THE COUNTERCYCLICAL CAPITAL BUFFER

PRINCIPLES FOR ASSESSING AND APPLYING THE BUFFER REQUIREMENT

JUNE 2024

This framework document presents the updated Eesti Pank principles for applying the countercyclical capital buffer requirement. It describes the fundamental nature and design of the buffer requirement that is set as a macroprudential measure and explains the conditions and indicators that Eesti Pank considers when raising or lowering the buffer requirement. The principles and framework for the analysis presented in this document are based on the Capital Requirements Directive of the European Union, the Credit Institutions Act and the ESRB recommendation ESRB/2014/1.

CONTENTS

CONTENTS 3

1. THE FOUNDATIONS OF THE FRAMEWORK FOR THE COUNTERCYCLICAL CAPITAL BUFFER 4

1.1.Aim and legal basis of the buffer requirement 4

1.2. Decision-making, coordination and publication 4

1.3. Reciprocity of buffer rates set in other countries and the institution-specific buffer requirement... 5

2. THE PRINCIPLES FOR SETTING A COUNTERCYCLICAL CAPITAL BUFFER REQUIREMENT 7

2.1. The two-part requirement of the Estonian countercyclical capital buffer 7

2.2. Principles for changing the countercyclical capital buffer rate 7

3. ASSESSMENT OF THE COUNTERCYCLICAL CAPITAL BUFFER RATE 10

3.1. Assessment of the base requirement 10

3.2. Assessment of the cyclical requirement 11

1. THE FOUNDATIONS OF THE FRAMEWORK FOR THE COUNTERCYCLICAL CAPITAL BUFFER

1.1. AIM AND LEGAL BASIS OF THE BUFFER REQUIREMENT

The countercyclical capital buffer requirement is intended to protect the banking sector against losses that could be caused by cyclical systemic risks increasing in the economy. A rise in the buffer rate requires the banks to hold additional own funds when credit is growing fast that they can use to cover larger loan losses if the economic and financial environment deteriorates substantially, so they can then continue lending. The countercyclical capital buffer is higher the larger the systemic risks accumulated in the credit market are. This helps to reduce the danger of lending being constrained if larger loan losses occur. It is not the direct aim of the countercyclical capital buffer to prevent booms in the economy or in credit, but a higher rate for the buffer requirement can help slow the growth in lending.

Setting a countercyclical capital buffer in the European Union is done under the terms of the **Capital Requirements Directive** (CRD) 2013/36/EU[1], which is guided by global regulatory standards developed by the Basel Committee on Banking Supervision (BCBS)[2].

The Capital Requirements Directive has been transposed into Estonian law through the **Credit Institutions Act**. Eesti Pank has the power to set the countercyclical capital buffer, and the buffer rate for credit risk exposures in Estonia is set by a **decree of the Governor of Eesti Pank**. Eesti Pank also defines the procedure for calculating the credit institution specific countercyclical capital buffer rate and the procedure for recognising buffer rates set in other countries[3].

EU Council Regulation No 1024/2013 allows the **European Central Bank** acting within the frame of the Single Supervisory Mechanism to set requirements for buffers for credit institutions that are stricter than those set by the competent or designated authority of member countries[4]. This also applies to the countercyclical capital buffer.

1.2. DECISION-MAKING, COORDINATION AND PUBLICATION

The key steps in deciding on the countercyclical capital buffer requirement are analysis of the need for a buffer, domestic and international notification and coordination of the decision, and publication (see Figure 1).

Eesti Pank carries out a regular quarterly **analysis and assessment** of the need to raise or lower the countercyclical capital buffer requirement. A detailed assessment of the cyclical and structural developments affecting financial intermediation is issued twice a year in the Financial Stability Review. Wider and more comprehensive consideration of risks and macroprudential measures gives a firmer and more reliable base for the steps planned that then means that the smooth functioning of the financial system can be better ensured.

The risk assessments and proposed measures contained in the Financial Stability Review, including the possible change to the countercyclical capital buffer rate, are discussed in the **joint committee**[5]

1 Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.

