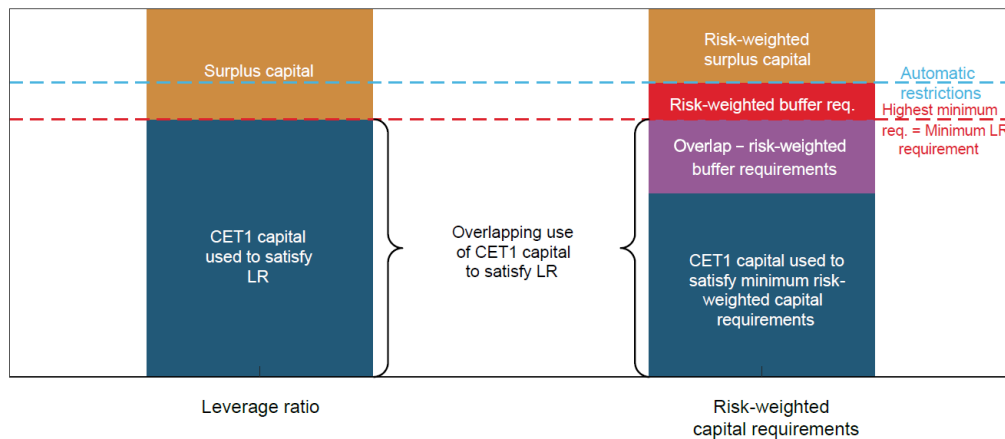
This section takes a closer look at situations where LR and MREL under BRRD II and the remainder of the EU banking package from 2019 can prevent banks from using their capital buffers. Since capital buffers must be satisfied with CET1 capital, we assess overlaps by examining how much CET1 capital the different requirements lay claim to. CET1 capital used to satisfy LR and MREL (dark blue area at left in Charts 2 – 5) is calculated on the basis of total LR and MREL and then deducting holdings of hybrid capital, subordinated debt capital and MREL-eligible liabilities that can be used for satisfying these. CET1 capital used to satisfy risk-weighted capital adequacy requirements is CET1 capital the bank uses to satisfy the most binding risk-based requirement. If, for example, a bank has little or no hybrid capital or subordinated debt capital, the bank may use more CET1 capital to satisfy the minimum Tier 1 capital requirement (6 percent) and/or the minimum total capital requirement (8 percent) than the minimum CET1 capital requirement (4.5 percent).

3.1. Overlap between risk-weighted capital buffer requirements and LR

Banks may satisfy minimum LR requirements with CET1 capital used to satisfy their risk-weighted capital buffers. Chart 2 shows a stylised example, where a bank uses more CET1 capital to satisfy minimum LR requirements than minimum risk-weighted capital adequacy requirements. In this situation, banks cannot draw on all capital buffers without breaching LR. There is therefore an overlap between LR and the capital buffer requirements. In the

chart, the dark blue areas are minimum requirements, purple and red areas the capital buffers and orange areas surplus capital (including Pillar 2 guidance). The purple area shows the portion of the total capital buffers that the bank cannot use without breaching LR, ie the overlap between the two requirements. The orange and red areas show the capital available for absorbing losses without breaching minimum requirements. The dotted light blue line shows the capital level that triggers automatic restrictions on MDA.

Chart 2 Stylised example of overlap between risk-weighted capital requirements and LR. CET1 capital in whole NOK

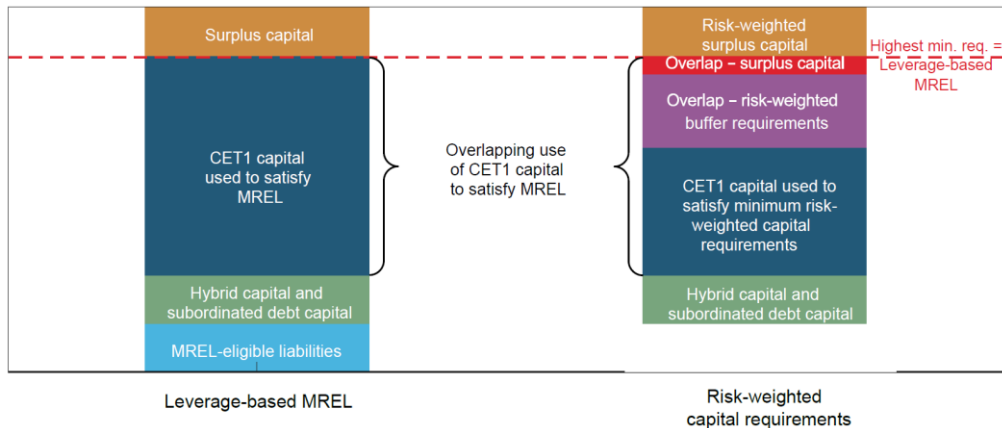


Source: Norges Bank

3.2. Overlap between risk-weighted capital buffer requirements and leverage-based total MREL

Banks can satisfy leverage-based total MREL with MREL-eligible liabilities and all regulatory capital, including CET1 capital used to satisfy risk-weighted capital buffers. Chart 3 illustrates a situation where it is assumed that a bank uses more CET1 capital to satisfy leverage-based total MREL than the minimum risk-weighted capital adequacy requirement, ie the dark blue area on the left-hand side of the chart is larger than the dark-blue area on the right. Portions of leverage-based total MREL are satisfied with MREL-eligible liabilities (light blue area), as well as hybrid capital and subordinated debt capital (green area). But the bank must also use the capital buffers (purple area) and a portion of risk-weighted surplus capital (red area) to satisfy leverage-based total MREL. In this situation, the bank cannot draw on all risk-weighted surplus capital without breaching MREL. Nor can it draw on the capital buffers. However, the bank can issue more hybrid capital, subordinated debt capital and MREL-eligible liabilities, so that surplus capital rises.

Chart 3 Stylised example of overlap between risk-weighted capital adequacy requirements and leverage-based total MREL. CET1 capital in whole NOK

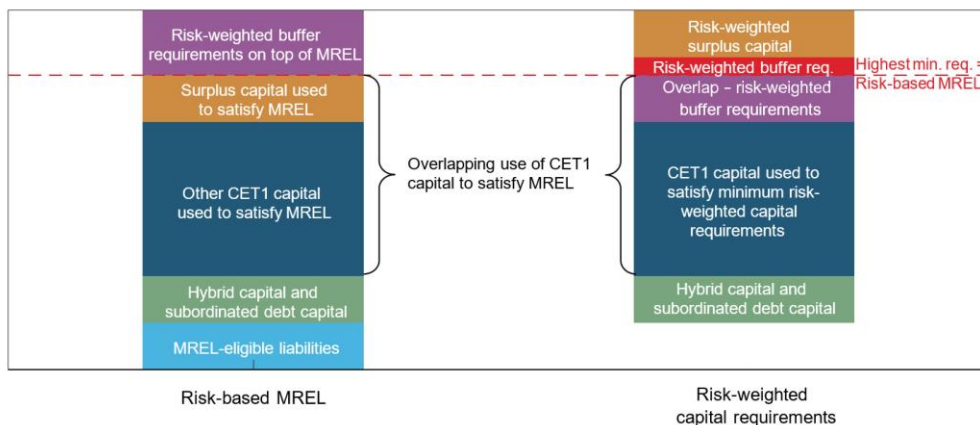


Source: Norges Bank

3.3. Overlap between capital buffer requirements and risk-based total MREL

Banks may not satisfy risk-based total MREL with CET1 capital they have used to satisfy buffer requirements. The buffer requirements therefore come above risk-based total MREL (see purple area at left in Chart 4). The idea is that banks should be able to dip into their capital buffers without breaching risk-based total MREL.

