

MEMORANDUM



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Finansinspektionen's approach to setting the countercyclical capital buffer

Introduction

In *Nya kapitalkrav för svenska banker*¹, Finansinspektionen (FI) describes how the new capital requirements will be applied after changes to the EU's capital adequacy regulations. The capital requirements include the so-called combined buffer requirement, of which the countercyclical capital buffer is one component. In this memorandum, we present FI's approach to setting the countercyclical capital buffer for affected credit institutions and securities companies.²

The countercyclical capital buffer aims to maintain capital in the banking sector for banks to draw on during an economic downturn. This supports credit supply during crises and alleviates the economic downturn. Unlike other capital requirements, the countercyclical buffer is expected to vary over time. The level of the requirement is based primarily on the development in the credit market as a whole, unlike other capital requirements that are based on the banking system's or individual banks' risk-taking.

FI's goal is to be transparent about the considerations that guide the authority's assessments regarding the countercyclical capital buffer. Even if the actual decisions on the buffer rate are always based on an overall assessment of the specific conditions at the relevant point in time, there is a value in communicating some general principles for how FI intends to act in the future. This makes it easier for the banks to understand how we will use the instrument, which will make it function more efficiently. We have therefore chosen to present in this memorandum the considerations that guide the authority's assessments regarding the countercyclical capital buffer.

¹ FI Ref. 20-20990

² Hereafter "banks" except when referring to the legal conditions.

Background

Since 2014, FI has had a mandate to decide on a quarterly countercyclical buffer rate for the banks' exposures to Swedish counterparties. The countercyclical capital buffer was introduced in the Basel III agreement and implemented into European legislation in 2013.³ In Swedish legislation, the provisions are set out in Chapter 7 of the Capital Buffers Act (2014:966). The application of the buffer will not change significantly as a result of the banking package.⁴ However, even if FI will continue to calculate the countercyclical buffer guide on a quarterly basis, the authority now only needs to set or change the countercyclical buffer rate as needed.

According to Recital 80 in the introduction to the Capital Requirements Directive IV (2013/36/EU), the overall aim of the countercyclical capital buffer is for banks to “accumulate, during periods of economic growth, a sufficient capital base to absorb losses in stressed periods. The countercyclical capital buffer should be built up when aggregate growth in credit and other asset classes with a significant impact on the risk profile of such credit institutions and investment firms are judged to be associated with a build-up of system-wide risk, and drawn down during stressed periods.”

In addition to the framework set out in the Capital Requirements Directive IV, the European Systemic Risk Board (ESRB) has issued a recommendation with guidance for setting the buffer rate (ESRB/2014/1).⁵ Basel III, the Capital Requirements Directive IV and the recommendation state that the intention is for competent authorities to activate and raise the countercyclical capital buffer when cyclical systemic risks are being built up in order to increase the banks' resilience.

Cyclical systemic risks can be built up when optimistic economic outlooks, low pricing of risk, rising asset prices, and generous credit assessments combine and give rise to excessive credit growth. Such periods have often been followed by economic or financial crises.⁶ But high credit growth in itself does not mean that systemic risks are increasing. High lending volumes can also reflect that the outlook for the economy is genuinely positive or that firms and households have good investment opportunities. Identifying when credit growth is not only high but excessive, causing systemic risks to increase, is

³ See Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms (Capital Requirements Regulation, CRR) and Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms (Capital Requirements Directive IV).

⁴ See *Nya Kapitalkrav för svenska banker*, FI Ref. 20-20990. A translation is available at www.fi.se.

⁵ ESRB/2014/1, Recommendation of the European Systemic Risk Board on guidance for setting countercyclical buffer rates

⁶ See, for example, Jordá, Schularick and Taylor (2013) and Bridge, Jackson and McGregor (2017).

therefore an important aspect of the work for authorities that set the countercyclical buffer rate.

The aim of this memorandum is to clarify FI's overall view on how the countercyclical capital buffer should be determined in different financial phases and explain how we identify these phases:

1. during periods when systemic risks are building up,
2. during periods of economic or financial stress,
3. during periods when systemic risks are gradually decreasing,
4. during normal periods when systemic risks are neither elevated nor subdued.

The memorandum is structured as follows. The first section presents the background and the legal framework for the instrument. The second section presents the goals and overarching strategy of the countercyclical capital buffer. The third section presents how the overarching strategy should be applied during different phases of the financial cycle. The fourth section presents the indicators that FI uses to measure the scope of systemic risks.

