

To ensure that the banking sector has enough capital to support the real sector, even during times of stress, it may be efficient to vary the capital requirements over time. With a help of the countercyclical capital buffer, authorities can increase the capitalisation of the banking sector in good times, when risks may be building up. The capital thus accumulated could then be used to absorb losses in stressed times, bolstering confidence in the banking sector and supporting banks' services to the real sector. To ensure international consistency and transparency, the Basel Committee on Banking Supervision has worked out a method to serve as a common starting point in setting countercyclical buffer rates. In this Commentary, the author illustrates how this method could be applied in Sweden.

An application of the Basel standard method for the calculation of the countercyclical capital buffer rate in Sweden

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Introduction

When times are good, credit institutions and their investors tend to underestimate the risks they take. General optimism about future prospects lowers lending standards and reduces the cost of credit. The booming economy is stimulated even further by abundant financing opportunities, making investors' initial assessment of low risks self-fulfilling in the short and medium term. Meanwhile, this increased lending, at times with poor credit quality, continues to accumulate. Once the economic and financial cycle turns, credit institutions and their investors become cautious. Investors require a higher level of capital in credit institutions, which these institutions may meet by scaling down their lending to the real sector. Credit institutions' reduced willingness to lend depresses the economic conditions even further, amplifying the initial fall in the credit quality of households and non-financials.

The narrative above is perhaps too simplistic to describe all financial and economic cycles in the past. Yet it carries a simple but strong economic message: capital is especially valuable when times are bad. To ensure that the banking sector also has enough capital to support the real sector during times of stress, it may be efficient to vary capital requirements over time. This is exactly what the countercyclical capital buffer aims to do. During good economic times, when optimism is widespread but system-wide risks² may be building up, the countercyclical capital buffer requires banks to build up capital. During the downturn, the capital buffer is released and this released capital acts as a shock absorber, bolstering confidence in the banking sector and supporting the banks' services to the real sector.

The timing and size of the countercyclical capital buffer is important for the success of this new instrument. To help national authorities set the buffer rates, as well as to ensure international consistency and transparency, the Basel Committee on Banking Supervision has worked out a method to serve as a common starting point in setting countercyclical buffer rates. Even though the method does not need to play a dominant role in taking and explaining buffer decisions, the authorities should maintain a buffer guide that includes the information on the countercyclical buffer rates obtained from the Basel standard method.

This article illustrates how the Basel standard method could be applied in Sweden. We start by explaining the role of the countercyclical capital buffer in the new capital adequacy regulations. We then move on to discuss how the size of the countercyclical capital buffer is decided and how the buffer decisions affect individual banks. Finally, we apply the Basel standard method to Sweden and show how the major Swedish banks could have been affected.

1. The author would like to thank Ola Melander, Jonas Niemeyer, Olof Sandstedt, Martin W Johansson, Joanna Gerwin, Cecilia Roos-Isaksson, Louise Oscarius, Erik Lenntorp, Elias Bengtsson and Kristian Jönsson for their valuable comments.

2. System-wide risk is a risk that the entire banking sector fails to function. For a more detailed discussion of systemic risks, see for instance, Juks and Melander (2012), "Countercyclical capital buffers as a macro-prudential instrument", Riksbank Studies.

The countercyclical capital buffer is a time-varying capital adequacy requirement

The countercyclical capital buffer (denoted as the CCyB) is a part of the new capital adequacy requirements for banks, introduced by the Basel Committee on Banking Supervision as part of the comprehensive reform package known as Basel III.³ According to Basel III, the new capital adequacy requirements consist of the minimum requirements and the buffers. Like the minimum requirements, the buffer requirements are expressed as a percentage of total risk-weighted assets.

The minimum capital requirements, as the name suggests, represent capital adequacy requirements which banks are required to meet at all times. The capital buffers, however, represent a more flexible form of capital adequacy requirement. When banks have enough capital to meet the minimum requirements, but not enough to fully meet the buffer requirements, they are required to build up capital by limiting their discretionary payouts, such as dividends. This tends to make the capital adequacy regulation more flexible and operational in times of distress when unexpected losses accumulate rapidly and banks may limit their lending in fear of breaching the minimum requirements.