Chart 4 Stylised example of overlap between risk-weighted capital adequacy requirements and risk-based total MREL. CET1 capital in whole NOK



Source: Norges Bank

However, risk-based total MREL can limit the ability to dip into capital buffers if banks' holdings of MREL-eligible liabilities are small. Banks can satisfy risk-based MREL with risk-weighted surplus capital. Chart 4 illustrates this situation, where a bank satisfies portions of risk-based total MREL with surplus capital. In Chart 4, the bank just satisfies risk-based total MREL, and it uses all of the risk-weighted surplus capital (orange areas at left and right) to

satisfy total MREL. Portions of risk-based total MREL are satisfied with MREL-eligible liabilities (light blue area), as well as hybrid capital and subordinated debt capital (green area). Since the bank in Chart 4 uses its entire surplus capital to satisfy risk-based total MREL, the bank will breach total MREL if it draws on surplus capital. The bank draws on surplus capital before drawing on the CET1 capital used to satisfy the buffer requirements. The bank in Chart 4 will therefore always breach MREL before breaching the buffer requirements, and the bank will thus not be able to dip into its capital buffers without breaching MREL.

Let us look more closely at what happens when a bank in this situation posts losses, so that it must draw on risk-weighted surplus capital. In this case, it ends up in breach of MREL, because it is not permitted to use any buffer capital to satisfy risk-based total MREL. But as long as the bank has surplus capital, it will not breach the buffer requirement under the capital adequacy rules.

Not until the bank breaches the capital buffer requirement will the automatic restrictions on dividend distributions and other payouts enter into force. If it then also ends up in breach with risk-based total MREL beyond double use of the buffers, the bank resolution authority may impose other measures on the bank. For example, it can order the bank to implement parts of its recapitalisation plan and in the worst case, assess if the bank is failing (see Section 2.3.3).

3.4. Overlap between capital buffer requirements and subordinated MREL (prudential formula)

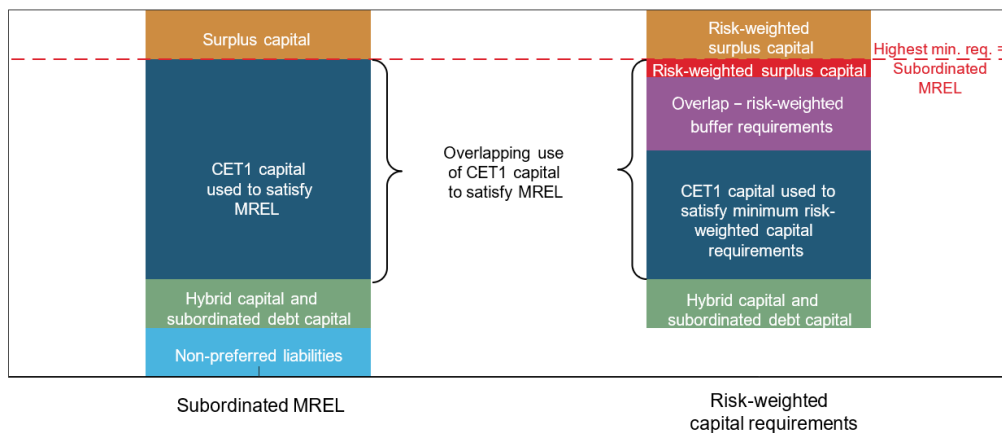
Norwegian banks' volume of senior bonds outstanding is relatively large. A fairly large share of these senior bonds may be used to satisfy total MREL. It will therefore be rather improbable that any bank will face the situations we have discussed in Sections 3.2 and 3.3 with a small margin above total MREL. On the other hand, Norwegian banks' issuance of non-preferred debt so far is insufficient for satisfying forthcoming requirements. If Norwegian banks do not issue substantially more non-preferred debt, there is a risk that they will satisfy subordinated MREL with a fairly small margin. In that case, they will be dependent on having substantial risk-weighted surplus capital in order not to end up in breach of subordinated MREL in bad times, even if they do not breach the buffer requirement.

The largest Norwegian banks will be covered by risk-based subordinated MREL calculated using the prudential formula. Unlike risk-based total MREL, buffer capital may be used to satisfy subordinated MREL in accordance with the prudential formula (see Section 2.3.2).

Chart 5 illustrates a situation where it is assumed that a bank uses more CET1 capital to satisfy subordinated MREL in accordance with the prudential formula than the minimum risk-weighted capital adequacy requirement, i.e. that the dark

blue area at left is larger than the dark blue area on the right-hand side of the chart. Portions of subordinated MREL are satisfied with non-preferred liabilities (light blue area), as well as hybrid capital and subordinated debt capital (green area), but the bank must use the capital buffers (purple area) and some of its risk-weighted surplus capital (red area) to satisfy subordinated MREL. In this situation, the bank cannot draw on all risk-weighted surplus capital without breaching MREL. Nor can it draw on its capital buffers. Note that in this example, the bank may end up in breach of subordinated MREL before it breaches buffer requirements.

Chart 5 Stylised example of overlap between risk-weighted capital adequacy requirements and subordinated MREL using the prudential formula. CET1 capital in whole NOK



Source: Norges Bank

If banks' margin above capital requirements is larger than above MREL, MREL will be breached first if capital adequacy declines. Correspondingly, the buffer requirement will be breached first if the margin above MREL is greater than the margin above the buffer requirement.

4. Data

We use a number of data sources to analyse how different capital requirements function together. Our analyses are largely based on capital adequacy data from CRD IV reporting. Among other things, this reporting shows banks' CET1 capital, other approved equity capital and Tier 2 capital. We also use data for banks' RWA, TEM and institution-specific buffer requirements from CRD IV reporting. Banks' CRD IV reporting data are also used to exclude banking groups' mortgage companies from MREL.³²

We complement CRD IV reporting with data from Finanstilsynet and the banks' own reports. Total assets from the banks' own reports is used to calculate leverage-based MREL. Non-preferred and senior liabilities

³² For banking groups' exposures to their own mortgage companies, we use 2020 data for DNB and 2019 data for the other banks.

outstanding are calculated using data from Stamdata and Bloomberg, while Finanstilsynet publishes individual banks' Pillar 2 requirements.³³

5. Calculations of capital requirements for banks in Norway and projections in bad times

We calculate risk-weighted capital adequacy requirements, LR and MREL for the largest banks in Norway and assess how they satisfy the requirements in force under BRRD II in 2024 and the remainder of the EU banking package from 2019. Our starting point is RWA, TEM, regulatory capital and liabilities at end-2020. We focus on how LR and MREL can prevent banks from using their risk-weighted capital buffers in bad times. Since risk-weighted capital buffers must be satisfied in their entirety with CET1 capital, we calculate how much CET1 capital banks use to satisfy different capital requirements based on banks' holdings of hybrid capital, subordinated debt capital and senior non-preferred liabilities, where the latter is the least expensive category of MREL-eligible capital that satisfies subordinated MREL. Banks with little hybrid capital, subordinated debt capital and senior non-preferred liabilities must use more CET1 capital to satisfy the minimum LR and MREL requirements. Banking groups' mortgage companies are excluded from MREL, and we adjust banks' RWA and regulatory capital accordingly.

We define risk-weighted surplus capital as CET1 capital that is not used to satisfy Pillar 1 and Pillar 2 risk-weighted capital adequacy requirements or the buffer requirements.

5.1. Total and subordinated MREL for Norwegian banks

As discussed in Section 2.3.2, there are two MREL requirements, since MREL does not need to be satisfied in its entirety with non-preferred liabilities, the total amount (total MREL) and subordinated MREL. This means that portions of total MREL can also be satisfied with ordinary senior liabilities under certain conditions.