Aim and overarching strategy for the countercyclical capital buffer

The aim of the countercyclical capital buffer is for banks to have sufficient capacity to maintain the credit supply during a crisis

FI's aim for the countercyclical capital buffer is that the Swedish banking system as a whole should have sufficient equity and loss-bearing capacity to maintain credit supply during periods of financial or economic stress. The purpose is to reduce the probability that regulatory capital requirements act as a constraint on the capacity and willingness of banks to supply non-financial firms and households with lending during crises, thus amplifying an ongoing crisis.⁷ If the capital buffer is positive when a shock occurs, FI can lower or even completely remove the buffer following a change in financial and economic conditions. This improves the banks' margin to minimum capital requirements and thus their ability to maintain the supply of credit.⁸

The buffer will not be increased in order to restrict credit growth

The primary purpose of the countercyclical capital buffer is to create a buffer enabling banks to maintain credit supply during a crisis. Increasing the countercyclical capital buffer can also indirectly restrict bank lending, particularly during periods when systemic risks are building up. This is because equity is typically a more expensive source of financing for banks than debt. A

⁷ For example, see the BIS (2010), *Guidance for national authorities operating the countercyclical capital buffer*.

⁸ The credit supply refers to the loans and the cost for the customer that banks offer given the customer's economic and financial circumstances, include their level of risk. Maintaining the credit supply does not necessarily entail maintaining the volume of credit; the demand for loans and the risk associated with firms requesting loans play a role as well.

higher countercyclical capital buffer can therefore lead to higher funding costs. For this reason, banks are likely to either raise lending rates to compensate for the higher funding costs, which may slow down credit growth, or constrain the volume of lending so that their risk-weighted assets do not increase. FI considers these constraining effects to be limited.

During normal periods, the goal is to keep the countercyclical buffer at 2 per cent.

For a number of reasons, it is important to build up the buffer at an early stage of the financial cycle:

1. There is a risk that systemic risks and financial imbalances cannot be identified in a timely manner. One reason for this is that risks may appear in the statistical record only after a certain delay.
2. According to the legislation, it normally takes twelve months for an increase in the buffer rate to enter into force. It is therefore important to begin accumulating the buffer at an early stage, when the risks are still in a build-up phase, and not when the probability that systemic risks will materialise is already high.
3. Early activation and gradual build-up make it easier for banks to adjust to a higher capital requirement, for example by withholding a larger part of their profit from dividend distribution, as compared to e.g. hurriedly issuing equity instruments or reducing their lending.

The value of a positive capital buffer in the banking system is also an important lesson from the economic crisis following the COVID-19 pandemic in the spring of 2020. FI then decided to lower the countercyclical buffer rate from 2.5 to 0 per cent, and the decision went into force on 16 March. Lowering the countercyclical buffer freed up capital so that banks could maintain their lending activity with a larger margin to other capital requirements, thereby mitigating a downturn in the economy. Authorities in countries that had not activated the countercyclical capital buffer did not have the same possibility of using it as a means to maintain credit supply during the crisis.

For these reasons, FI will henceforth strive to keep the countercyclical capital buffer at a positive neutral level. The aim is to create a capital buffer that can be used to mitigate unexpected shocks that occur before the manifestation of elevated systemic risks. This means that FI will raise the countercyclical capital buffer earlier and faster than what can be motivated by indicators for systemic risks. The countercyclical capital buffer that we will strive for during normal periods is 2 per cent. This creates room for lowering the buffer requirement during a greater interval of the financial cycle, i.e., also in cases when a shock occurs without having been preceded by a period of palpably rising systemic risks.

When the countercyclical buffer is lowered, FI aims for banks to utilise the freed-up buffer to absorb losses and maintain the supply of credit during a

crisis. It is therefore important not to raise the buffer requirement too early or quickly after a crisis. Otherwise, banks may be unwilling to use the buffer. Once the buffer has been lowered, it will only become relevant to bring the requirement back to the neutral level when the situation that triggered the lower rate has stabilised. This means, for example, that the real economy is showing clear signs of recovery and the banks have either

1. absorbed the losses incurred or
2. satisfied a temporary increase in demand for credit.

The timing for when to start raising the buffer depends on the banks' capital situations and their ability to handle a higher capital requirement without creating negative side effects.