Among the buffer requirements are conservation and countercyclical capital buffers (see Figure 1)⁴. A distinguishing feature of the two capital buffers is how they vary over time. While the size of the conservation buffer rate is predetermined and constant over time, the size of the CCyB rate varies over time. This time-varying feature is at the heart of the CCyB, as it ensures, in an efficient manner, that banks have enough capital to support their activities, even in times of stress. When system-wide risks are building up during a boom, the size of the CCyB rate is meant to be increased which, in turn, requires the banks to strengthen their capital positions. When systemic risks materialise, the size of the CCyB rate is meant to be decreased to allow the banks to absorb any losses and help avoid credit supply constraints.⁵

How is the size of the countercyclical capital buffer rate decided in a given country?

The countercyclical capital buffer will be phased in globally between 2016 and 2019, but in the EU context it could be introduced earlier.⁶ Each country will be responsible for setting the countercyclical capital buffer rate that applies to exposures in its country. The decision to activate the buffer should be based on an assessment of the build-up of system-wide risks, especially risks associated with aggregate credit growth, as well as on the guidance obtained from the Basel Committee and, in the EU context, the European Systemic Risk Board (ESRB).⁷ The decision to release the buffer should be based on the assessment of financial stress.

In practice, the assessment of the build-up of system-wide risks means monitoring various indicators of system-wide risk, interpreting the signals received from these indicators and, finally, taking a decision on the concrete size of the countercyclical capital buffer rate. The authorities may maintain a wide range of indicators to reflect the complex nature of system-wide risks. The authorities may also use statistical tools, as well as their judgment, to interpret signals from various indicators when deciding the size of the countercyclical buffer rate.


3. See BIS (2011), "Basel III: A global regulatory framework for more resilient banks and banking systems".

4. The figure serves an illustrative purpose and is a simplified version of the total capital adequacy requirements under Basel III. The figure excludes other buffers, such as those designed for the systemically important financial institutions. The figure also refers only to the capital adequacy requirements that apply to the highest level of capital, Common Equity Tier 1 capital. For the information on all capital requirements, see BIS (2011), "Basel III: A global regulatory framework for more resilient banks and banking systems".

5. The release of the countercyclical buffer may be problematic. For the more detailed discussion of the release, see for instance Juks and Melander (2012).

6. The exact implementation of Basel III on the EU level is regulated by new, EU-wide legislation – the Capital Requirements Regulation (CRR) and the Capital Requirements Directive IV (CRD IV). According to the draft of CRR/CDR IV, each Member State shall designate a public authority or body that is responsible for setting the countercyclical capital buffer for its country. For more information, including the exact time-line, see Council of the European Union (2013), "Revised capital requirements rules (CRD IV)", 2011/0203 (COD), available at <http://register.consilium.europa.eu/pdf/en/13/st07/st07746.en13.pdf>.

7. For a more comprehensive discussion of how the countercyclical capital buffer rate is decided, see, for instance, Juks and Melander (2012), "Countercyclical capital buffers as a macro-prudential instrument", Riksbank Studies.



At the same time, it is important to ensure a certain international consistency, as well as to give various stakeholders a better understanding of the potential size of the countercyclical buffer rate. The authorities are therefore also expected to calculate a buffer guide. This guide should reflect the assessment of the risks that are associated with the credit cycle and excess credit growth. The main indicator in this assessment should be the credit gap, which is defined as the difference between the ratio of credit-to-GDP and its long-term trend⁸. The credit gap is a useful common reference point, but it does not need to play a dominant role in taking and explaining buffer decisions.

The idea of using the credit gap in setting the countercyclical capital buffer rates comes from the Basel Committee. Drawing on empirical evidence from episodes of more than 40 systemic banking crises in 36 countries around the world, the Basel Committee found that the credit gap tended to systematically increase as early as three to four years prior to the crisis and, in addition, the proportion of false alarms⁹ was low.

