Bank of Russia

2019

DETERMINING THE CREDIT CYCLE PHASE AND ESTABLISHING A NATIONAL COUNTERCYCLICAL CAPITAL BUFFER

Consultation paper

Moscow
2019

CONTENTS

INTRODUCTION

The global crisis of 2007–2008 revealed a number of problems in the regulation of credit institutions both in individual countries and in a global context. The lack of countercyclical regulation of financial institutions, first of all, banks, is one of such problems. Despite the favourable situation in the 2000s globally (rapid growth of the global economy, low inflation, rising stock indices etc), the largest banks did not increase their capital adequacy and generally reduced their capital stock. As a result, credit institutions turned out to be unprepared for losses that they incurred at the negative phase of the credit cycle, and it took significant taxpayer expenses to save them. In a global context, the materialisation of risks in one country led to the materialisation of risks in other countries and triggered a network effect.

To mitigate these threats, at their Washington summit in November 2008, the G20 leaders decided to implement a financial regulation reform, including with a view to reducing the procyclicality of regulatory policies and increasing the efficiency of regulation during the economic cycle.

In December 2010, the Basel Committee on Banking Supervision (BCBS) published a final document with guidelines for improving the resilience of banks and banking systems, which is known as Basel III. The BCBS proposes using a countercyclical buffer (CB) as a tool to reduce the procyclical nature of regulation.[1] Each country sets its own level of countercyclical buffer, and credit institutions calculate the total buffer value by weighting exposures to different jurisdictions by the value of the buffers established in such jurisdictions.

To determine the point at which a countercyclical buffer should be introduced, the BCBS suggested an approach based on the credit-to-GDP gap (credit gap) indicator, which is calculated as the difference between the current value of the credit-to-GDP ratio and its long-term trend. If the credit gap value exceeds 2 pp, setting a positive value of the CB is recommended.

The approach proposed by the BCBS has a number of weaknesses, the key one being its inapplicability for emerging markets that are characterised by structural shifts in the development of the economy and the financial sector. Structural shifts are often followed by a situation where, in effect, a credit boom is observed, and the credit gap takes on negative values.

In this report, the authors aim to present possible alternative approaches to determining the credit cycle phase. Section 1 describes the experience of countries that have introduced a positive CB value in recent years. Section 2 addresses the list of indicators that the Bank of Russia is guided by when making a decision on the value of the national CB. Section 3 provides an overview of models other than the BCBS's approach which are used by foreign regulators to determine the credit cycle phase and examines the approaches to determining the credit cycle phase developed by the Bank of Russia.

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[1] *A countercyclical buffer is a buffer on the capital adequacy ratio. A bank that does not meet the requirement for a countercyclical buffer will be subject to profit distribution restrictions. This makes it possible to accumulate capital buffers from the bank's profits.*

1. INTERNATIONAL PRACTICE OF USING THE COUNTERCYCLICAL BUFFER

In 2010, the BCBS published its Guidance for National Authorities Operating the Countercyclical Capital Buffer (December 2010). This document describes a list of recommended indicators that may be used for introducing the CB and determining its value. The main indicator signalling the need to establish or increase a CB is the credit gap indicator. It is defined as the difference between the debt-to-GDP ratio and its long-term trend. To distinguish a long-term trend in the time series, using a one-sided Hodrick–Prescott filter with λ = 400,000 is suggested. A one-sided filter assumes that only one new point is added to the trend's time series as of the new reporting date, and the previous values remain unchanged. This procedure makes it possible to preserve the historical values of the credit gap so that their regular revision will not affect the national authorities' decisions on the value of the CB. Using the parameter λ = 400,000 indicates that the trend changes insignificantly over time as the values of the original series change. The BCBS proposes increasing the CB value linearly from 0 to 2.5% of risk-weighted assets if credit gap values grow from 2 to 10 pp.

The BCBS points out that the credit gap is just one of the possible indicators that could signal the accumulation of systemic risks. In this respect, regulators are also advised to use other risk assessment indicators, for example, price dynamics for various types of assets, lending terms, real GDP growth rates and the ability of non-financial organisations to discharge their debt obligations. Moreover, national authorities may develop their own approaches to assessing the credit gap indicator which better reflect the process of systemic risk accumulation.

At the same time, a number of countries declare that, in neutral conditions, their goal is to maintain the CB value at the level of 1%. This policy is pursued by the UK,[1] Lithuania,[2] and Ireland.[3] In this case, reducing the buffer to 0% can be an incentive measure in the case of an undesirable drop in lending.

An overview of foreign practices has shown that the credit gap is not used as an unconditional benchmark in setting the CB level. In many countries, the credit gap became negative in the aftermath of the global financial crisis. Moreover, in a number of countries, even despite significant growth in lending, its negative values are expected to persist for several years. In some countries, the credit gap value is almost -80 pp (Ireland); at the same time, national regulators have concluded that cyclical risks persist and have decided to establish a positive value of the CB. For example, in Bulgaria, while the credit gap was -42.7 pp in September 2018, the CB was increased to 0.5%; in Iceland, the credit gap was -76.9 pp in May 2018, and the CB was increased to 1.75%; and in Ireland, with a credit gap of -77 pp in July 2018, it was decided to increase the CB to 1%. A positive CB with a negative credit gap was also established in the UK, Denmark, Lithuania, Norway, and the Czech Republic. The credit gap in Luxembourg (-0.2 pp) and Slovakia (a standard credit gap of 0% and a national credit gap calculated taking only lending to national borrowers into account of 0.25%) is practically at zero, and the CB in these countries is also higher than zero. A non-zero CB with a positive credit gap has been introduced in Hong Kong, France, and Sweden.

The European Systemic Risk Board (ESRB) notes[4] that the credit gap is not always a reliable benchmark for determining the CB level. The ESRB recommends that European countries employ other approaches to calculating the credit gap (for example, using various parameters to smooth

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[1] https://www.bankofengland.co.uk/-/media/boe/files/statement/2016/the-financial-policy-committees-approach-to- etting-the-countercyclical-capital-buffer.

[2] https://www.lb.lt/uploads/documents/files/TS_2015_Nr_5_AKR_taikymas_Lietuvoje_2017_EN.pdf.

[3] https://www.centralbank.ie/docs/default-source/publications/financial-stability-notes/no-4-measuring-and-mitigating-cyclical-systemic-risk-in-ireland-(o%27brien-o%27brien-and-velasco).pdf?sfvrsn=6.

[4] https://www.esrb.europa.eu/pub/pdf/other/esrb.handbook_mp180115.en.pdf.

the trend or including various components in the lending indicator). In their guidelines for making decisions on the CB value, some countries also take the specifics of the market/economy into account. For example, the Hong Kong Monetary Authority (HKMA) additionally analyses the situation in the real estate market (the growth rates of real estate prices, the real estate price to income ratio etc), the debt burden of the non-financial sector, macroeconomic imbalances and external factors. France assesses the debt dynamics of non-financial organisations, real estate prices and the dynamics of financial, macroeconomic and monetary indicators. Some countries use their own indicators. For example, Slovakia builds a Cyclogram, a composite indicator that takes into account a number of factors, for example, the national credit gap (loans to national borrowers only), lending growth, non-performing loans (NPL), debt of households and private non-financial companies, increase in real estate prices, the unemployment rate and other indicators (see Section 3 for more details). The UK and Norway determine the CB value using stress testing results. Stress testing makes it possible to determine the utilisation of buffers and banks' capital for covering losses in connection with the materialisation of risks in various scenarios. In its stress testing conducted in 2018, the UK also took risks related to leaving the EU into account.

Regulators' refusal to use the Basel gap as a key benchmark may indicate its low efficiency or incorrect calibration.

Table 1 provides a brief overview of the reasons for introducing a positive CB in a number of countries.

BUFFER SETTING PRACTICE IN COUNTRIES*   *Table 1*

Country	Countercyclical buffer (CB) value	Activation date	Lending to GDP ratio	Credit gap		Reasons for introduction
Bulgaria	0,50%	01.10.2019	100,60%	-42.7 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
United Kingdom	1%	28.11.2018	149,80%	-16.5 pp	+	Acceleration of lending to individuals
						Acceleration of lending to non-financial companies
						Growth in real estate prices
Hong Kong	2,50%	01.01.2019	244,90%	19.3 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Denmark	1%	30.09.2019	225,45%	-31.7 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Iceland	1,75%	15.05.2019	163,30%	-76.9 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Ireland	1%	05.07.2019	91% of GNI; 241% of GDP	-77 pp	+	Acceleration of lending to individuals
				-87 pp		Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Lithuania	1%	30.06.2019	64,90%	-12.2 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Luxembourg	0,25%	01.01.2020	104,70%	-0.2 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices

Country	Countercyclical buffer (CB) value	Activation date	Lending to GDP ratio	Credit gap	Reasons for introduction	
Norway	2,50%	31.12.2019	199,70%	-4.86 pp		Acceleration of lending to individuals
						Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Slovakia	1,50%	01.08.2019	98,50%	3.87 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
France	0,50%	01.04.2020	133,30%	2.9 pp		Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Czech Republic	1,75%	01.01.2020	89,20%	-2.2 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
					+	Growth in real estate prices
Sweden	2,50%	01.01.2020	158,70%	2.34 pp	+	Acceleration of lending to individuals
					+	Acceleration of lending to non-financial companies
						Growth in real estate prices

The reasons for the introduction of the countercyclical buffer in the indicated countries are described in detail in the Appendix.