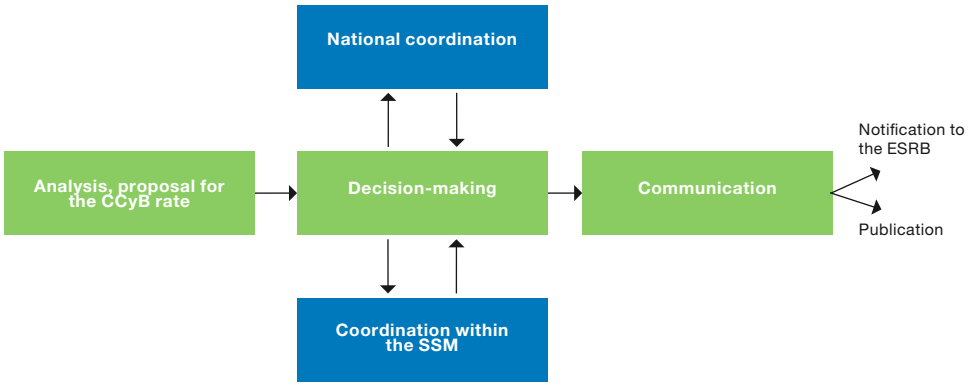
2 BSCS (2010). Basel III: A global regulatory framework for more resilient banks and banking systems. December 2010 (rev June 2011).

3 Eesti Pank Governor's Decree No.9 of 1 December 2015 *Calculation of credit institution specific countercyclical capital buffer rate and recognition of the countercyclical capital buffer rate set in another country.*

4 Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions.

5 The joint committee is a domestic coordination body that handles issues relating to the legal acts affecting the financial sector, supervision and crisis management. It works under an agreement signed on 21 December 2007 between the Ministry of Finance, Finantsinspektsioon and Eesti Pank.

Figure 1. Decision-making for changing the countercyclical buffer rate



Source: Eesti Pank

of staff from the Ministry of Finance, Finantsinspektsioon and Eesti Pank. Decisions to change the rate of the countercyclical capital buffer are taken by the Executive Board of Eesti Pank. The decisions, the reasons for them and the quarterly assessment, together with the indicators used in the assessment are **published on the Eesti Pank website**.

The Single Supervisory Mechanism (SSM) makes the European Central Bank responsible for macroprudential measures, including the countercyclical capital buffer requirement, alongside the states that have joined the SSM. Under Article 5 of Council Regulation (EU) No 1024/2013, 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. If the European Central Bank considers the level of the buffer rate to be insufficient, it can object to the rate notified, and Eesti Pank must consider the arguments used by the European Central Bank when proceeding with its decision-making process.

The European Systemic Risk Board (ESRB) coordinates the setting of macroprudential measures by member states within the European Union. Member states have to notify the ESRB when a decision is taken to change the rate of a countercyclical capital buffer. The ESRB publishes the rates for all the countercyclical capital buffers it has been informed about and any related information on its website.

1.3. RECIPROCITY OF BUFFER RATES SET IN OTHER COUNTRIES AND THE INSTITUTION-SPECIFIC BUFFER REQUIREMENT

The Capital Requirements Directive lays out the principles for recognising the countercyclical capital buffer requirements of other member states. Reciprocity, meaning applying the buffer requirement of another state, is **mandatory when the buffer is at a rate of up to 2.5%**. Mandatory reciprocity ensures that a countercyclical buffer requirement applies to all the credit claims issued in that state regardless of whether the lender is a domestic bank or a foreign one.

If the buffer rate is above 2.5%, it is the designated authority of each member state that decides on recognition, this being Eesti Pank in Estonia. The ESRB Recommendation[6] says that designated authorities should generally recognise the countercyclical capital buffer rates applied in other member states, including rates above 2.5%, as there may be negative cross-border side-effects from non-recognition.

The principles for reciprocity of the countercyclical capital buffer rates of other countries are set out in a decree of the Governor of Eesti Pank[7].

6 Recommendation ESRB/2014/1 of the European Systemic Risk Board of 18 June 2014 on guidance for setting countercyclical buffer rates.