To make the credit gap operational, the Basel Committee proposed a quantitative rule that links the size of the credit gap to the size of the countercyclical buffer rate (see Figure 2). When the credit gap exceeds 2 per cent, the countercyclical buffer is activated. When the credit gap is between 2 and 10 per cent, the countercyclical buffer rate is a linear function of the credit gap. When the credit gap is higher than 10 per cent, the countercyclical buffer rate is set at 2.5 per cent.¹⁰

The Basel standard method for calculating the size of the countercyclical buffer rate is appropriate in the build-up phase. It is less suitable for the release of the buffer. As the credit gap may actually increase during times of distress, when GDP is either falling or growing slowly, the Basel standard method may misleadingly indicate the need to increase rather than release the buffer during such times of distress. In other cases, the credit gap may actually turn negative, even though the ratio of credit-to-GDP stays at elevated levels due to the mechanical nature of the trend¹¹. Hence, especially for periods of financial stress, the actual buffer rate set by the authorities is likely to deviate from the buffer rate implied by the Basel standard method. Other, high-frequency indicators, as well as judgment, are likely to be very important during such periods.

How is the countercyclical capital buffer rate calculated for individual banks?

The calculation of the CCyB rate for each bank depends on the CCyB rates in the countries where it has relevant credit exposures^{12,13}. Banks with only domestic credit exposures would have a CCyB rate that is equal to the CCyB rate set by the respective domestic authority. Internationally-active banks also having credit exposures outside their home countries would have a CCyB rate that would partially depend on the CCyB rate in the home country, but also on the CCyB rates in countries where they have credit exposures.

We illustrate the calculation of the CCyB rate for internationally-active banks with a simple example. Consider a hypothetical bank that has 80% of its credit exposure in its home country and 20% of its credit exposure in a foreign country (see Table 1). Assume further that the home authority has decided a buffer rate for its jurisdiction that is equal to 1%, while the foreign authority has decided a buffer rate for its

8. The trend is calculated as a one-sided HP filter with the smoothing parameter of 400,000. For more information, see BIS (2010), "Guidance for national authorities operating the countercyclical capital buffer" and Drehmann, M., Borio, C., and Tsatsaronis, K. (2011), "Anchoring Countercyclical Buffers: the Role of Credit Aggregates," BIS Working Paper No. 355.

9. A false alarm is a signal of a crisis approaching when no crisis is actually approaching.

10. It should be noted that the CCyB rate can be set higher than 2.5 per cent if this is justified by the underlying risks.

11. This trend calculation implicitly assumes that any level of credit-to-GDP ratio can be or could become sustainable. Thus, if the credit-to-GDP ratio has stabilised at a high level after a period of rapid credit growth and large credit gap, the trend tends to catch up the credit-to-GDP ratio.

12. The relevant credit exposures are calculated in the form of risk-weighted assets that derive from credit and market risk. For more information, see BIS (2011), "Basel III: A global regulatory framework for more resilient banks and banking systems" and Council of the European Union (2013), "Revised capital requirements rules (CRD IV)", 2011/0203 (COD), available at <http://register.consilium.europa.eu/pdf/en/13/st07/st07746.en13.pdf>.

13. It is the country of the residence of the borrower that should be taken into account when the location of the exposure is decided. For more information, see BIS (2011) "Basel III: A global regulatory framework for more resilient banks and banking systems", footnote 52.

jurisdiction that is equal to 4%. According to the principle of international reciprocity, the domestic authority must only accept the foreign authority's buffer decision up to 2.5%. Therefore, depending on the decision of the domestic authority, the countercyclical buffer rate for the bank will be either $80\% \cdot 1\% + 20\% \cdot 4\% = 1.6\%$ (with full reciprocity) or $80\% \cdot 1\% + 20\% \cdot 2.5\% = 1.3\%$ (with only a mandatory reciprocity) of the total risk-weighted assets.

How could the Basel standard method be applied in Sweden?

Below, we illustrate the calculation of the CCyB rate for Sweden using the Basel standard method. To apply the Basel standard framework in practise, each country must decide on the measure of aggregate credit stock and a method for the calculation of the long-term trend. The Basel Committee recommends a broad measure of credit, which should include all credit extended to households and other non-financial private entities in the economy, independent of its form and the identity of the suppliers of funds.¹⁴

As for Sweden, our preferred measure of credit is lending to the domestic non-financial private sector by the monetary financial institutions and the outstanding stock of certificates and bonds issued by the domestic non-financial sector (see appendix for data details).¹⁵ For the calculation of the long-term trend, we use a one-sided HP filter as recommended in the guidance from the Basel Committee¹⁶.