2. THE PROCEDURE FOR DECISION-MAKING ON THE VALUE OF THE NATIONAL COUNTERCYCLICAL BUFFER IN THE BANK OF RUSSIA

The Bank of Russia has a set of instruments for implementing the countercyclical regulation policy. In addition to capital conservation buffers, systemic importance buffers and the countercyclical buffer defined by Basel III, add-ons to risk weights are also applied to certain types of assets. Add-ons to risk weights make it possible to accumulate capital buffers and limit risks in certain lending segments without affecting other segments. Currently, add-ons to risk weights are applied to unsecured consumer loans, mortgage loans, loans to legal entities in a foreign currency and investments in debt securities denominated in a foreign currency. A countercyclical buffer is set when lending activity increases in all major lending segments, and the use of the above macroprudential instruments does not help achieve the desired goals.

When making a decision on setting a countercyclical buffer, the Bank of Russia considers a wide range of indicators characterising the dynamics of the debt burden of the private sector as a whole, lending activity in certain lending segments, lending standards, the level of credit risks in banks' portfolios, the dynamics of capital adequacy ratios and the practice of profit distribution by credit institutions and also takes into account the effect of other macroprudential measures.

Table

Indicator		Minimum since 2008	Maximum since 2008	Previous value (in the previous year)	Last value (as of 1 January 2019)
Performance of the banking sector					
1	Capital adequacy ratio				
	total capital (N1.0)*	12.0%	21.8%	14.8%	14.4%
	Tier 1 capital (N1.1)*	8.5%	11.6%	10.5%	10.4%
	core capital (N1.2)*	8.6%	12.2%	10.8%	11.0%
2	Loans/GDP	35.4%	51.0%	45.8%	46.6%
Lending conditions					
3	Growth rate of loans to non-financial organisations				
	in RUB, yearly	− 2.1%	61.6%	5.8%	12.9%
	in RUB, quarterly	− 2.2%	12.8%	− 0.2%	3.1%
	in RUB, monthly	− 2.2%	5.0%	− 0.8%	0.4%
	in foreign currency, yearly**	-14.4%	70.6%	-0.6%	-11.1%
	in foreign currency, quarterly**	-10.8%	15.3%	3.3%	-7.5%
	in foreign currency, monthly**	-6.2%	5.6%	3.6%	-2.0%
4	Share of foreign currency loans to non-financial organisations	22.5%	41.0%	29.9%	28.8%
5	Share of overdue loans to non-financial organisations				
	in RUB	1.1%	9.3%	8.2%	7.8%
	in foreign currency	0.4%	5.5%	2.3%	2.6%
6	Share of IV – V quality category loans to non-financial organisations	3.5%	12.7%	12.0%	12.2%
7	Growth rates of household loans				
	yearly**	-12.6%	61.1%	13.3%	22.7%
	quarterly**	-5.2%	12.6%	4.5%	5.2%
	monthly**	-1.9%	4.5%	1.5%	1.1%

	Indicator	Minimum since 2008	Maximum since 2008	Previous value (in the previous year)	Last value (as of 1 January 2019)
8	Share of overdue loans to households	3.2%	8.6%	6.9%	5.1%
9	Share of loans overdue for more than 90 days, %				
	residential (including mortgage housing) loans	1.3%	6.2%	2.1%	1.6%
	unsecured consumer loans (excluding housing and car loans)	4.9%	17.7%	12.8%	9.1%
Credit gaps					
10	Credit gap (broad definition of loan offer)	-11.2	8,7	-7.5	-7.1
11	Credit gap (narrow definition of loan offer)	-6.5	2,7	-5.3	-4.4
12	Credit gap (narrow definition of loan offer to non-financial organisations)	-4.9	3,3	-4.6	-4.3
13	Credit gap (household loans)	-2.0	1,6	-1.3	-0.3

Notes:
All calculations are indicated for banks operating as of 1 January 2013, including previously reorganised banks.
 * Excluding credit institutions that are going through financial rehabilitation.
** Excluding currency revaluation.

Private sector debt burden dynamics

The debt burden of the private sector, which includes non-financial organisations and households, reflects the level of debt burden of the economy and is calculated as the ratio of liabilities of economic entities to GDP. Like most central banks, the Bank of Russia assesses the debt burden as defined both broadly and narrowly. The broad definition of debt burden includes loan debt of individuals on bank loans as well as internal and external debt of companies, including liabilities on debt securities. The narrow definition of the debt burden includes household debt on bank loans as well as the liabilities of companies on loans issued by Russian banks and on investments of Russian banks in corporate debt securities.

Chart 1 shows that in Russia the debt burden according to the broad and narrow definitions has remained virtually unchanged since mid-2017. This is due to two opposing trends: an increase in lending to households and non-financial organisations in rubles and a decrease in corporate indebtedness on external debt in the context of restrictive measures imposed by certain countries as well as a decrease in corporate foreign currency debt on domestic loans. Since a significant part of corporate liabilities is denominated in foreign currencies, the debt burden indicator is subject to

DEBT BURDEN DYNAMICS   *Chart 1*

DEBT BURDEN DYNAMICS USING THE BROAD DEFINITION   DEBT BURDEN DYNAMICS USING THE NARROW DEFINITION
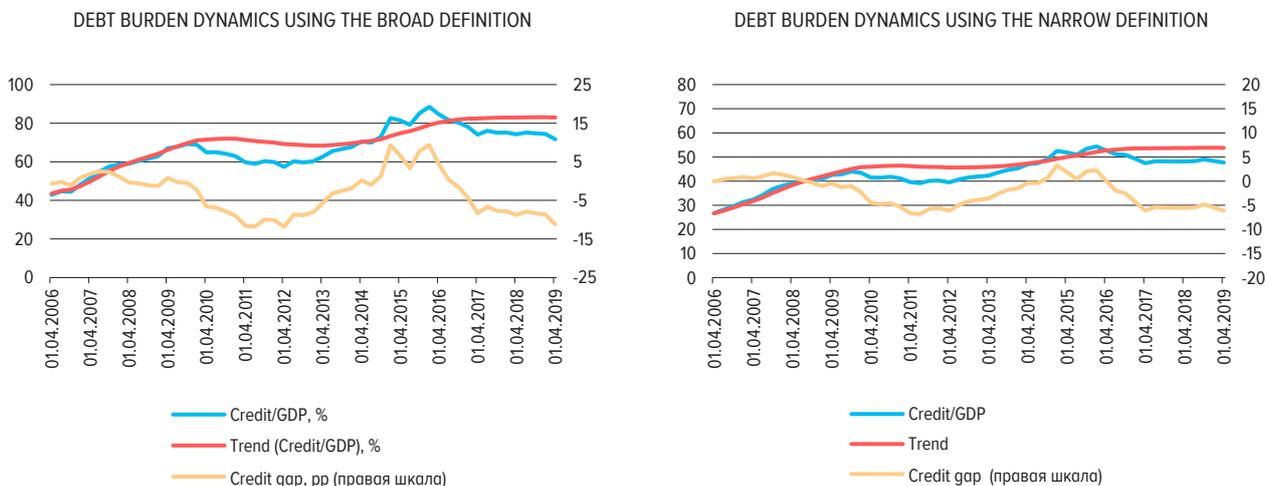
Source: Bank of Russia calculations.

fluctuations due to exchange rate revaluation. Moreover, with structural shifts (for example, with a new equilibrium value of oil prices), the equilibrium level of the debt-to-GDP ratio changes. At the same time, the current methodology does not take into account the existence of structural shifts, and the trend component is too slow in adjusting to the new values of the indicator. This makes it difficult to use the approach proposed by the BCBS.

Lending activity in individual segments, lending standards, level of credit risks

Since risks may accumulate in certain lending segments, the Bank of Russia monitors lending activity, lending standards and materialised risks in terms of various types of loans. Risks are monitored in the segment of corporate, mortgage and unsecured consumer lending.

Lending activity dynamics are assessed using the annualised growth rates of loan debt over the last three months and their comparison with the actual annual growth rates. To remove seasonality from monthly growth rates, the ARIMAX12 approach is used. The annualised growth rates of loan debt are a leading indicator of lending activity.

Due to the high share of foreign currency bank loans and significant external corporate debt, the level of the economy's debt burden according to the broad and narrow definitions is sensitive to ruble exchange rate fluctuations. For indicative purposes, the Bank of Russia calculates credit gaps based on a fixed ruble exchange rate as well as separately for liabilities of individuals and legal entities denominated in rubles. Chart 2 shows that lending to individuals in 2019 will surpass the long-term trend. To limit the procyclical risks in this segment, the Bank of Russia has been taking macroprudential measures since 2017, increasing the risk ratios for unsecured consumer loans and mortgage loans with a small down payment.