The countercyclical capital buffer will be raised at a pace that allows banks sufficient time to meet the higher requirement

The buffer rate can be changed in multiples of 0.25 percentage points. When the buffer rate is raised, banks normally have twelve months before the higher rate goes into effect. Such a long implementation period is intended to facilitate banks' capital planning so they can reach a new capital target without resorting to drastic measures. FI normally also applies gradual increases to the buffer rate in order to give banks sufficient time to reach a new capital target. In case of an exceptionally fast or rapid build-up of systemic risk, FI can specify a shorter implementation period and may increase the buffer at a more rapid pace.

Automatic reciprocity applies for buffer rates up to 2.5 per cent.⁹ However, the limit on automatic reciprocity should not be viewed as a cap on the buffer. If systemic risks are high or growing significantly faster than what is sustainable in the long run, it may be necessary to implement a buffer rate higher than 2.5 per cent. In such cases, FI will request reciprocity from affected foreign authorities.

The countercyclical capital buffer may be lowered following a financial shock to the banking system or certain types of macroeconomic shocks

FI will primarily lower the countercyclical capital buffer in order to make it easier for Swedish banks to maintain their supply of credit. There are two main scenarios that could threaten the banks' ability to issue credit.

The first scenario is a strong financial shock resulting from an expectation of widespread credit losses that affect the entire banking system, significantly impaired financing conditions or weakened bank profitability. In other words, this scenario reflects a shock that entails the materialisation of systemic risks that justified a prior increase in the countercyclical capital buffer. In this case,

⁹ Automatic reciprocity means that foreign authorities are obligated to place the same requirements on banks under their supervision for operations that are conducted as branches in Sweden.

there is a risk that the banks' equity would be depleted such that they would no longer be able to meet the combined buffer requirement. This could force them to constrain their credit supply. FI can prevent such a credit crunch by lowering the countercyclical capital buffer. Once the crisis has subsided – i.e. when credit losses have abated, banks profitability has normalised and the economy has stabilised – FI will raise the countercyclical capital buffer back to its neutral level. FI will adapt the rate of increase to the banks' profitability and ability to meet the requirement in the longer term.

The second scenario is a macroeconomic shock that temporarily increases the demand for credit among households and non-financial firms. The economic impact of the break-out of the COVID-19 pandemic in 2020 is an example of this kind of shock. Banks will most likely not make sufficient provisions for a period of temporarily higher credit demand in their capital planning. This means that FI may need to free up sufficient buffer capacity for banks to handle the scenario. This type of situation does not necessarily mean that systemic risks have materialised. If the banks do not suffer major credit losses, it is probable that previously identified systemic risks remain elevated. If the countercyclical capital buffer was lowered from a level that was above the neutral level, this means that FI could gradually raise the buffer back to a level that corresponds to the degree of systemic risk at that point in time. However, the buffer will only be raised after the banks have satisfied the elevated demand for credit and the situation in the real economy has otherwise stabilised. Just like in the first example, FI will adapt the rate of increase to the banks' ability to meet the requirement.

FI will be cautious about lowering the countercyclical capital buffer during periods of gradually decreasing systemic risks. In order for the countercyclical buffer to be lowered, the risks must not only have decreased; there must also be an expectation that the risks will remain at these low levels. Just like with increases of the buffer rate, a decrease must be assessed to have a positive impact, for a decision to lower the rate to be considered. For example, this could mean that, in addition to lower systemic risks, FI has found evidence that the capital requirements are preventing banks from lending in a way that materially hampers economic growth.

Strategy for the countercyclical capital buffer in different situations

Risk build-up

High cyclical systemic risks refer to situations where lending to non-financial firms and households is overly excessive. Historically, this type of lending has often preceded financial crises.¹⁰ The definition of *excessive lending*, however, is often difficult to identify in advance. For example, this can apply to a situation where lending is higher than what is justified by economic

¹⁰ See, for example, Schularick and Taylor (2012).

fundamentals or when credit supply, both in terms of new lending volumes and contract terms, interacts with and fuels asset price growth and risk appetite on financial markets.¹¹ In such a situation, the banks' borrowers and other counterparties become more vulnerable to shocks, which could give rise to large negative knock-on effects for both the financial system and the real economy. If the banks meet such a shock with good capital adequacy, there is a higher probability that they will be able to maintain the supply of credit and take steps to ensure that other fundamental functions of the financial system are functioning well.¹²

In a situation where cyclical systemic risks are rising, credit markets are too expansive in relation to non-financial firms' and households' current or expected cash flows, asset values, or the degree of activity in the real economy. High credit growth, however, does not necessarily mean that credit markets are too expansive. High credit growth can be justified by improved investment opportunities, for example when the economy is in a recovery phase following a crisis. The assessment of what constitutes *too expansive* also includes the market participants that are driving growth and on what terms. A typical example of when cyclical systemic risks are high or the economy is at the top of a financial cycle¹³ is when

- credit growth is high,
- counterparties with lower creditworthiness are driving credit growth,
- the terms of credit do not sufficiently differentiate between leverage, cash flows, or other important factors of repayment capacity, and
- asset prices are high.

