



# Riksbank Studies

## **COUNTERCYCLICAL CAPITAL BUFFERS AS A MACROPRUDENTIAL INSTRUMENT**

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## ■ Foreword

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The objective of the studies is to contribute knowledge and understanding of current issues or of issues that are expected to come to the fore in the near future.

This publication is a study by Reimo Juks and Ola Melander from the Riksbank's Financial Stability Department on the theme "Countercyclical Capital Buffers as a Macroprudential Instrument".<sup>1</sup>

Stockholm, 13 December 2012

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## ■ Summary

Capital requirements are a central part of banking regulation. Bank capital helps reduce the probability and severity of financial crises. The main reason for having capital requirements for banks is that unregulated banks would hold less capital than is socially optimal given the important role banks play in the financial system and the economy as a whole. The existing capital requirements are to a large degree static, so they are well suited to addressing more permanent systemic risk. However, to the extent that systemic risks vary over time, it may be desirable that capital requirements also vary over time.

### *How does the countercyclical capital buffer work?*

The Basel III framework introduces a time-varying capital requirement on top of the minimum requirement, the countercyclical capital buffer (CCyB). The requirement will be phased in gradually from 2016 to 2019. However, individual EU member states may be able to introduce the CCyB as early as 2013. The goal of the CCyB is to ensure in an efficient way that the banking sector as a whole has enough capital to carry out its main functions. In good times when systemic risks are typically building up, the CCyB should be activated to help banks build up capital. In times of adverse financial or economic circumstances, when losses tend to deplete capital and banks are likely to restrict the supply of credit, the CCyB should be released to help avoid a credit crunch. As a positive side-effect the CCyB may lead to a smoother supply of credit over the cycle.

Each country sets the buffer requirement that applies to credit exposures located in its jurisdiction. Hence banks with only domestic exposures would only be affected by the buffer set by the respective domestic authority. Banks with credit exposures to foreign countries are required to hold a buffer that reflects the composition of the bank's domestic and foreign exposures. When a country's buffer is lower than 2.5 per cent of risk-weighted assets, banks from other countries are required to hold the full buffer according to the principle of international reciprocity. National authorities can implement a buffer above 2.5 per cent if deemed appropriate in their national context. However, the mandatory international reciprocity requirement would not apply to the amount of the buffer in excess of 2.5 per cent.

### *When should the tool be used?*

The CCyB is a powerful but blunt tool since it does not discriminate between the sources of risk, but rather focuses on consequences of risks. For example, if risks were building up in specific segments of the credit market, the use of CCyB would be inefficient since it would also affect banks with no direct exposures to these segments. Instead, other instruments such as time-varying sectoral capital requirements could be used to target sector-specific risks.

Nevertheless, the CCyB tool is useful in situations where the concrete origins of systemic risks are hard to detect. Moreover, in some cases risk may originate outside of the banking sector, making it difficult for the national authorities to target directly the origins of the risk. Finally, the CCyB tool may also be effective in dealing with regulatory arbitrage and potential spill-over effects, which are more difficult to address with only risk-specific tools.

### *Indicators for activation and deactivation*

Taking decisions to activate and release CCyBs is a complicated task and requires the macroprudential authority to have sufficient analytical capacity. Firstly, there is a need to develop and then monitor the set of indicators that could guide the authority's decision to activate the buffer. Secondly, there is a need to develop a method that transforms the entry signals into the concrete size of the buffer that is required. And finally, there is a need to develop and then monitor the set of indicators that could guide the authority's decision to release the buffer.

Decisions on the activation of the CCyB should be based on a set of indicators that reflect the build-up of systemic risk, and decisions on the release should be based on indicators that reflect the level of stress in the financial sector. Entry indicators should indicate the build-up of systemic risks well in advance of an actual financial crisis. Some indicators, such as the deviation of the credit-to-GDP ratio from its long-term trend, have been useful in signalling financial crises in the past. There are also other indicators that may be useful which rely less on statistical analysis and focus instead on understanding systemic risks and the underlying mechanisms. For example, an indicator that reflects how bank lending is funded can be a useful guide in determining whether the credit growth is excessive or not. Rapid credit growth that is funded by stable sources, such as deposits, is more likely to be sustainable as compared to credit growth that is funded by unstable sources, such as short-term market borrowing.

Suitable entry indicators are not necessarily appropriate as exit indicators. A good exit indicator should reflect stress in the financial sector. One example of such an indicator in Sweden is the Swedish financial stress index developed by Sveriges Riksbank, which measures stress in the debt, equity and foreign-exchange markets.

### *How large should the buffer be?*

The size of the CCyB could be based on an assessment of the potential shortfall of capital in a stressed situation. The natural starting point would be to use stress-testing tools that allow the estimation of unexpected losses in a stressed situation. But the capital shortfall should also take into account that investors may require a higher layer of capital for a given level of unexpected losses than in normal times. Even in situations when the projected unexpected losses are relatively small, the functioning of the banking sector may still be hindered due to investors' decreased willingness to take risks.

### *Challenges*

Given the novelty of the countercyclical buffers, the macroprudential authority is likely to face a number of challenges when the buffer is implemented in practice. Among these, the most important one is for the authority to be ready to act when the crisis is still distant, but the risks are steadily building up. Therefore, the successful implementation of the CCyB relies also on the existence of a macroprudential authority which is willing to take decisions that may be unpopular.

## ■ COUNTERCYCLICAL CAPITAL BUFFERS AS A MACROPRUDENTIAL INSTRUMENT

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*The new capital requirements introduced in the Basel III framework can be divided into two components. The first component is a minimum, static capital requirement. The second component is a buffer on top of the minimum requirement. One part of the buffer is static and another part of the buffer—the countercyclical capital buffer (CCyB)—is intended to vary over time as systemic risks vary over time.*

*The aim of this paper is to provide background information on the CCyB to the general public and to highlight issues that are important for the successful practical implementation of these buffers. The paper describes the economic rationale behind capital regulation in general and the CCyB in particular, and deals with the regulatory details of the CCyB, including the Basel III framework and its implementation in the European Union. The paper also discusses general issues related to the practical implementation of CCyBs, including the types of risks that should be targeted and the interaction of CCyBs with other macroprudential tools. We also provide guidelines for decisions to activate and release the buffer and discuss possible quantitative indicators to help guide entry and exit decisions. Finally, the paper discusses some potential problems related to the implementation of the CCyBs and proposes possible remedies.*

## THE ECONOMIC RATIONALE FOR COUNTERCYCLICAL CAPITAL BUFFERS

### *Why is capital regulation needed in the first place?*

Capital regulation is a central part of the existing banking regulation. Bank capital helps reduce the probability and severity of financial crises. The main reason for the existence of capital requirements for banks is that unregulated banks would hold less capital than is socially optimal given the important role banks play in the financial system and the economy as a whole.

Banks have a key role in maintaining the three basic functions of the financial system—to mediate payments for goods and services, to convert savings to investments, and to allocate risks among those who are willing to take risks and those who are not—and all three functions are central to the functioning of the economy as a whole. As a result bank failures can have major negative consequences for the broader economy. For example, in a financial crisis the supply of credit can decline substantially. In turn lower credit availability reduces firms' ability to invest, which slows down economic growth and raises unemployment.

Moreover, banks are often closely linked and problems in one bank can easily spread to other banks and to the financial system more generally.<sup>2</sup> However, individual banks do not have any incentives to consider such negative externalities when choosing how much capital to hold. Since it is often more costly to fund banking operations through capital instead of debt, unregulated banks would thus tend to hold less capital than is optimal from society's perspective.

Banks are inherently unstable and dependent on saver confidence as the conversion of savings to investments entails short-term borrowing (demand deposits and short-term market borrowing) and long-term lending to households and firms. Even false rumours that a bank is facing problems can lead depositors to want to take their money out, which may give the bank real problems. This creates a need for deposit insurance which in turn creates a moral hazard problem (that is banks take excessive risks since they do not need to take responsibility for the consequences). Deposit insurance effectively limits the losses for depositors in case of default, and as a result

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<sup>2</sup> The links between banks can be either direct or indirect. Direct links can arise through interbank lending or derivatives exposures. Indirect links can arise if banks hold similar assets and are thus exposed to similar risks. See also Brunnermeier et al. (2009).



depositors do not require the banks to hold as much capital as they would in the absence of deposit insurance.<sup>3</sup> This also tends to make unregulated banks hold less capital than is socially optimal.

*Why are time-varying capital requirements needed?*

Minimum, static capital requirements are suitable to address permanent systemic risk. But for those systemic risks that vary over time, static requirements are not enough.<sup>4</sup> In principle it would clearly be possible to set static capital requirements at a sufficiently high level to correspond to the maximum level of systemic risk. Indeed, if there are only benefits and no costs associated with capital requirements, why not keep them at 100 per cent all the time? The problem is that capital requirements also have a social cost since they may reduce the ability of banks to create liquidity and credit by accepting deposits.<sup>5</sup> A more efficient way to handle time-varying systemic risk could therefore be to let capital requirements vary over time as well.

