COUNTERCYCLICAL CAPITAL BUFFER

The principles and indicators for setting the buffer rate in Estonia

October 2015

CONTENTS

1. THE PRINCIPLES FOR SETTING A COUNTERCYCLICAL CAPITAL BUFFER

1.1. The aim of the countercyclical capital buffer and its main features

The countercyclical capital buffer requirement is a macroprudential measure that requires banks to hold additional capital if credit risk accumulates. The buffer should be introduced at a time when rapid credit growth is increasing systemic risk, and the buffer should be removed when the risk in the local credit market is lower or when clear signs of a financial downturn appear. Banks can use the additional capital buffers they have built up during the growth phase of the financial cycle to cover losses that may arise during periods of stress and to continue supplying credit to the real economy. The larger the systemic risk accumulation in the credit market during the growth phase of the cycle, the higher the capital buffer is set so as to ensure the resilience of the banks.

As the national designated macroprudential authority, Eesti Pank sets the rate for the countercyclical buffer in Estonia. The buffer rate is set in accordance with the European Union Directive 2013/36/EU, Recommendation ESRB/2014/1 of the European Systemic Risk Board, and the Credit Institutions Act. The main features of the countercyclical buffer are:

- **Objective.** The countercyclical capital buffer is intended to protect the banking sector against potential losses associated with cyclical systemic risks building up in the economy. As well as strengthening the resilience of the banks, the requirement for the additional capital buffer can help dampen excessive credit growth and asset-price rises. However, the countercyclical buffer does not aim directly to affect the financial cycle, but moderate credit growth and asset-price rises can be seen as a beneficial side-effect of the buffer requirement.

- **Buffer rate.** Eesti Pank sets the countercyclical capital buffer rate for credit risk exposures located in Estonia, and it is usually set at between 0% and 2.5%. Where justified by identified severe systemic risk accumulation, the rate can also be set higher than 2.5%. The buffer is calibrated in steps of 0.25 percentage point.

- **Setting and releasing the buffer.** Eesti Pank decides on the buffer rate once a quarter. If it is decided to increase the rate, Eesti Pank generally informs banks and the public of this 12 months before the rate comes into force. This gives the banks sufficient time to increase their capital if they need to. If Eesti Pank decides to remove the buffer requirement, it is done either in full and immediately after the decision is taken, or in a series of steps as the cyclical systemic risk diminishes.

- **The methodology for assessing the buffer rate.** The assessment of the need for the countercyclical buffer follows the principle of guided discretion. Under this principle Eesti Pank combines a rules-based approach with its discretionary powers. A buffer guide is calculated using the assessment of the credit-to-GDP gap, and a pre-defined set of indicators are assessed and published regularly. Eesti Pank also considers other quantitative and qualitative information when setting the buffer rate (see Section 2 on the assessment of the countercyclical capital buffer rate).

- **Publication.** Eesti Pank publishes the countercyclical buffer rate on its website once a quarter together with its reasoning and the date it will apply from. The methodology for assessing the buffer rate is also published.

- **Scope.** The countercyclical buffer rate applies for all banks that have credit risk exposures in Estonia. Thus the buffer rate applies both for the credit institutions that provide cross-border banking services in Estonia, and for the branches of foreign banks that are headquartered in the European Union or in countries that adhere to the principle of mutual recognition of countercyclical buffer rates.

- **The institution-specific countercyclical capital buffer.** Credit institutions authorised in Estonia have to meet the countercyclical capital buffer requirement at an institution-specific rate that takes account of the buffer rates that apply to the credit risk exposures of the bank both in Estonia and abroad (see section 1.5 on the calculation and fulfilment of the institution-specific countercyclical buffer rate). The buffer must be held at both the consolidated and the non-consolidated levels, and it must be met by common equity tier 1 (CET1) capital. Investment firms operating in Estonia also have to meet the countercyclical buffer requirement[1].

1 Under article 130(2) of the European Union Directive 2013/36/EU, investment firms also have to meet the countercyclical buffer requirement unless the member state has decided to exempt them and fully reasoned the decision.

1.2. The legal basis

The Basel Committee on Banking Supervision (BCBS) issued international standards for capital and liquidity requirements for banks in December 2010 under the **Basel III** regulatory framework. One part of the proposals put forward to strengthen banks and the banking system was that capital requirements for credit institutions would be stricter than before and would amplify the economic cycle less. The countercyclical capital buffer was introduced as one of these measures.

The Basel III framework provides core international standards that have been adopted by the European Union and laid out in Regulation (EU) No 575/2013 and **Directive 2013/36/EU** of the European Parliament and of the Council of 26 June 2013. Articles 135–140 of the Directive concern the setting and calculating of countercyclical capital buffers.

The ESRB issued Recommendation ESRB/2014/1 under Article 135 of the Directive to member states in June 2014. This **ESRB Recommendation** gives guidance to designated authorities of member states on assessing and setting the buffer rate and on recognising the buffer rates set in other member states. To ensure a sound approach to credit cycles and to promote sound and consistent decision-making across member states the Recommendation provides guidance on developing the appropriate methodology to be used by designated authorities when setting and removing the buffer requirements.

The Directive has been transposed into Estonian law through the **Credit Institutions Act**, with the amendments applying from 19 May 2014. The transitional terms of the Directive, under which an upper limit would have been set on the countercyclical buffer of 0.625% in 2016, 1.25% in 2017 and 1.875% in 2018, were not applied in Estonia. This means that if necessary the buffer rate can be set as high as 2.5% or more for credit risk exposures in Estonia even before 2019.

Section 86[46] (2) of the Credit Institutions Act gives Eesti Pank the power to set the countercyclical capital buffer rate for Estonia. Eesti Pank grounds its decisions on the buffer rate in the European Union legal framework, the recommendations of the ESRB, the Credit Institutions Act, and the principles and analytical framework that is based on these and described in more detail in this document. Eesti Pank notifies and coordinates its decisions on buffer rates domestically and internationally, in accordance with the procedures set in regulations and agreements between the authorities.

The countercyclical capital buffer rate for Estonia is set by a **decree of the Governor of Eesti Pank**. Eesti Pank also defines the procedure for calculating the institution-specific countercyclical buffer rate and the procedure for recognising buffer rates set by the designated authorities of other member states or third countries.