5.1.1. Total MREL

Norwegian banks' risk weights are high compared with foreign banks. Risk-based total MREL will therefore normally be more binding than leverage-based total MREL for Norwegian banks than for banks in other countries. Risk-based total MREL will also generally be lower under BRRD II than under current Norwegian rules. This reflects the fact that the combined buffer requirement is counted only once under BRRD II, compared with twice under

³³ See "[Publication of Finanstilsynet's decision on Pillar 2 requirements for individual banks](#)" on Finanstilsynet's website.

BRRD II. On the other hand, buffer capital may not be used to satisfy risk-based total MREL under BRRD II (see Section 2.3).

Total MREL will normally not be binding for Norwegian banks, because they have ample holdings of senior debt.

5.1.2. Subordinated MREL

Owing to Norwegian banks' high risk weights, risk-based subordinated MREL is more binding than leverage-based subordinated MREL. According to the Ministry of Finance's consultation document on the EU banking package from 2020, between 30 and 100 percent of "top-tier" and "fished" banks in Norway will be subject to subordinated MREL in accordance with the prudential formula.³⁴

Based on our calculations, the non-preferred liabilities requirement will only be of importance with the prudential formula and not if the minimum subordinated MREL of 13.5 percent should be applied. Use of the prudential formula does not involve any substantial costs for banks. Measured by the average interest rate on banks' funding, the difference in funding costs for the two forms of subordinated MREL will likely be less than 1 basis point.

5.1.3. Norwegian and Nordic banks

When Finanstilsynet issues individual decisions on MREL for the most important Norwegian banks in December 2021, the decisions will be formulated in line with the provisions of BRRD II.³⁵ In Norway, Sweden and Denmark, banks have been given an extension on the deadline for fully satisfying subordinated MREL until 1 January 2024, but the requirement is being phased in gradually in all countries. In Norway, Finanstilsynet has decided that the most important banks must satisfy risk-based subordinated MREL of 13.5 percent by 1 January 2022. This requirement cannot be satisfied with CET1 capital used to satisfy the buffer requirement.

Norwegian banks will likely be subject to a higher risk-based subordinated MREL than other Nordic banks, because Norwegian banks' risk weights are generally high. Some large Nordic banks with very low risk weights may be bound by leverage-based MREL, ie MREL-TLOF. In principle, this will limit the effect of low risk weights on subordinated MREL for these banks.

The cost increase for large Nordic banks will likely be less than for Norwegian banks, because the large Nordic banks are subject to lower subordinated MREL. At the same time, the pricing of non-preferred liabilities will be of considerable significance for the net effect of the requirements. More non-

³⁴ See "Høring – gjennomføring av bankpakken mv." [Consultation – implementation of the banking package] (in Norwegian only).

³⁵ See "Nærmere om etterstilt gjeld" [Non-preferred liabilities] on Finanstilsynet's website (in Norwegian only).

preferred liabilities may reduce the price premium on ordinary senior debt. In that case, this can limit the effect of subordinated MREL on funding costs.

5.2. Credit rating and banks' adjustments

Issuance of non-preferred debt may improve banks' credit rating. It may incentivise banks to issue non-preferred debt beyond current requirements. The credit rating agency S&P's credit ratings of banks are affected by loss prospects on ordinary senior debt in the event of a bail-in. S&P appears to prefer a bank resolution to liquidation. The risk on ordinary senior debt is assumed to be higher in a liquidation.

The rating agency Fitch has previously been explicit that a rating is upgraded when sufficient non-preferred debt is issued; for example, SpareBank 1 SR-Bank's senior debt was upgraded in December 2020 following an issue of senior non-preferred liabilities. Nordea has probably also attained a better rating on its ordinary senior debt by issuing senior non-preferred liabilities well above the current requirements. Ratings can thus affect banks' adjustments beyond regulatory requirements.

When ratings are announced, rating agencies also disclose an intention to lower the rating if the authorities subsequently set lower requirements for non-preferred liabilities. In their credit ratings publications, there is little mention of NCWO by rating agencies, but they do mention cross-jurisdiction differences in creditor hierarchies.³⁶

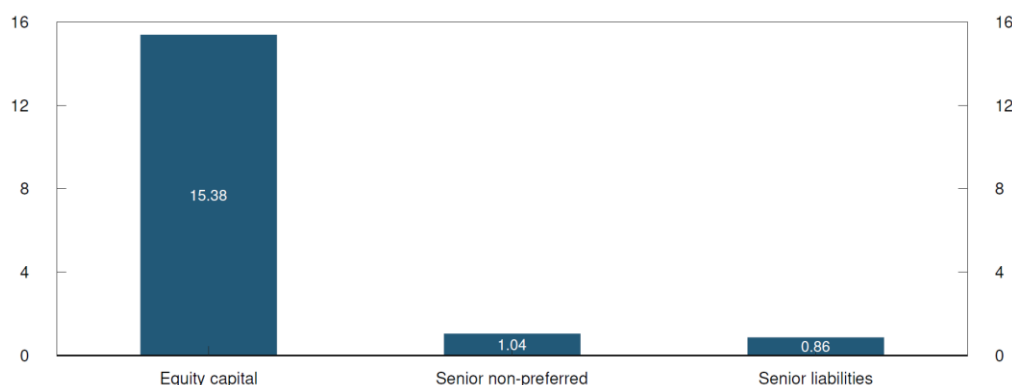
Bank resolution strategies also differ across jurisdictions, and they can change for specific banks based on a public interest assessment. S&P's rating of all six large Nordic banks improved owing to sufficient "extra loss capacity", which is likely affected by the extent of senior non-preferred liabilities.

5.3. Funding costs may affect adjustments

The costs associated with different funding instruments will likely be of considerable importance for banks' adjustment to MREL. Ordinary senior debt is the most reasonably priced instrument banks can use in part to satisfy MREL. On 2 September 2021, ordinary senior debt for large Norwegian and Nordic banks with five years' maturity cost 40-50 basis points over Nibor (Chart 6). For senior non-preferred liabilities, the cost was around 20 basis points higher.

³⁶ See eg S&P Global Ratings: "[The Resolution Story For Europe's Banks: More Flexibility For Now, More Resilience Eventually](#)". 20 September 2020.

Chart 6 Funding costs. Cost of equity before tax, cost of senior and senior non-preferred liabilities including three-month Nibor at 2 September 2021. Large Norwegian and Nordic banks. Percent.



Sources: Nordic Bond Pricing and Norges Bank

Price differences between funding instruments incentivise use of ordinary senior debt wherever possible and use of senior non-preferred liabilities only where necessary to satisfy subordinated MREL. This price effect on banks' adjustment is normally also visible in how banks satisfy capital and Tier 1 capital requirements. Banks generally satisfy capital requirements in the least expensive manner. The most expensive capital is CET1 capital, which often accounts for around 90 percent of recognised equity capital. Norwegian banks rarely issue equity capital, and equity normally increases when earnings are retained.

On the basis of banks' profitability targets and equity market pricing, the cost of equity can be estimated at around 12 percent after tax or just above 15 percent before tax, based on a sample of large banks' profitability targets (Chart 6). The cost of senior non-preferred liabilities at September 2021 is therefore less than a tenth of the cost of equity capital. Banks with little senior non-preferred liabilities may use CET1 capital to satisfy subordinated MREL. But considerable cost differences incentivise issuance of senior non-preferred liabilities, with surplus CET1 capital distributed as a dividend to shareholders instead. Such an adjustment will likely reduce real funding costs somewhat.