An example of systemic risk that varies over time arises from banks' capital management practices. As shown by Adrian and Shin (2010) banks tend to have targets for leverage ratios, that is the size of their assets relative to their capital. These targets are usually met by changes in assets and debt rather than changes in capital. Such behaviour results in a procyclical supply of credit; the financial system amplifies the business cycle by producing excessive credit expansion in upswings and exaggerated deleveraging in downturns. A positive shock to banks' capital makes banks expand credit, while a negative shock to banks' capital translates into a forced deleveraging via asset shrinkage to decrease bank debt. This can give rise to credit-driven asset price bubbles: a positive shock to bank equity leads to more bank credit which in turn pushes up asset prices, thus giving a new positive shock to bank equity and credit. Not surprisingly, such a positive feedback loop can create prolonged asset price bubbles where asset prices depart from their long-term sustainable values. Conversely, the credit cycle may push asset prices below their fundamental level in a downturn.

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<sup>3</sup> See for example Giammarino et al. (1993) and Morrison and White (2005). For simplicity, we ignore other types of government guarantees for banks. But as a general principle, any type of government guarantee would effectively lower banks' incentives to hold capital.

<sup>4</sup> For a thorough discussion of the procyclicality of the financial sector and risks, see Borio et al. (2001).

<sup>5</sup> See Diamond and Rajan (2000) for a theoretical model and Van den Heuvel (2008) for an attempt to quantify the social costs. See also Admati et al. (2011) for a general discussion of the social cost of capital requirements.

The procyclicality of the financial system tends to make systemic risk vary over time. In good times risks seem to be low and credit availability is high, but systemic risks are building up.<sup>6</sup> In bad times when risks have already materialized banks cut lending by more than necessary. Since systemic risk varies over time, it may hence be desirable that capital requirements also vary over time.

*A macroprudential approach is needed to identify and manage systemic risks*

Traditional capital regulation has a microprudential perspective, focusing on the health of individual financial institutions rather than on the health of the financial system as a whole. Countercyclical capital buffers (CCyBs) target systemic risks that this traditional monitoring cannot detect.<sup>7</sup> It does not focus specifically on individual systemically-important banks; such banks are covered by other capital charges. Instead, the CCyB has a macroprudential perspective and deals with systemic risks that can arise in the entire financial system, i.e. even in a large group of small banks.<sup>8</sup> An illustrative example below serves to illustrate what is meant by systemic risk and to explain why a microprudential perspective would fail to identify the risks.<sup>9</sup>

The example deals with idiosyncratic vs. systemic concentrations. In one scenario, a large number of small banks hold concentrated exposures, but the exposures are uncorrelated with each other (idiosyncratic concentrations). An authority having only a microprudential perspective would be concerned with the possible failure of individual institutions due to the concentrated exposure, while an authority focusing on systemic risks would be less concerned since a shock would affect only a limited number of banks with little or no systemic effects.<sup>10</sup> In another scenario, every bank has diversified, but exactly the same, exposures (systemic concentrations). An authority having only a microprudential perspective would not be concerned given that individual banks are well diversified, but an authority with a macroprudential focus would be concerned that a

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<sup>6</sup> See Borio et al. (2001) for a similar view.

<sup>7</sup> A tool similar to the CCyB that is at the disposal of a microprudential authority is the so-called Pillar 2 of the Basel framework. While Pillar 2 is used to handle bank-specific risks (e.g. inadequate internal risk management routines) and risks that individual banks pose to the financial system, the CCyB is used to protect the banking sector as a whole against systemic risks.

<sup>8</sup> See Nordh Berntsson and Molin (2012) for a broad discussion of systemic risk and the macroprudential policy toolkit.

<sup>9</sup> The procyclical tendencies of the financial system discussed in the section above is another example of systemic risk.

<sup>10</sup> Assuming here that interconnectedness between banks is limited.

shock would affect all the banks in the same way, potentially causing a systemic banking crisis.

### *The goal of the countercyclical capital buffer*

As for any other capital requirements, the general goal of countercyclical capital buffers is to ensure that banks are well-capitalized to avoid the negative externalities that otherwise would follow. More specifically, the goal of countercyclical capital buffers is to ensure in an efficient way that the banking sector as a whole has enough capital to carry out its main functions.

In times of adverse financial or economic circumstances losses tend to deplete capital and banks may want to cut credit supply. Then the CCyB should be released to help avoid a credit crunch. In good times, the CCyB should be activated to help ensure that banks enter into these adverse financial and economic times with already sufficient capital.

The use of countercyclical capital buffers may also have certain positive side-effects, but these should not be confused with the underlying purpose. For instance, they may lead to smoother credit cycles. In boom times, when systemic risks tend to build up, CCyBs would increase banks' capital requirements, which would dampen the supply of credit. In times of distress, when risks materialize, CCyBs would lower banks' capital requirements, which would stimulate the supply of credit. Any reduced procyclicality of credit would be a positive side-effect of CCyBs, but not the goal of countercyclical buffers per se.<sup>11</sup>

## THE REGULATORY DETAILS ON COUNTERCYCLICAL BUFFERS

Against the theoretical background on countercyclical buffers provided in the previous section, this section explains the CCyB regime under the Basel III framework and its implementation in the European Union.

Under the Basel III framework, there is a static minimum capital requirement of 4.5 per cent of risk-weighted assets (see Figure 1). In addition to the minimum requirement, there is a capital conservation

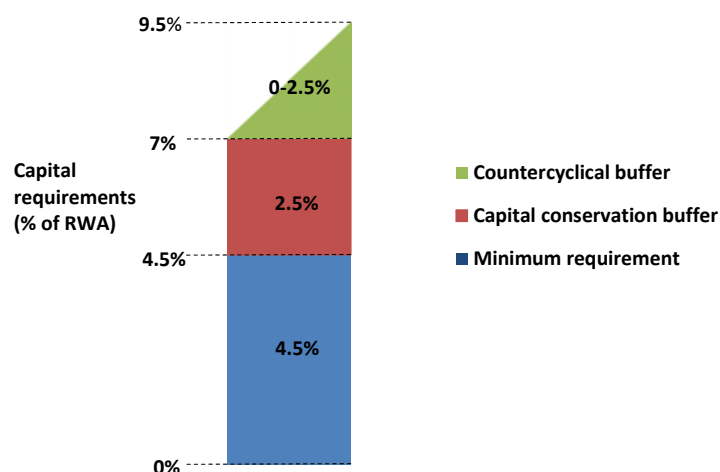
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<sup>11</sup> See also Bank for International Settlements (2010): "In addressing the aim of protecting the banking sector from the credit cycle, the countercyclical capital buffer regime may also help to lean against the build-up phase of the cycle in the first place. This potential moderating effect on the build-up phase of the credit cycle should be viewed as a positive side benefit, rather than the primary aim of the countercyclical capital buffer regime."

buffer of 2.5 per cent. On top of the minimum capital requirement and the capital conservation buffer, Basel III recommends the activation of a CCyB when excess aggregate credit growth is judged to be associated with a build-up of systemic risk.<sup>12</sup> The CCyB will be released when the systemic risk materializes or dissipates. A bank's CCyB requirement will extend the size of the capital conservation buffer. The purpose of the buffers is to help banks conserve earnings to absorb losses by introducing a "soft" capital requirement above the "hard" minimum level. Breaking the hard minimum requirement may cause a bank to lose its license, but breaking the soft capital requirement will only lead to restrictions on distributions. Internationally active banks will calculate their bank-specific CCyB requirement as a weighted average of the requirements that are applied in jurisdictions to which they have credit exposures.

In the following, the elements above will be explained in more detail.

**Figure 1. Relationship between the minimum capital requirement and buffers**



### *National CCyB requirement*

According to the Basel III framework, the CCyB requirement ranges from 0 to 2.5 per cent of risk-weighted assets (RWA). National authorities can implement a buffer requirement above 2.5 per cent if deemed appropriate, but international reciprocity is voluntary above the 2.5 per cent limit (see below for details on reciprocity).

<sup>12</sup> Since this paper focuses on time-varying systemic risks and CCyBs, other buffers dealing with structural systemic risks and systemically important financial institutions are not discussed here.

If the countercyclical buffer is increased, this should normally be preannounced by up to 12 months to give banks time to meet the higher capital requirements before they take effect. However, if it can be justified by exceptional circumstances, the pre-announcement period can be shorter than 12 months. Reductions in the buffer rate, on the other hand, would take effect immediately to help reduce the risk of credit supply being constrained.

From a technical point of view CCyB will be implemented by extending the size of the capital conservation buffer.<sup>13</sup> Banks that do not have large enough buffers will be subject to restrictions on distributions of capital, such as dividends and share buybacks. The sanctions also include restrictions on discretionary bonus payments to staff.