7 Eesti Pank Governor's Decree No.9 of 1 December 2015 *Calculation of credit institution specific countercyclical capital buffer rate and recognition of the countercyclical capital buffer rate set in another country.*

- If the countercyclical capital buffer rate in another member state is below 2.5%, credit institutions with an operating licence in Estonia will have to consider that rate in calculating their credit exposure in the country that has applied the buffer rate. If the buffer rate is above 2.5%, Eesti Pank will generally recognise that requirement. If Eesti Pank decides not to recognise the rate above 2.5% of another member state, it informs the ESRB, the designated authorities of other member states and the European Central Bank.
- In calculating countercyclical capital buffer rates for credit exposure in third countries, Eesti Pank starts from the terms of the banking directive that if a third country has not applied a countercyclical capital buffer or has set a buffer rate that Eesti Pank considers too low, Eesti Pank may set its own rate that banks will have to adhere to in their credit exposure in that third country. The banks generally have to consider the buffer rates applied in third countries, or if no buffer rate has been set, the buffer rate of 0% applies to exposures in that country.

The size of the **institution-specific countercyclical capital buffer** requirement is defined by multiplying the total risk exposure[8] of the bank 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 bank and the buffer rates applicable in those countries. The institution-specific countercyclical capital buffer rate is the weighted average of those rates.

The geographical location of a credit exposure is identified using regulatory technical standards that have been developed by the European Banking Authority (EBA)[9]. The location of the exposure is generally the country of the debtor, though the standards allow for cases where the location may be given as the home country of the bank. The EBA standards allow banks 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.

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

9 Commission delegated regulation (EU) No 1152/2014 (04.06.2014) http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014L0059&from=EN

2. THE PRINCIPLES FOR SETTING A COUNTERCYCLICAL CAPITAL BUFFER REQUIREMENT

2.1. THE TWO-PART REQUIREMENT OF THE ESTONIAN COUNTERCYCLICAL CAPITAL BUFFER

Eesti Pank decided in autumn 2021 to change the principles for applying the countercyclical capital buffer (CCyB) and to set the buffer requirement as two components:

1. **a base requirement** that is generally held unchanged at a fixed and steady rate;
2. **a cyclical requirement** that is added to the base requirement if the cyclical risks from rapid growth in the debt of companies and households are increasing.

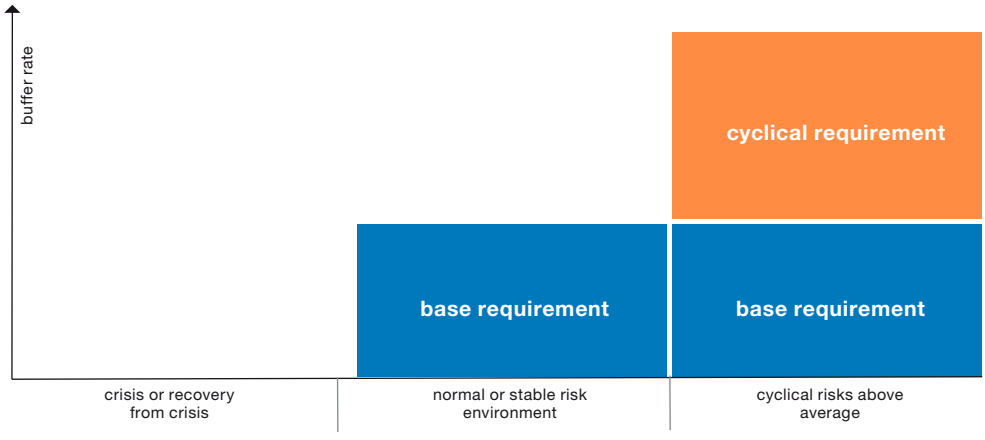
The countercyclical capital buffer rate in Estonia is defined as the sum of the rates for the two requirements:

$$r_{CCyB} = r_{base} + r_{cyclical}$$

The level of the countercyclical capital buffer depends on developments in the financial cycle. **Three phases** can be defined for the setting of the countercyclical capital buffer (see Figure 2).

1. When the credit market is functioning as usual, borrowing is moderate and the rate of growth in the debt of the non-financial sector matches the rate of growth in the economy, the CCyB rate is set at the level of the base requirement. The base requirement helps to make sure that some capital buffer is available for the banks and to avoid the danger of the requirement being raised too late[10].
2. The requirement is raised above the base rate if cyclical risks increase. The rate of the cyclical requirement depends on the size of the cyclical risks.
3. If there is a deep recession or a large financial shock that could cause large loan losses to the banks and threaten to interrupt the supply of credit, then the whole buffer requirement can be cut to 0%. The CCyB rate is then held at zero until the danger has dissipated and raising the buffer requirement would not hamper lending and so impede the recovery of the economy.