Article 5(2) of Council Regulation (EU) No 1024/2013 allows the **European Central Bank**, which is also involved in macroprudential policies for countries participating in the Single Supervisory Mechanism, to set requirements for macroprudential capital buffers, including the countercyclical buffer, that are stricter than those set by the national designated authorities. Such requirements are applied following an assessment by the European Central Bank of the economic and financial situation of the member state and of the phase of the economic cycle. A notification and coordination procedure is followed before such measures are taken, in accordance with the rules set out in the regulations for single supervision.

1.3. Decision-making, coordination and publication

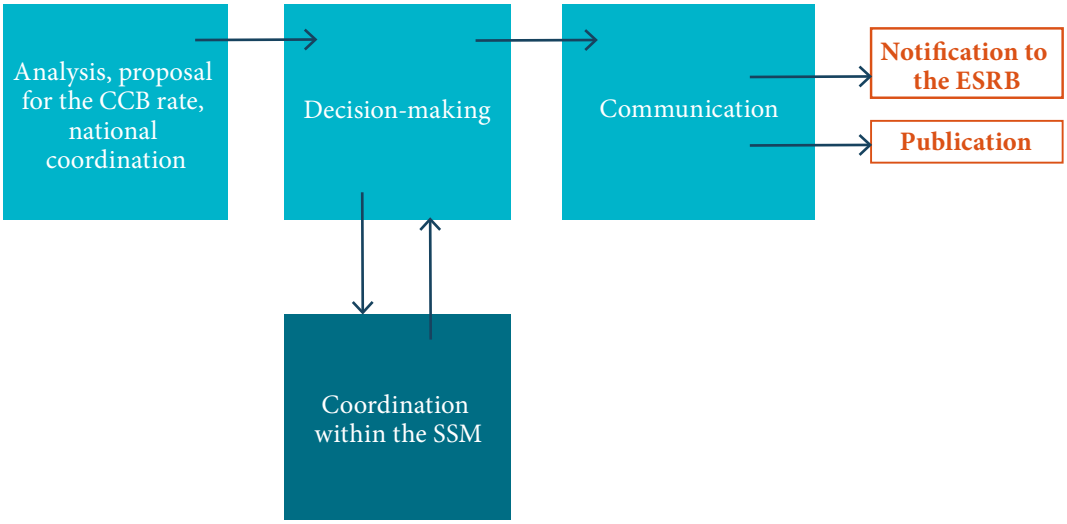
There are three steps in the approach taken by Eesti Pank to setting the countercyclical buffer rate (see Diagram 1): analysis of the need for cyclical measures and assessment of the appropriate buffer rate, domestic and international coordination of the assessment and decision on the buffer rate, and publication.

Analysis and domestic coordination

Eesti Pank carries out a regular quarterly analysis and assessment of the need to maintain, raise, lower or remove the countercyclical capital buffer requirement. The buffer rate is assessed using several pre-defined indicators that can provide the best estimates of the Estonian credit cycle from many angles. Eesti Pank also considers other quantitative and qualitative information when deciding the buffer rate (see Section 2 on the assessment of the countercyclical capital buffer rate).

Support for the assessment of the need for countercyclical measures comes from the twice-yearly Financial Stability Review published by Eesti Pank, which analyses cyclical and structural developments that have an impact on financial intermediation and contains an in-depth assessment of

Diagram 1. Setting the countercyclical buffer rate in Estonia



systemic risks to the financial system. The risk assessments and proposed measures contained in the Review, including the possible change in the countercyclical capital buffer rate, are discussed in the Joint Committee before the regular publication of the Review at least twice a year[2]. Wider and more comprehensive consideration of risks and macroprudential measures means that macroprudential objectives can be better achieved.

Decision-making and coordination of the buffer rate under single banking supervision

The Executive Board of Eesti Pank decides on the rate of the countercyclical buffer and that level is set by a decree of the Governor of Eesti Pank. Decisions on the buffer rate take account of other macroprudential measures and the combined effect of the measures in reducing systemic risk.

Although the primary responsibility for the implementation of macroprudential measures lies with the national authorities, single banking supervision means the European Central Bank can apply higher requirements for capital buffers, including the countercyclical buffer, than those applied by the national designated authorities. Under the procedures in Article 5 of Council Regulation (EU) No 1024/2013, a national designated authority such as Eesti Pank has to notify the European Central Bank of the preliminary decision on the buffer rate ten working days before the final decision on the buffer rate is taken. The European Central Bank can object to the notified rate within five working days, and Eesti Pank must consider the arguments used by the European Central Bank prior to proceeding with the decision-making.

The European Central Bank can set a higher countercyclical buffer rate for credit risk exposures in Estonia than that set by Eesti Pank if its analysis and assessment calls for it. It must inform Eesti Pank in advance of its intention to do this, and Eesti Pank may submit reasoned arguments against the proposed rate, which the European Central Bank then has to consider in its own decision-making processes.

Publication of the buffer rate

Eesti Pank publishes the countercyclical buffer rate and the date it will apply from on its website once a quarter together with any other circumstances relating to the setting of the buffer. Section 86[46](7) of the Credit Institutions Act requires the following information to be published:

1. the applicable countercyclical capital buffer rate;
2. the credit-to-GDP ratio and its deviation from the long-term trend;
3. the buffer guide;
4. the reasoning behind the buffer rate;
5. the date from which the buffer rate will apply;
6. the extraordinary circumstances responsible

2 The Joint Committee is a domestic coordination body that handles issues relating to the legal acts affecting the financial sector, supervision and crisis management. The Joint Commission works under an agreement signed on 21 December 2007 between the Ministry of Finance, the Estonian Financial Supervision Authority and Eesti Pank and is composed of high-level staff from the three authorities.

if the increased buffer rate will apply within less than twelve months;

7. the expected period during which it is not planned to raise the buffer rate if it has been lowered.

The ESRB coordinates the setting of macroprudential measures by member states within the European Union. Each time a decision is taken on a countercyclical buffer rate, which means once a quarter, national designated authorities have to send the information listed above to the ESRB. The ESRB publishes all notified countercyclical buffer rates and any related information on its website.

1.4. Recognition of buffer rates set by other countries

The countercyclical buffer rate for a credit institution that operates internationally is the weighted average of the buffer rates that apply in countries in which the bank has credit risk exposures (see section 1.5 on the calculation and fulfilment of the institution-specific countercyclical capital buffer rate). This means that countries have to announce their decisions on buffer rates as clearly as possible and must coordinate them effectively.