Cyclical systemic risks can also be considered to be elevated even if only a few of these criteria are met. One example is if credit growth is normal but the growth is primarily driven by riskier firms or households, at the same time as lending terms do not differentiate according to repayment capacity. One category that does not constitute a sign of higher cyclical systemic risks in and of itself is asset prices. For example, high asset prices can be explained by optimism about the future. But if asset prices are high at the same time as credit markets are expansive, this may instead be a sign of risk build-up.¹⁴ Along the same lines, low expected volatility and low risk premiums are signs of low risk, but they can also be signs of excessive optimism or underestimation of the risks that are associated with an expansive credit supply.¹⁵

¹¹ See, for example, Minsky (1986) and Geanakoplos (2010).

¹² See Jimenez et al. (2017) for an evaluation of cyclical capital requirements' impact on the credit supply.

¹³ See, for example, Borio (2012).

¹⁴ See, for example, Di Maggio and Kermani (2017) and Mian and Sufi (2019) for the link between expansive credit supply and housing prices.

¹⁵ See, for example, Danielsson et al. (2018) for the link between low volatility and risk build-up, in other words the so-called *volatility paradox*.

Since increases to the buffer rate are normally gradual and are implemented first after twelve months, it is important that FI identifies risk build-up at an early phase. This reduces the probability that banks will have too little capital relative to the systemic risks if a shock were to occur. It is possible, for example, that FI will choose to raise the buffer rate, or send signals that an increase is to be expected, when cyclical systemic risks are showing clear tendencies of increasing rather than when they are determined to be at an elevated level.

Since the buffer rate is normally increased incrementally, the rate will not be increased only in situations with rapid risk build-up. An increase could also be justified if cyclical system risks remain at high levels after an increase. For example, it may become relevant if systemic risks have built up quickly and the incremental approach means that the buffer rate is lower than what is justified by the level of risks, even if the risks are no longer increasing. In such a situation, there is a value in FI clearly communicating a plan for future increases in conjunction with the decision on the first increase. If the banks' uncertainty about future capital requirements can be lowered, this improves their ability to make sufficient provisions in their capital planning. This, in turn, reduces the risk of negative effects associated with increases in the requirement.

When cyclical systemic risks justify the need for a higher buffer rate, FI assesses the potential economic costs associated with a higher buffer before making a decision to raise it. This type of assessment includes, for example, the banks' ability to meet a higher capital requirement. For example, it is less likely that FI will decide on an increase if profitability in the banking system is temporarily low and many banks would need to conduct a share issue or reduce their lending to meet a higher capital requirement.

It is also important for FI to consider the interplay with other capital requirements. The implementation of the EU's so-called banking package introduces a number of changes to the capital adequacy and crisis management regulations applicable to banks. For Sweden, the leverage ratio requirement is an important change. For banks with low risk-weighted assets, the leverage ratio requirement could be the binding requirement, or it could become the binding requirement if FI lowers the countercyclical capital buffer. To ensure that the banks are sufficiently resilient and can maintain the supply of credit following a future shock, it may therefore be relevant to strive for a higher buffer rate in the future. This is one reason why FI has chosen to apply a positive neutral level for the buffer rate. However, it can also mean that the buffer rate will need to be raised above the neutral level in certain situations, in order to achieve a similar effect on the buffers the banks have at their actual disposal as under the earlier regulatory framework.

When systemic risks increase, it is also important to evaluate other instruments that FI has at its disposal. There may be measures that have been implemented and justified given structural systemic risks that also serve to dampen cyclical

systemic risks, such as e.g. other capital requirements and borrower-based measures that target households. The link to other measures is particularly important if a certain sector is solely responsible for the build-up of risk. For example, if Swedish non-financial firms in a certain sector are receiving large loans while the credit supply is constrained in other sectors and for Swedish households, the countercyclical capital buffer is less effective since it applies to all lending to Swedish counterparties.