The distribution constraints relate to the minimum capital conservation ratios set for the capital conservation buffer. When the CCyB is zero, the capital restrictions are the same as for the capital conservation buffer. If the CCyB is 2.5 per cent, the minimum capital conservation standards are calculated on the basis of a capital buffer of 5 per cent (the sum of the CCyB and the capital conservation buffer). The minimum capital conservation standard for a bank depends on how much of the buffer the bank holds. If the bank's capital is within the first (lowest) quartile of the total buffer, the minimum capital conservation standard is 100 per cent of earnings. For banks that hold capital in higher quartiles of the total buffer, the distribution constraint is gradually loosened.

As a starting point for taking decisions regarding the size of the buffer, there is a common reference guide based on the gap between the credit-to-GDP ratio and its long-term trend. In the past, this measure would often have been an important indicator of the build-up of systemic risk, as many systemic crises are preceded by credit booms.

However, national authorities are expected to apply judgment in the setting of CCyBs after using the best information available to measure the build-up of systemic risk. Therefore, the common reference guide should be complemented with other indicators such as macroeconomic conditions, balance-sheet indicators and information from market prices.

The new CCyB under the Basel III regime will be phased in gradually in parallel with the capital conservation buffer to enable the banking sector to move to the higher capital standards while supporting lending to the real economy. All countries need to have a

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<sup>13</sup> Hence banks must meet the CCyB requirement with Common Equity Tier 1.

framework for establishing a CCyB, so that they, on a quarterly basis by 2016, can set, publically announce and enforce the size of the buffer required for exposures to their domestic markets. The requirement for international reciprocity (see below) will begin at 0.625 per cent of RWA in 2016 and gradually increase to 2.5 per cent in 2019. Countries experiencing excessive credit growth may accelerate the implementation of the CCyB and also implement a larger CCyB, but in such cases the reciprocity principle will only apply in accordance with the phase-in arrangements.

*The reciprocity principle for internationally active banks*

The reciprocity principle is a cornerstone of the Basel III framework for CCyBs. Its purpose is to protect internationally-active banks from systemic risks arising outside their home country and to avoid incentives to circumvent the CCyB. The latter is particularly important in banking systems characterized by a large share of cross-border banking.<sup>14</sup>

The reciprocity principle requires banks with credit exposures to foreign countries to hold a buffer that reflects the composition of a bank's domestic and international exposures. An authority in each country sets the buffer requirement that applies to credit exposures located in its jurisdiction. The home authority should ensure that the banks they supervise calculate their buffer requirements based on the geographic location of their exposures. For example, a CCyB decision by the Swedish authority will apply automatically to the Swedish exposures of foreign banks and, by the same token, Swedish banks' international exposures will be subject to the CCyBs set by the host authorities.

A simple example can illustrate that banks with credit exposures to foreign jurisdictions will need to hold a buffer that reflects a weighted average of a bank's domestic and international exposures. Assume that a bank with its headquarter in Sweden has exposures to two countries: Sweden and Finland. 70 per cent of the bank's risk-weighted exposures are to borrowers in Sweden while 30 per cent are to borrowers in Finland through branches. The Swedish macroprudential authority has set the CCyB to zero for exposures in Sweden, and the Finnish macroprudential authority has set the CCyB to 2 per cent for exposures in Finland. In this situation, the bank would need to have a CCyB of:  $0.7 * 0 + 0.3 * 2 = 0.6$  per cent of RWA.

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<sup>14</sup> Without reciprocity the host authority would be able to set the buffer requirement for subsidiaries of foreign banks, but branches of foreign banks would not be affected.

When a country's buffer is lower than 2.5 per cent of risk-weighted assets, branches of foreign banks are required to hold the full buffer according to the principle of international reciprocity. National authorities can implement a buffer above 2.5 per cent if deemed appropriate in their national context. This would apply to domestic banks, including domestically incorporated subsidiaries of foreign banks. However, the international reciprocity requirements would not apply to the amount of the buffer in excess of 2.5 per cent. In other words, reciprocity is mandatory for CCyBs up to 2.5 per cent, but it is voluntary for CCyBs above 2.5 per cent. As an example, assume that a bank with its headquarters in Sweden also has exposures to Finland through branches. If the Finnish authority sets a CCyB of 4 per cent for exposures in Finland, the Swedish authority can decide whether to comply with this level (voluntary reciprocity) or keep the buffer at 2.5 per cent for those exposures (mandatory reciprocity).

### *The implementation of Basel III and CCyBs in the European Union*

On July 20, 2011, the European Commission published a proposal on how to implement the Basel III agreement through new EU-wide legislation – the Capital Requirements Regulation (CRR) and a Capital Requirements Directive IV (CRD IV). The CRR/CRD IV has since then been subject to lengthy political negotiations. On May 21, 2012, the Council of the European Union published a compromise proposal.<sup>15</sup> The discussion in this section is based on that proposal. However, the Council of the European Union and the European Parliament are currently negotiating the CRR/CRD IV. Thus, it is important to remember that the final version of the CRR/CRD IV has not yet been agreed.<sup>16</sup>

The CRD proposal allows Member States to implement the countercyclical capital buffer already from 1 January 2013 (see Box 1 for international examples of buffer frameworks). According to the proposal, each Member State shall designate a public authority or body that is responsible for setting the countercyclical buffer rate for

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<sup>15</sup> See European Union (2012a and 2012b).

<sup>16</sup> There are also ongoing discussions of the European Commission's proposal to set up a Single Supervisory Mechanism (banking union). For euro area countries the proposal would transfer the control over macroprudential instruments in the field of banking, including the CCyB, to the ECB. Such a centralization of decision-making power would be problematic, especially for smaller countries. National authorities have the expertise and incentives to analyse risks to financial stability in their jurisdiction and to take appropriate macroprudential measures.

that Member State. The authority or body is called the “designated authority”.

The designated authority shall every quarter calculate a buffer guide based on the deviation of the ratio of credit-to-GDP from its long-term trend. Every quarter the designated authority shall also set the countercyclical buffer rate on the basis of:

- (i) the calculated buffer guide;
- (ii) any current guidance maintained by the European Systemic Risk Board (ESRB); and
- (iii) any other indicators that may signal a build-up of system-wide risk.<sup>17</sup>

The ESRB may provide guidance on principles to guide the authorities when exercising their judgment as to the appropriate CCyB rate, as well as on variables that indicate the build-up of system-wide risk and on variables that indicate that the buffer should be reduced or fully released.

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<sup>17</sup> The ESRB was established in December 2010 with a mandate to oversee risk in the financial system as a whole. It can issue recommendations for remedial action in response to the risks identified and, where appropriate, make those recommendations public. The ESRB recommendations are not binding. However, if an addressee does not take appropriate action in response to a recommendation it must provide adequate justification for inaction (“comply or explain”). In cases where national macroprudential policy has material cross-border effects, the ESRB may encourage countries to coordinate policy measures.



## BOX 1: INTERNATIONAL EXAMPLES OF COUNTERCYCLICAL BUFFER FRAMEWORKS

Switzerland has introduced a CCyB framework early because of concerns about the risks of cyclical imbalances developing in the domestic mortgage and real estate markets. The Swiss buffer can be implemented on a broad basis or target specific segments of the credit market. The initial focus was on a possible activation of a sectoral CCyB targeted at the domestic mortgage and residential real estate markets.<sup>18</sup>

Similarly, the UK interim Financial Policy Committee (FPC) has recommended that the statutory FPC should be responsible for setting not only the level of the overall CCyB, but also varying sectoral capital requirements to target risks in particular sectors. The UK government plans to legislate to give the FPC control over both instruments subject to the requirements imposed by EU legislation.<sup>19</sup>

While the CCyB is generally seen as a broad tool not aimed at specific sectors, the Swiss and UK examples show that time-varying sectoral capital requirements could be used as an alternative to time-varying sectoral risk weights.<sup>20</sup> The overall CCyB and the time-varying sectoral capital requirements target different types of risk, but both tools require the policymaker to have a macroprudential perspective and a focus on systemic risks. Therefore, it may be desirable for the authority responsible for the overall CCyB to also have time-varying sectoral capital requirements as part of its toolkit.

<sup>18</sup> For a more detailed discussion, see Danthine (2012).

<sup>19</sup> For the interim FPC advice, see Bank of England (2012a), and for the government proposal, see HM Treasury (2012).

<sup>20</sup> See also the discussion in section 3.1.2 of Bank of England (2011).

## FURTHER CONSIDERATIONS RELATING TO THE IMPLEMENTATION OF COUNTERCYCLICAL CAPITAL BUFFERS

Theoretical underpinnings and the legal details for countercyclical buffers described in the previous sections are useful for a general understanding of how CCyBs are intended to work. Yet, there are also a number of practical matters that are important when implementing the framework. These include, for instance, the risks that should be targeted by CCyBs and the interaction of CCyBs with other macroprudential tools.