The Directive lays out the principles for recognising the buffer rates of other member states. Mutual recognition is mandatory when the buffer rate is between 0% and 2.5% and in other cases it is generally the national designated authority that decides on recognition, this being Eesti Pank in Estonia. The ESRB Recommendation[3] says that designated authorities should generally recognise the countercyclical buffer rates applied in another member state in excess of the mandatory level too, as there may be negative cross-border side-effects from non-recognition.

Recognition of the buffer rate set by Eesti Pank

If the countercyclical buffer rate set by Eesti Pank remains at **up to 2.5%**, this rate will have to be considered in calculations against credit risk exposure in Estonia not only by banks authorised in Estonia, but also by credit institutions in other member states that operate in Estonia through branches or that provide cross-border financial services. If Eesti Pank sets the rate **above 2.5%**, recognition of the excess above 2.5% will depend on the legislation and the designated authority of each country.

3 Recommendation A.6 of ESRB Recommendation ESRB/2014/1

Recognition of buffer rates set by the designated authorities of other member states and third countries

If the countercyclical buffer rate set by the designated authority in another country is **up to 2.5%**, credit institutions authorised in Estonia will have to consider that rate against their credit risk exposure in the country that has applied the buffer rate. If the buffer rate is **above 2.5%**, Eesti Pank will generally recognise the rate applied by another member state and credit institutions will have to comply with that rate. If Eesti Pank decides not to recognise the rate above 2.5%, it will notify the ESRB, the designated authority setting the buffer rate, and the European Central Bank in accordance with the recommendation of the ESRB.

If the designated authority of a third country has not set a countercyclical buffer rate, credit institutions that have credit risk exposures in that country will be guided by the rules set by Eesti Pank. In calculating buffer rates for credit risk exposures in third countries, Eesti Pank starts from the directive: if a third country has not applied a countercyclical buffer or has set a buffer rate that Eesti Pank considers too low, Eesti Pank may set a different buffer rate for that third country for the purpose of calculating the institution-specific countercyclical capital buffer rate. In decision-making and communication of the appropriate buffer rate for third countries Eesti Pank follows the principles and guidelines of the ESRB recommendation.

1.5. Calculation and fulfilment of the institution-specific countercyclical capital buffer rate

The size of the institution-specific countercyclical buffer requirement is defined by multiplying the total risk exposure[4] of the credit institution by the institution-specific buffer rate. Calculation of the institution-specific countercyclical capital buffer rate considers the geographical location of the credit exposure of the credit institution and the buffer rates applicable in those countries. The institution-specific countercyclical capital buffer rate is the weighted average of the countercyclical buffer rates that apply in the countries where the credit exposures of the credit institution are located.

The geographical location of credit exposures for the calculation of the institution-specific countercyclical capital buffer rate is identified using **regulatory technical standards** that have been developed by the EBA and published as a delegat-

4 Total risk exposure is calculated in accordance with Article 92(3) of Regulation (EU) No 575/2013.

ed regulation by the European Commission[5]. The standards state that the location of the credit exposure is generally the country of the obligor (or the debtor for trading book exposures), though the standards allow for cases where the location may be given as the home country of the credit institution. The EBA standards allow credit institutions to count foreign exposure as domestic exposure if the total amount of the foreign exposures does not exceed 2% of the aggregate of its general credit, trading book and securitisation exposures.

Credit institutions must regularly publish data on the geographical distribution of their credit exposures and the amount of the institution-specific countercyclical capital buffer requirement, using the disclosure templates developed by the EBA. This information must be published at least once a year together with the credit institution's financial statements.

Whether the countercyclical buffer **requirements are met** is monitored for significant banks by the European Central Bank under the single supervisory framework, and for less significant banks by the Estonian Financial Supervision Authority. The countercyclical buffer is part of the combined buffer, which also contains the capital conservation buffer, the systemic risk buffer, and a buffer that must be held by systemically important credit institutions. If a credit institution fails to meet the combined buffer requirement, limits are placed on the distribution of dividend payments and on variable remuneration or discretionary pension benefit payments. A credit institution which fails to meet its combined buffer requirement will also have to draw up a capital conservation plan. The procedure for calculating the maximum distributable amount of equity has been defined by Eesti Pank[6].

5 Commission Delegated Regulation (EU) No 1152/2014 of 4 June 2014

6 Eesti Pank Governor's Decree no 13 of 9 July 2014, "Procedure for calculation of the maximum distributable amount of equity".

2. ASSESSMENT OF THE COUNTERCYCLICAL CAPITAL BUFFER RATE

2.1. Legal background and the main principles for assessment of the buffer rate

Eesti Pank develops and implements its methodology for assessing the countercyclical buffer rate starting from the general requirements of the Credit Institutions Act and the more specific guidelines of the ESRB Recommendation ESRB/2014/1.

- **The Credit Institutions Act** states that Eesti Pank is responsible for setting the exact rate for the countercyclical buffer. Section 86[46](3) says that the rate setting should consider
  1. the phase of the credit cycle;
  2. risks arising from credit growth;
  3. specific features of the local economy;
  4. the buffer guide;
  5. credit growth and changes in the credit-to-GDP ratio;
  6. the recommendations issued by the ESRB in accordance with Regulation (EU) No 1092/2010 of the European Parliament and of the Council on the macro-prudential oversight of the financial system (OJ L 331, 15.12.2010, pp. 1-11);
  7. other circumstances that are relevant in considering cyclical systemic risks.

- **The ESRB Recommendation** provides guidelines that member states should follow in setting their countercyclical buffer rates. The recommendations cover measurement of the credit-to-GDP gap and the method for calculating the buffer guide. They also define which additional indicators should be used when decisions are taken on setting the buffer rate. Separate guidelines are given for indicators that indicate the build-up of risk, and for indicators that show the need to reduce or fully release the buffer.

The principle of **guided discretion** is used in assessing the buffer rate, where a rule-based quantitative methodology is used but some room is left for discretion. This means that account can be taken of additional qualitative and quantitative factors that may not be considered by a rigid rule. Rules still play a somewhat more important role in analysis of the need for a countercyclical buffer requirement than is the case with most other macroprudential measures. That the methodology is quite uniform between countries helps in employing the buffer requirement across borders.

In the methodology outlined by the Basel Committee on Banking Supervision[7], assessment of the credit-to-GDP gap serves as a common starting point for countries setting the countercyclical buffer rate. Although the assessment of the credit-to-GDP gap is used to calculate the buffer guide, the buffer guide does not bind the designated authority in taking the decision on the applicable buffer rate. When deciding the buffer rate Eesti Pank considers the credit cycle, the risks coming from excess credit growth, the state of the national economy, and the use of other macroprudential tools.