Crisis and recovery

If a major financial shock were to occur and the banking system incurred large losses, banks' capital positions may be depleted so as to fall below the combined buffer requirement. If this happens, they need to prepare capital conservation plans and restrictions on dividend would enter into force. There are other capital buffer requirements than the countercyclical capital buffer that are also associated with systemic risk. The combined buffer requirement includes the systemic risk buffer (SRB), the capital conservation buffer (CCB) and the requirements on other systemically important institutions (OSII), all of which are intended to absorb losses in a crisis. The buffer requirements together create a loss-bearing capacity and thus increase the banks' ability to withstand a shock.

Even if banks can use these regulatory buffers, an individual bank may be unwilling to do so, for example to avoid stigma effects associated with maximum distributable amount (MDA) restrictions. One way a bank can avoid breaching the capital requirements is to decrease its lending to reduce its risk-weighted assets, thus strengthening its capital ratio. There is hence a concern that banks are less likely to draw on capital set aside for structural buffer requirements than capital that has been freed up by lowering a buffer requirement. Lowering the countercyclical capital buffer in a crisis can thus prevent banks from reducing their lending by more than what is justified by economic and financial fundamentals. There is, in other words, a value in being able to lower the countercyclical capital buffer in a crisis and thus transform constrained capital – capital that is needed to meet the capital requirements – to free capital that can be used for lending without restricting individual banks' discretion to dispose of their profits.

A typical example of a situation that justifies lowering the countercyclical capital buffer is when, due to high losses, there is a risk that large parts of the Swedish banking system might fall below the combined buffer requirement and at the same time experience significantly higher funding costs. In other words, lowering the countercyclical capital buffer is not an option if an individual bank experiences losses or funding problems due to an idiosyncratic shock. The countercyclical capital buffer could also be lowered following shocks originating outside the Swedish financial system. For example, large shocks outside the Swedish financial system (to the extent they are not offset by liquidity support from the Riksbank or another authority) could affect banks' funding costs such that the banks experience pressure on their profitability, in

turn raising the probability that several banks will breach the combined buffer requirement. The need for additional usable capital can also arise if a crisis makes it significantly more expensive to finance minimum requirements on equity and eligible liabilities (MREL). Lowering the countercyclical capital buffer can then free up capital for the banks to meet the MREL requirement without constraining their supply of credit or taking other procyclical measures.

There are other situations that also justify a lowering of the countercyclical capital buffer. One example is if credit demand increases due to a widespread shock to the real economy. FI could then lower the buffer to enable banks to meet the demand for credit, thus preventing credit supply constraints from further aggravating the situation in the real economy. A similar situation lay behind FI's lowering of the buffer rate in March 2020.

Since credit supply constraints can aggravate a negative course of events, it is important that FI is able to lower the buffer in response to a shock, particularly since forward-looking provisions for credit losses can rapidly deplete banks' capital margins to the extent that their funding costs increase. This means that it may be relevant to lower the buffer at a stage when there is clear evidence that financial markets expect credit losses to increase, but these losses have not yet been realised. When the buffer rate is lowered, the new rate goes into effect immediately. Just as a new lower buffer rate increases the banks' capital capacity, expectations of future increases, or uncertainty about the timing and pace of them, can impact the willingness of banks to use the buffer. This can counteract the aim of lowering the buffer. By law, FI must therefore specify a minimum period during which the new lower buffer rate is expected to apply.

During and immediately after a crisis, FI will also clearly communicate its risk assessment and provide guidance on future increases. By lowering banks' uncertainty about future capital requirements, it is more likely that they will view the capital made available by lowering the buffer rate as usable, and thus less likely that the credit supply will contract. After a crisis, the countercyclical capital buffer will normally be raised incrementally and at a rate that is line with normal profitability. This assumes that the situation in the banking system or the economy as a whole has stabilised. Even in such a situation it may be relevant for FI to communicate a plan about future decisions. If the plan is to raise the countercyclical capital buffer incrementally to a certain target, FI can communicate the target and a plan for future decisions in conjunction with the decision on the first increase.

FI's target level for the requirement depends on what type of crisis caused the buffer to be lowered. If the crisis entailed a materialisation of the systemic risks identified at an earlier stage, FI will gradually raise the countercyclical capital buffer to its neutral level. If the buffer was lowered to make it easier for the banks to meet a temporarily elevated demand for credit, without the previously identified systemic risks having materialised, FI may raise the requirement to a higher level.