Global experience shows that banks tend to soften lending standards in the upward phase of the credit cycle. With this in mind, the Bank of Russia surveys the largest banks to monitor the debt burden of individual borrowers for loans issued by banks (payment-to-income ratio) as well as the down payment requirements on mortgage loans (Chart 3a) as loans with a small down payment are characterised by an increased level of the borrower's credit risk. Within the scope of the survey, banks calculate a borrower's aggregate payments for all loans issued by the given bank. At the same time, the borrower may be in arrears on loans from other banks. Effective 1 October 2019, credit institutions will be required to define the debt burden indicator taking into account the individual's

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CREDIT GAP DYNAMICS   *Chart 2*

CREDIT GAP ON RUBLE LIABILITIES OF INDIVIDUALS TO CREDIT INSTITUTIONS, PP

CREDIT GAP ON RUBLE LIABILITIES OF NON-FINANCIAL ORGANISATIONS TO CREDIT INSTITUTIONS, PP
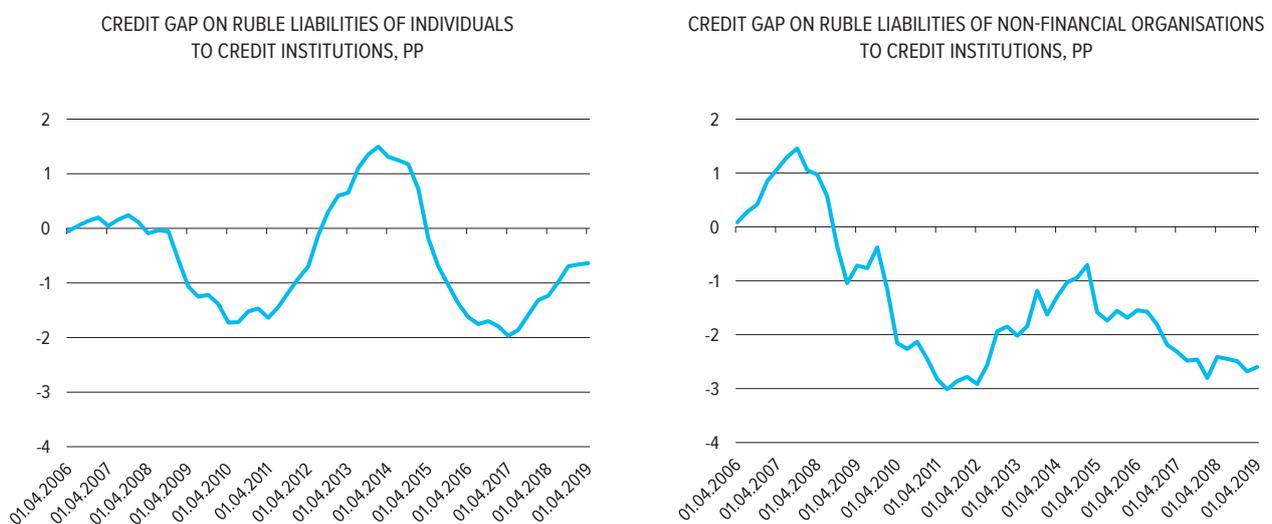
Source: Bank of Russia calculations.

INDIVIDUAL INDICATORS CHARACTERISING THE RISKS IN THE RETAIL LENDING SEGMENT   *Chart 3*

DISTRIBUTION OF ISSUED MORTGAGE LOANS
BY THE LOAN-TO-COLLATERAL INDICATOR

DEBT BURDEN FOR LOANS TO INDIVIDUALS
(PAYMENT TO DISPOSABLE MONEY INCOME RATIO), %
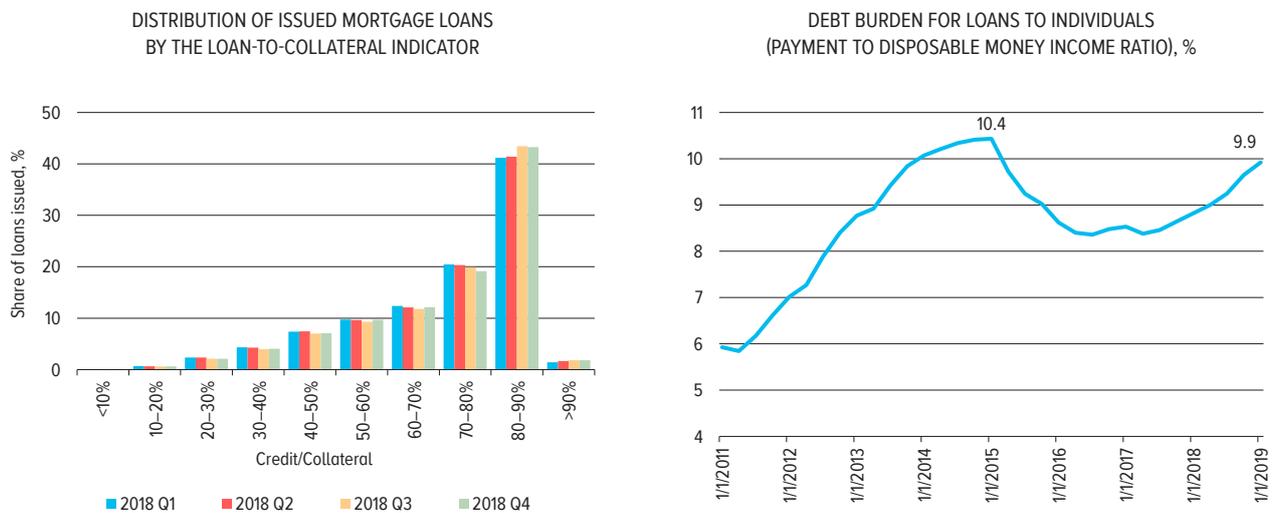
Source: Bank of Russia calculations.

debt on all credit facilities (loans) to all creditors, [1] which will, among other things, improve risk monitoring.

To assess the sensitivity of banks' loan portfolios to the credit cycle phase, the household debt burden indicator at the macro level is also calculated (Chart 3b). In this approach, the scheduled payments for all household loans [2] are correlated with household disposable income. The indicator characterises the household debt burden. This indicator takes into account, in particular, the dynamics of interest rates in the economy and loan maturity. In 2018, banks exhausted their ability to further reduce the rates for consumer loans, and, as a result, the compensating effect of this factor on the debt burden was limited, and the growth of debt burden was largely determined by the growth rate of outstanding loans. The debt burden indicator demonstrates growth even if banks maintain lending standards at the micro level because of increasing loan penetration – that is, growth in the number of people who have loans.

The debt burden and the down payment for a mortgage loan are important factors in a borrower's credit risk; however, they are not exhaustive. Since credit risk depends on a large number of factors, it is necessary to monitor the quality of banks' loan portfolios. The increase in the risk cost in the growth phase of the credit cycle indicates the need to take macroprudential measures both to limit the practice of riskier lending and for banks to accumulate capital buffers to cover future losses.

To assess the level of the materialised risk, an analysis is conducted of the loan portfolio as a whole based on bank reporting and for generations of loans based on information from credit history bureaus. To assess the credit risk for the portfolio as a whole, the share of bad loans [3] and the rate of its change (adjusted for write-offs and sales of outstanding loans) are analysed. For loans to non-financial organisations, an assessment is made of the changes in loan loss provisions (LLPs) based on the revision of the estimated provision by types of economic activity, which reflects changes in the credit risk of borrowers. The influence of such factors as the amortisation of outstanding loans, the issuance of new loans and the write-off and sale of loans on LLP dynamics is excluded.

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[1] *The method for calculating debt burden is established by Bank of Russia Ordinance No. 4892-U, dated 31 August 2018 (Appendix 1).*

[2] *M Drehmann, M Juselius. Do debt service costs affect macroeconomic and financial stability? 2012.*

[3] *Bad loans to individuals are loans with outstanding arrears of more than 90 days. Bad loans to financial organisations are loans of quality category 4 or 5.*

Dynamics of capital adequacy ratios in the banking sector

A significant part of credit risks accumulated in the upward phase of the credit cycle are materialised during periods of economic recession. For this reason, it is crucial that the profits that banks receive during periods of credit expansion be accumulated as capital to cover future losses. For example, in 2011–2012, the credit gap did not reach a critical value; however, accelerated lending activity was accompanied by a rapid decline in the capital adequacy ratio, which limited banks' ability to absorb future losses.

To monitor this process, the Bank of Russia analyses the dynamics of capital adequacy indicators both for the entire banking sector and for individual banks. Moreover, the impact of the existing macroprudential measures on the dynamics of capital adequacy ratios is taken into account. Add-ons to risk weights tie up part of the capital of credit institutions, allowing banks to create additional buffers to cover future loan losses. Thus, if risks in certain lending segments can be offset by the accumulation of capital buffers for the relevant exposures, introducing a countercyclical buffer may be inexpedient.

Taking into account the results of macroprudential stress testing

Another instrument for determining the need to introduce a countercyclical buffer and calibrating its value is stress testing of the banking sector. It makes it possible to assess whether the current capital stock of credit institutions is sufficient to cover losses in the event of a cyclical stress scenario. As a criterion of capital adequacy based on stress testing results, the minimum value of capital adequacy ratios can be used. If capital stock is not enough to cover losses, this may evidence the need to increase the capital of the banking sector, including by means of a countercyclical buffer.

The Bank of Russia conducts stress testing of the banking system using the bottom-up method as well as the top-down method for macroprudential stress testing of the financial system. Macroprudential stress testing makes it possible to assess the stability of the banking system, taking into account the financial standing of non-bank financial institutions that are part of a banking group and considering the claims and obligations between various banking groups, which may be a source of contamination/network effect in the event of a shock scenario. Moreover, a macroprudential stress test may take into account the feedback effects from the deterioration of the financial standing of market participants in response to a decline in economic activity.