In assessing and publishing the countercyclical buffer rate Eesti Pank uses the main indicators, which include the commonly defined credit-to-GDP gap, together with some pre-defined additional indicators that are potentially able to express clearly the Estonian credit cycle from various perspectives. The main indicators are used to find the benchmark buffer rates and the buffer guide, which is one of several components used in the assessment. Alongside the buffer guide and the previously defined indicators, Eesti Pank considers other quantitative and qualitative information when assessing the rate for the buffer (see Diagram 2).

2.2. Main indicators

Empirical analysis by the ESRB expert group[8] has shown the credit-to-GDP gap to be the best single indicator for the whole of the European Union for expressing the build-up of the risks that the countercyclical buffer is intended to ease. The credit-to-GDP gap should be estimated and published in the same way for all European Union countries.

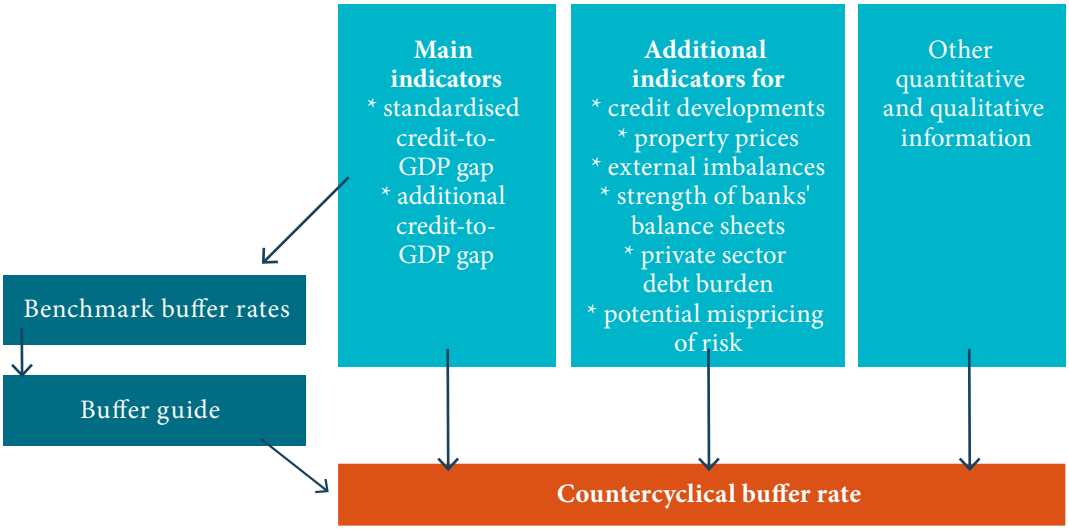
The method used for estimating the credit-to-GDP gap decomposes the ratio of credit to GDP, or indebtedness, into trend and cyclical parts in order to estimate excess credit growth. The trend, which is the natural rate of growth, is removed from the cyclical components of the systemic risk using a one-sided HP-filter with the lambda-parameter, which is found from the results of empirical tests so that the signal-to-noise ratio is at the optimal level.

In estimating the **standardised credit-to-GDP gap** proposed in the ESRB Recommendation, the method of the Basel Committee on Banking

7 Basel Committee on Banking Supervision (2010). Guidance for national authorities operating the countercyclical capital buffer, December 2010.

8 Detken C et al. Operationalising the countercyclical capital buffer: indicator selection, threshold identification and calibration options. ESRB Occasional Paper No. 5 / June 2014.

Diagram 2. Components of the assessment of the contercyclical buffer rate



Supervision is used, by which the gap is estimated using the equation

$$\mathbf{GAP_t = INDEBTEDNESS_t - TREND_t},$$

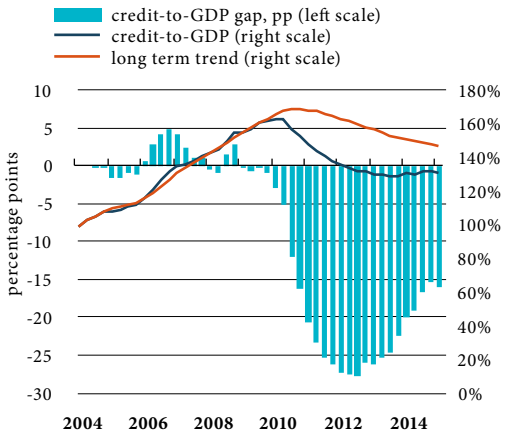
where
t is the last day of the period considered, where the period is one quarter;
$INDEBTEDNESS_t$ is $(CREDIT_t / (GDP_t + GDP_{t-1} + GDP_{t-2} + GDP_{t-3})) \times 100\%$;
GDP_t is Estonia's gross domestic product in quarter t;
$CREDIT_t$ is the broad measure of the stock of credit to the Estonian private sector at the end of quarter t;
$TREND_t$ is the one-sided recursive Hodrick-Prescott (HP) filtered trend of INDEBTEDNESS with a smoothing parameter lambda of 400,000.

To estimate the standardised credit-to-GDP gap, the broadest possible measure of credit to non-financial enterprises and households must be used for calculating the credit-to-GDP ratio. An appropriate data source is the financial accounts of the national accounts system and the data series covers resources borrowed and bonds issued by the Estonian private sector both within Estonia and abroad.

Eesti Pank has compiled a quarterly time series for the standardised credit-to-GDP gap for Estonia starting from the fourth quarter of 2003 (see Figure 1). However, this method was not appropriate for the years 2005–2008, when credit growth was rapid, because too few statistics were being collected at that time. Technical difficulties in measuring the gap are smaller looking forward as new data are added and the time series extended. Nevertheless, uncertainties remain concerning the suitability of the method for assessing credit cycles in Estonia.

On top of the standardised credit-to-GDP gap, the ESRB recommendation also allows for an **additional credit-to-GDP gap** to be used if adjusting some element in the equation would lead it to reflect better the specificities of the national economy. As both households and companies in Estonia are mainly funded by the banking sector, the credit-to-GDP gap can also be calculated from banking statistics alone in order to assess the build-up of

Figure 1. Standardised credit-to-GDP gap



Sources: Statistics Estonia, Eesti Pank

cyclical systemic risk (see Figure 2). An advantage of these data is that they have a long time series, with suitable data available from the fourth quarter of 1996, and there is a shorter lag between the reporting period and the compilation of the statistics. The difference between the additional credit-to-GDP gap and the standardised credit-to-GDP gap lies only in the credit aggregates used, as other parameters, including the smoothing parameter lambda, are the same.