### *Which risks should CCyBs target?*

The BIS paper that provides guidance on the implementation of CCyBs, makes a reference to excess aggregate credit growth when it discusses the build-up of system-wide risks: "The primary aim... is ...protecting the banking sector from periods of excess aggregate credit growth that have often been associated with the build-up of system-wide risk".<sup>21</sup> Unfortunately, this reference to excess aggregate credit growth creates confusion since it opens up for multiple interpretations. For instance, it raises the question of whether credit growth in itself is a cause of the systemic risk or whether it is merely a symptom of the build-up of systemic risk.

Fortunately, the underlying econometric analysis behind the BIS paper makes it clear that excess aggregate credit growth is merely one of the indicators of an upcoming crisis.<sup>22</sup> This means that neither the credit growth per se nor the systemic risk resulting from the credit growth is the main focus of CCyBs.

The main focus of CCyBs is on any time-varying systemic risk irrespective of its source or the indicators used. Needless to say, this does not rule out that some systemic risks arise from or are associated with a rapid growth of aggregate credit.

Such a relatively broad coverage of time-varying systemic risks implies that CCyBs do not necessarily treat causes, but rather deal with consequences. It also raises the issue of interaction with other macroprudential tools. Both of these issues are discussed below.

### *Dealing with consequences vs. treating causes*

It is worthwhile highlighting the following aspects in the framework of CCyBs:

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<sup>21</sup> See Bank for International Settlements (2010) p. 1.

<sup>22</sup> See Drehmann et al. (2011)

1. The focus of CCyBs is on banks. Therefore, other financial intermediaries such as professional asset managers (e.g. money market funds) and insurance companies are not directly affected by CCyBs.
2. It is only a bank's total exposure in a given jurisdiction that is used to calculate the bank-specific CCyB. Therefore, the bank's individual contribution to systemic risks is ignored.

Both of these aspects imply that CCyBs are better suited to dealing with potential consequences rather than with the underlying causes. We illustrate this aspect below with a few practical examples.

A situation may arise where a systemic risk originates outside of the banking sector (for example, because of insurance companies' excessive exposure to sovereign debt). Ideally the relevant authority or authorities should implement appropriate measures to deal directly with the source of systemic risk. But in some cases such direct measures may be delayed or insufficient to mitigate the risk. In such a situation, it may nevertheless be prudent to activate countercyclical buffers if there are good reasons to believe that banks would be negatively affected by the realization of such a risk.

Another interesting situation arises when a systemic risk originates outside of the domestic economy. Even if all banks have only purely domestic exposures and there are no concerns related to those exposures, it may nevertheless be prudent in certain circumstances to activate countercyclical buffers. The reason is that banks may be exposed to a general loss of confidence, for instance via their funding side, especially if they have many international investors. In addition, an open economy could be adversely affected via exports, thereby affecting also banks' credit losses related to lending to local export firms.

A practical case study to illustrate this point is the Swedish banks' excessive lending in the Baltic countries during the period 2005-2007. A part of the systemic risk in this context included direct losses by Swedish banks from exposures to the Baltics, which in principle could potentially have been covered by the buffers set by the Baltic authorities. But such direct losses in the Baltics also led to a general loss of confidence among investors with detrimental effects on the entire Swedish banking sector. Indeed, during the crisis of 2008-2009 even Swedish banks with no Baltic exposures were affected negatively through the lack of confidence on the international funding markets.

In retrospect, and following the broad guidelines for CCyBs, this build-up of excessive lending in the Baltics could – at least hypothetically – have qualified as a case for the activation of the buffer in Sweden. If buffers had been built up in the pre-crisis period, they could have mitigated the adverse impact of losses in the Baltics on confidence in the Swedish banking system. As a first-best solution, the relevant authority or authorities should implement other, more direct measures to deal with the source of systemic risk to the extent possible. The CCyB should only be used as a last resort and with appropriate justification.

### *Interaction with other potential instruments*

In the light of its broad coverage of time-varying risks and its focus on consequences rather than causes, it is important to understand how a CCyB interacts with other macroprudential tools.

In ideal circumstances, countercyclical capital buffers tend to be inferior to other instruments. Indeed, given that the sources and/or originators of systemic risks are detectable, it is often more efficient to treat sources rather than deal with consequences. Therefore, the case for using CCyBs must be based on certain imperfections that may arise due to:

- (i) an inability to detect the specific sources of systemic risks,
- (ii) an inability to respond to the specific sources of systemic risks  
or
- (iii) the possibility of regulatory arbitrage and the presence of spill-over effects.

In many cases, the concrete sources or origins of systemic risks may be hard to detect. For instance, a credit expansion may lead to a self-driven cycle. A general expansion of credit intermediation can lead to increasing economic activity and asset prices, which in turn may pave the way for further credit expansion and so forth. In such circumstances, the specific origins or sources of systemic risks are unclear, thus justifying the use of CCyBs.

An inability to respond to the exact sources of risk may also justify the use of CCyBs. Such an inability may for instance arise when the exact source of risk originates outside Sweden. The build-up of unsustainable public finances in normal times, similar to the one that subsequently led to the outbreak of the sovereign debt crisis in Europe, could serve as an illustrative case here.

An inability to respond may also arise from the underlying institutional setup. An authority may only be equipped with the CCyB

tool and thus fail to exert powers over other tools that may be better suited to targeting the underlying risks. For instance, the control over loan-to-value (LTV) or loan-to-income (LTI) limits and CCyBs may be separated. If the source of systemic risk stems from house price overvaluation, and the LTV and LTI tools are not used, the CCyBs could be used as a second-best solution.

The use of CCyBs rather than other instruments may also be justified by the existence of regulatory arbitrage and the interconnectedness between banks. We illustrate these points by comparing sectoral capital requirements with CCyBs. While CCyBs are applied to total exposures, these sectoral capital tools can be applied to sectoral exposures (for example residential mortgages instead of total private sector credit). In principle, changing sectoral capital requirements is equivalent to changing sectoral risk-weights.

For concreteness, let us assume that retail mortgage lending is at the heart of current systemic risk. Addressing such a risk with sectoral capital requirements is clearly efficient: those banks that focus on retail mortgage lending are causing the systemic risk and will be targeted directly by these capital requirements, while banks with no retail mortgage lending will not be affected at all by these capital requirements.

However, one problem with sectoral based capital requirements is that they require the exact definition of retail mortgage lending, which may be difficult to define. Thus, such sectoral-based capital requirements may run the risk of regulatory arbitrage.<sup>23</sup>

Another issue, perhaps more important, is that banks tend to be highly interconnected via interbank and derivative markets. Thus, even those banks that have no retail mortgage lending may suffer considerably once the losses from retail mortgage lending start accumulating. Thus, CCyBs may be also used together with other tools, in this case with sectoral capital requirements, as a back-up instrument to mitigate spill-over effects.

To summarize, the CCyB is potentially a rather powerful but also a blunt tool in terms of targeting the sources and causes of systemic risk. Its role is therefore to act as a back-up tool for and complement to other macroprudential tools and its focus is on mitigating consequences rather than on preventing the risks from arising.

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<sup>23</sup> Of course, even the general capital requirements can be arbitrated via banks' ability to change the risk-weights.

## TAKING A DECISION ON COUNTERCYCLICAL CAPITAL BUFFERS

### *The general description of optimal entry and exit*

In general, taking a decision on countercyclical buffers includes the following stages:

- monitoring the set of indicators that reflect the build-up of systemic risk
- taking a decision on the activation of the buffer and its size
- monitoring the set of indicators that reflect stress in the banking sector
- taking a decision to release the buffer

The first two stages, monitoring systemic risk indicators and taking a decision on activation of the buffer, are related to the optimal activation of the countercyclical buffer or, in short, are about entry. The last two stages, monitoring stress indicators and taking a decision on the release of the buffer, are about the optimal release of the countercyclical buffer or, in short, are about exit.

Both entry and exit decisions are conceptually simple tasks. When systemic risk is building up, the buffer should be activated or increased further if it is already activated; when systemic risk has materialized or disappeared, the buffer should be decreased or released entirely.

In practice, neither entry nor exit decisions are simple tasks. Both decisions assume that some suitable signalling indicators exist, but developing suitable indicators is not a trivial task in practice. Besides signalling variables, one also needs a method that helps transform signals into the concrete size of the buffer – also not a trivial task in practice.

### *Guidelines for entry and exit indicators*

An ideal entry indicator should:

- reflect the build-up of systemic risk inside or outside the banking sector
- indicate the build-up of systemic risk well in advance of the unfolding of an actual crisis
- be easily interpreted and transparent about the underlying drivers of risk.

The first criterion makes it clear that an entry indicator should be associated with a systemic risk. Importantly, such a risk does not have

to originate from the banking sector itself, but the banking sector must be affected by the realization of such a risk.