DYNAMICS OF CAPITAL ADEQUACY IN THE BANKING SECTOR   *Chart 4*
(EXCLUDING BANKS UNDERGOING RESOLUTION AS OF 1 FEBRUARY 2019)
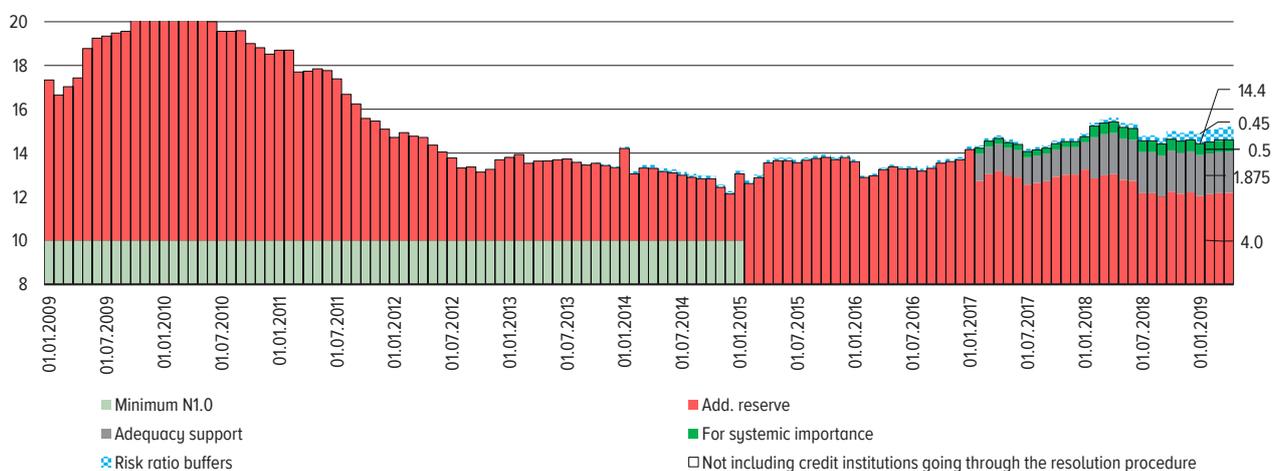
Source: Bank of Russia calculations.

In the event of a significant decrease in the capital adequacy of banks based on stress testing results, it can be concluded that a CB should be introduced. However, this may be not always expedient; it is important to assess the factors underlying such a decrease. A decrease in capital adequacy as a result of a materialised stress scenario may be experienced by banks expressly specialising in certain sectors of the credit market: consumer lending, mortgage lending or lending to certain sectors of the economy, for example, construction. These segments may demonstrate periods of accelerated lending followed by a credit crunch in the event of stress. At the same time, banks may initially have a high capital surplus – that is, the introduction of the buffer will not affect whether they will create buffers. In this regard, an effective mechanism of forming additional capital buffers for such banks is establishing macroprudential buffers to the risk ratios for certain types of assets or using other instruments to limit lending.

The Bank of Russia analyses a wide range of indicators characterising the credit cycle phase. If risks accumulate in certain lending segments, macroprudential instruments will be used, allowing banks to accumulate necessary capital buffers and restraining excessive growth in lending activity. At the same time, such measures do not affect the segments where lending growth is a sign of recovery. Using a CB may be advisable in the event of simultaneous growth in lending activity in all lending segments at a rate significantly outstripping economic growth.

3. AREAS FOR IMPROVING THE METHODS OF DETERMINING THE CREDIT CYCLE PHASE

As shown in Section 1, in their practice, many central banks have encountered the inapplicability of the standard Basel methodology for determining the credit cycle phase based on the credit gap indicator. In most countries, this can be attributed to structural shifts in the economy which were preceded by a credit boom. Therefore, many regulators have studied alternative models for evaluating the credit cycle phase and the amount of the countercyclical buffer (CB). The approaches developed can be divided into 3 types:

assessment of the cyclical component of various indicators, including the credit gap or its transformations, using alternative statistical filters

early warning models

banking system stress tests.

The first two approaches can be used to determine the time when a CB should be introduced. The third approach may both indicate the need for a CB and determine the CB value.

3.1. Alternative approaches to determining the credit cycle phase in various countries

Assessment of the cyclical component of the credit gap

Ireland, like many other countries, experienced a credit boom between 2000 and 2007 followed by a structural shift. As a result, the debt-to-GDP trend calculated using the Hodrick–Prescott filter is strongly biased and leads to long periods of negative credit gap values. The Bank of Ireland points out that the cyclical dynamics of lending activity significantly depend on the dynamics of real estate prices and the interest rate spread between Irish and German bonds. These factors should be taken into account when identifying the cyclical component of the debt-to-GDP indicator.

In this respect, the Bank of Ireland's paper (Measuring and Mitigating Cyclical Systemic Risk in Ireland: The Application of the Countercyclical Capital Buffer, 2018) proposes using a semi-structural model to isolate the trend and cyclical components calibrated based on the solution of the Kalman filter problem. Debt-to-GDP is replaced with debt-to-GNI (Gross National Income) as GNI better reflects the economic activity in Ireland.

The Kalman filter equations are written as follows:

$$y_t = \tau_t + c_t \tag{1}$$
$$\tau_t = \tau_{t-1} + v_t \tag{2}$$
$$c_t = \mu + \theta_1 c_{t-1} + \theta_2 c_{t-2} + \gamma_1 AUX1_{t-1} + \gamma_2 AUX1_{t-2} + \beta_1 AUX2_{t-1} + \beta_2 AUX2_{t-2} + u_t \tag{3}$$

The first equation postulates that the debt-to-GDP dynamics (y_t) consist of the trend (τ_t) and a cyclical component (c_t). The second equation indicates that the trend component retains the previous value (τ_{t-1}) and changes only under the influence of shocks (v_t). The third equation connects the changes in the cyclical component with its previous values with a lag of one (c_{t-1}) and two (c_{t-2}) quarters and a set of macro factors responsible for cyclical processes in the economy. For Ireland, these variables are the yield spread of 10-year government bonds versus German bonds

($AUX1$) and the deviation of real estate prices from equilibrium values ($AUX2$). According to the authors, this approach better reflects the development of the Irish economy and more accurately defines the periods when the credit cycle phase changes.

Early warning models

Early warning models are also used by central banks to determine the credit cycle phase. The signal in this model indicates an increase in procyclical risks and their possible subsequent materialisation. The signal indicator is built as a weighted indicator from a set of a predetermined list of indicators. The weights are either set as equal or are defined on the basis of regression of the initial indicators to a binary variable responsible for the existence (non-existence) of a crisis.

One such model is implemented in a paper by the Bank of Finland (Evaluating Indicators for Use in Setting the Countercyclical Capital Buffer, 2018). Based on the list of indicators published by the European Systemic Risk Board (ESRB) in 2018, indicators are selected that best reflect the accumulation of systemic risks. The model is calibrated using data from euro area countries and crises observed therein. The model signals an increase in risks three years before their possible materialisation.

The ESRB suggests using proxy indicators to measure 6 risk categories:

1. credit growth
2. private sector debt burden
3. deviation of real estate prices from the equilibrium level
4. external imbalances
5. underestimation of possible risks
6. financial stability of the banking sector.

As a result, the following early warning indicators were selected for each of the 6 risk categories.

1. To measure credit growth, the authors propose 2 indicators: the growth rate of lending in real prices and credit-to-GDP.

2. To determine the level of debt burden of households and non-financial organisations, standard ratios such as DTR (total debt-to-income) and DSTI (debt service-to-income), calculated at the macro level, are used. These indicators have been proved to be useful in predicting financial crises.

3. To assess excessive growth in real estate prices, the following set of indicators is used: the change in prices for residential and commercial real estate in real terms, the residential real estate value to rent rate ratio and the residential real estate value to household income ratio. The combination of accelerated growth in mortgage lending and growth in real estate prices is considered to threaten financial stability.

4. To determine external imbalances, an analysis is conducted of the extent to which lending is financed out of foreign capital. To assess this imbalance, the authors consider the current account deficit (the current account-to-GDP ratio), the capital account deficit, the portfolio investment-to-GDP ratio and the ratio of other investments to GDP The authors also examine the ratio of cross-border loans to GDP. Omitted are such indicators as the share of exports to GDP, the terms of trade and exchange rate overvaluation, which sometimes turn out to be statistically significant predictors of currency crises.

5. The following indicators are used to measure the potential underestimation of risks by the market: stock market index, stock market volatility, dividend yield ratio, price-to-earnings ratio (P/E), price-to-book ratio (P/B), risk premiums on high-yield corporate bonds, long-term and short-term interest rates of the two main economies (US and Germany) and retail and corporate loan portfolio margin.

THE BANK OF SLOVAKIA'S CYCLOGRAM AND THE CONTRIBUTION OF CERTAIN FACTORS TO ITS DYNAMICS   *Chart 5*

CYCLOGRAM

CYCLOGRAM: THREE MAIN COMPONENTS
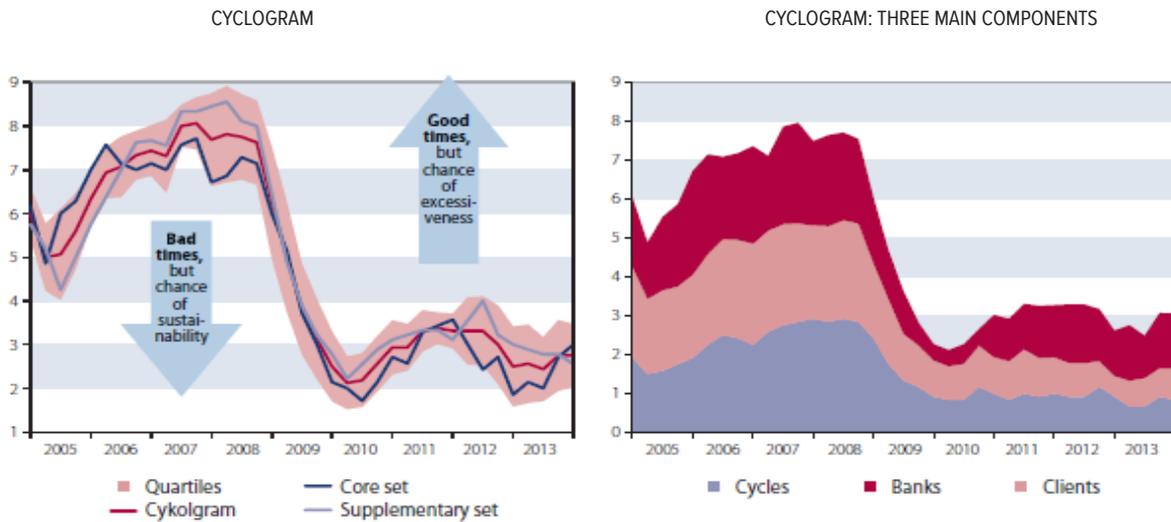
Source: Bank of Slovakia.