2.3. The buffer guide

Eesti Pank uses the credit-to-GDP gap as the base for calculating the benchmark buffer rates and selects the buffer guide from among them.

To calculate the **benchmark buffer rate**, Eesti Pank draws on the methodology in the ESRB Recommendation, which is itself based on the guidelines of the Basel Committee on Banking Supervision. If the credit-to-GDP gap is below or equal to the lower threshold (L), the benchmark rate is zero. After this the benchmark buffer rate rises linearly with the credit-to-GDP gap until that gap reaches the upper threshold (H) or crosses it. In the guidelines of the Basel Committee on Banking Supervision, the lower threshold for the gap, from which the buffer rate should be applied, is at two percentage points, and the upper threshold is at ten percentage points (see Figure 3). The benchmark buffer rate rule can be expressed in simplified form as:

- if $GAP_t \leq L$, then the benchmark buffer rate is 0%,
- if $GAP_t \geq H$, then the benchmark buffer rate is 2.5%,
- if the gap is between L and H, the benchmark rate is interpolated linearly using the formula $0.3125 \times GAP_t - 0.625$,

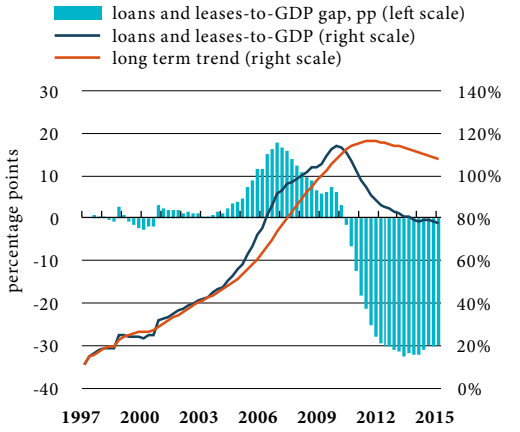
where

L is the lower threshold of two percentage points;
H is the upper threshold of ten percentage points;

Eesti Pank does not necessarily have to follow the upper threshold rule if the credit-to-GDP gap is higher than ten percentage points. In such cases the benchmark buffer rate is found linearly using the formula $0.3125 \times GAP_t - 0.625$, with the result rounded to 0.25 percentage point.

Eesti Pank calculates the benchmark buffer rate using this approach for both the standardised and the additional credit-to-GDP gaps. Analyses so far have not identified any bottlenecks that would

Figure 2. Additional credit-to-GDP gap



Sources: Statistics Estonia, Eesti Pank

Figure 3. Benchmark buffer rate found from the credit-to-GDP gap

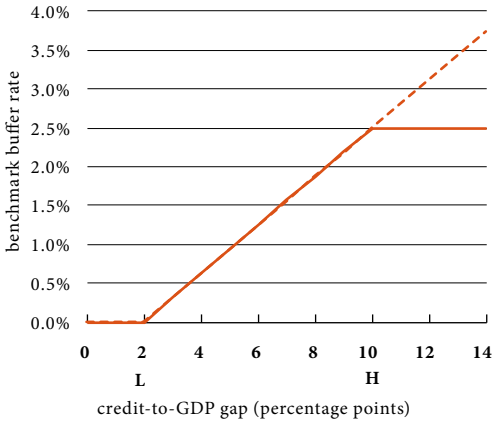
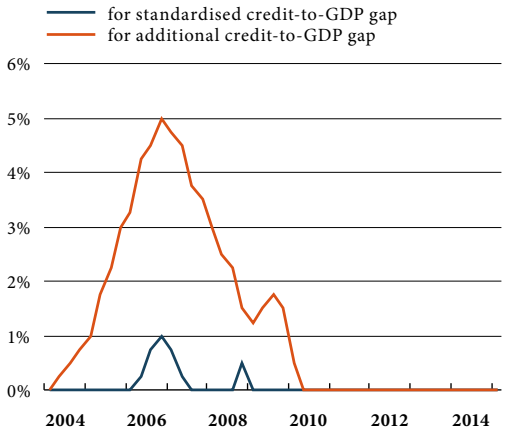


Figure 4. Historical benchmark buffer rates



Source: Eesti Pank calculations

make it preferable to calculate the benchmark rate using methods other than that in the guidelines of the Basel Committee on Banking Supervision.

When defining the **buffer guide** Eesti Pank assesses changes in both the standardised and the additional credit-to-GDP gaps and cyclical factors that affect the development of the credit aggregates they are based on. For example, the buffer guide for the rapid credit growth in 2005–2008 would be better found using the additional credit-to-GDP gap (see Figure 4).

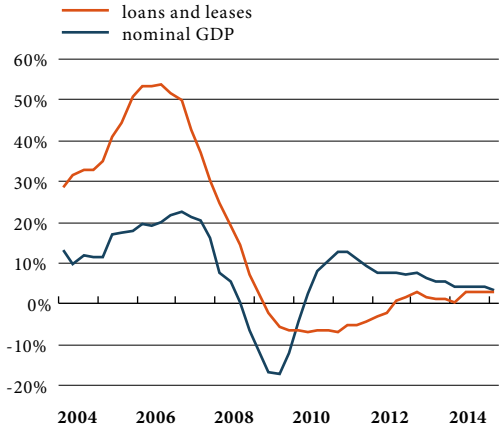
2.4. Additional indicators

Alongside the main indicators that show changes in indebtedness, additional indicators that can indicate a build-up of risk are also considered when the need for the buffer is assessed. A large number of indicators are regularly assessed, but for publication Eesti Pank focuses on a smaller set of pre-defined indicators that are divided into six groups using the structure provided in the ESRB Recommendation (see Table 1). The set of additional indicators is chosen by how well they explained the build-up of risk in Estonia in previous periods. Eesti Pank analyses how appropriate the chosen indicators are and if necessary removes indicators or adds them.