The second criterion deals with the appropriate timing for entry and lies at the heart of the CCyB framework. Recall that the CCyB aims to increase capital in times when markets are still hot, but systemic risks are building up. The extra capital would then be released at times of distress to help banks absorb losses. Therefore, the second criterion requires that an indicator starts signalling the build-up of systemic risk early on.

The third criterion reflects the need to communicate the buffer decisions to the general public. An indicator that is easy to interpret and that reflects the factors that drive systemic risk makes the communication with the public easier and transparent.

Clearly, entry indicators that satisfy all three requirements are hard to develop in practice. Nevertheless, the guiding principles are helpful in understanding the pros and cons associated with different indicators. For instance, market indicators such as credit market spreads usually perform well in capturing the current level of stress in the financial sector. These indicators are usually also transparent and easily explained. However, they may be less useful for setting CCyBs, since they tend to reflect the materialization of risks rather than their build-up.

Finding suitable exit indicators is considerably easier. In principle, there is only one criterion for exit indicators and that is the timely indication of considerable stress on the banking sector.<sup>24</sup> This criterion comes directly from the underlying rationale behind countercyclical capital buffers: buffers are meant to incentivize banks to hoard extra capital in normal times that can then be used to absorb losses and bolster confidence during periods of distress.

### *Illustrations of how entry could be decided*

As illustrated in previous sections, systemic risks are complex and therefore difficult to measure. In this section, we therefore illustrate how systemic risks can be measured in practice.

There are two main approaches that can be distinguished here: the reduced- and structural-form approaches. The reduced-form approach focuses on finding variables that have been useful in signalling

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<sup>24</sup> One could argue that the buffer should be released when the level of systemic risk has been reduced. Unfortunately, the entry indicators can stay high even when the actual crisis unfolds.

financial crises in the past. Such an approach is usually agnostic about the concrete mechanisms of the build-up of systemic risks and causal structures. Instead, it focuses on the ability of the indicators to predict crises in the past. An example of such an approach is the BIS standard approach (see below).

The structural-form approach instead focuses on the understanding of systemic risks and underlying causal structures. It focuses less on statistical analysis and more on theoretical arguments.

Clearly, both approaches have pros and cons. The strength of the reduced-form approach is that it is based on actual historical correlations, but it usually falls short in explaining the mechanisms and runs the risk of potential breakdowns of historical correlations. The structural approach makes it possible to consider a wide range of risks, but it is open to multiple interpretations and may fall short in supportive empirical evidence in favour of these risks.

### **The BIS standard framework**

The BIS has worked out the so-called common reference point to guide the relevant national authorities in setting the countercyclical buffer rates.<sup>25</sup> The framework is based on empirical evidence drawn from episodes of more than 40 systemic banking crises in 36 countries around the world.<sup>26</sup>

The BIS standard framework relies on the so-called credit gap, defined as the deviation of the credit-to-GDP ratio from its long term trend<sup>27</sup>. The empirical analysis conducted by the BIS shows that the credit gap has the most suitable signalling properties among a wide range of possible indicators. The credit gap tends to systematically increase as early as three to four years prior to the crisis and in addition the proportion of false signals is low.<sup>28</sup>

To make the credit gap operational, the BIS framework follows a mechanical rule to determine the size of countercyclical buffers based on the size of the credit gap (see Figure 2). When the credit gap reaches over 2 per cent, the CCyB is activated. When the credit gap is between 2 and 10 per cent, the CCyB is a linear function of the credit gap. When the credit gap is higher than 10 per cent, the CCyB is set to 2.5 per cent<sup>29</sup>.

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<sup>25</sup> See Bank for International Settlements (2010).

<sup>26</sup> See Drehmann et al. (2011)

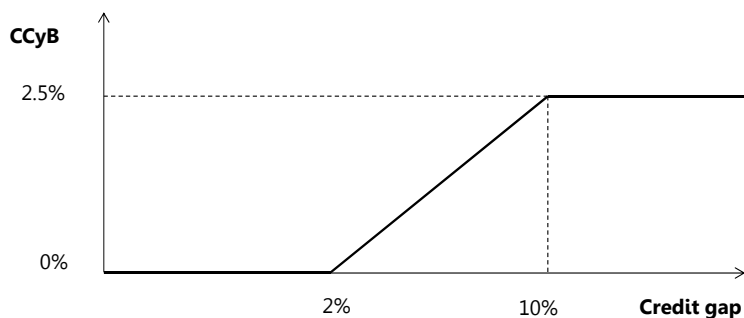
<sup>27</sup> The long-term trend is calculated using the one-side HP filter with the smoothing parameter equal to 400,000.

<sup>28</sup> See Drehmann et al. (2011).

<sup>29</sup> As this is the maximum level within the reciprocity requirement.



**Figure 2. The mapping of the credit gap to the size of the CCyB**



To apply the BIS standard framework in practice, each jurisdiction should decide the appropriate measure of aggregate credit. The BIS recommends a broad measure which in principle should include not only bank-intermediated credit, but also direct market funding by non-financial companies.

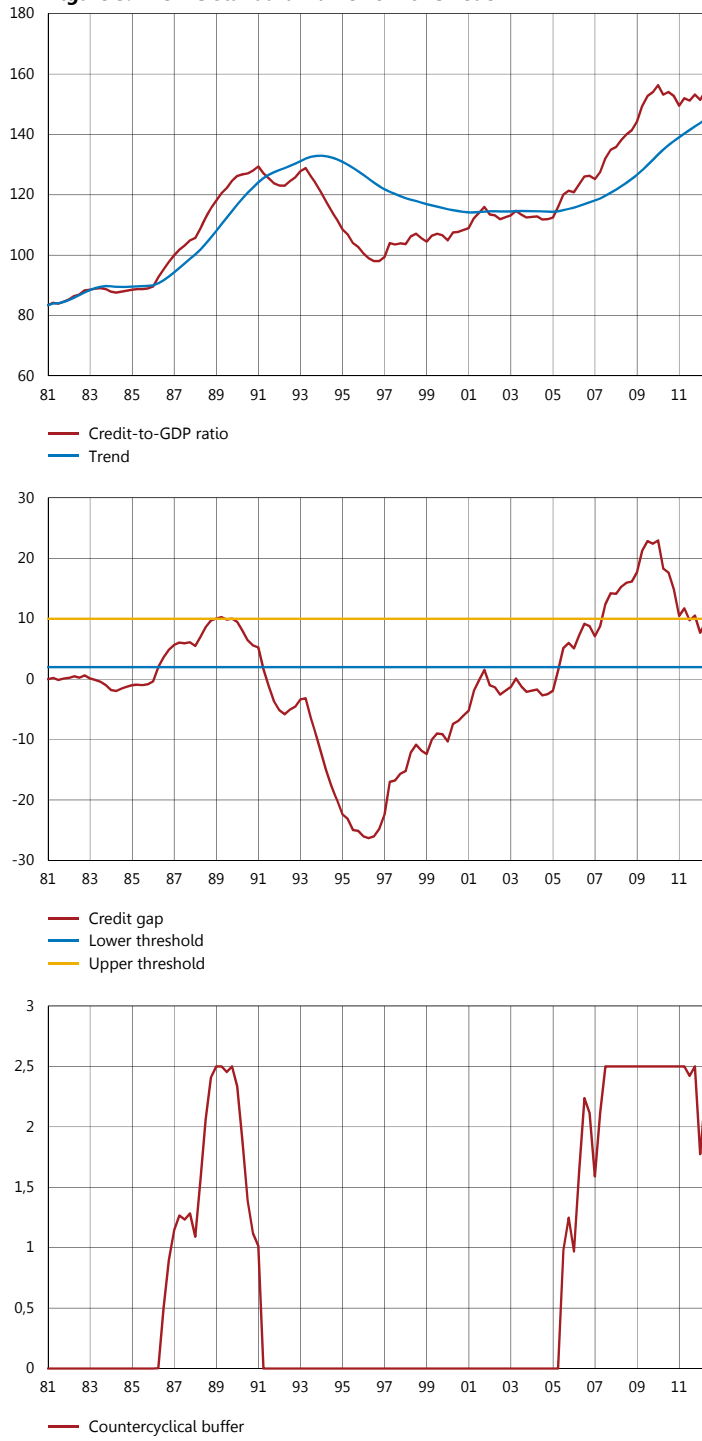
Following the BIS recommendation, the measure of aggregated credit for Sweden hence includes not only bank-intermediated credit to the non-financial sector, but also direct market funding by the non-financial sector.

The results from an implementation of the BIS standard framework for Sweden are presented in Figure 3. The first panel shows the evolution of credit-to-GDP ratio and its long-term trend during the period 1981-2012. The second panel shows the credit gap, that is the deviation of the credit-to-GDP ratio from its long-term trend, together with the lower and upper thresholds of 2 per cent and 10 per cent from Figure 2. Finally, the last panel shows the evolution of countercyclical buffer in Sweden seen from a historical perspective.