Figure 2. Three stages of the CCyB requirement



Source: Eesti Pank

2.2. PRINCIPLES FOR CHANGING THE COUNTERCYCLICAL CAPITAL BUFFER RATE

Eesti Pank takes account of the legal requirements and the strategy for the countercyclical capital buffer of a base requirement and a cyclical requirement, and it applies the following principles for maintaining and changing the CCyB rate.

10 Under the Capital Requirements Directive (CRD) the CCyB rate is generally raised 12 months after the decision to raise the rate has been taken.

I. General principles. Assessment of the cyclical risk and calibration of the CCyB rate

1. Eesti Pank assesses how appropriate the CCyB requirement is with a cyclical risk assessment each quarter. The assessment considers that one part of the requirement, the base requirement, generally remains permanently unchanged at a target level that is higher than zero. An exception occurs during a deep crisis, when the base requirement is reduced or removed. The cyclical requirement is larger when cyclical risks are larger.
2. The starting point for calibrating the CCyB rate is the benchmark rate or buffer guide found using the Eesti Pank main indicators. Eesti Pank assesses regularly every two or three years whether the methodology used for finding the benchmark rate is still appropriate, at the same time that it assesses the adequacy of the CCyB base rate.
3. The benchmark rate is only one input in the calibration. There is also a cyclical risk assessment that uses the main indicators together with other dynamics for the credit market and the real estate market, the resilience of the banking sector and the appetite for risk, and other indicators that reflect the financial environment more broadly and the macroeconomic and credit growth forecasts. The decision also considers the other macroprudential measures that apply, the cross-border impact of the measures, qualitative information, and expert assessments.
4. Eesti Pank publishes the cyclical risk assessment and the main indicators used as the basis for the assessment. The quarterly assessment together with the time series for the indicators are published on the Eesti Pank website.

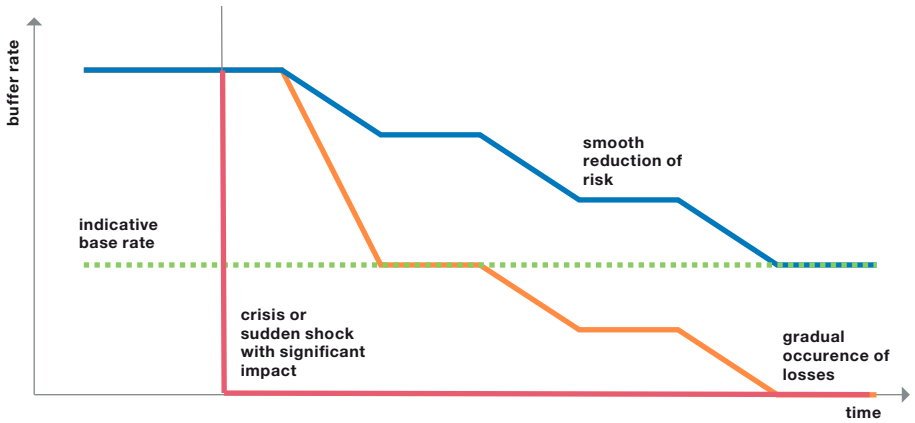
II. Principles for raising the cyclical rate of the CCyB

1. Eesti Pank considers increasing the cyclical rate of the CCyB when the assessment of cyclical risk indicates risks are increasing and the benchmark rate exceeds the threshold calculated[11]. Eesti Pank can also raise the CCyB rate 0.5 percentage point above the benchmark rate if the cyclical risks remain high and the rate of growth in credit remains fast during the two quarters after the higher cyclical rates started to apply. Even if the rate of credit growth is not accelerating, growth remaining fast could mean that risks are increasing and that larger capital buffers are needed.
2. Eesti Pank raises the CCyB cyclical rate in steps of 0.5 percentage point. The higher rate generally applies 12 months after the decision to raise it has been taken. It may start to apply earlier under exceptional circumstances.