The results of an application of the Basel standard method for Sweden are presented in Figure 3. The first panel shows the evolution of the 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 BIS lower and upper thresholds of 2 per cent and 10 per cent. Finally, the last panel shows the hypothetical evolution of the countercyclical buffer rate in Sweden in the past based on the Basel standard method.

In retrospect, the CCyBs would have been activated in Sweden twice, according to our application of the Basel standard method: in mid-1986, reflecting the boom ahead of the 1990s crisis, and in mid-2005, reflecting the boom before the global financial crisis¹⁷.

How could the Swedish banks be affected?

The major Swedish banks have extensive operations outside Sweden (see Figure 4). Consequently, the calculation of the countercyclical capital buffer rates for the Swedish banks also requires an assessment of the countercyclical capital buffer rates for countries in which the Swedish banks have relevant credit exposures. Furthermore, one also needs to know how the banks' relevant credit exposures in Sweden and abroad relate to their total credit exposures. This is necessary if we are to obtain the correct weighting across the CCyB rates set by countries where the Swedish banks have credit exposures.

As stated in the previous sections, each country itself decides the CCyB rate applied in its jurisdiction. To obtain an assessment of the CCyB rates for countries important to the Swedish banks, we apply the Basel standard method to all the Nordic and Baltic countries, as well as the United Kingdom and Germany (see appendix for data details).¹⁸ The CCyB rates obtained for different countries in this way serve purely illustrative purposes. The respective countries may well obtain different results when

14. For more information, see BIS (2010), "Guidance for national authorities operating the countercyclical capital buffer".

15. Such a measure of credit would exclude some sources of credit, such as student loans for households, which are given by the state, and intra-group loans for the non-financials. There are good reasons to exclude intra-group loans, as these loans are often motivated by reasons other than obtaining financing, such as incentives to reduce taxes. For more information, see Gunnar Blomberg, Jyry Hokkanen and Sofia Kåhre (2012), "Tax planning may have contributed to high indebtedness among Swedish companies", *Economic Commentaries*, no. 3.

16. A one-sided filter means that the trend is calculated using only the data that is available before the date for which the trend is calculated.

17. Global trends, such as decreasing levels of interest rates, were driving credit conditions, both in Sweden and abroad.

18. The CCyB rates for the remaining countries where the Swedish banks are active, such as Poland, for instance, are not modelled directly and are approximated with the equally-weighted average of the buffer rates that are modelled explicitly.

applying the Basel standard method to themselves, due to differences in the definition of credit and long-term trend.¹⁹

As for the weights that are needed to obtain the CCyB rates for the Swedish banks, we use the banks' lending to the public in countries in which each bank is active. This is a simplification due to the lack of relevant public data.²⁰ The correct weighting should be based on credit exposures, which also accounts for the riskiness of lending.²¹

The CCyB rates for countries and banks are presented in Figures 5 and 6, respectively. Studying the period before the most recent global financial crisis, one can note that the activation of the CCyB would have taken place first in other Nordic countries and then in Sweden. This would have meant higher CCyB rates for banks that are equally active in all Nordic countries, as compared to banks that focus on the Swedish market. From 2005 onwards, the CCyB rate for Sweden would have started to increase gradually, catching up with the already high CCyB rates in the Baltic countries, as well as other Nordic countries. By 2007, the CCyB rates would have reached high levels for all the large Swedish banks.

Looking at the most recent CCyB rates, one can notice that the rates are zero in the Baltic countries, as well as in Denmark and Norway. In the Baltic countries and Denmark, this is a reflection of low credit growth and a falling credit-to-GDP ratio. In Norway, the credit-to-GDP ratio is still close to its all-time high. The ratio has been stable since 2009, following a rapid increase during the period 2001-2008. Nevertheless, the credit gap in Norway has fallen due to a mechanical increase in the trend. A similar tendency can be also observed in Sweden, where the credit-to-GDP ratio is stable, but the credit gap is falling due to an increasing trend. As explained earlier, the Basel standard method for calculating the size of the countercyclical buffer rate is appropriate in the build-up phase; it may be less suitable for the release of the buffer. Thus, the decline in the CCyB rate that is observed both in Sweden and Norway should be interpreted with some caution.