5.4. Overlap between capital requirements after the introduction of BRRD II

In this section we assess how Norwegian banks' capital buffers may overlap with minimum LR requirement and MREL when BRRD II is fully implemented in 2024. Our starting point is banks' balance sheets at end-2020. We assume that banks issue so much non-preferred debt that they satisfy the most binding requirement under MREL (subordinated MREL) by a margin equal to 1 percent of RWA. As a simplification, we assume no other balance sheet adjustments or changes in RWA or TEM. Furthermore, we assume that banks satisfy adopted changes in buffer requirements, ie a CCyB rate of 1.5 percent and a systemic risk buffer rate of 4.5 percent. In addition, we assume that the

Norwegian LR buffer requirements are removed from the Norwegian rules before 2024.

If the minimum LR requirement or MREL requires more CET1 capital than the most binding minimum risk-weighted capital adequacy requirement, an overlap arises with the buffer requirements (see Section 3). For example, buffer requirements and MREL will overlap in a situation where a bank's minimum risk-weighted capital adequacy requirements require 100 of CET1 capital, while the bank uses 150 of CET1 capital to satisfy subordinated MREL using the prudential formula. In that case, the bank must use 50 of its buffer capital to satisfy MREL. If the bank's combined buffer requirement is 100, it may then only use half of its capital buffers before it breaches subordinated MREL without a reduction in buffer requirements.

5.4.1. Overlap with an unchanged margin above MREL and unchanged CCyB requirement

If banks use more CET1 capital to satisfy minimum LR and MREL requirements than risk-weighted capital adequacy requirements, banks will not necessarily be able to draw on surplus capital or dip into their buffers without breaching LR or MREL. Capital used to satisfy the buffer requirements may not be used to satisfy risk-based total MREL and risk-based subordinated MREL of 13.5 percent (see Section 2.3.2). If banks use more CET1 capital to satisfy these requirements than risk-weighted capital adequacy requirements, banks must use risk-weighted surplus capital to satisfy these requirements under MREL. If banks use surplus capital to satisfy MREL, they will not be able to dip into their capital buffers without breaching MREL (see Section 3.3).

Capital used to satisfy buffer requirements can be used to satisfy leverage-based total MREL, leverage-based and TLOF-based subordinated MREL as well as risk-based subordinated MREL calculated using the prudential formula. If banks use more CET1 capital to satisfy these requirements under MREL than the risk-weighted capital adequacy requirements, banks will not be able to dip into their entire buffer capital without breaching MREL (see Sections 3.2 and 3.4).

A reduction of buffer requirements will reduce subordinated MREL using the prudential formula in an equal amount. Subordinated MREL therefore does not prevent banks from getting capital freed-up when buffer requirements are reduced. Risk-based total MREL also falls with a reduction in buffer requirements other than the CCyB.

Since the buffer requirements are to be satisfied with CET1 capital, we calculate how much CET1 capital banks use to satisfy the minimum LR requirement and MREL. We compare this capital need with how much CET1 capital banks use to satisfy minimum risk-weighted capital adequacy requirements. First, we calculate how much CET1 capital is required by the most binding minimum risk-weighted capital adequacy requirement. Then we calculate how much CET1 capital banks use to satisfy LR and MREL. This is done by calculating the overall LR and MREL requirements and then

deducting hybrid capital, subordinated debt capital and senior non-preferred.³⁷ Banks with little hybrid capital, subordinated debt capital and senior non-preferred liabilities must use a considerable share of CET1 capital to satisfy LR and MREL.

Leverage based requirements under MREL are not binding for Norwegian banks. However, the results show that the portion of MREL that the largest Norwegian banks³⁸ will have to use the most CET1 capital to satisfy is risk-based subordinated MREL calculated using the prudential formula. According to the calculations, there is considerable overlap between this requirement and most large banks' buffer requirements under the assumptions we have applied (Table 1). This means that a number of banks only can dip into portions of their buffers without breaching MREL. Many of these banks use most of their buffer capital to satisfy subordinated MREL calculated using the prudential formula. An important reason for this is that the banks' margin above the capital buffer requirements at end-2020 is high, while here we assume a 1 percentage point margin for MREL. There is also a small overlap between the buffer requirements and the minimum LR requirement for four banks.

Table 1 Share of combined buffer requirement that cannot be breached without breaching minimum LR and MREL requirements.¹⁾

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 6	Bank 7	Bank 8	Bank 9	Bank 10	Bank 11	Bank 12	Bank 13
Leverage ratio requirement	8 %	0 %	4 %	0 %	0 %	0 %	7 %	0 %	5 %	0 %	0 %	0 %	0 %
MREL													
Leverage-based total MREL	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Risk-based total MREL	-	-	-	-	-	-	-	-	-	-	-	-	-
Prudential formula - subordinated MREL	89 %	87 %	91 %	69 %	78 %	43 %	65 %	0 %	45 %	90 %	52 %	32 %	38 %
Risk-based subordinated MREL (13.5 %)	-	-	-	-	-	-	-	-	-	-	-	-	-
TLOF - subordinated MREL (8 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Leverage-based subordinated MREL (5 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %

1) CCyB requirement of 1.5 percent and margin above MREL of 1 percent of RWA.

Source: Norges Bank

5.4.2. Overlap when buffer requirements are reduced

The effect of reductions in buffer requirements depends on whether banks also use buffer capital to satisfy the minimum LR requirement and MREL. If this is the case, a reduction in buffer requirements will not always lower banks' capital requirements. This issue is only relevant if leverage-based MREL is binding and banks use CCyB capital to satisfy this requirement. Risk-based MREL does not prevent a reduction in buffer requirements from freeing up banks' CET1 capital. Risk-based total MREL cannot be satisfied with CCyB capital. But if the CCyB is reduced, the freed-up capital may be used to satisfy risk-based total MREL. Risk-based subordinated MREL calculated using the

³⁷ We use banks' holdings of hybrid capital, subordinated debt capital and non-preferred liabilities at end-2020, and we assume that banks issue sufficient extra non-preferred liabilities to attain a 1 percent margin above MREL.

³⁸ DNB, OBOS-banken, Sbanken, SpareBank 1 BV, SpareBank 1 Nord-Norge, SpareBank 1 SMN, SpareBank 1 SR-Bank, SpareBank 1 Østlandet, Sparebanken Møre, Sparebanken Sogn og Fjordane, Sparebanken Sør, Sparebanken Vest and Sparebanken Øst.

prudential formula falls by the same extent as reductions in buffer requirements (see formula on page 14).

We begin by assuming that the CCyB rate is kept unchanged at 1.5 percent and calculate how much of the CCyB banks can breach before they breach LR or MREL. If the minimum LR requirement or MREL ties up more CET1 capital than the sum of the minimum risk-weighted capital adequacy requirement, capital conservation buffer, systemic risk buffer and buffer for systemically important banks, banks must use all or part of the CCyB to satisfy LR or MREL.

The results show that four banks must use parts of their CCyB capital to satisfy subordinated MREL calculated using the prudential formula (Table 2). At the same time, these four banks use the remaining buffers in their entirety to satisfy subordinated MREL. The calculations suggest that none of the largest Norwegian banks must use CCyB capital to satisfy leverage-based MREL.

Table 2 Share of CCyB that cannot be breached without breaching minimum LR and MREL requirements.¹⁾

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 6	Bank 7	Bank 8	Bank 9	Bank 10	Bank 11	Bank 12	Bank 13
Leverage ratio requirement	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
MREL													
Leverage-based total MREL	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Risk-based total MREL	-	-	-	-	-	-	-	-	-	-	-	-	-
Prudential formula - subordinated MREL	14 %	26 %	47 %	0 %	0 %	0 %	0 %	0 %	0 %	42 %	0 %	0 %	0 %
Risk-based subordinated MREL (13.5 %)	-	-	-	-	-	-	-	-	-	-	-	-	-
TLOF - subordinated MREL (8 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Leverage-based subordinated MREL (5 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %

1) CCyB requirement of 1.5 percent and margin above MREL of 1 percent of RWA.