Historically, the BIS standard framework has performed well in Sweden. The buffers that result from the BIS standard framework tend to signal coming crises well in advance. In retrospect, CCyBs would have been activated in Sweden twice: in 1986, reflecting the upcoming 1990s crisis, and in 2005, reflecting the upcoming global financial crisis.<sup>30</sup>

<sup>30</sup> It is less clear that the credit-to-GDP ratio is an appropriate exit indicator, since the buffer remains at or near the maximum level throughout the global financial crisis.

**Figure 3. The BIS standard framework in Sweden**



## **Complementary indicators to the BIS standard framework**

Despite its good historical performance for Sweden, the BIS standard approach is unlikely to be used to set CCyBs on a stand-alone basis. The BIS approach has at least two shortcomings which can be remedied with complementary tools.

As pointed out above, a suitable entry indicator should be transparent to make it possible to understand why the risks increase. The BIS framework relies on aggregate credit in the economy and it is therefore unable to indicate which segment of borrowers is behind a rapid growth of aggregate credit.

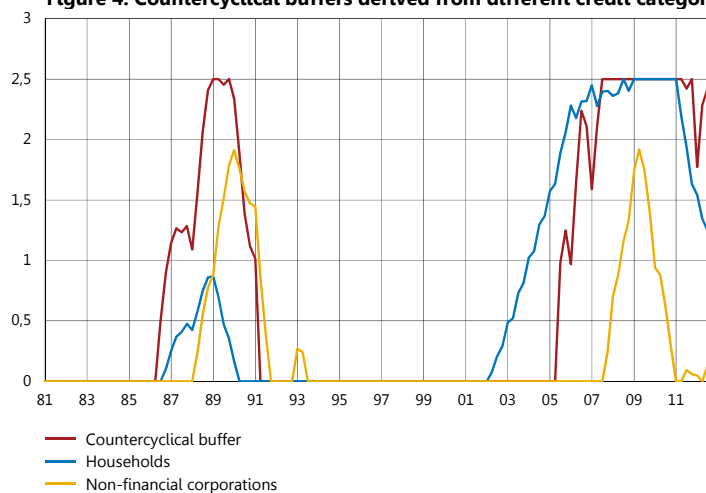
Its backward-looking nature is another shortcoming of the BIS framework. The BIS approach relies on a statistical analysis that is designed to signal the arrival of the crises we have had in the past. In other words, the framework allows us to evaluate whether there is excessive aggregate credit growth seen from a historical perspective assuming that the historically-observed correlations remain unchanged. This raises a valid question about the extent to which this indicator can be used to detect the build-up of future crises. This worry is a particular concern given that the origins of the crises tend to differ.

To remedy these two shortcomings of the BIS approach, complementary tools should be developed. Below we illustrate some tools that can serve as complements to the BIS standard approach.

The transparency issue of the BIS approach can be easily remedied by looking at the components of the aggregate credit and applying the BIS standard framework to different components separately. Such a decomposition shows explicitly which groups of borrowers are driving the buffer. This decomposition may also detect circumstances where some sectors are experiencing a rapid credit growth, but no signal is coming from the standard BIS approach.

The decomposition of the BIS standard approach for Sweden is illustrated in Figure 4. The figure shows that the 1990s crisis was primarily driven by the rapid growth of credit extended to non-financials (including the commercial real estate sector) and to a lesser degree by credit to households. Looking at the most recent global financial crisis, we can see the opposite: the buffer is driven mainly by credit to the household sector. As a matter of fact, if the buffer had been based only on household credit it would have indicated the need for the activation of the buffer already from 2002, while the buffer from the BIS standard approach would not have been activated until 2005. This illustrates the importance of such decomposition as a complementary tool to the BIS standard approach.

Figure 4. Countercyclical buffers derived from different credit categories



To remedy the second problem, that is that the BIS reduced-form approach is backward-looking and sensitive to changes in historically observed correlations, we propose a list of structural indicators that have some theoretical underpinnings.

First, one could analyse how the credit growth is funded by credit institutions. The idea comes from Shin (2010) who argues that an excessive credit growth in the economy must be reflected on the funding side. The part of lending that is based on stable sources, such as deposits, can be regarded as sustainable while the part of lending that is based on unstable sources, such as short-term unsecured debt, can be regarded as risky. In the spirit of this idea, one can decompose the lending to the public into sustainable and risky parts and then determine the size of countercyclical buffers based on the risky part.

Second, one could study the financial market's appetite for taking risks. In boom times, financial markets tend to be "over-optimistic" and heavily discount the potential for a crisis.<sup>31</sup> Therefore, a common root of excessive credit growth and a heavy reliance on unstable funding sources could be myopic financial markets. To assess over-optimism or investors myopia in practice, one could use a financial stress-index and credit spread decomposition. In the case of the stress-index, warning signals could be extracted from low levels of stress index. In the case of credit spread decomposition, warning signals could be extracted from low levels of implied risk-premiums. One way to calculate the implied risk premium is to calculate the long-term expected loss for a given debt instrument and subtract it from the total spread.

<sup>31</sup> See also Goodhart (2008) and Greenwood and Hanson (2012)

Third, one could also study the debt capacity of the real sector, particularly households. If indeed aggregate credit shows excessive tendencies and it also comes from a particular group of borrowers, then it is natural to devote further study to the debt capacity of these borrowers. For households, one way to do this is as follows. Given the level of household debt, disposable income and other parameters, one can calculate the number of years it would take households to become debt-free. The resulting outcome can then be used to evaluate excessive tendencies in household debt.

This list of indicators hence serves to illustrate potential entry indicators. The indicators mentioned above are closely linked with the BIS standard approach. It is clear that indicators that target other types of systemic risk should also be developed. These risks could include risks outside the domestic banking sector (e.g. insurance companies, foreign lending and funding), potential issues with public debt, unsustainable levels of house prices and so on. The signals from the indicators developed above should clearly also be complemented with a judgment-based assessment of financial stability issues that quantitative models cannot capture (see also Box 2 on the experience of the Swiss and UK authorities). Such risks could be search-for-yield tendencies, so-called carry trades, or broad macroeconomic imbalances to name but a few.

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## BOX 2: INTERNATIONAL EXAMPLES OF ENTRY AND EXIT INDICATORS

Both the Swiss National Bank (SNB) and the UK interim FPC have provided some guidance on the envisaged balance between rules and discretion and the role of quantitative indicators. The SNB proposals on entry and exit decisions will be based on an approach of “guided discretion”.<sup>32</sup> When a set of key quantitative indicators point to imbalances building up in the system, the SNB decision on whether to propose activation will draw heavily on the guidance provided by the indicators. For the sectoral CCyB applied to residential mortgage loans, the key indicators would include measures capturing the volume of domestic mortgage loans and domestic residential real estate prices. When the key indicators give a more mixed picture, more discretion enters the decision and a broader set of quantitative and qualitative indicators will also be used. These additional indicators include measures of banks’ risk-taking such as interest-rate risk, interest-rate margins, credit-condition indicators and leverage, as well as alternative credit and real estate price indicators.

The SNB decision to propose deactivation of the buffer would follow a similar approach. In addition to the set of key and additional indicators, higher-frequency information will be monitored on an on-going basis. However, judgment will play an important role in the decision to release the buffer.

To provide guidance about the use of CCyBs and other macroprudential tools, the UK interim FPC will identify a relatively short list of core indicators that it would review regularly, which had proved helpful in identifying previous periods of financial instability.<sup>33</sup> But given the complexity of the financial system and its tendency to evolve over time, there would be no mechanical rule and judgment would play a material role. Depending on which risks are emerging, the FPC would also need to monitor a much wider set of indicators.

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<sup>32</sup> For further details on the SNB approach, see Swiss National Bank (2012).

<sup>33</sup> See Bank of England (2012b).

### *Illustrations of how exit can be decided*

As discussed above, finding suitable exit indicators is considerably easier than finding entry indicators. Despite this, the decision to release the buffer is relatively complex.

The decision to release the buffer should counterbalance the following two aspects:

- the release should be timely to allow banks to use the capital and thereby lessen the potential risk of a credit crunch;
- the release should be such that extra capital is used to absorb credit losses rather than paid out to the owners.

These two aspects are relatively difficult to combine. To avoid a credit crunch and procyclical effects arising from capital regulations, it is wise to release the buffer when various stress indicators indicate a high level of stress on the financial sector, including the banks. On the other hand, if the buffer is released before credit losses have occurred, there is a risk that extra capital will be paid out before the losses start incurring.

Below we illustrate the exit decision with a Swedish financial stress index.<sup>34</sup> The index has two main components: spreads from money and bond markets and volatility estimates from equity and foreign-exchange markets.<sup>35</sup> A negative value of the stress-index signals that financial markets are currently experiencing better than benchmark conditions, while a positive value of the stress index signals that financial markets are currently experiencing worse than benchmark conditions. The absolute value of the index indicates how much worse or better the current situation is compared to the benchmark situation. The index itself is expressed in terms of standard deviations, so the value of the index shows how many standard deviations the current value of the stress index deviates from the benchmark conditions.