III. Principles for lowering the cyclical rate of the CCyB

1. The CCyB rate can be lowered because the cyclical risks that caused it to be raised have abated, or have materialised. How fast the CCyB rate is lowered is determined by an assessment of the reduction in risk, the extent of loan losses, and the speed at which credit constraints are accumulating, and the possible impact of these (see Figure 3).

Figure 3. Scenarios for lowering the countercyclical capital buffer rate



Source: Eesti Pank

11 See section 3.2.2. *Method of calibrating the benchmark rate.*

2. If cyclical risks are decreasing naturally, Eesti Pank can cut the CCyB rate gradually to the level of the base rate in steps of 0.5 percentage point. Eesti Pank considers the cyclical risk to have decreased permanently if the main indicator is negative or has fallen or if the benchmark rate has been below the threshold calculated for at least four quarters. Cyclical risks decreasing does not necessarily mean that the buffer requirement will be reduced. The rate can be reduced if is assessed that the probability of cyclical risks increasing in the future is small and that no substantial increase in loan losses is expected in the coming year. This is necessary to avoid the risk of insufficient capitalisation, which could arise if the buffer requirement is reduced prematurely.
3. If cyclical risks materialise and loan losses accumulate, the decision to cut the CCyB rate can be taken following a current assessment of the depth, extent and duration of an economic or financial crisis. An important factor in the decision is the profitability and capitalisation of the banks. If the negative impact of an economic or financial shock on credit growth is unclear and the banks have sufficient capital buffers, it must first be assumed that the banks will use their existing buffers to cover their losses[12]. Tension in the credit market and larger loan losses could equally make it necessary to cut the CCyB rate faster and in larger steps, with the base requirement fully released if needed. Cuts to the buffer requirement may also be considered if large loan losses have not yet occurred but are highly likely to do so in the near future.

4. **When Eesti Pank lowers the CCyB rate, it decides on and announces the period during which the rate will not be raised again.**

12 This could also mean automatic restrictions on distributions of profit and capital, which are normal and necessary during uncertain times.

3. ASSESSMENT OF THE COUNTERCYCLICAL CAPITAL BUFFER RATE

3.1. ASSESSMENT OF THE BASE REQUIREMENT

The base requirement of the countercyclical capital buffer ensures that the banks have a capital buffer in place to soften the impact of unexpected negative systemic shocks. The base requirement also helps avoid the danger of the countercyclical capital buffer rate being raised too late because there is a risk that the build-up of systemic risks is not detected in time. When the credit market is functioning as usual, borrowing is moderate and the rate of growth in the debt of the non-financial sector matches the rate of growth in the economy, the CCyB rate is the base requirement.

The need to set the base requirement comes from the structural vulnerability of the Estonian economy and the financial sector. This vulnerability lets problems caused by unforeseen negative events emerge rapidly and to a greater extent than in many other European countries.

1. Mainly because of its small size and this openness, the Estonian economy reacts easily to negative economic events. In recent decades the Estonian economy has gone through dramatic cycles of boom and bust. Estonia's foreign trade is highly concentrated geographically and by sector, and exports of goods and services as a share of the economy are around one and a half times as much in Estonia as the average in the euro area or the European Union. Previous experience has shown that an unexpected worsening of the economic environment can rapidly lead to a marked deterioration in the ability of companies and households to service their loans.
2. The Estonian banking sector is very exposed to the risks from the real estate market. Loans to companies in real estate and construction have on average over the past 10 years been 37% of all the corporate loans issued by the banks, which is one of the highest figures in the European Union. As investments in the real estate sector are capital intensive, the average financial leverage of companies in the sector is higher than that of those in other sectors. The financial position of real estate companies is consequently more sensitive to changes in the economic cycle and the quality of those loans can deteriorate to a much greater extent in an economic downturn than loans to businesses in other sectors on average.

Except during crises and the recovery from them, the rate of the base requirement will always be unchanged at a fixed level. **The target level for the base rate** should be enough to cover the possible negative impact of unexpected shocks. One of the main tools for assessing the target level is the macroprudential stress test. Eesti Pank uses the stress test to measure the resilience of the banks to financial and economic shocks. The stress test is an analytical tool that allows the possible impact of negative scenarios for the level of capital in the banking sector to be assessed. The principle followed in assessing the target level of the base rate is to aim to match the level of capital in the banking sector to the magnitude of the risks that it faces. Eesti Pank assesses whether the target level for the base rate is appropriate regularly every two or three years.