Risk mitigation

A phase of increasing cyclical systemic risks and high debt growth, can be followed by a phase where the credit supply is excessively restrictive without there having been a crisis. The ESRB recommendations focus on increases during risk build-up and decreases during a crisis, which indirectly means that the buffer rate will be maintained as long as there are no signs that banks are finding it difficult to raise funding or that there is a crisis in the financial system. In practice, this means that the requirement will not be applied symmetrically. In order to lower the countercyclical capital buffer, there should not only be signs that the systemic risks have decreased, and be expected to remain at this lower level, but there should also be signs that the capital requirements are restricting the banks' lending activities to an extent that the real economy is negatively impacted.

An asymmetric application of the buffer requirement can be justified given the uncertainty associated with metrics and indicators of systemic risk and the large economic costs associated with a financial crisis. The economic costs of raising the countercyclical capital buffer are small in comparison to the costs of the banks not having sufficient resilience to a financial shock. FI will therefore be much more cautious about lowering the requirement when there are signs of decreasing systemic risks than about raising the requirement when there are signs of rising systemic risks. Another reason for this asymmetric application is that the lowering of the buffer rate goes into effect immediately. In other words, there is not the same need to identify decreasing systemic risks at an early phase as there is to identify a build-up of risk.

Neutral level

Neutral level refers to the level targeted during a phase when systemic risks are neither high nor increasing.¹⁶ These periods could, for instance, occur after a situation when systemic risks have materialised. It is conceivable that periods without any build-up of systemic risk will be longer in the future than they were before.¹⁷

FI will raise the rate above the neutral level only when the assessment of systemic risks justifies a countercyclical buffer higher than 2 per cent. This

¹⁶ See, for example, Bank of England "The Financial Policy Committee's approach to setting the countercyclical capital buffer." The Bank of England's strategy for the tool to set the capital buffer at 1 per cent given neutral conditions. In December 2019, the Bank of England announced that its capital buffer would instead be 2 per cent given neutral conditions.

¹⁷ One reason for this could be an outcome of the implementation of the resolution framework. The resolution framework ensures that banks' investors fully bear the losses that may arise. By removing the implicit state guarantee that previously existed for large banks, the rules aim to neutralise incentives for banks to take on risk in a procyclical manner. If the framework is applied in a reliable and consistent manner, the scope of cyclical systemic risk in the financial system will decrease in the longer term.

means that FI, when deciding on increases, will deduct the requirement's neutral level from the buffer rate deemed appropriate based on indicators of systemic risk. The introduction of an explicit neutral level does not mean that the requirement will be higher in all phases of the financial cycle; rather, only in phases when systemic risks are not high or building up rapidly.

The neutral level will also function as a floor if incremental decreases become relevant. Such a situation could occur after a longer period of risk mitigation that follows a build-up of risk (see the section Risk Mitigation above).

Indicators for monitoring risk and resilience

In order to identify, measure and follow cyclical systemic risks, FI uses a number of quantitative indicators. These indicators play a key role in FI's decision and communication regarding the buffer rate. The decisions are not mechanically tied to any level or rate of change for an individual or specific combination of indicators; rather, FI makes a comprehensive qualitative assessment based on the indicators.

As a starting point in its selection of indicators, FI uses the ESRB recommendations. The selection of indicators also reflects the literature on financial crises, which identifies a number of factors that can signal a build-up of cyclical systemic risks. The indicators presented here constitute the current point of departure for FI's assessment. The number and selection of indicators is updated regularly as new research is published, more data becomes available, the financial system develops and FI's knowledge, as well as the knowledge of other international authorities, about the impact of the tool increases.

General indicators

Situations with rising real estate values, optimism, increased risk appetite, and favourable terms of credit can lead to the private sector (households and non-financial firms) taking on more and more debt over a short period of time. When these factors combine so as to become self-reinforcing, systemic risks that can cause crises tend to be built up. One general indicator is the development of the private sector's total debt in relation to GDP. In accordance with Chapter 7 of the Capital Buffers Act (2014:966) and the ESRB recommendations, FI must use this indicator to calculate a credit gap and set a buffer guide every quarter.

The credit gap is defined as the deviation in percentage points between the actual level (of the private sector's credit debt in relation to GDP) and the underlying trend. The buffer guide is based on the credit gap and is intended to be a guide for setting the buffer rate when systemic risks are increasing. Historically, the credit gap has been used to identify periods of elevated cyclical systemic risk. However, there are some inherent weaknesses to the credit gap that make it less suitable as an indicator. One major disadvantage is that it is misleading after long periods of rapidly increasing debt. After such

periods, the underlying trend can grow in a way that is not sustainable in the longer term. A deviation between two time series that are both growing in a similar and unsustainable way thus underestimates the build-up of cyclical systemic risk. Another disadvantage is that the credit gap is less effective for signalling the need to lower the buffer rate, which the ESRB has also noted. This is because the credit gap tends to increase in a crisis. Taken together, these disadvantages mean that FI places less importance on the credit gap, along with the buffer guide, in its assessment of the buffer rate.