Indicators of credit developments

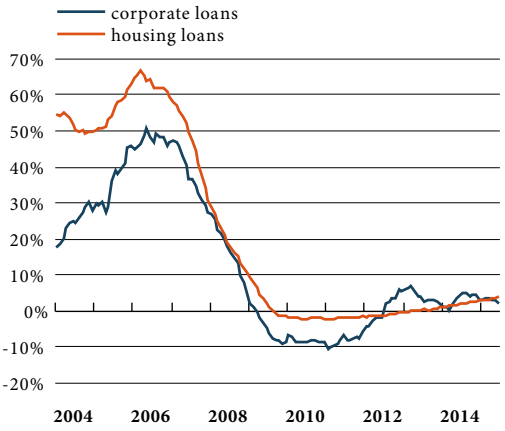
Growth in the loan and lease portfolio is an important monthly indicator for assessing the build-up of credit risk. The indicator shows the growth of credit intermediated by domestic banks and is available a short time after the end of the reporting period, and it helps the estimation of the growth of indebtedness by providing information rapidly. To assess whether credit growth is too fast or not given the development of the business cycle, it is easiest to compare it to nominal GDP growth (see Figure 5). Credit growth can also be compared to

Figure 5. Annual growth of loans and leases and nominal GDP



Sources: Statistics Estonia, Eesti Pank

Figure 6. Annual growth of corporate loans and housing loans



Source: Eesti Pank

Table 1. Additional indicators for assement of the countercyclical buffer rate

Indicator group	Indicator
indicators of credit developments	* annual growth of loans and leases and nominal GDP * annual growth of corporate loans and housing loans
indicators of potential overvaluation of property prices	* annual growth of housing prices and number of transactions * ratio of square metre prices for apartments to monthly gross wage
indicators of external imbalances	* current account balance as ratio to GDP
indicators of the strength of bank balance sheets	* banking sector leverage ratio * banking sector loan-to-deposit ratio
indicators of the private sector debt burden	* interest burden of households * interest burden of non-financial enterprises
indicators of potential mispricing of risk	* interest margin of new housing loans against 6m EURIBOR * OMXT index

*The classification of indicators is based on ESRB Recommendation ESRB/2014/1

a GDP indicator that has had the cyclical volatility component removed, for example with an HP-filtered time series, as GDP growth is partly caused by credit development.

Together with the total growth of the loan and lease portfolio, Eesti Pank analyses how the growth is affected by its main components such as **loans to companies and housing loans** (see Figure 6).

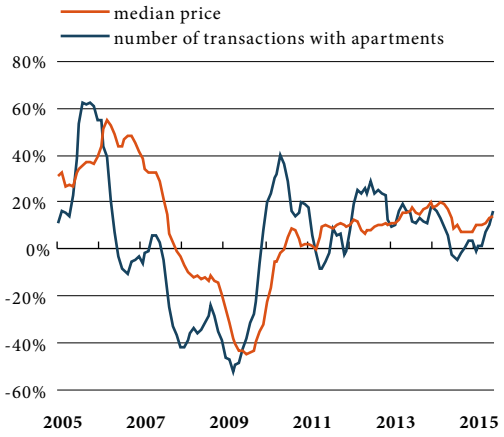
Indicators of potential overvaluation of property prices

The property market is one of the main sectors of the economy that uses borrowed money. Changes in transaction activity and prices in the property market consequently indicate the build-up of risks in the credit market. Real estate plays a major role in the solvency and financial behaviour of households as an asset and as collateral. Property prices are affected by the decision of households to borrow and by their ability to do so. A rise in property prices could lead to expectations among borrowers and lenders that the value of the collateral is rising and this could then become self-fulfilling and lead to a cycle of rising property prices and steadily and rapidly increasing debt. If this leads to mutually reinforcing developments in property prices and household borrowing, it could lead to imbalance, and then when the cycle turns it could amplify loan losses and an economic downturn.

The main indicator that Eesti Pank observes each month is **annual growth of median apartment prices** (see Figure 7). It must be remembered when assessing this indicator that the values for the median price can sometimes be affected strongly by changes in the structure of transactions such as a change in the share of transactions with new and more expensive apartments. To assess the credit cycle, changes in the structure of financing of real estate transactions should be observed as well as prices and the number of transactions. For this reason, Eesti Pank analyses not only the developments in the residential real estate market, but also the role of housing loans in financing real estate transactions.

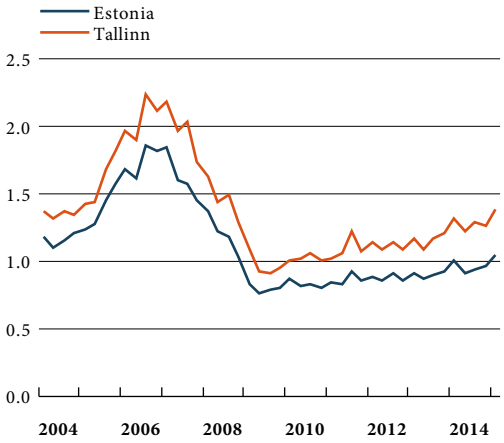
The ratio of the average square metre price for an apartment to gross monthly wages helps in assessing possible overvaluation of residential real estate in terms of the average income level. As more than 40% of apartment transactions in Estonia are in Tallinn, the affordability indicator is also observed separately for the capital (see Figure 8).

Figure 7. Annual growth of housing prices and number of transactions



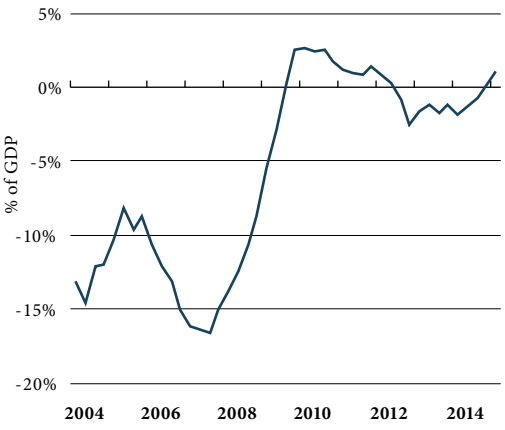
Source: Estonian Land Board
* 3-month moving average

Figure 8. Ratio of square metre price for apartments to monthly gross wage



Sources: Estonian Land Board, Statistics Estonia

Figure 9. Current account balance



Sources: Statistics Estonia, Eesti Pank

Indicators of external imbalances

The current account balance-to-GDP ratio is the indicator most often used for assessing external imbalances (see Figure 9). Estonia's small and open economy is particularly affected by foreign investment and the resultant capital flows. Earlier data for Estonia show that at times of rapid financial deepening, when the need for external financing is especially large, the external imbalance in the economy was significant. A large current account deficit makes the national economy vulnerable to negative developments that could come from destination countries, source countries or other countries. The availability of foreign resources could deteriorate sharply and their price could rise, which could then in turn weaken the profitability of the banks.