If the base requirement rate is cut to 0% because of a crisis, the CCyB will be held at that level until there is no danger that raising it would constrain lending and the recovery of the economy. The rate for the base requirement is raised to its target level in one or more steps and it starts rising when three conditions have been met.

- **The business cycle condition.** Several economic indicators show that the impact of the crisis has faded. For example GDP growth is approaching its long-term average, the outlook for growth is good, unemployment is falling, the real estate market is recovering, or similar.
- **The financial strength of the banks condition.** A major part of the loan losses caused or potentially caused by the crisis have been absorbed, and it is not foreseen that loan losses could weaken the capitalisation of the banks in the near term. The banking sector is profitable.
- **The absence of constraints on the loan supply condition.** The lending market is functioning normally, as banks are able to meet the demand for loans without setting excessive restrictions on the loan supply.

3.2. ASSESSMENT OF THE CYCLICAL REQUIREMENT

Eesti Pank assesses how appropriate the cyclical requirement is with a cyclical risk assessment each quarter. The assessment considers that one part of the requirement, the base requirement, generally remains unchanged at a target level that is higher than zero. The assessment follows the principle of **guided discretion**, which means that the decision considers both quantitative indicators and other relevant qualitative factors. This approach allows the assessment to take account of a large amount of time-dependent data and is much more adaptable to all possible economic and financial conditions than a solution based rigidly on indicators.

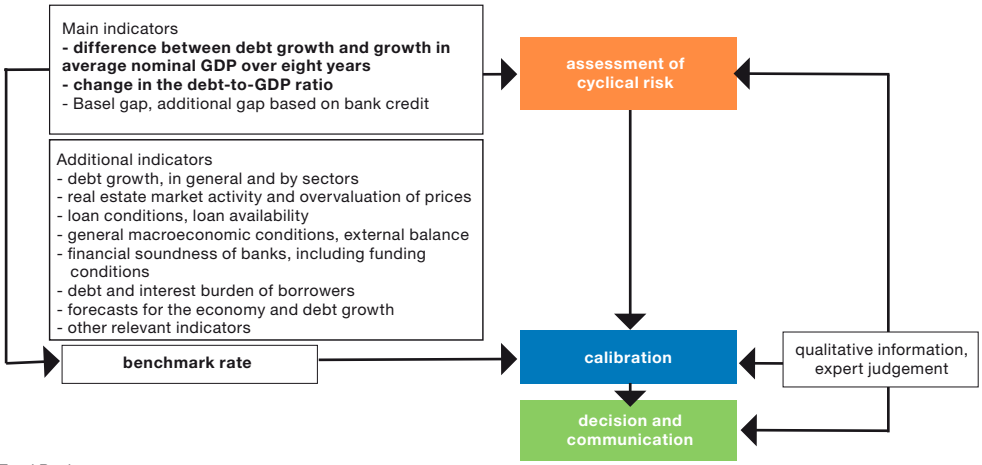
Eesti Pank bases its assessment of the countercyclical capital buffer rate on the provisions of the Credit Institutions Act and the guidelines in the ESRB Recommendation ESRB/2014/1. The ESRB recommendation states that empirical analysis has shown the debt-to-GDP ratio gap calculated under the guidelines of the Basel Committee on Banking Supervision to be the single best indicator for identifying the accumulation of cyclical risks in the European Union as a whole. Measuring and calculating this indicator also increases comparability across countries both within the European Union and outside it, and so the ESRB recommends that the authorities responsible in each member state measure and calculate the Basel **standard debt-to-GDP gap** each quarter, and also calculate a buffer guide from it. Eesti Pank calculates and publishes these indicators on its website each quarter. Eesti Pank uses the methodology in the ESRB/2014/1 Recommendation for the calculation.

The ESRB recommendation also notes however that the differences in financial systems and their dynamics and the individual features of economies mean that the relevance of the standard debt-to-GDP gap and the buffer guide calculated from it can vary between countries, and so the standard buffer guide is not intended as a basis for automatically applying the buffer rate. Member states are consequently recommended to use other indicators and information as well when assessing cyclical risks and setting the buffer rate.