6. To measure the financial stability of the banking sector, the following indicators were selected: the ratio of the banking sector's total assets to GDP, the leverage ratio established by the BCBS, the loans to deposits ratio, the ratio of non-core liabilities to total assets or GDP[1] and liquidity ratios.

The approach proposed by the Bank of Slovakia (Follow-up on CCyB in Slovakia: Build-up, Calibration and Release, 2018) and used by the European Central Bank may be an alternative to the early warning model based on signals from individual indicators. To determine the credit cycle phase, the Bank of Slovakia uses a cyclogram – an aggregate of 14 indicators from 6 ESRB risk categories. Each of the indicators is normalised, and the historical distribution of its values is built. The current

CYCLOGRAM+ OF THE BANK OF SLOVAKIA   *Chart 6*

DECOMPOSITION: FINANCIAL AND ECONOMIC CYCLE (IN %)

DECOMPOSITION: HOUSEHOLDS AND ENTERPRISES (IN %)
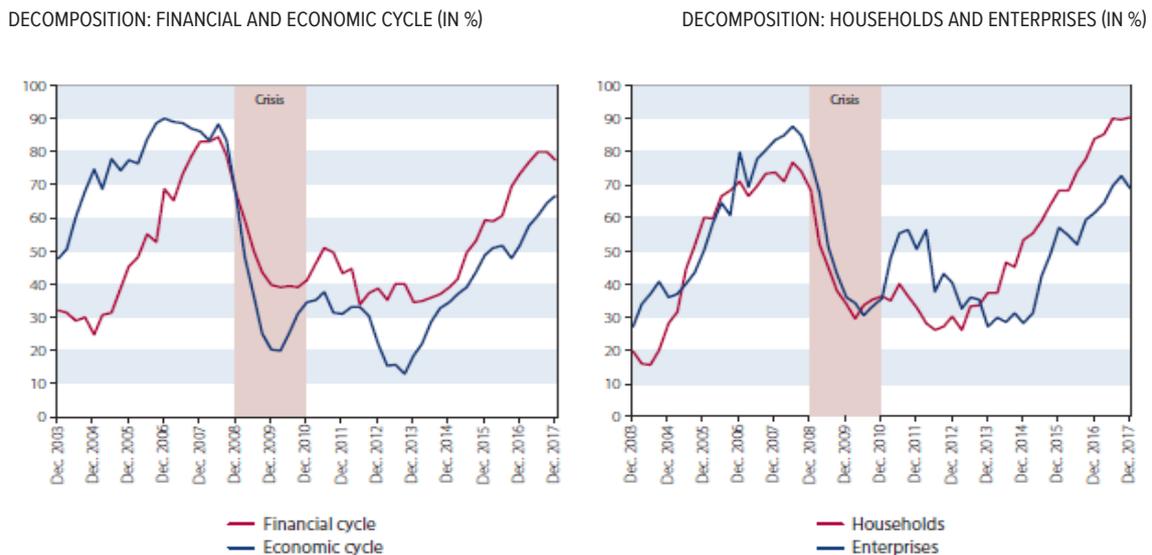
Source: Bank of Slovakia.

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[1] *Non-core liabilities are the difference between the total assets of the banking sector and deposits, capital and provisions.*

Table

No.	Indicator	Weight, %
1	Changes in the debt-to-GDP indicator for two years	36%
2	Debt growth defined broadly over two years (in real terms)	5%
3	Changes in the debt service ratio for two years	5%
4	Residential real estate value to household income ratio	17%
5	Stock price growth in real terms for three years	17%
6	Ratio of the current account of the balance of payments to GDP	20%

value of the indicator is assigned a number from 1 to 9 depending on the percentile of the historical distribution it falls into. After that, the average value of all indicators is calculated.

An example of the cyclogram dynamics for Slovakia and the contribution of individual components is shown in Chart 5.

In 2018, the Bank of Slovakia finalised the methodology, selected 23 indicators and used them to form its Cyclogram+ aggregate. Unlike an ordinary cyclogram, it enables differentiation between various types of cycles, financial and economic, and to separate the impact of household loans and loans to non-financial organisations (Chart 6).

The European Central Bank uses a similar scheme to build the d-SRI (domestic cyclical systemic risk indicator) (Anticipating the Bust: a New Cyclical Systemic Risk Indicator to Assess the Likelihood and Severity of Financial Crises, 2018). The difference is that the ECB takes only 6 indicators, but with the highest predictive power. Indicators are selected from the list of indicators proposed by the ESRB, one indicator from each group (see the experience of the Bank of Finland). The selected indicators are normalised, and an aggregate is formed using a separate weight for each indicator. Indicator weights are determined using a panel regression between the selected indicators and the indicators signalling a crisis for EU countries. Below is a list of selected indicators and their corresponding weights.

Early warning models based on building a composite indicator from individual indicators are sensitive to structural shifts in the economy. After structural changes, the dynamics and volatility of the initial indicators may differ substantially from the historical ones, which will lead to changes in the amplitude of fluctuations of the composite indicator and reduce its predictive power.

A separate task is to select countries with a similar economic structure for building early warning models based on the statistics of crises in different countries. If this fact is ignored, the same indicator may have different signal levels for different countries. The early warning model averages these levels. The aggregate indicator obtained in this way will give a biased assessment of risk growth.

Banking system stress testing

One possible approach to assessing the need for a CB and determining its value is stress testing. For example, this approach is used by the Bank of England. In 2018, the 7 largest banking groups participated in stress testing. Consolidation included investment banks but excluded insurance companies. Capital adequacy for loss coverage was assessed using capital adequacy ratios (total and basic) and the leverage ratio. Moreover, banks were required to assess credit risks using the approach established by IFRS 9. The stress testing horizon was five years.

Based on the results of stress testing, the Bank of England, first of all, determines the level of systemic impact. If the banks' losses exceed the total level of buffers operating in the banking system, the Bank of England Prudential Regulatory Authority decides whether and how much to increase the macroprudential buffers, including the CB. Once systemic buffers are established, the

Prudential Regulatory Authority (PRA) assesses the quality of banks' portfolios and sets individual buffers for banks with poor stress testing results.

Regulatory stress testing is supplemented with market stress testing proposed in a paper by the Bank of Canada (Calibrating the Magnitude of the Countercyclical Capital Buffer Using Market-Based Stress Tests, 2018). Determination of the CB value based on its results is proposed. This approach does not require a large amount of detailed data on the bank's borrowers and the bank's investments in assets. The banks' capital is valued at market prices for shares and changes in accordance with their dynamics. In stress, the banks' stock prices decrease, causing a decrease in their capital. The CB is formed during periods of growth in stock prices, which is generally observed during periods of growth in lending activity. It is proposed to establish the CB at a level such that, with a confidence level of 95%, banks will not violate the minimum value of the capital adequacy ratio even after a shock that occurs once in 10 years. A decrease in the banks' stock price for six months, which is transformed into a decrease in the capital adequacy of banks, is used as a shock.

The proposed methodology has been calibrated based on the experience of six advanced economies. The assumed buffer values are within the range of 1.4 to 1.7% of the bank's total (not risk-weighted) assets. Additional calculations for Russia show that the buffer value should be within the range of 1.5 to 1.8% of risk-weighted assets.

This approach also has its disadvantages. Some factors influencing the market prices of the banks' stock (for example, the global risk premium) may have no effect on the assessment of the stability of credit institutions. Unlike market stress testing, regulatory stress testing can provide a more accurate estimate of losses as it relies on confidential details. Therefore, it is possible, in particular, to more accurately assess the contribution of various channels to the spread of risk: bank loans to common borrowers, network effects etc.

Applying this methodology to the Russian banking system can also be difficult because of the following circumstances:

A small number of banks with stock listed on a stock exchange.

Inclusion of the risk premium associated with restrictions imposed by certain countries on borrowing by a number of Russian banks in the stock price.

The market stress testing model was developed and calibrated based on the experience of the banking sectors of developed countries, which requires its adaptation to emerging economies.

The historical market shock used to calibrate the model may include a decrease in stock prices caused by low liquidity of the stock market during periods of crisis or due to hot sales, which does not reflect the materialisation of systemic credit risks for which the countercyclical buffer is formed[2].