Indicators of the strength of bank balance sheets

Financial leverage in the banking sector is mainly assessed from the ratio of bank CET1 to total assets (see Figure 10). A fall in the ratio of CET1 to total assets could indicate excessively fast credit growth and excessive financial leverage in the credit market, but it could equally indicate a deterioration in the solvency of banks.

As the leverage ratio does not cover branches of foreign banks, developments in it need to be considered together with other indicators that show the strength of the banking sector, such as profitability indicators, in assessment of the credit cycle. Other factors that could equally affect the capitalisation of the banking sector, such as decisions by parent groups about capital allocation, also need to be considered, though they may not show changes in the risk behaviour of banks.

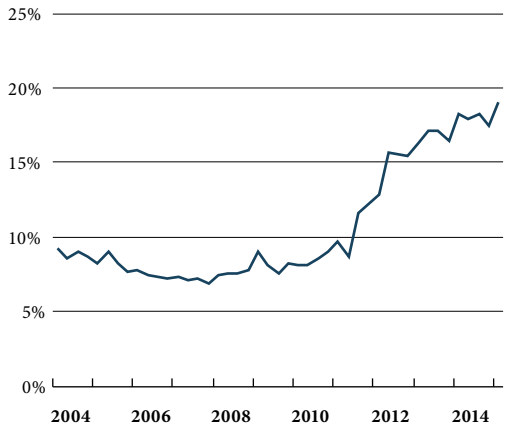
The **loan-to-deposit ratio** indicates the vulnerability of the banking sector to a deterioration in funding conditions. A rise in it may also indicate excess supply in the credit market. Assessment of macro-level credit risks must observe both the level of and changes in the loan-to-deposit ratio.

Eesti Pank calculates the ratio using a relatively broad aggregate that omits only interbank loans and deposits. A version of the ratio that excludes the more volatile development of loans and deposits for non-residents is also observed (see Figure 11).

Indicators for the private sector debt burden

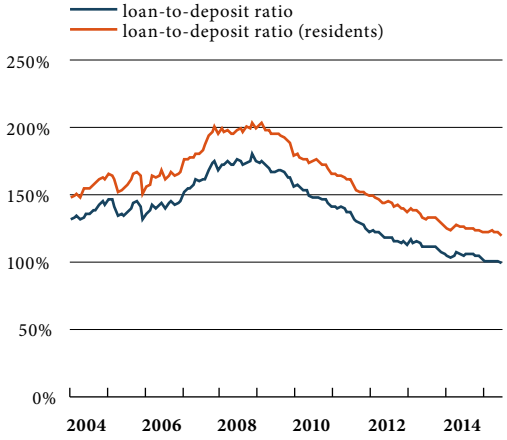
Balance sheets in the private sector are generally vulnerable to a rise in interest rates and to a fall in

Figure 10. Banking sector CET 1 to total assets



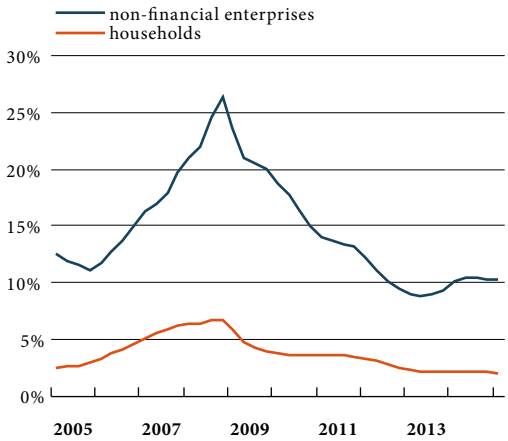
Source: Eesti Pank

Figure 11. Loan-to-deposit ratio



Source: Eesti Pank

Figure 12. Private sector interest burden



Source: Eesti Pank

the real estate value in ratio to incomes. This makes it important to observe how much the debt burden of the private sector changes over the credit cycle. While it is practical at the level of individual companies and households to look at the periodical principal and interest payments-to-income ratio, at the macro-level Eesti Pank uses indicators of the interest burden by sector (see Figure 12).

To calculate the **household interest burden** at a sectoral level, the annual interest payment is divided by the disposable income of households. For the calculation of interest payments the stock of all household debt liabilities and the average interest rate on the outstanding stock of loans and leases issued by banks is used.

The **interest burden for companies** is calculated by deriving annual interest payments in the same way as for household debt liabilities, and the result is divided by corporate gross operating surplus and mixed income. The estimated indicator for the corporate interest burden has a greater risk of measurement error since a large part of the debt obligations are taken from outside the banking sector, where the interest rates may be quite different from those offered by the banks. For this reason it is appropriate to observe not only the interest burden estimated against debt liabilities, but also indicators that are estimated only from data for domestic bank loans and leases.

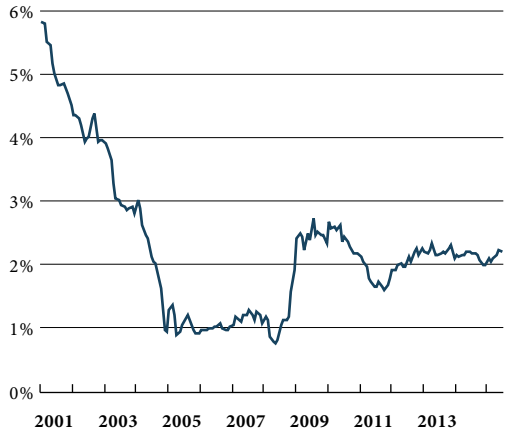
Indicators of potential mispricing of risk

The build-up of cyclical risk may be boosted further by mispricing of risk by lenders, borrowers or other market participants of developments in the credit environment or the economy and of the outlook for them. For this reason the ESRB has recommended that indicators of changes in risk assessments be used in assessing the need for countercyclical buffers.

The **average interest margin for new housing loans** has been good at showing excessive risk taking by banks in Estonia during periods of rapid credit growth and the increase in risk aversion when conditions in the external environment have worsened sharply (see Figure 13). However, other factors that affect the interest rate, like the international interest rate environment, funding conditions or competition in the credit market, should also be considered when the interest margin is used as an indicator for the credit cycle.