For the release, we are interested in high values of the stress index. To transform the stress index into the release signals, we can introduce lower and upper thresholds. The appropriate thresholds clearly depend on the underlying dynamics of the stress index, but for illustrative purpose we set the lower threshold equal to 2 and the upper threshold equal to 10.

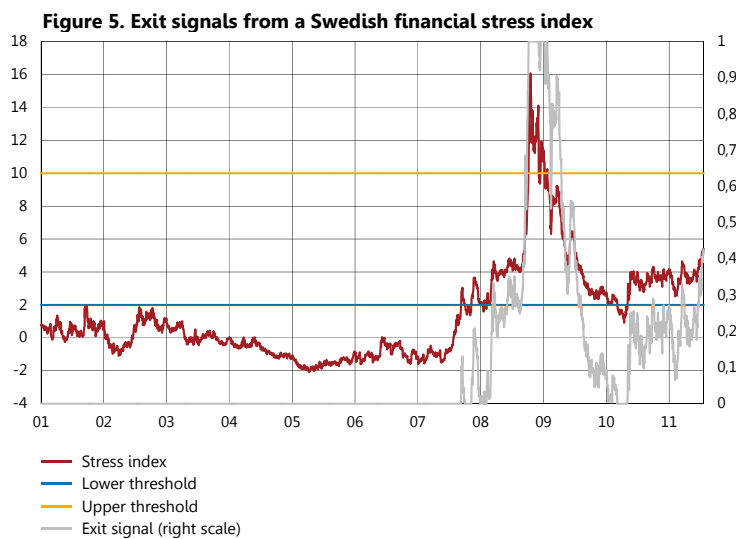
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<sup>34</sup> An alternative exit indicator for Sweden is the estimated joint probability of default for the Swedish banks (see Jönsson 2011).

<sup>35</sup> See Forss Sandahl et al. (2011).

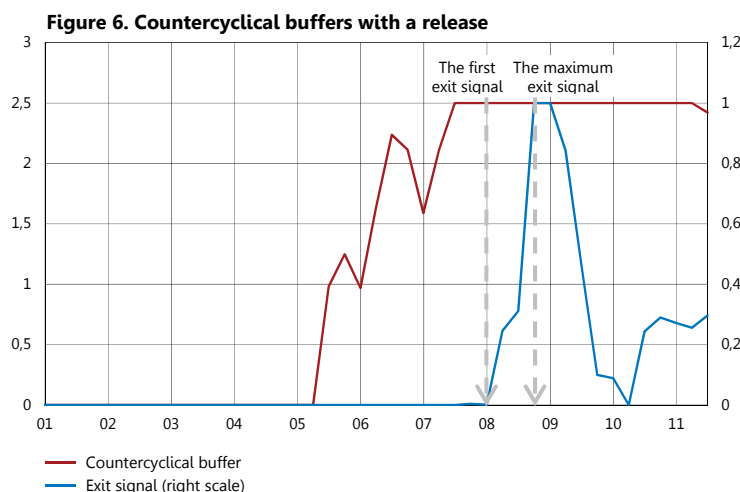
The stress index and exit signals are presented in Figure 5. Using this methodology, the first signals would arrive already from the end of 2007. The signal would stay at the medium level until September 2008 (Lehman's bankruptcy), when the signal reaches its maximum level.

To conclude the analysis we also illustrate how the entry and exit could work together (see Figure 6). The buffer from the BIS standard framework would reach its maximum in the middle of 2007 and the buffer would stay high during the period of stress 2008–2009. This illustrates that an indicator that is suitable for entry decisions may not be optimal for exit decisions. Following our exit indicator, the buffer would have been released somewhere during late 2008 and late 2009. To ensure that the buffer would have been used to absorb credit losses, it is likely that the authorities would have exercised their right to "prohibit" dividends.<sup>36</sup>



<sup>36</sup> See Bank for International Settlements (2010).





### *Deciding the size of the countercyclical capital buffers*

Previous sections focused on entry and exit indicators. While entry indicators may signal that systemic risks are building up, they do not necessarily guide the decision makers in terms of the optimal size of the countercyclical capital buffers.

Recall that the goal of CCyBs is to guarantee in an effective way that banks have enough capital to facilitate the functioning of the banking sector even during periods of distress. The reference to efficiency is important since otherwise it would be easy to achieve the goal by requiring banks to hold the buffers at the maximum level at all times.

Reflecting the need for efficiency, the optimal size of CCyBs should take into account the shortfall of capital in a stressed situation, but also take into consideration the impact on economic activity of higher capital requirements in non-crisis times.

The natural starting point with regard to the potential shortfall of capital during periods of distress is the assessment of unexpected losses that would result in a stressed situation. In practice, such an assessment could be carried out with the help of various stress-testing tools<sup>37</sup> or simply by looking at losses that banks have incurred in previous stressed times.

Another important factor in determining the potential short-fall of capital is the price of risk in times of stress. Even in situations when the projected magnitudes of unexpected losses are relatively small in

<sup>37</sup> A promising way to measure the short-fall of capital is the so-called S-RISK measure that estimates the short-fall of capital using banks' stock returns (see Acharya et al (2012)).

stressed time, the functioning of the banking sector may still be hindered due to investors' decreased willingness to take risks. In stressed times investors may require more capital for a given level of unexpected losses than in normal times. To compensate for this possibility, the assessment of the shortfall of capital should also account for investors' changed attitude towards risks in stressed times.

The issue of the impact of higher capital requirements on economic growth in non-crisis times is debated in both the theoretical as well as empirical academic literature.<sup>38</sup> However, the existing empirical evidence that is most relevant for the CCyBs shows that the activation of CCyBs in good economic times tends to have a rather small adverse impact on economic activity, while the release of CCyBs in stressed times tends to give a significant boost to economic activity.<sup>39</sup> The practical implication of this empirical finding is that the size of CCyBs should focus on the potential shortfall of capital in stressed times, which then should be activated whenever some signs of systemic risks begin appearing.

#### POTENTIAL RISKS AND PROBLEMS WITH CCYBS AND HOW TO REMEDY THEM

The CCyB is a new tool for supervisory regulators. Therefore, there are a number of issues that may arise when CCyBs are implemented in practice. We discuss some of the issues below and offer some remedies to cope with these issues.

##### 1. Late activation of the buffer

As explained above, good timing lies at the heart of the CCyB tool. In practice, it is usually easier to detect risks that have already started materializing compared with risks that are in the build-up phase. This problem is also compounded by the standard time period of 12 months between the announcement of the buffer and the actual implementation of the buffer.

The following remedies are recommended:

- The proposal for the activation of the CCyB should include an analysis of the state of the market for bank equity.
- The magnitude of the CCyB should take into account the potential for late activation.

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<sup>38</sup> See for instance Hanson et al (2010).

<sup>39</sup> See Jiménez et al. (2012).

2. Early exit of the buffer

A CCyB that banks hold in normal times should be used in a distressed situation. As the stress arrives, buffers should be released to encourage lending and avoid banks' deleveraging via the asset side. However, the timely release of the buffer at the beginning of a period of stress runs the risk that banks will use excess capital for dividend payments rather than for the absorption of credit losses that usually incur later.

The following remedies are recommended:

- To ensure that banks use their released capital to absorb losses, the authorities should seek ways to "prohibit" dividends even when the buffer is fully released.<sup>40</sup>

3. An adverse signal to the market when the CCyB is activated

The activation of the CCyB should take place when systemic risk starts building up. Paradoxically, the more convincing the case for the build-up of systemic risk, the more likely it is that the market will price in such risks, making it more expensive for banks to raise the level of capital by issuing equity.

The following remedies are recommended:

- An early detection of risks and activation of the CCyB makes this concern less of a problem.
- The communication strategy can take into account such a risk. The macroprudential authority and explain that an early activation of the CCyB should make the banking sector more resilient, thus minimizing the potential problem.

4. Distortive effects

A central feature of the CCyB is that it focuses on consequences rather than on the exact causes of systemic risk. In practice, this means that even banks with no direct contribution to systemic risk will be affected by the CCyB. This can lead to adverse consequences, such as distortions in the allocation of bank lending. For instance, a bank that focuses mainly on corporate lending will be affected by the CCyB that, say, is motivated by risks with retail mortgage lending.

The following remedies are recommended:

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<sup>40</sup> See Bank for International Settlements (2010).

- Other instruments that target specific sources of risk should be used whenever possible. The CCyB may be used together with other, more specific tools as a back-up instrument to mitigate possible spill-over effects.

#### 5. Non-binding CCyB

In some cases, banks may already hold a buffer over the minimum capital requirements. If this is the case, the activation of CCyB may not be binding for the banks.