3.2. Areas for improving the methods for determining the credit cycle phase in the Bank of Russia

1. Changing the methodology for assessing the cyclical and trend components

The methodology for calculating the credit gap proposed by BCBS involves using one-sided Hodrick–Prescott filter (HP filter), which decomposes the time series y_t into trend g_t and cyclical c_t components by minimising the following functions:

$$\left\{ \sum_{t=1}^{T} c_t^2 + \lambda * \sum_{t=1}^{T} [(g_t - g_{t-1}) - (g_{t-1} - g_{t-2})]^2 \right\} \to min$$

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[2] *In accordance with Principle 1 set in the BCBS Guidelines for national authorities on the establishment of countercyclical buffers, the purpose of establishing the buffers is to cover future losses caused by the accumulation of risks during periods of excessive credit growth.*

TREND COMPONENT OF LOANS TO INDIVIDUALS (% OF GDP) IN 2000–2019 BASED ON A ONE-SIDED HP FILTER   *Chart 7*
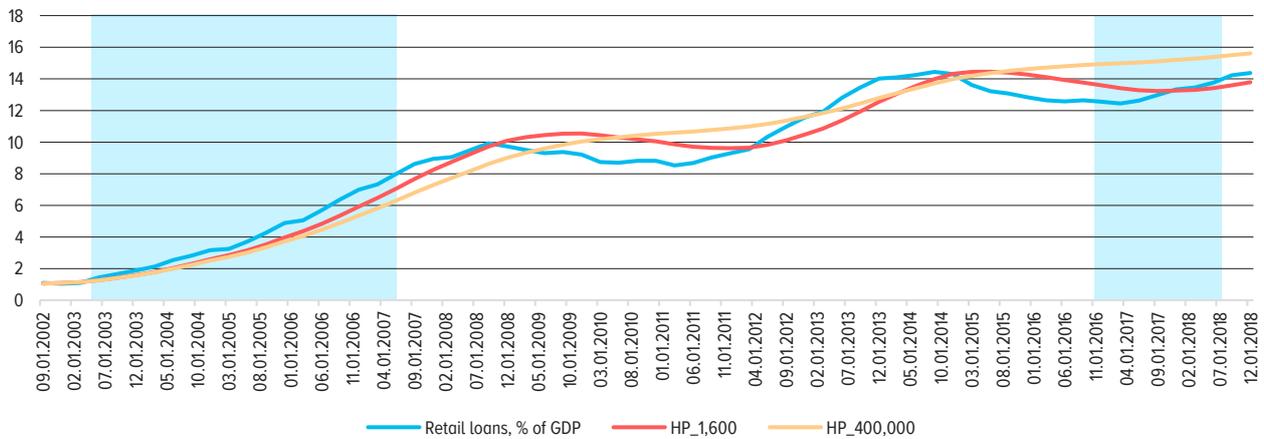
Source: Bank of Russia calculations.

In the building of the HP filter, the parameter λ imposes a penalty for the presence of the trend acceleration component (second derivative). The BCBS proposes using the value λ = 400,000, which makes the trend immune to changes in the dynamics of the initial debt-to-GDP indicator. At the same time, the equilibrium level of debt burden may change in conditions of structural shifts or with changes in fundamental factors affecting economic development. This may lead to incorrect identification of periods of credit boom or credit shortage if the initial time series accelerates due to fundamental or structural factors. Structural factors for Russia include, for example, economic restrictions imposed by a number of countries, while fundamental factors include changes in the level of oil prices.

For example, the inability of the HP-400,000 filter to promptly adjust the trend component leads to the identification of overheating in the retail lending market only in mid-2013, while excessive credit growth was already observed in 2012.

CYCLIC DECOMPOSITION OF THE DEBT BURDEN OF IRELAND AND BULGARIA BASED   *Chart 8*
ON THE HP-400,000 FILTER

IRELAND'S CREDIT BURDEN DEFINED BROADLY,
TREND COMPONENT BASED ON HP-400,000

BULGARIA'S CREDIT BURDEN DEFINED NARROWLY,
TREND COMPONENT BASED ON HP-400,000
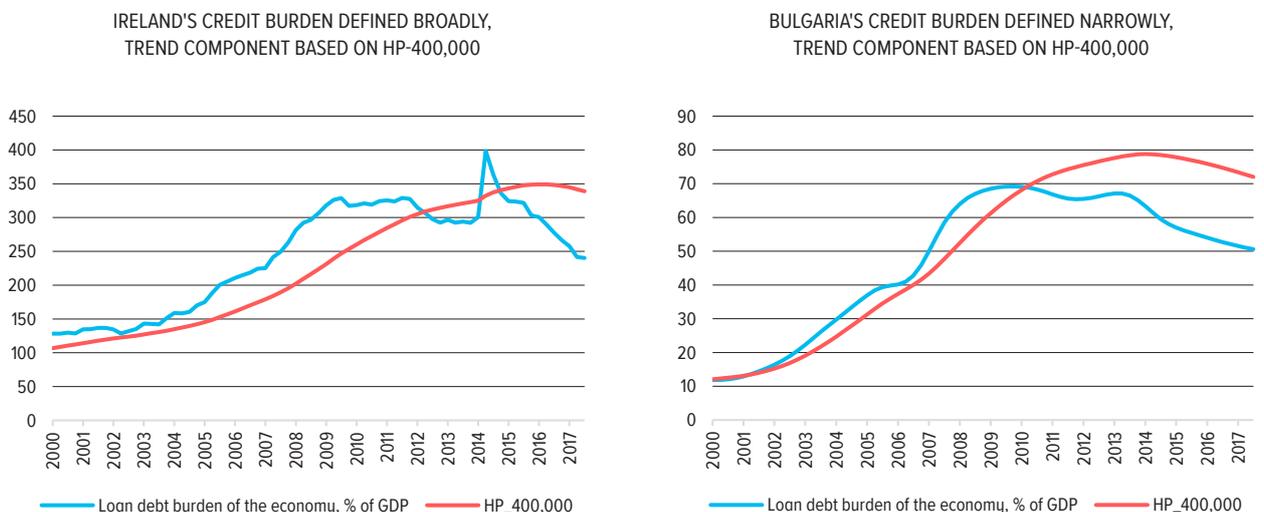
Source: Bank of Russia calculations.

THE CYCLICAL COMPONENT OF THE RATIO OF RUBLE LOANS OF INDIVIDUALS TO GDP BASED   *Chart 9*
ON THE HP-1,600 AND HP-400,000 FILTERS
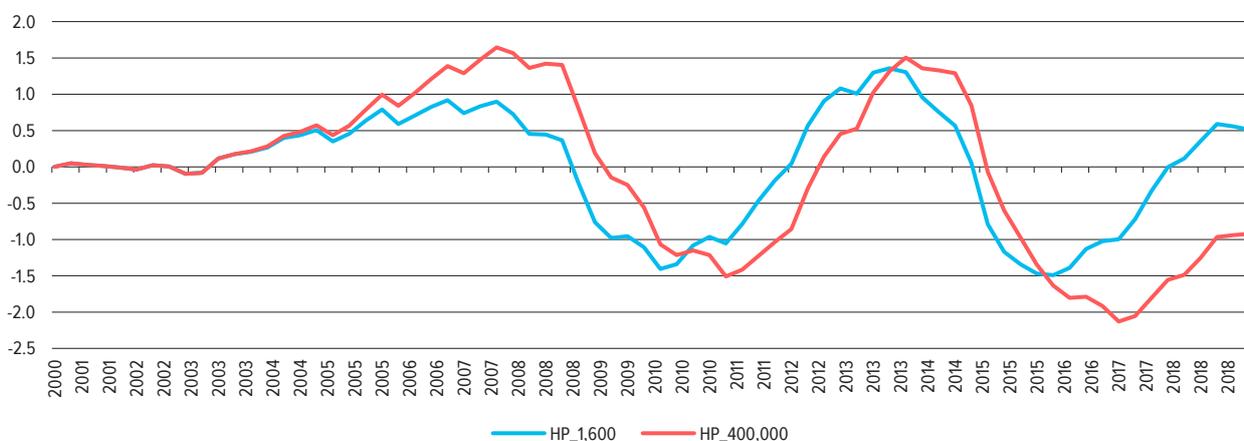
Source: Bank of Russia calculations.

THE CYCLICAL COMPONENT OF THE ECONOMY'S DEBT BURDEN DEFINED BROADLY BASED   *Chart 10*
ON THE* HP-1,600 AND HP-400,000 FILTERS
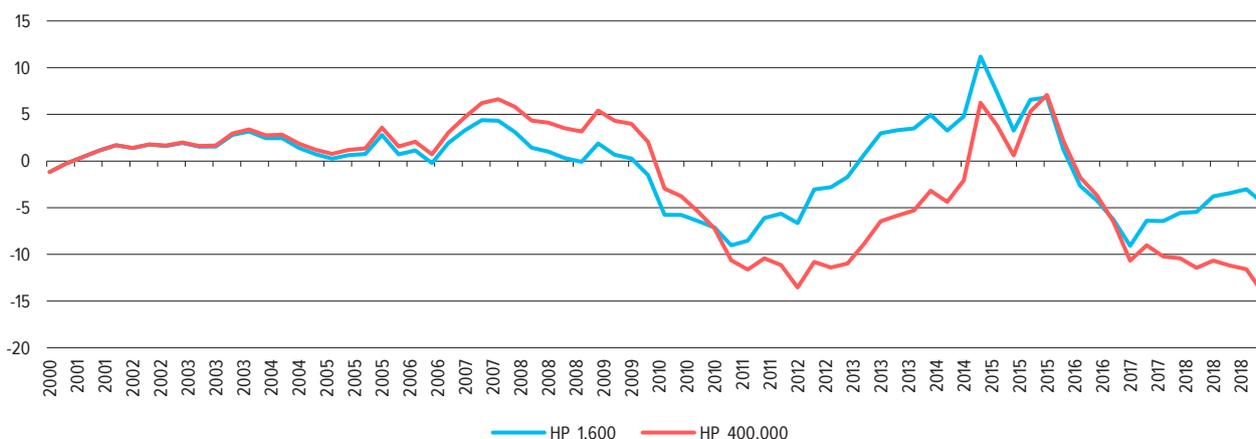
** Bank loans to individuals and non-financial organisations, debt securities issued and external debt of the non-financial sector. Calculated by credit institutions operating as of the last
  reporting date, including those previously reorganised.*
Source: Bank of Russia calculations.