The time series of the standard debt-to-GDP gap for Estonia is short and the indicator was strongly distorted by the large boom in lending in 2005-2007 and the subsequent deep recession, so this indicator can give a misleading picture of the Estonian financial cycle and is not suitable as the main indicator for justifying the countercyclical capital buffer rate. **Eesti Pank consequently assesses the credit cycle in Estonia using two main indicators that it has defined for itself and that are better suited for the Estonian context, and these are the change in indebtedness, and the gap between the growth in debt and the growth in long-term nominal GDP.** For the buffer guide Eesti Pank uses a benchmark rate that is calibrated from the main indicator and shows the gap between the growth in debt and the growth in long-term nominal GDP.

Although the main indicators chosen by Eesti Pank describe Estonia's financial cycle much better than the standard debt-to-GDP gap indicator, none of the indicators are so perfect that a decision on the buffer rate can be made based on them alone. Eesti Pank's assessment of the CCyB rate consequently

Figure 4. Analytical inputs for changing the CCyB rate



Source: Eesti Pank

also considers other indicators that describe the dynamics for the credit market and the real estate market, the resilience of the banking sector and the appetite for risk, and other indicators that reflect the financial environment more broadly and the macroeconomic and credit growth forecasts. The decision also considers the other macroprudential measures that apply, the cross-border impact of the measures, qualitative information, and expert assessments.

3.2.1. INDICATORS OF CYCLICAL RISK

1. Main indicators

- Change in indebtedness

Eesti Pank calculates indebtedness using the formula

$$INDEBTEDNESS_t = \frac{DEBT_t}{\sum_{i=t-3}^{t}(GDP_i)}$$

where
t is the last day of the period considered, and the period is one quarter;
DEBTt is the total debt of the Estonian private sector at the end of quarter t;
GDP is Estonia's gross domestic product in that quarter;
and i is the time shift in the successive summation of the GDP indicator.

Eesti Pank observes the change in indebtedness from the quarterly and yearly change in the indicator for indebtedness. A positive change shows an increase in indebtedness, which generally appears in the upswing of the financial cycle and indicates that risk is increasing. The advantage of this indicator is its simplicity but its disadvantage is that it can be affected very much by the business cycle. A sharp drop in the economy for example could see nominal GDP shrink faster than the total debt of the non-financial sector, in which case the indicator calculated for indebtedness would rise and misleadingly point to an increase in risks from the financial cycle. Temporary very fast growth in nominal GDP could in a similar way hide excessively fast growth in credit. Eesti Pank consequently always observes this indicator in combination with other indicators.

- The gap between the growth in debt and the growth in long-term nominal GDP

Eesti Pank calculates the gap between growth in debt and growth in long-term nominal GDP using the formula

$$GAP_t = \frac{DEBT_t}{DEBT_{t-4}} - \frac{\sum_{i=t-31}^{t}\left(\frac{\sum_{j=i-3}^{i}(GDP_j)}{\sum_{j=i-3}^{i}(GDP_{j-4})}\right)}{32}$$

where
t is the last day of the period considered, and the period is one quarter;
i and j are the time shift in the successive summations of the GDP indicator.
DEBTt is the total debt of the Estonian private sector at the end of the quarter;
and GDP is Estonia's gross domestic product in that quarter.

The gap between the growth in debt and the growth in long-term nominal GDP describes the financial cycle. If the gap is positive and widening, it means that debt is growing faster than long-term nominal GDP, which could indicate an upswing in the financial cycle and a possible increase in systemic risks. The advantage of this indicator over the indicator for the change in indebtedness is that it is affected much less by the business cycle because it uses long-term average GDP growth, which is much less volatile, instead of current nominal GDP. Eesti Pank uses the arithmetic average of nominal GDP growth over the past eight years as the indicator for long-term GDP growth. This time window is long enough to smooth the short-term volatility in the business cycle, but also short enough to cover developments in the business cycle without the average being calculated from data that have already become irrelevant and

out of date. Using long-term average nominal GDP extends the lag for the indicator, and so Eesti Pank observes its dynamics together with those of other indicators.