In conclusion, our application of the Basel standard method to the Swedish banks illustrates how the authorities could have used the instrument to increase the capitalisation of these banks before the actual arrival of stress in the past.

19. See for instance Norges Bank's own calculations, "Criteria for an appropriate countercyclical capital buffer", Norges Bank Papers No. 1, 2013.

20. Banks do report the geographic distribution of their credit risk exposures, but not in the form of risk-weighted assets.

21. For more information, see BIS (2011), "Basel III: A global regulatory framework for more resilient banks and banking systems" and Council of the European Union (2013), "Revised capital requirements rules (CRD IV)", 2011/0203 (COD), available at <http://register.consilium.europa.eu/pdf/en/13/st07/st07746.en13.pdf>.

Figure 1. Capital adequacy requirements according to Basel III
Per cent of risk-weighted assets

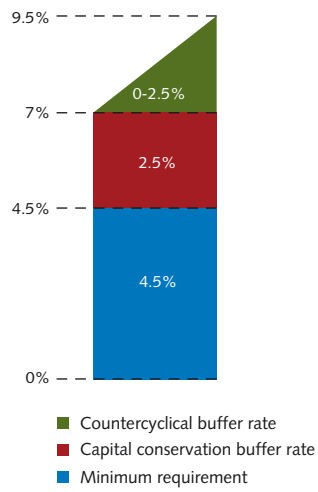


Figure 2. The mapping of the credit gap to the size of the countercyclical buffer rate