A similar lagged effect of the HP-400,000 filter was recorded for many countries characterised by a low base effect in their development, for example, for Ireland, Bulgaria etc (see Section 1 of the Appendix).

Given the fact that it takes at least six months from the adoption of a decision to increase the CB to its formation by banks, using an HP filter in the current methodology significantly reduces the performance of macroprudential policy.

To neutralise the above drawbacks of the HP filter, the Bank of Russia intends to use a parameter value of λ = 1,600. The identification of the cyclical component using the HP-1,600 filter indicates the beginning of overheating in the retail lending segment in early 2012, reaching its peak at the end of 2013, and at the end of 2017 when the Bank of Russia began to increase risk ratios for unsecured consumer loans with the purpose of restricting risks in this segment (Chart 9). At the same time,

DECOMPOSITION OF THE DYNAMICS OF THE RETAIL RUBLE LOAN-TO-DEPOSIT RATIO   *Chart 11*

RETAIL LOAN-TO-DEPOSIT (LTD) RATIO DYNAMICS

CYCLICAL COMPONENT OF THE LTD INDICATOR
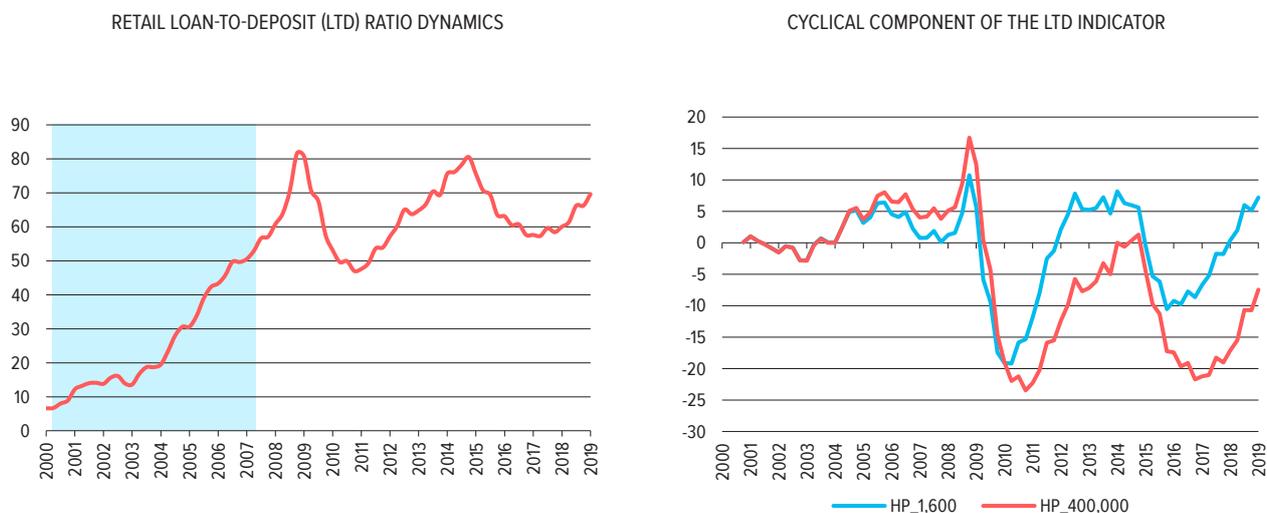
Source: Bank of Russia calculations.

12 LOAN-TO-DEPOSIT RATIO FOR THE GROUP OF EUROPEAN COUNTRIES AS OF 1 FEBRUARY 2019   *Chart 12*
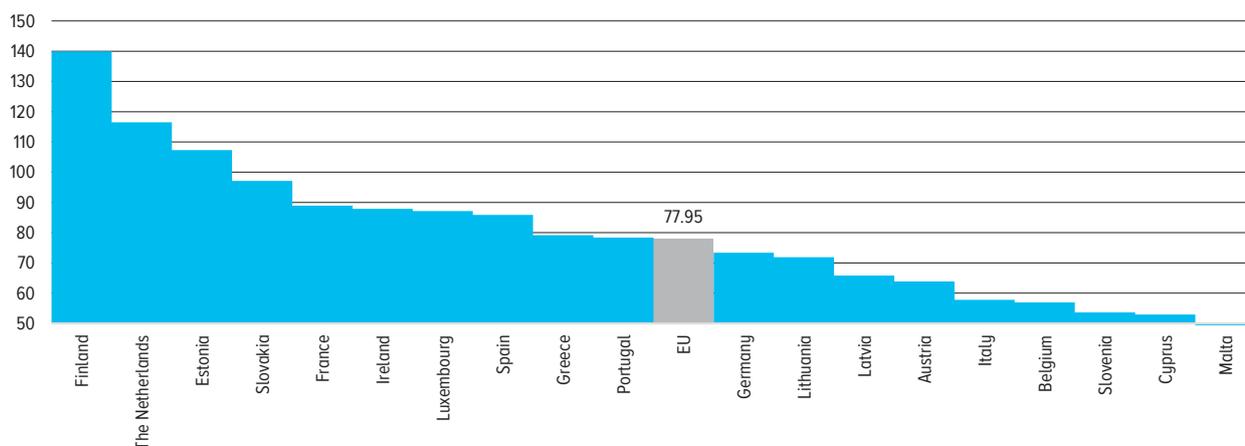
Source: Bank of Russia calculations.

the dynamics of the cyclical component of the debt-to-GDP indicator for debt defined broadly remain negative (Chart 10) as the growth in ruble lending to economic entities is partially offset by a decrease in corporate arrears on external and domestic debt in foreign currency.

2. Taking the factor of deposit security of loans into account

The growth of loans to individuals due to net borrowing from legal entities indicates an imbalance in the banking system. To take these risks into account in the retail lending segment, the loan-to-deposit ratio is used. Given that in 2001 the debt of households in Russia was less than 15% of deposits of individuals, this indicator can only be used starting in 2008, after it reached the zone of stable values (60–80%).

CYCLOGRAM COMPONENTS FOR LOANS TO INDIVIDUALS EXCLUDED FROM THE CALCULATION   *Chart 13*

Interest margin (retail loans) —— Real estate prices to per capita income ratio —— Mortgage rate —— Unemployment rate ——

Source: Bank of Russia calculations.

LIST OF INDICATORS USED TO BUILD THE CYCLOGRAM   *Table 2*

Group of indicators	Indicator
Lending market	credit gap for liabilities of individuals to banks
	credit gap for liabilities of non-financial organisations to banks
	growth rate of loan debt of individuals
	growth rate of loan debt of non-financial organisations
Risk appetite	share of non-performing loans of non-financial organisations
	Increase in loan loss provisions, % of debt on unsecured loans
	Increase in loan loss provisions, % of debt on mortgage loans
	Increase in LLP, % of debt on loans to legal entities
Debt burden	Household debt service ratio
	Share of mortgage loans with down payments less than 20% in loans issued by banks
Macroeconomic indicators	Current account deficit, % of GDP

The HP-1,600 filter identifies the overheating stages of the retail lending market from mid-2012 to December 2014 and the beginning of a new cycle from December 2017. This indicator can be used as one of the indicators of the credit cycle phase in the retail lending segment.

The loan-to deposit ratio for most European countries is in the range of 60–90%.

3. Cyclogram

For Russia, a cyclogram was calculated based on 11 indicators characterising the state of the credit market; their dynamics in 2010–2018 were determined by cyclical factors rather than structural ones. For example, the interest margin, the real estate value to average salary ratio and the unemployment rate have a dominant trend component[3], which ensures their monotonous

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[3] *For 2010–2019, the interest margin on loans to individuals decreased from 13 to 7%, the cost of a meter of residential property in the primary market dropped from 2.5 times to 1.4 times average monthly wages and the unemployment rate dropped from 9 to 5%.*

CYCLOGRAMS FOR LOANS TO INDIVIDUALS AND LEGAL ENTITIES CALCULATED FOR RUSSIA   *Chart 14*
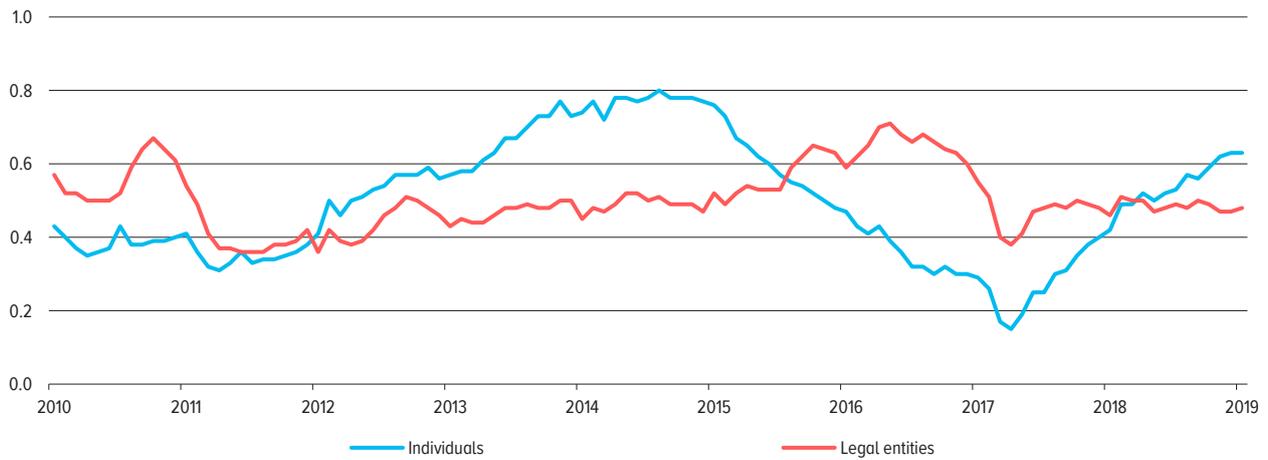
Source: Bank of Russia calculations.