Source: Norges Bank

Subordinated MREL calculated using the prudential formula, which the largest banks will have to use the most CET1 capital to satisfy falls by the same extent as reductions in the CCyB and other buffer requirements. In that case, banks can use the freed-up capital from reductions in buffer requirements. The buffers are thus able to function as shock absorbers. When the CCyB is reduced to zero, the capital used by the largest Norwegian banks to satisfy the remaining buffer requirements will be sufficient to satisfy subordinated MREL (Table 3). The overlap between the buffer requirements and MREL will thus be smaller if the CCyB is reduced.³⁹

³⁹ Overlap in percentage points declines. But since the combined buffer requirement (the denominator in the overlap) becomes smaller with a CCyB at zero, the overlap becomes larger in percentage.

Table 3 Share of buffer capital used to satisfy minimum LR and MREL requirements if the CCyB is reduced.¹⁾

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 6	Bank 7	Bank 8	Bank 9	Bank 10	Bank 11	Bank 12	Bank 13
Leverage ratio requirement	9 %	0 %	5 %	0 %	0 %	0 %	8 %	0 %	6 %	0 %	0 %	0 %	0 %
MREL													
Leverage-based total MREL	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Risk-based total MREL	-	-	-	-	-	-	-	-	-	-	-	-	-
Prudential formula - subordinated MREL	90 %	88 %	92 %	66 %	77 %	36 %	61 %	0 %	39 %	91 %	45 %	22 %	30 %
Risk-based subordinated MREL (13.5 %)	-	-	-	-	-	-	-	-	-	-	-	-	-
TLOF - subordinated MREL (8 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Leverage-based subordinated MREL (5 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %

1) CCyB requirement of zero percent and margin above MREL of 1 percent of RWA.

Source: Norges Bank

5.4.3. Overlap with issuance of more non-preferred debt and reduction in the CCyB

The calculations in 5.4.1 and 5.4.2 may overestimate the potential overlap, because they are based on banks' substantial holdings of CET1 capital at end-2020. During the pandemic, dividend restrictions have compelled banks to retain a large portion of profits. This has pulled up CET1 capital. Large holdings of CET1 capital reduce the need to issue non-preferred debt in the calculations. Banks' use of CET1 capital to satisfy MREL is relatively high and use of non-preferred debt is relatively low, which results in a large overlap between MREL and the buffer requirements in the calculations (see Appendix 2 for a further discussion of how the overlap is affected by changes in the composition of banks' liabilities and capital). The dividend restrictions ended from the end of September 2021. Increased dividend distribution may reduce the share of CET1 capital that banks use to satisfy MREL.

MREL overlaps less with the capital buffers if banks issue so much non-preferred debt that they attain a margin above MREL greater than 1 percent of RWA. Credit rating considerations and the relative low cost associated with senior non-preferred liabilities may prompt banks to opt for an adjustment with a higher margin above MREL (see Sections 5.2 and 5.3), so that MREL overlaps less with the buffers. If we change the assumptions that banks adjust with a margin above MREL from 1 to 6 percent of RWA, and assume that the CCyB is reduced to zero, banks can dip into a substantially larger share of the buffers without breaching MREL (Table 4).⁴⁰ This suggests that banks should issue enough non-preferred debt to enable them to draw on their capital buffers without breaching MREL.

⁴⁰ In the calculations it is also assumed that the CCyB is reduced to zero.

Table 4 Share of combined buffer requirement that cannot be breached without breaching minimum LR and MREL requirements if the CCyB is reduced and the margin above MREL is increased.¹⁾

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 6	Bank 7	Bank 8	Bank 9	Bank 10	Bank 11	Bank 12	Bank 13
Leverage ratio requirement	9 %	0 %	5 %	0 %	0 %	0 %	8 %	0 %	6 %	0 %	0 %	0 %	0 %
MREL													
Leverage-based total MREL	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Risk-based total MREL	-	-	-	-	-	-	-	-	-	-	-	-	-
Prudential formula - subordinated MREL	25 %	15 %	20 %	0 %	4 %	0 %	0 %	0 %	0 %	20 %	0 %	0 %	0 %
Risk-based subordinated MREL (13.5 %)	-	-	-	-	-	-	-	-	-	-	-	-	-
TLOF - subordinated MREL (8 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Leverage-based subordinated MREL (5 %)	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %

1) CCyB requirement of zero percent and margin above MREL of 6 percent of RWA.

Source: Norges Bank

If banks use more CET1 capital to satisfy LR and (subordinated) MREL than the most binding minimum risk-weighted capital adequacy requirement and the buffer requirements, an overlap also arises with surplus capital (margin above the buffer requirements) (see Section 3). The calculations do not indicate that MREL (prudential formula) ties up more surplus capital, whether the bank satisfies MREL with a margin of 1 or 6 percent of RWA.

5.4.4. Overlap between capital requirements in bad times – analyses using Norges Bank’s stress test

The purpose of the capital buffers is to help enable banks to maintain activities in bad times. In this section, we use Norges Bank’s stress test to assess whether MREL and LR can prevent banks from dipping into their buffers in bad times.⁴¹

Norges Bank’s stress test is intended to assess whether bank capital is sufficient to absorb losses in a macroeconomic downturn, so that banks do not amplify the downturn. In the stress test, Norges Bank projects developments in nine large Norwegian banks.⁴² The calculations contain forecasts of most variables relevant for assessing overlap between capital requirements, including CET1 capital, hybrid capital, subordinated debt capital, RWA and total assets.

Downturns can affect overlaps between capital requirements in a number of ways. Financial market stress and higher prices for funding can affect how banks fund themselves. In addition, losses generally increase in bad times, which can absorb bank capital and reduce capital adequacy. Moreover, in bad times, banks’ assets are often considered riskier, which can increase risk weights and thus RWA.⁴³ Changes in banks’ capital, funding, assets and risks can affect how much LR and MREL overlap with the buffer requirements.

⁴¹ See Section 3 of *Financial Stability Report 2021* for a further description of the stress test.

⁴² DNB Bank, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør, SpareBank 1 Østlandet, SpareBank 1 Nord-Norge, Sbanken and Sparebanken Møre

⁴³ It is primarily IRB banks that may see an increase in RWA when loans are assessed as riskier. Under the IRB approach, banks calculate their risk weights using a formula set by the authorities. IRB banks’ own loss

In the stress test, the economy is exposed to large shocks that are amplified by vulnerabilities in the Norwegian financial system. The shocks lead to a sharp downturn in the Norwegian economy, where GDP at end-2024 is more than 8 percent lower than in Norges Bank's baseline scenario. Property prices are assumed to fall substantially, and the shocks push up banks' funding costs.

A number of technical assumptions regarding economic policy are applied. The policy rate is set at zero and remains there to the end of the stress period. No extraordinary fiscal policy measures are implemented. The CCyB is initially held at the current level, ie 1 percent, through the analysis period.