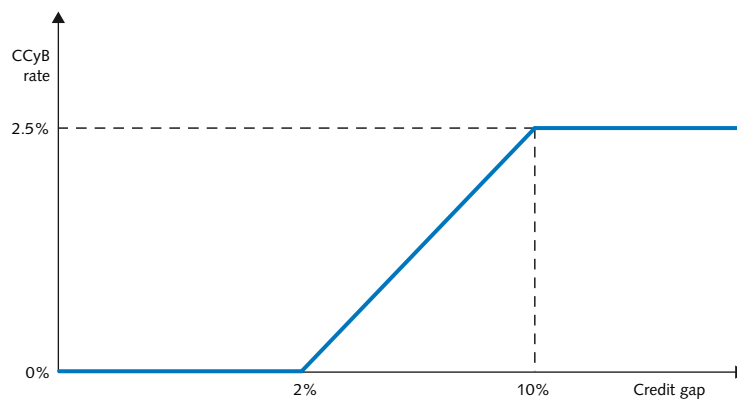


Figure 3. An application of the BIS standard method in Sweden
Per cent

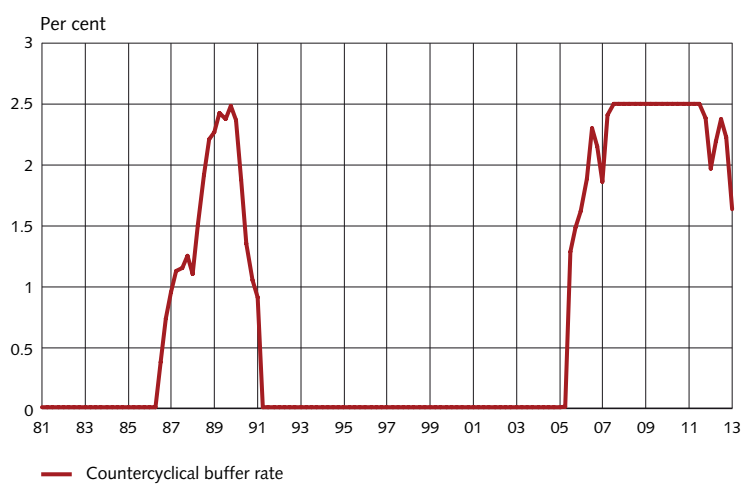
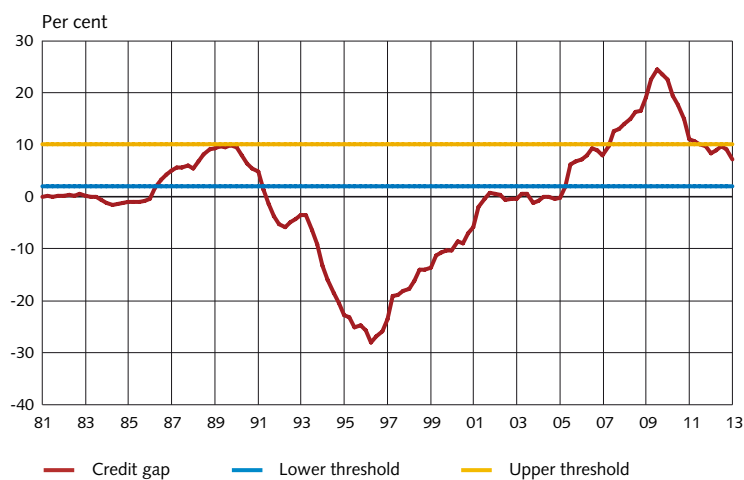
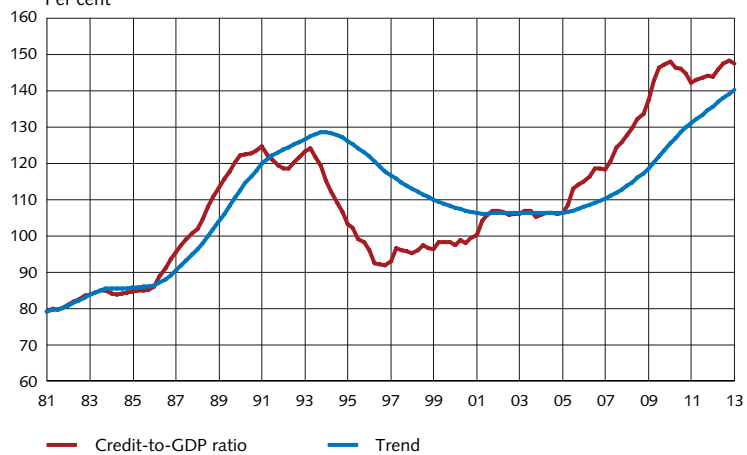


Figure 4. The geographic distribution of lending to the public by the large Swedish banking groups, 2012
Per cent

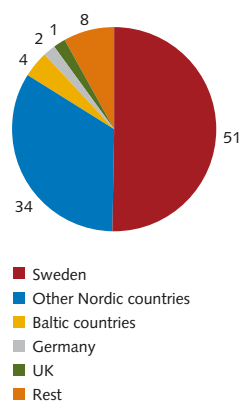


Figure 5. Countercyclical buffer rates in the Nordic and Baltic countries according to the Basel standard method
Per cent

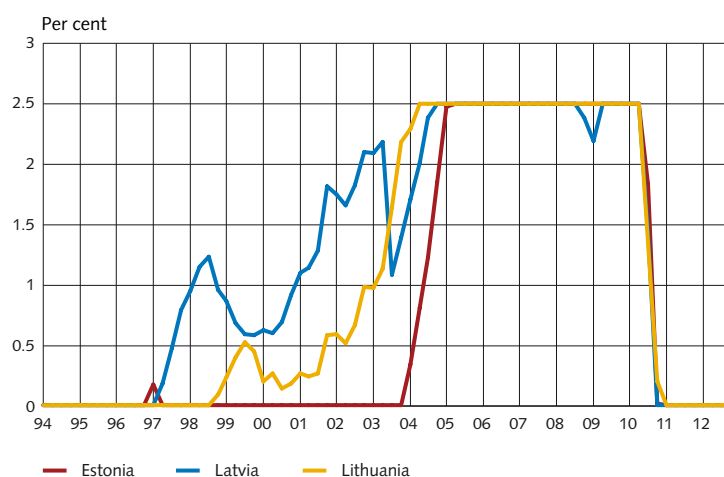
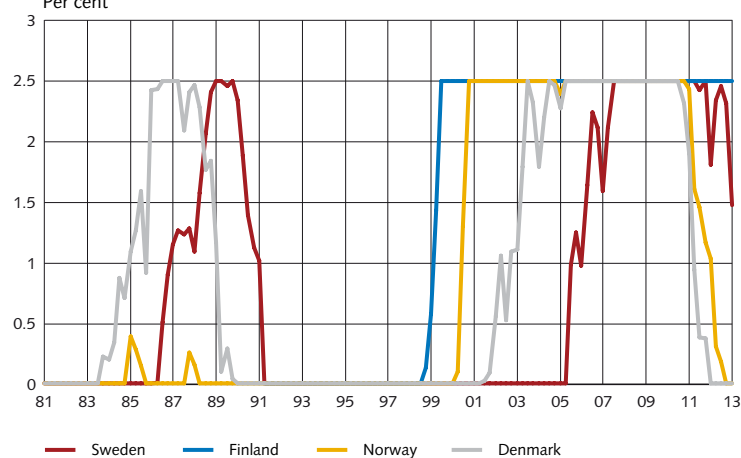