2. Additional indicators

To get a broad picture of the credit cycle it is important to analyse not only the main indicators, but also other indicators that describe changes in the cyclical risk. Eesti Pank observes several additional indicators that can be categorised into the indicator groups in the ESRB recommendation (see Table 1). Which indicators are observed can vary depending on the economic and financial climate, and the assessment focuses above all on the indicators that are best able to describe the financial cycle in the given period. In its publications, Eesti Pank uses a smaller set of indicators that help to cover the main monitoring of cyclical risk.

Table 1. Indicator groups and examples of indicators for assessment of the countecyclical capital buffer rate

Indicator group	Examples of indicators
Indicators of credit developments	growth of loan portfolio, growth of new lending
Indicators of potential overvaluation of property prices	house price growth, growth of transactions, overvaluation of property prices
Indicators of external imbalances	current account balance as a ratio to GDP
Indicators of the strength of bank balance sheets	profitability, financial leverage, loan-to-deposit ratio
Indicators of the private sector debt burden	interest burden of households and non-financial enterprises
Indicators of potential mispricing of risk	interest margin of new loans, stock price index

Source: Eesti Pank

The cyclical risk assessment found from the main and additional indicators is the general basis for the decisions on whether to maintain, raise or lower the CCyB rate. Eesti Pank is able to lift the buffer requirement entirely **if risks materialise**, and additional indicators are used to identify such an event. Eesti Pank follows the guidelines in the ESRB recommendation when selecting and classifying the indicators that describe the materialisation of risk, and supplements them with financial market indicators for a deterioration in loan quality and for credit restrictions (see Table 2).

Table 2. Examples of indicators indicating the possible materialisation of risk

Sign of risk materialising	Examples of indicators
Stress in the financial system or financial markets	ECB composite indicator of systemic stress (CISS), bond spreads
Deterioration of credit quality	overdue loans, loan losses
Credit constraints for the non-financial sector	bank lending standards (BLS), indicators of credit availability

Source: Eesti Pank

3.2.2. METHOD OF CALIBRATING THE BENCHMARK RATE

Since the standard benchmark rate calculated under the guidelines of the Basel Committee on Banking Supervision from the debt-to-GDP ratio gap may give misleading signals for the Estonian data, Eesti Pank uses a main indicator of its own choosing to find an additional benchmark rate. **The gap between the growth in debt and the growth in long-term nominal GDP is the better of the two main indicators used by Eesti Pank for calibrating the benchmark rate**, as it is affected substantially less by the business cycle.

The starting point for calibrating the benchmark rate is the historical data for the main indicator, and the long-term empirical distribution of these data, meaning their mean and standard deviation, is used to set the thresholds for the benchmark rate[13]. The thresholds are calibrated using quarterly figures for the

13 The methodology uses a simplified assumption that the long-term empirical distribution of the indicator follows normal distribution.

main indicator from 2011-2022. Earlier years are not used for the observation period, as the extraordinary credit boom in 2005-2007 and the subsequent economic crisis would have seriously distorted the estimates of the distribution characteristics, and could then have caused the thresholds for the benchmark rate to underestimate the expansion phase of the financial cycle.

The lowest threshold of the indicator is calibrated for a benchmark rate of 1.5%[14] and one standard deviation in the distribution of the indicator is used. The next thresholds use two and three standard deviations (see Table 3). As the observation data increase, the estimate of the distribution characteristics may change over time, and so Eesti Pank plans to recalculate the characteristics of the distribution regularly

Table 3. Calibration of thresholds for the benchmark rate of the CCyB requirement

Benchmark rate	Calibration range
1.5% (including a 0.5% cyclical rate)	$\bar{I} + \sigma < \boldsymbol{I} < \bar{I} + 2\sigma$
2% (including a 1% cyclical rate)	$\bar{I} + 2\sigma < \boldsymbol{I} < \bar{I} + 3\sigma$
2.5% (including a 1.5% cyclical rate)	$\bar{I} + 3\sigma < \boldsymbol{I}$

* based on data about the main indicator for the period 2011–2022
Source: Eesti Pank

14 This methodology only affects the calibration of the cyclical component of the CCyB rate, and so the lowest possible benchmark rate is 1.5%, with a cyclical component of 0.5%.