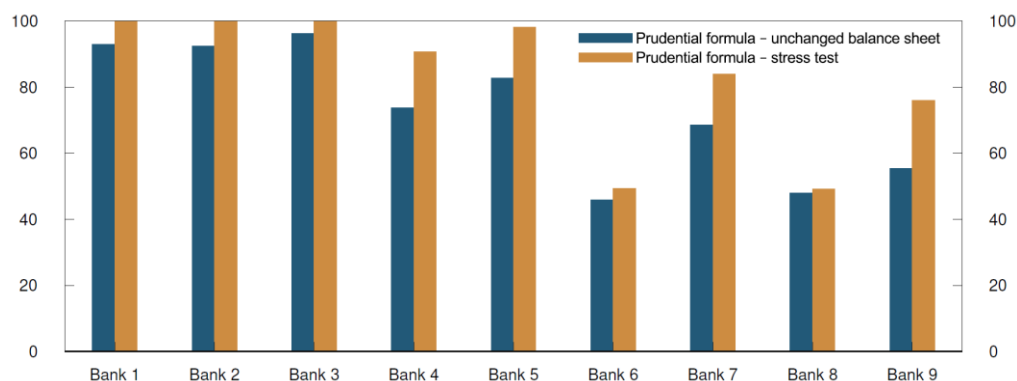
In the stress test, higher credit losses and risk weights lead to a pronounced fall in capital adequacy. Banks' losses increase sharply and at their highest amount to 2 percent of loans. This is lower than during the banking crisis at the beginning of the 1990s, but higher than during the financial crisis. The losses reduce banks' CET1 capital, and some banks' surplus capital is lost. At the same time, higher credit risk pulls up banks' risk weights somewhat. The rise in risk weights increases banks' RWA through the projection period. This contributes to weaker capital adequacy. Most banks post some profits from 2024, and capital adequacy remains broadly unchanged between 2024 and 2025.

Our starting point is the stress test's projections of banks' capital, liabilities, RWA and TEM at end-2024. We assume that banks issue so much non-preferred debt that they satisfy the most binding requirement under MREL before the downturn hits. Banks then maintain these holdings of non-preferred debt during the downturn. We also assume that senior debt that can be used to satisfy total MREL grows in pace with total senior debt.

In the stress test, banks' LR remains high above the forthcoming minimum requirement of 3 percent. We therefore focus on the overlap between the buffer requirements and MREL. Under our assumptions regarding non-preferred debt, the overlap between the buffer requirement and MREL (prudential formula) increases for all nine banks (Chart 7). Three banks must use all their remaining capital buffers and some of their surplus capital to satisfy the prudential formula.

estimates are key in the formula, including estimates of probability of default (PD) and loss given default (LGD). Risk weights increase with increases in both PD and LGD.

Chart 7 Share of capital buffers that banks¹⁾ use to satisfy MREL (prudential formula).²⁾ Largest Norwegian-owned banking groups. Percent



1) DNB Bank, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør, SpareBank 1 Østlandet, SpareBank 1 Nord-Norge, Sbanken and Sparebanken Møre.

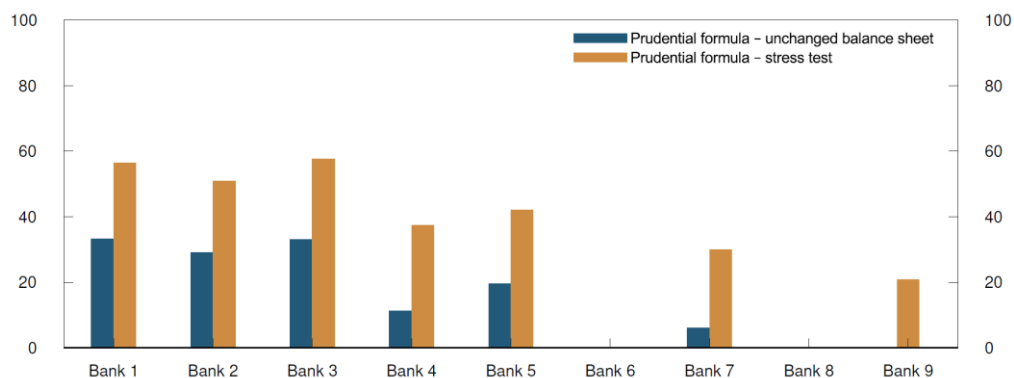
2) CCyB at 1 percent through the analysis period. Banks adjust with a margin above MREL of 1 percent of RWA in 2021.

Source: Norges Bank

The increase in overlap is driven by the rise in risk weights that raises RWA. MREL calculated using the prudential formula accounts for a larger share of RWA than the minimum risk-weighted capital adequacy requirement (see Section 2.3.2.1). When RWA rises, the holdings of CET1 capital that banks use to satisfy the prudential formula rises considerably more than holdings of CET1 capital that cover the minimum capital requirements, increasing the overlap.

If we change the assumption that banks adjust with a margin above MREL from 1 to 6 percent of RWA and assume that the CCyB is reduced to zero in 2022, banks can dip into a substantially larger share of their capital buffers without breaching MREL. Nevertheless, the overlap between the buffer requirements and MREL (prudential formula) increases for seven of the nine banks in the stress test (Chart 8). This shows that the overlap between buffer requirements and MREL may increase in bad times, especially if risk weights rise. Moreover, the calculations show that the overlap may turn out to be considerable in bad times, even when we assume that banks have previously issued so much non-preferred debt that they satisfy the prudential formula with a margin equal to 6 percent of RWA before the downturn hits. This suggests that MREL may prevent banks from dipping into their capital buffers, especially if risk weights rise.

Chart 8 Share of capital buffers that banks¹⁾ use to satisfy MREL (prudential formula).²⁾ Largest Norwegian-owned banking groups. Percent



1) DNB Bank, SpareBank 1 SR-Bank, Sparebanken Vest, SpareBank 1 SMN, Sparebanken Sør, SpareBank 1 Østlandet, SpareBank 1 Nord-Norge, Sbanken and Sparebanken Møre.

2) CCyB rate reduced from 1 percent to zero percent in 2022, and banks adjust with a margin above MREL of 6 percent of RWA in 2021.

Source: Norges Bank

6. Other procyclical effects

There may be a number of indirect effects between the buffer requirements and MREL. For example, the level of the buffers can affect the price and availability of MREL-eligible liabilities. Banks with substantial CET1 capital will normally have more ample access to senior debt and senior non-preferred liabilities, because more equity capital gives bond holders better protection against losses. Reduced capital adequacy owing to lower buffer requirements can therefore result in more expensive MREL funding.

6.1. Possible procyclical effects of funding costs

The introduction of BRRD and BRRD II mitigates the risk of bank bail-outs with taxpayer funds and increases the possibility of “bail-ins”. The credit risk will then rise on debt instruments that previously were more likely to be shielded from losses and restructuring in a bail-out. Senior non-preferred liabilities were introduced as a new debt class after BRRD was adopted. This debt instrument is lower in priority than ordinary senior liabilities. Under BRRD II, the largest Norwegian banks’ need for senior non-preferred liabilities will be determined by the prudential formula, less regulatory capital. Together with current holdings of regulatory capital, the formula implies that senior non-preferred liabilities must at least account for between 1.5 and 2 percent of banks’ liabilities and equity. During downturns with a greater probability of bail-ins, the premium on senior non-preferred liabilities may rise sharply. Even though the spread above ordinary senior debt were to widen from around 20 basis points in September 2021 to around 100 basis points, the effect of subordinated MREL on total funding costs will likely not exceed 2 basis points. The maturity of non-preferred liabilities is often five to seven years, and it will therefore take time before the full effect of a crisis is felt on banks’ funding costs. The procyclical effects should therefore be limited.

The introduction of subordinated MREL will increase funding costs somewhat more for banks persistently challenged by weak profitability and solvency, relative to other banks. This results in a slightly higher risk that such banks will face a negative spiral since they may become gradually less competitive. These banks have previously benefitted most from the implicit government guarantee, which has reduced the price of particularly risky wholesale funding. On the one hand, the requirements for non-preferred liabilities may strengthen banks' incentives to avoid high credit losses and weakened profitability. At the same time, the requirements could increase the risk that banks with already weaker earnings will choose, to the extent possible, to increase risk-taking to improve earnings. Finanstilsynet should take note of the latter possibility.