Figure 6. The countercyclical buffer rates for the major Swedish banks
Per cent

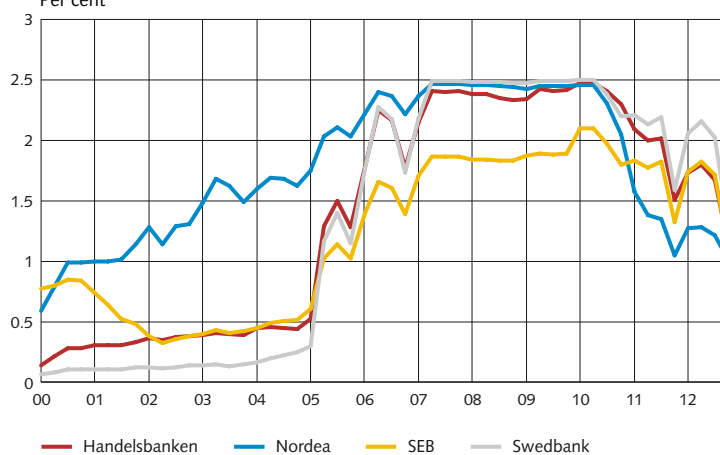


Table 1. An example of the calculation of the CCyB rate for international banks

	HOME COUNTRY	FOREIGN COUNTRY	CCB RATE FOR THE BANK
Exposure	80%	20%	
CCyB rate	1%	4%	
CCyB rate with full reciprocity	1%	4%	1.6%
CCyB rate with mandatory reciprocity	1%	2.5%	1.3%

Appendix. Data series and sources

COUNTRY	MEASURE OF CREDIT	TIME PERIOD	DATA SOURCES
Sweden	Lending by monetary financial institutions to private non-financial sector and outstanding stock of certificates and bonds issued by the Swedish private non-financial sector	1980Q4-2012Q4	Financial Market Statistics by the Riksbank and Financial Accounts by Swedish Financial Supervisory Authority
Denmark	Lending to non-financial sector by banks and mortgage banks	1980Q4-2012Q4	Danmarks Nationalbank and Danmarks Statistik
Norway	Total debt (C3) of mainland non-financial enterprises and domestic debt (C2) of households	1980Q4-2012Q4	Norges Bank and Statistics Norway
Finland	Total debt of households and non-financial corporate sector	1991Q1-2012Q4	Statistics Finland, State Treasury and Bank of Finland
Estonia	Total loans to households and to commercial undertaking	1994Q1-2012Q4	EcoWin and Bank of Estonia
Latvia	Total loans to households, private and public non-financial corporations	1994Q1-2012Q4	EcoWin and Bank of Latvia
Lithuania	Loans to non-financials and households	1994Q1-2012Q4	EcoWin and Bank of Lithuania
UK	M4 lending, total household sector and private non-financial corporations	1990Q1-2012Q4	EcoWin
Germany	Lending to domestic enterprises and households	1980Q1-2012Q4	EcoWin