International authorities and the scientific community have developed alternatives to the credit gap, although they have not yet been introduced in recommendations or legislations. Two alternative general indicators of systemic risk are Growth-at-Risk (GaR) and Domestic Systemic Risk Indicator (d-SRI).¹⁸ They both serve the same purpose as the credit gap but can work better and solve some of the credit gap's problems. FI will continue to follow the development of these two indicators and in the future potentially allow them to play a greater role in decisions.

Indicators of elevated systemic risk

As previously mentioned, cyclical systemic risks are built up when different factors combine in a manner that is not sustainable in the long run. That factors that FI follows to measure elevated systemic risk are

- general debt development,
- debt burden of the private sector,
- asset prices,
- the price of risk,
- external imbalances, and
- banks' resilience.

Rapidly increasing debt has historically been a robust indicator of growing systemic risks and of predicting bank crises. In addition to the private sector's total debt in relation to GDP, FI also follows lending growth over time (one and three years) and household debt in relation to disposable income. In order to apply a forward-looking approach to the debt trend, FI also uses forecasts. In order to assess whether the debt in the private sector is sustainable, FI uses indicators of debt service payments (interest and amortisation payments) and interest payments as a share of revenue.¹⁹ Indicators for international

¹⁸ See Prasad et al. (2019) for a review of GaR, which, based on current macrofinancial conditions, estimates a probability distribution of future economic growth and thus quantifies risk outcome over time. And see Lang et al. (2019) for a review of d-SRI, which is a compilation of the change of five indicators. FI normally follows the five input indicators, and this method can help draw conclusions about the extent to which systemic risks are increasing.

¹⁹ Detken et al. (2014), Drehmann and Juselius (2014), and Tölö et al. (2018) show that the debt service ratio can be used as an early signal of financial crises and as a supplement to the assessment of growing systemic risks. The higher the debt service ratio, the less of the private

borrowing are also used as a supplement in the assessment of the debt trend in order to obtain an indication of growing external imbalances.

Real estate prices tend to be aligned with debt since real estate purchases are often financed by loans.²⁰ Since banks', households' and some non-financial firms' balance sheets are largely linked to real estate, they are vulnerable to major price corrections. Banks also use mortgages as collateral in their funding, which means that a fall in prices could lead to an increase in funding costs. To measure and follow up on the build-up of systemic risks linked to real estate values, FI uses indicators such as the change in housing prices, housing prices in relation to disposable income, commercial real estate prices, and a composite indicator to measure imbalances in the pricing of commercial real estate.²¹

During periods of high optimism and confidence about the future, different types of risk can be underestimated and thus priced incorrectly, whether consciously or unconsciously. This greater risk appetite (risk-taking) can indicate a build-up of systemic risk in general. Indicators such as the change in real share prices, the volatility on the stock market, and the risk premium on corporate bonds are used to identify such periods.²² Since countries and economic regions' financial markets are strongly interconnected, FI is following the development of these indicators for other countries and areas as well.

If resilience in the banking sector is low, it could entail deeper crises. Banks balance sheet indicators are an easy way to assess the banks' capacity to manage shocks and absorb losses. Core Tier 1 capital in relation to total and risk-weighted assets, respectively, the size of the management buffer, profitability, the share of non-performing loans, and realised losses as a share of total assets are used in the assessment of the banking system's resilience. The results from macro-based stress tests can also be used to obtain a general indication of how well the banking system is able to cope with different types of disruptions. The scenarios in the stress tests vary over time to reflect the current risk environment. Before making decisions about increases and the length of the implementation period, FI assesses the banks' ability to meet a higher buffer requirement based on their profitability. This ensures that they

sector's revenue that can be used for investments, consumption, savings and managing the impact of a shock.

²⁰ There are thus a lot of similarities between the credit cycle and the real estate price cycle; see Schüler et al. (2015) for more information. According to Grinderslev et al. (2017), a change in real estate prices has preceded a change on the credit market. Thus, the change in real estate prices also indicates future changes in banks' lending.

²¹ See, for example, Mian and Sufi (2014), Detken et al. (2014) and Jordà, Schularick and Taylor (2015), who identify the combination of rapidly growing debt and real estate prices as an indication of future bank crises and build-up of systemic risk.