6.2. Could requirements to contribute to the resolution financing arrangement have a procyclical effect?

BRRD requires the creation of a resolution financing arrangement that can be used for bank resolution tools. The resolution financing arrangement is at the disposal of the bank resolution authority (Finanstilsynet) and can be used for tools that promote more efficient resolution of a bank (Section 20-52 of the Financial Institutions Act). For example, such tools include covering some creditors' losses in a bail-in, so that these creditors are not left worse off than if the bank had been wound up under public administration (the NCWO principle; see Section 2.3). The arrangement's resources may also be used to inject equity capital into a failing bank under resolution.

All banks must make an annual contribution to the resolution financing arrangement (Section 20-51 of the Financial Institutions Act). Banks' contributions shall total 0.1 percent of aggregate covered deposits. The resolution financing arrangement shall at least equal 1 percent of aggregate covered deposits (Section 20-50 of the Financial Institutions Act). Should the resources available to the resolution financing arrangement not be sufficient to cover losses, costs or other expenses, banks shall make the overall additional contribution needed to cover the shortfall (Section 20-51, second paragraph, of the Financial Institutions Act). Thus, the additional contribution could increase in bad times if banks need to be resolved, so that the additional contribution has a procyclical effect. But the additional contribution shall for each bank not exceed three times that bank's ordinary annual contribution. For 2020, this would have been equal in any case to NOK 3.9 billion for all Norwegian banks as a whole⁴⁴, ie around 10 percent of after-tax profits. A bank may be granted a deferment of up to six months for payment of additional contribution. Resources in the resolution financing arrangement will only be drawn on when systemically important banks are resolved. In that case, the Norwegian economy will most likely be in a downturn, and payment of additional contribution with such a short deadline will have a procyclical

⁴⁴ In our calculation of covered deposits, we have only counted covered deposits from private Norwegian firms and Norwegian households at end-2020.

effect. However, the arrangement shall have access to alternative financing sources, including borrowing, for situations where the arrangement's resources are insufficient. The arrangement can borrow amounts that can be repaid later with the aid of additional contributions after the crisis in the economy is over. In this way, a situation can be avoided where the additional contributions have a procyclical effect.

Should the resources available to the resolution financing arrangement diminish below the minimum requirement, Section 20-50, third paragraph, of the Financial Institutions Act requires banks to guarantee the shortfall. The guarantee amount for each bank shall not exceed three times its annual contribution, and the guarantee must not be redeemed until the economic crisis is over. Nevertheless, the existence of this guarantee could have a procyclical effect. This will particularly be the case if the guarantee must be counted together with RWA and/or TEM.

7. Possible government measures to reduce overlap between capital requirements

Even though the capital requirements have a well-justified purpose (see Section 2), both our analyses and the literature show that they could have unintended effects if they are satisfied with the same capital. A number of government measures can reduce the unintended effects of overlapping capital requirements. First, risk-weighted capital adequacy requirements can be made more binding by increasing the minimum capital adequacy requirement, Pillar 2 requirements, buffer requirements or risk weights. These measures can reduce the overlap for Norwegian banks if the result is that banks maintain or increase their margins above MREL. Second, the way capital requirements interact can be changed, eg by not permitting banks to satisfy the LR requirement and MREL with the same CET1 capital they use to satisfy risk-weighted capital adequacy requirements. We have not assessed the cost of these measures. Some of the measures will also require amendments to EU banking rules.

7.1. Increase risk-weighted capital adequacy requirements

The overlap between the prudential formula and the buffer requirements for Norwegian banks could be reduced by increasing risk-weighted capital adequacy requirements (see Appendix 1 for a further discussion). Most measures that increase risk-weighted capital adequacy requirements will make the prudential formula require more capital and non-preferred debt. The overlap will therefore only shrink if Norwegian banks adjust to the measures by issuing more hybrid capital, subordinated debt capital or MREL-eligible liabilities, which they are likely to do if they wish to maintain their margin above MREL. Without such adjustments by banks, the overlap between the prudential formula and the buffer requirements could increase.

Risk-weighted capital adequacy requirements could be increased by raising Pillar 2 requirements, buffer requirements and risk weights. These measures could be implemented under the current Norwegian rules. Risk weights could be raised directly or indirectly through stricter requirements for IRB models.

Risk-weighted capital adequacy requirements could also be increased by raising minimum capital adequacy requirements or introducing a general floor for risk-weighted assets. These measures require amendments to EU banking rules. The European Commission has proposed a new “output floor” for IRB banks to be phased in between 2025 and 2030. Once phased in, the new floor is intended to ensure that IRB banks’ risk-weighted assets do not fall below 72.5% of that estimated under the new standardised approach to credit risk.

7.2. Change the way capital requirements interact

The problem of overlapping capital requirements could be mitigated by changing the way capital requirements interact. One possibility is to prohibit banks from satisfying MREL and LR requirements with the same CET1 capital that they use to satisfy risk-weighted capital adequacy requirements (see Appendix 2 for a further description of how overlap is affected by changes in banks’ liabilities and capital). However, this will also require amendments to European banking rules. It would also require banks to hold more capital. On the other hand, it is the only measure that will ensure full buffer usability.

Another possibility is to require all minimum risk-weighted capital adequacy requirements and LRE to be satisfied with CET1 capital. This will raise banks’ CET1 capital adequacy requirement, among other reasons because the minimum CET1 capital requirement under Pillar 1 rises from 4.5 percent to 8 percent (current requirement for regulatory capital), but at the same time, average buffer usability will increase. While this will also require amendments to European banking rules, the rules will become simpler.

8. Conclusion

Sufficient bank capital buffers mitigate the risk that banks will amplify economic downturns. Capital buffers function as shock absorbers against higher losses, so that banks can maintain lending and other activities in bad times without breaching minimum capital adequacy requirements. But other requirements for loss-absorbing capital could prevent banks from using their buffers, especially if the consequences of breaching other requirements are more serious than the consequences of breaching buffer requirements.

In this *Staff Memo*, we analyse how different capital requirements function in Norwegian banks in bad times. The results show that the portion of MREL that the largest Norwegian banks will have to use the most CET1 capital to satisfy is risk-based subordinated MREL calculated using the prudential formula. Leverage-based MREL requirements are not binding for Norwegian banks.

The results suggest that the largest banks will have to use a substantial share of their buffer capital to satisfy MREL, ie subordinated MREL calculated using the prudential formula, at least if the banks' non-preferred debt issuance is small. This means that a number of banks could only dip into portions of their buffer capital without breaching MREL. Analyses based on Norges Bank's stress test also show that the overlap between buffer requirements and the prudential formula can increase in bad times, especially if risk weights rise. If banks consider the consequences of breaching MREL to be more serious than of breaching buffer requirements, MREL could prevent banks from dipping into their buffers.

Reductions in the CCyB and other buffer requirements will function as intended for Norwegian banks since subordinated MREL calculated using the prudential formula will be binding. The overlap between the requirements will become smaller if buffer requirements are lowered, because subordinated MREL falls with reductions in buffer requirements. In that case, banks could use the freed-up capital from buffer reductions.

The calculations show that MREL overlaps less with the capital buffers if banks issue more non-preferred debt, giving them a larger margin above MREL. This suggests that banks should issue enough non-preferred debt to enable them to draw on their capital buffers without breaching MREL.