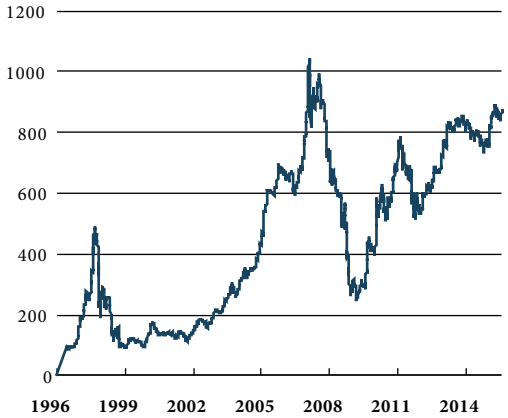
Changes in equity prices should generally provide a good reflection of appetite for risk or risk aversion in the economy. The Estonian stock market

Figure 13. Interest margin of new housing loans against 6m EURIBOR



Sources: Eesti Pank, European Central Bank

Figure 14. OMXT index



Source: NASDAQ OMX Tallinn
* last observation 19.05.2015

is very small and has low liquidity, so it has very high volatility, which is affected by developments in international financial markets (see Figure 14). This makes it hard to use changes in the Estonian stock market to identify the financial cycle, and so care is needed in using this indicator.

2.5. Indicators suggesting the buffer should be reduced or fully released

The decision to lower the countercyclical buffer rate or to remove it is based on the following considerations:

1. has the credit cycle turned or the risk of excessive credit growth diminished and the risks to the resilience of credit institutions declined, or
2. have signs appeared of an economic or financial downturn.

In the first case, the countercyclical buffer rate may be reduced gradually. In the second case, the immediate release of the buffer should be considered, as this would make it easier for banks to bear loan losses and help avoid possible credit tightening.

Any **reduction in risk** is assessed from the indicators that Eesti Pank uses for the regular quarterly assessment of the buffer rate. Most important among these are the indicators that show changes in the volume of credit or in asset prices.

For timely identification of a **financial downturn**, the assessment needs indicators that are published frequently and with a short lag. This allows for rapid reaction in the face of a downturn to remove the buffer. It must of course be remembered that indicators may contain noise and false signals and so expert judgement plays an important role in any decision to remove the buffer.

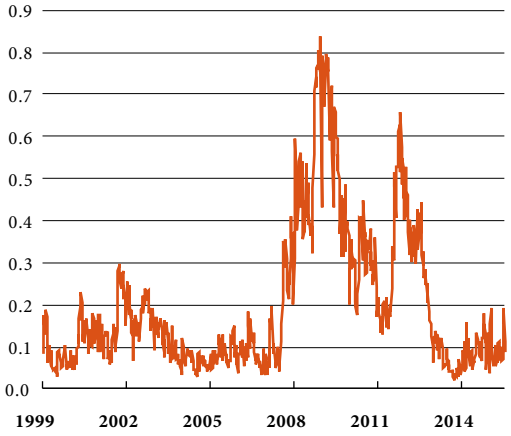
The ESRB suggests in its Recommendation that an indication of the need to release the buffer could come from indicators showing tensions in financial markets. The ESRB recommends that if such indicators are available in the member state, the set of appropriate indicators should include:

1. indicators that indicate stress in bank funding markets, such as the LIBOR-OIS (overnight interest rate swaps) spread, or the bank CDS (credit default swap) premiums;
2. indicators that indicate general systemic stress, like the CISS (composite indicator of systemic stress) of the European Central Bank.

As the Estonian banking market is dominated by foreign banks and local liquidity and funding are affected by developments in international financial markets, Estonia-based risk indicators for financial markets do not give any significant additional value over international indicators. Furthermore, no market indicators that appropriately express the situation in the local financial market can be used in Estonia as no bank or other financial institution currently has shares listed on the local stock exchange and the bonds of Estonian financial institutions are not traded on the regulated market. As the Estonian central government has not issued any bonds it is not possible to use the interest rates on sovereign bonds or their CDS premiums for assessing sovereign risk.

As a result, stresses in the Estonian financial market are better shown by the European Central Bank's CISS, which measures general systemic

Figure 15. CISS indicator of the European Central Bank



Source: European Central Bank

Figure 16. CDS premiums of parent banking groups (arithmetic average)

Sources: Bloomberg, Eesti Pank calculations

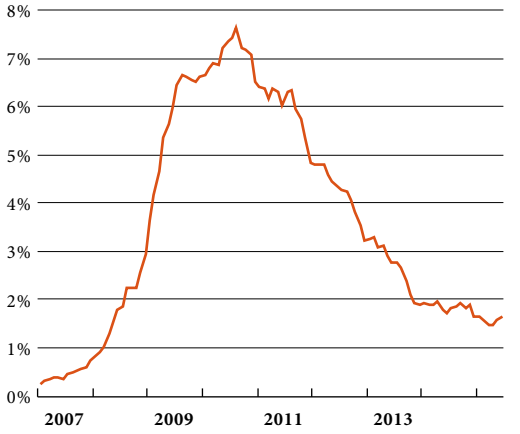
stress in the European Union, and by the CDS premiums of parent banks, which measure stress in banks' funding. Alongside market-based indicators, indicators of the credit quality of the banks also need to be considered in assessing whether to remove the buffer.

1. **The European Central Bank's CISS** covers 15 market-based measures, which indicate tensions in financial markets. These are divided into five sub-categories of financial intermediation, money markets, stock markets, bond markets and currency markets. The CISS takes a value between 0 and 1, where a value closer to 1 indicates higher stress, and closer to 0 is lower stress (see Figure 15). The indicator is published once a week on the website of the European Central Bank

2. **The CDS premiums of parent banking groups** are market-based indicators that reflect the assessment of market participants about the credit risk of the parent banks. If investors find that the credit risk of bonds issued by a bank has increased, this is reflected in a rise in its CDS premiums. Bloomberg shows the risk premiums for those banks on a daily basis. Eesti Pank uses the arithmetic average of the risk premiums of four parent banking groups – Swedbank, SEB, Nordea and Danske – in assessing the funding risk to the banking system coming from market stress, but it also observes changes in the risk premiums for the institutions individually (see Figure 16).

3. **The share of loans in the portfolio overdue by more than 60 days** is an indicator of loan quality for the banks operating in Estonia that has reacted relatively rapidly to a deterioration in the economy when the cycle has been in a downturn (see Figure 17). Data on overdue loans are collected every month, and so this indicator is likely to be quite suitable for showing whether the countercyclical buffer should be removed. It is also wise to observe changes in loans overdue by less than 60 days, as this can provide an early indication of when loan quality starts worsening.

Figure 17. Share of loans overdue by more than 60 days in the loan portfolio



Source: Eesti Pank