The following remedies are recommended:

- A non-binding CCyB does not necessarily have to be problematic. If banks already hold capital that is deemed sufficient to guarantee the function of the banking sector in stressed times, activation of the CCyB will only reduce banks' capital that is over the regulatory requirements. However, if the level of capital that banks hold is less than is deemed sufficient, authorities can increase the CCyB to the level that makes capital requirements binding.

#### 6. Inaction

When the CCyB is used in practice the costs will be immediate while the benefits tend to accrue in the future. The costs will also be observable to the general public in terms of a higher price and lower availability of credit while the benefits in terms of a more resilient financial system are unobservable and not well understood by the general public. Such an asymmetry may lead to a situation where the authority in charge of the CCyB may fail to use the CCyB when it is needed.

The following remedies are recommended:

- The CCyB tool should be given to an authority that is not under immediate political influences.

#### 7. Increasing systemic risk

In some cases, the activation of the CCyB may cause systemic risks to increase. For instance, systemic risk can arise outside of the banking sector, say in the shadow banking system. In this case, increasing capital requirements for banks makes banks less competitive vis-à-vis the shadow banking system, thus leading to increased systemic risk.

The following remedies are recommended:

- The activity in the shadow banking system should be closely monitored and, if possible, suitable remedies should be undertaken.<sup>41</sup>

8. Difficult to identify “bad” credit booms

Studies by the International Monetary Fund (2011) and Dell’Ariccia et al. (2012) find that it is difficult to tell “bad” from “good” credit booms in real time. Rapid credit growth can be a leading indicator of financial instability, if it is associated with an asset price bubble or a lowering of bank lending standards, but it can also be a healthy response to expected future productivity gains. Analysis using a macroeconomic model including financial frictions and a banking sector shows that strong and persistent credit booms that are associated with sharp asset price increases, a sustained worsening of the trade balance, and a marked deterioration of bank capitalization are often indicative of future financial instability (International Monetary Fund (2011)). However, Dell’Ariccia et al. (2012) find that the significance of the additional indicators disappears when controlling for the presence of a credit boom. For example, while asset prices grow much faster during credit booms than in normal times, they grow at about the same pace during both good and bad booms. The only robust finding is that the probability of future financial instability is higher for booms that are large and long-lasting.

The following remedies are recommended:

- The set of entry indicators should be updated as more scientific evidence arrives.

9. Market capital requirements

In a financial crisis market capital requirements may be higher than the capital requirements set by the supervisors. As a consequence, the release of CCyBs in periods of stress may only have a limited impact on the lending capacity of banks.

The following remedies are recommended:

- Whether or not the release of the CCyBs is effective in curbing the credit crunch depends on the size of the CCyB.

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<sup>41</sup> See for instance, Hanson et al (2010) for a proposal how to regulate the shadow banking system.

Therefore, the size of the CCyB should be set so that it can account for the increased market requirements together with unexpected credit losses that accumulate in stressed times.

## CONCLUDING REMARKS

The countercyclical capital buffer is an important new instrument in the toolkit of a macroprudential authority. Its strength lies in its time-varying feature that gives regulators the flexibility to efficiently deal with time-varying systemic risks.

The most recent global financial crisis as well as previous crises have shown that risks tend to build up over a long period of steady economic growth, while they materialize relatively fast in a downturn. To ensure that banks have enough capital to support lending to the real economy even during periods of financial stress, countercyclical buffers are meant to be activated in boom times, ideally several years before the upcoming distress.

An authority that is responsible for the countercyclical capital buffers should have in place appropriate analytical tools that allow well-grounded entry and exit decisions on countercyclical capital buffers. While the entry decisions should be based on various statistical as well as theory-based indicators that reflect the build-up of systemic risks, the exit decisions should be based on indicators that reflect the level of stress in the financial sector. The size of the buffers should take into account the shortfall of capital in a stressed situation, which in turn could be estimated with the help of various stress-testing tools.

Given the novelty of the buffers, the macroprudential authority is likely to face a number of challenges when the buffer is implemented in practice. Among these, the most important is to be ready to act when the crisis is still distant, but the risks are steadily building up.

## REFERENCES

1. Acharya, V., Engle, R., and Richardson, M., 2012, "Capital Shortfall: A New Approach to Ranking and Regulating Systemic Risks," *American Economic Review*, Vol. 102, No. 3, pp. 59-64.
2. Admati, A., DeMarzo, P., Hellwig, M., and Pfleiderer, P., 2011, "Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is not Expensive," Rock Center for Corporate Governance at Stanford University Working Paper No. 86.
3. Adrian, T. and Shin, H., 2010, "Liquidity and Leverage," *Journal of Financial Intermediation*, Vol. 19, No. 3, pp. 418-437.
4. Aiyar, S., Calomiris, C., and Wieladek, T., 2012, "Does Macroprudential Leak? Evidence from a UK Policy Experiment," Bank of England Working Paper No. 445.
5. Bank of England, 2011, "Instruments of macroprudential policy," Discussion paper, December.
6. Bank of England, 2012a, Record of the Interim Financial Policy Committee Meeting held on March 16.
7. Bank of England, 2012b, Record of the Interim Financial Policy Committee Meeting held on September 14.
8. Bank for International Settlements, 2010, "Guidance for national authorities operating the countercyclical buffer," December.
9. Borio, C., Furfine, C., and Lowe, P., 2001, "Procyclicality of the Financial System and Financial Stability: Issues and Policy Options," BIS Paper No. 1.
10. Brunnermeier, M., Crockett, A., Goodhart, C., Persaud, A., and Shin, H., 2009, "The Fundamental Principles of Financial Regulation," London, Centre for Economic Policy Research.
11. Danthine, J., 2012, "Taming the Financial Cycle," Speech held at the 30<sup>th</sup> SUERF Colloquium, Zurich, September 5.
12. Diamond, D. and Rajan, R., 2000, "A Theory of Bank Capital," *Journal of Finance*, Vol. 55, No. 6, pp. 2431-2465.
13. Drehmann, M., Borio, C., and Tsatsaronis, K., 2011, "Anchoring Countercyclical Buffers: the Role of Credit Aggregates," BIS Working Paper No. 355.
14. European Union, 2012a, Proposal for a Regulation of the European Parliament and of the Council on Prudential Requirements for Credit Institutions and Investment Firms, Council of the European Union, No. 10099/12.
15. European Union, 2012b, Proposal for a Directive of the European Parliament and of the Council on the Access to the Activity of



Credit Institutions and the Prudential Supervision of Credit Institutions and Investment Firms and Amending Directive 2002/87/EC of the European Parliament and of the Council on the Supplementary Supervision of Credit Institutions, Insurance Undertakings and Investment Firms in a Financial Conglomerate, Council of the European Union, No. 10100/12.

16. Forss Sandahl, J., Holmfeldt, M., Rydén, A., and Strömquist, M., 2011, "An Index of Financial Stress for Sweden", *Sveriges Riksbank Economic Review*, No. 2, pp. 49-67.
17. Giammarino, R., Lewis, T., and Sappington, D., 1993, "An Incentive Approach to Banking Regulation," *Journal of Finance*, Vol. 48, No. 4, pp. 1523-1542.
18. Goodhart, C., 2008, "The Background to the 2007 Financial Crisis," *International Economics and Economic Policy*, Vol. 4, No. 4, pp. 331-346.
19. Greenwood, R. and Hanson, S., 2012, "Issuer Quality and the Credit Cycle," Working Paper No. 11-065, Harvard Business School.
20. Hanson, S., Kashyap, A., and Stein, J., 2011, "A Macroprudential Approach to Financial Regulation," *Journal of Economic Perspectives*, Vol. 25, No. 1, pp. 3-28.
21. HM Treasury, 2012, "The Financial Services Bill: the Financial Policy Committee's Macroprudential Tools," September.
22. Jiménez G., Ongena, S., Peydró, J., and Saurina, J., 2012, "Macroprudential Policy, Countercyclical Bank Capital Buffers and Credit Supply: Evidence from the Spanish Dynamic Provisioning Experiments," Barcelona GSE Working Paper No. 628.
23. Jönsson, K., 2011, "A Systemic Risk Indicator for the Swedish Banking System," Economic Commentaries, Sveriges Riksbank.
24. Morrison, A. and L. White, 2005, "Crises and Capital Requirements in Banking," *American Economic Review*, Vol. 95, No. 5, pp. 1548-1572.
25. Nordh Berntsson, C. and J. Molin, 2012, "Creating a Swedish Toolkit for Macroprudential Policy," Riksbank Studies, Sveriges Riksbank.
26. Shin, H., 2010, "Macroprudential Policies Beyond Basel III", Policy Memo.
27. Swiss National Bank, 2012, "Implementing the Countercyclical Capital Buffer in Switzerland: Concretising the Swiss National Bank's Role," Fact Sheet, June.

28. Van den Heuvel, S., 2008, "The Welfare Cost of Bank Capital Requirements," *Journal of Monetary Economics*, Vol. 55, No. 2, pp. 298-320.





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