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Appendix 1 – Effects of changes in capital requirements on overlap between requirements for loss-absorbing capital

Changes in risk-weighted capital adequacy requirements can affect how much buffer requirements overlap with other requirements. Section 1 of this appendix describes how changes in risk-weighted capital adequacy requirements can affect the overlap between LR and buffer requirements, while Section 2 discusses how higher risk-weighted capital adequacy requirements can affect the overlap with MREL.

1. Overlap between LR and risk-weighted capital buffer requirements

The overlap between risk-weighted capital buffer requirements and minimum LR requirements could be reduced by increasing the minimum risk-weighted capital adequacy and buffer requirements. Risk-weighted capital adequacy requirements could be increased either by raising Pillar 2 requirements or with measures that increase risk weights, eg by introducing a floor for risk weights or stricter requirements for IRB models. This will increase the dark blue area to the right in Chart 2 in Section 3.1 and thus reduce the purple area in the chart (the overlap). Our calculations show that an increase in RWA of at least 11 percent will remove the overlap between LR and the capital buffer requirements for all banks in Section 5.4.1. The same overlap disappears for all banks if the individual Pillar 2 requirements rise by at least 0.7 percentage point. An increase in buffer requirements will also make larger buffers available for use, ie increase the red area in Chart 2 and reduce surplus capital above the risk-weighted capital adequacy requirements (risk-weighted surplus capital).

2. Overlap between MREL and risk-weighted capital buffer requirements

Changes in risk-weighted capital adequacy requirements could affect the overlap between risk-weighted capital buffer requirements and requirements under MREL in a number of ways. The overlap between risk-weighted capital buffer requirements and leverage-based total MREL could be reduced by

increasing the risk-weighted capital adequacy requirements, eg through measures that increase risk weights. This will increase the dark blue area to the right in Chart 3 in Section 3.2 and thus reduce the overlap, ie, first the red area and then the purple area in the chart. At the same time, risk-weighted surplus capital (orange area) will fall, and the risk of breaching the buffer requirements will rise.

Increased buffer or Pillar 2 requirements reduces the surplus capital used to satisfy risk-based total MREL (see orange area in Chart 4 in Section 3.3), but increased capital requirements do not affect the usability of the capital buffers, because they come on top of total MREL. Since Pillar 2 requirements are included in both the loss-absorption amount and the recapitalisation amount, increases in Pillar 2 requirements will increase risk-based total MREL more than increases in buffer requirements. Increased Pillar 2 requirements will therefore make it more likely that a bank will have to use risk-weighted surplus capital to satisfy risk-based total MREL. The CCyB is not included in risk-based total MREL and therefore does not affect this, but a higher CCyB reduces the surplus capital that can be used to satisfy total MREL. An increase in the other buffer requirements will increase risk-based total MREL and risk-weighted capital adequacy requirements to the same extent, because these buffer requirements are included in risk-based total MREL (see formula on page 14).

Changes in CCyB and other buffer requirements entail the same changes for subordinated MREL calculated using the prudential formula, ie subordinated MREL will be an additive requirement to the capital requirements. This means that given a reduction in the CCyB, banks will be able to use the extra surplus capital they are given (Chart 5 in Section 3.4).

Appendix 2 – Effects of changes in capital composition on overlap between requirements for loss-absorbing capital

Changes in the composition of banks' liabilities and capital can affect how much buffer requirements overlap with other requirements. Section 1 of this appendix describes how changes in capital composition can affect the overlap between LR and the capital buffer requirements, while Section 2 discusses how the capital composition can affect the overlap with MREL.

1. Overlap between LR and risk-weighted capital buffer requirements

Changes in capital composition can affect the overlap between LR and the buffer requirements in a number of ways. More hybrid capital could reduce this overlap if minimum risk-weighted CET1 requirements are more binding than minimum risk-weighted Tier 1 capital adequacy requirements and total capital adequacy requirements. More hybrid capital frees up CET1 capital for the bank to satisfy LR. The dark blue area in Chart 2, which is calculated as LR

requirements less hybrid capital, will then shrink. The broken red line in Chart 2 falls correspondingly, and the orange area at left will increase correspondingly. If at the same time, risk-weighted CET1 capital requirements are more binding than the other minimum risk-weighted capital adequacy requirements, the overlap will be smaller. In this situation, more hybrid capital will not free up CET1 capital from the CET1 capital requirement, and the dark blue and orange areas at right in the chart remain unchanged. Nevertheless, the purple area, ie the overlap, will be smaller, since less CET1 capital is required to satisfy LR. Our calculations show that the overlap between LR and the capital buffer requirements in Section 5.4.1 disappears for all banks if they increase their hybrid capital by at least 35 percent.

More hybrid capital will not reduce the overlap if risk-weighted Tier 1 or total capital adequacy requirements are binding and CET1 capital used to satisfy LR is reduced to the same extent as CET1 capital used to satisfy risk-weighted capital requirements, ie just as much CET1 capital is freed up from LR and from risk-weighted capital adequacy requirements. In that case, the two dark blue areas in Chart 2 shrink to the same extent. The purple area in the chart, ie the overlap, remains unchanged.

More subordinated debt capital could increase the overlap between LR and buffer requirements if total risk-weighted capital adequacy requirements are more binding than the minimum CET1 capital and Tier 1 capital adequacy requirements. In this situation, more subordinated debt capital will free up CET1 capital used to satisfy total risk-weighted capital adequacy requirements, ie shrink the dark blue area at right in Chart 2. At the same time, CET1 capital used to satisfy LR will not be freed up, ie the dark blue area at left in the chart will remain unchanged. The purple area, ie the overlap, will then increase in size. The calculated overlap between LR and the buffer requirements in Section 5.4.1 increases in size for one of the banks, if it obtains more subordinated debt capital.

2. Overlap between MREL and risk-weighted capital buffer requirements

More subordinated debt capital, hybrid capital and MREL-eligible liabilities can reduce the overlap between risk-weighted capital buffer requirements and MREL. More MREL-eligible liabilities will increase the light blue area in Chart 3 (leverage-based total MREL), Chart 4 (risk-based total MREL) and Chart 5 (subordinated MREL using the prudential formula). CET1 capital used to satisfy leverage based total MREL will fall accordingly, ie reduce the dark blue area at right in Chart 3 accordingly. In that case, the bars at right in Chart 3 will move up to the same extent as the light blue area increases in size, and the red area and after that the purple areas will become smaller. Similarly, more hybrid capital and regulatory capital can also reduce the overlap, given that CET1 capital used to satisfy MREL falls more than CET1 capital used to satisfy risk-weighted capital adequacy requirements.

More MREL-eligible liabilities can reduce surplus capital used to satisfy risk-based total MREL, ie reduce the orange area at left in Chart 4. The bars at

right in Chart 4 will move up to the same extent as the light blue area. In that case, the overlap illustrated by the purple area becomes smaller. Similarly, more hybrid capital and subordinated debt capital can also reduce the overlap as long as just as much CET1 capital is not freed up from risk-weighted capital adequacy requirements.

More MREL-eligible liabilities also reduce CET1 capital used to satisfy subordinated MREL calculated using the prudential formula (see Section 5.4.3). In Chart 5, the dark blue area at left will be reduced to the same extent as the light blue area increases. In that case, the bars at right in Chart 5 will move up to the same extent as the light blue area increases in size and the red area and after that the purple area become smaller.

More subordinated debt capital and hybrid capital also reduces CET1 capital used to satisfy subordinated MREL calculated using the prudential formula. Our calculations show that a doubling of hybrid capital will on average reduce the overlap between the prudential formula and the buffer requirements in Section 5.4.1 by a quarter. The same overlap will almost be reduced by half if banks double their subordinated debt capital.