²² See e.g. Danielsson et al. (2018) and Tölö et al. (2018) for how low volatility on financial markets can encourage investors to take increasingly higher risk, and Babecký et al. (2014) for how the risk premium on corporate bonds is a good indicator of increased risk-taking and an indication of the build-up of systemic risk.

are able to meet a higher buffer requirement and that the increase will not generate undesired costs.

Indicators for lowering the buffer rate

In a financial crisis, or if there is a particularly large need in the real economy, the buffer rate will be lowered. There are fewer indicators that can provide guidance for lowering the buffer rate. The decision to lower the buffer in conjunction with a financial crisis is largely dependent on expert assessments and as broad of information base as possible. The indicators FI uses most to identify financial market stress are share prices, confidence indicators, and the ECB's composite indicator for financial stress (CISS)²³ and CDS (Credit Default Swaps) spreads.

Situations may also arise that expose the banking system to a shock, where a lowering of the buffer rate could stabilise the situation. Indicators such as pricing on the inter-bank market (IBOR-IOIS), bank share prices in relation to equity, pricing of MREL instruments, share of loans with past due payments²⁴ and credit loss reserves according to the accounting standard IFRS 9 are used to get an early indication of potential problems in the banking sector. The lack of long time series for some indicators can make the assessment of the indicator's signalling capacity more difficult, which means that the interpretation needs to be combined with expert assessments.

²³ There are also other composite indicators for financial stress that may be relevant, for example the Riksbank's FCI. See "An index for financial conditions in Sweden", Sveriges Riksbank February 2020.

²⁴ Refers to the share of loans where payments are past due by between 30 and 89 days. This indicator is similar to the share of non-performing loans (over 90 days have passed without the borrower paying agreed interest and amortisation). This metric provides an earlier indication of impaired credit quality of the banks' lending portfolios, which could mean higher future costs.

Table 1: Indicators of elevated systemic risk

Indicators	Transformation	Direction for increased risks
<i>General debt development</i>		
Private sector total debt-to-GDP ratio	Annual and three-year change	+
Basel's credit gap	Level	+
Household debt-to-income ratio	Annual and three-year change	+
Lending to:		
- Private sector (MFI and marketbased funding)		
- Private sector (MFI)		
- Households		
- Non-financial firms	Annual and three-year change	+
<i>Debt burden of the private sector</i>		
Debt-service ratio		
- Private sector		
- Households	Annual and two-year percentage points change	+
- Non-financial firms		
Räntebetalningskvot		
- Hushåll	Annual and two-year percentage points change	+
- Icke-finansiella företag	Level	-
Gross interest rate margin on lending		
<i>Asset prices</i>		
House prices (single family homes and tenant-owned apartments)		
	Annual and three-year change	+
	Annual and three-year change, difference from historical average	+
House prices-to-income ratio	Annual change	+
Commercial real estate prices	Annual percentage points change and level	+
Misalignment indicator of commercial real estate prices		
<i>The price of risk</i>		
Real equity prices		
	Annual and three-year change	+
Equity volatility	Level	-
Risk premium corporate bonds	Level	-
<i>Banks' resilience</i>		
CET1 capital in relation to total assets		
	Level	-
CET1 capital in relation to risk exposure amount	Level	-
Management buffer (Excess capital adequacy)	Level	-
Total assets in relation to GDP	Two-year percentage points change	+
Return on equity	Level and annual percentage points change	-
Lending in relation to deposits		
Share non-performing loans	Level and annual percentage points change	+
Credit loss reserves (IFRS 9) in relation to total assets	Level and annual percentage points change	+
<i>External imbalances</i>		
Current account balance		
	Level	-
Foreign debt-to-GDP ratio	Annual and three-year change	+
<i>Composite indicator for systemic risk</i>		
d-SRI	Level	+

Table 2: Indicators of financial stress

Indicators	Transformation
Real equity prices	Annual change
Inter-bank market spread (IBOR-10S)	Level
CISS composite indicator	
- Equity market	
- Bond market	
- Money market	
- Foreign exchange market	Level
Equity volatility	Level
CDS spread	Level
Banks' price-to-book ratio (P/B)	
Pricing of MREL instruments	Level
Share non-performing loans (30-89 days)	Level and annual percentage points change
Credit loss reserves (IFRS 9) in relation to total assets	Level and annual percentage points change
Confidence indicators	
- PMI	
- Economic tendency indicator	Level
Share of non-financial firms with financing problems	Level

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