CYCLOGRAM COMPONENTS CHARACTERISING THE RETAIL LENDING MARKET   *Chart 15*
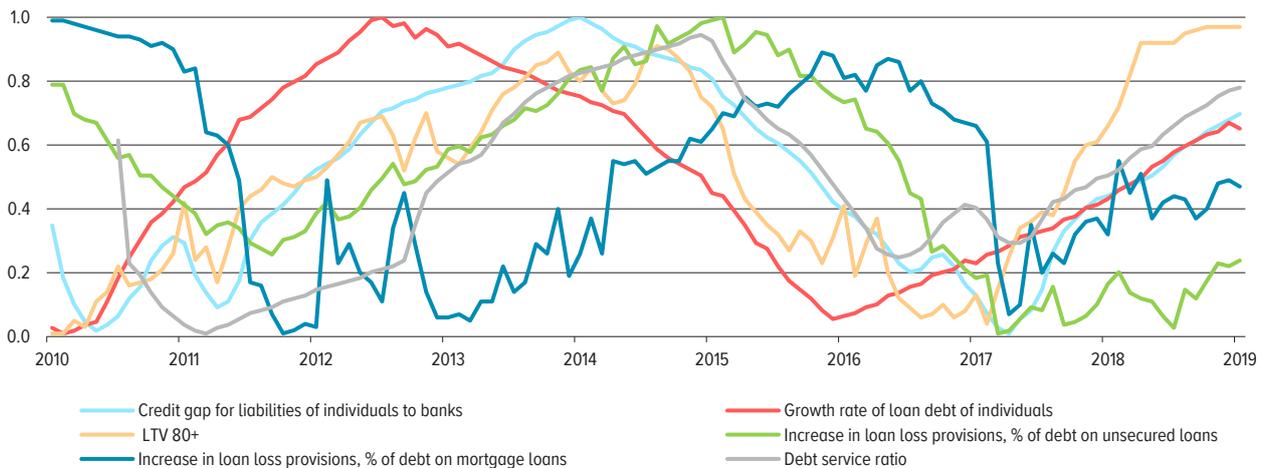
Source: Bank of Russia calculations.

decline during 2010–2019. If these indicators stabilise at new long-term equilibrium levels, they can be included in the calculation of the aggregate index.

Indicators were grouped, and cyclograms were built separately for non-financial organisations and households.

The cyclogram for the retail lending segment showed a high sensitivity to the credit cycle. The amplitude of fluctuations in household lending indicators is significant and amounts to about 60%, which is associated with the coordinated dynamics of a number of its constituent indicators.

The beginning of a credit boom in the consumer lending segment (an index value over 60%) was identified starting in 2013 Q2, which is in line with expert assessments.

In terms of retail lending, the cyclogram may be used as an indicative figure for determining the stage of the credit cycle.

CYCLOGRAM COMPONENTS CHARACTERISING THE CORPORATE LENDING MARKET   *Chart 16*

Credit gap for liabilities of non-financial organisations to banks
Share of non-performing loans of non-financial organisations
Current account deficit, % of GDP
Growth rate of loan debt of non-financial organisations
Increase in LLP, % of debt on loans to legal entities
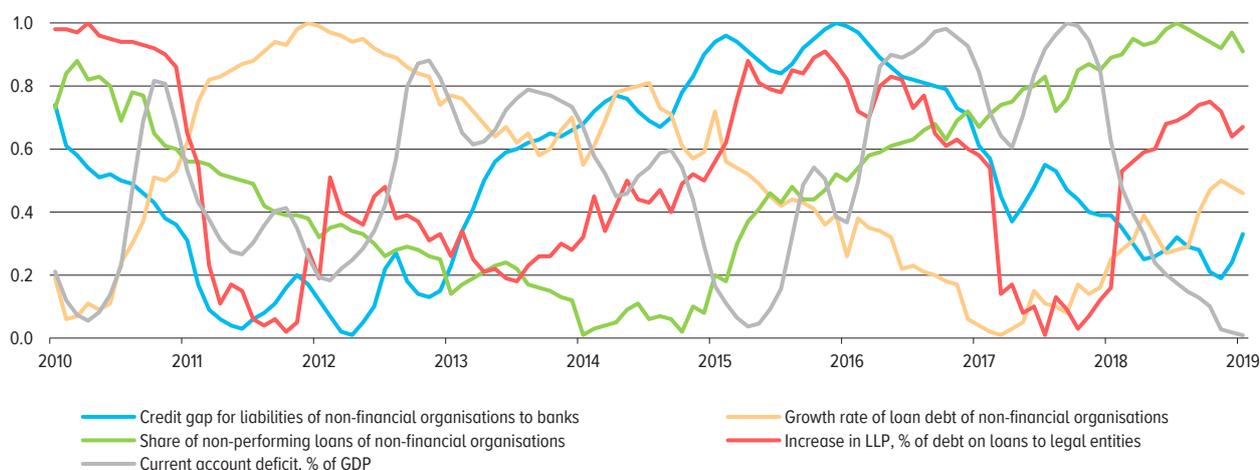
Source: Bank of Russia calculations.

The dynamics of the corporate lending cyclogram show the absence of significant fluctuations in the growth rates of outstanding loans, both in rubles and in foreign currency, after 2008. The low amplitude of the cyclogram fluctuations (less than 20%) is caused by the multidirectional dynamics of its constituent components. At the same time, there is no long-term trend component in their dynamics, which makes it possible to use the corporate cyclogram to assess the state of the sector.

The analysis of alternative methods used for defining credit cycles allows us to draw the following conclusions:

- To assess the credit cycle phase, it is expedient to use a number of indicators characterising the situation in individual lending segments.
- The said alternative indicators record overheating in the retail lending market in 2012–2014.
- The indicators recommended for quantifying the credit cycle phase in the retail segment (HP-1,600 filter, loan-to-deposit gap, cyclogram) currently have values corresponding to mid-2013.
- According to the analysed indicators, corporate lending is close to equilibrium levels.

APPENDIX 1. EXAMPLES OF DECISIONS TO ESTABLISH A NATIONAL COUNTERCYCLICAL BUFFER IN VARIOUS COUNTRIES

Bulgaria

Buffer value	Decision date	Effective date
0%	12 December 2015	12 December 2015
0.50%	26 September 2018	1 October 2019

A decision to increase the CB was made by the National Bank of Bulgaria on 26 September 2018[1].

Justification. Despite the fact that the loan-to-GDP ratio was 100.6%, and its credit gap was negative (-42.7 pp), the National Bank of Bulgaria decided to increase the CB based on other indicators. For example, they took into account the revival of economic activity and the rapid growth in lending (especially in the housing lending segment – 9.9%[2]), which contributed to a rise in prices for residential real estate, indicating the recovery phase of the credit cycle. Rapid lending growth may trigger cyclical risks in the event of a future increase in interest rates or a downturn in economic activity. This, in turn, will entail a drop in the level of debt service by borrowers and an increase in NPL.

United Kingdom

Buffer value	Decision date	Effective date
0%	17 June 2014	26 June 2014
0.5%	23 March 2016	29 March 2017
0%	5 July 2016	5 July 2016
0.5%	27 June 2017	27 June 2018
1%	28 November 2017	28 November 2018

1) The decision on the first increase of the countercyclical buffer in the United Kingdom was made by the Financial Policy Committee (FPC) in March 2016[3].

Justification. According to the FPC, despite the improvement in banks' position since November 2015, investors expected a decrease in the profitability of banks. Moreover, there was an increase in a number of internal (associated with a relatively high level of household debt burden) and external (normalisation of the US policy, capital flows from developing countries and revaluation of assets) threats to financial stability. At the same time, the overall risks of the banking sector were estimated to be at a standard level. The FPC concluded that, although the described situation involved setting the CB at 1%, in view of the need for a phased implementation, it was decided to raise the buffer level to 0.5%.

At the time of the decision, the ratio of loans issued to the private non-financial sector to GDP[4] was 143.2%, and the credit gap amounted to -24.4 pp.

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[1] http://www.bnb.bg/PressOffice/POPressReleases/POPRDate/PR_20180926_ACCB_EN.

[2] https://www.minfin.bg/upload/37796/mreport_May2018_eng.pdf.

[3] https://www.bankofengland.co.uk/statement/fpc/2016/financial-policy-committee-statement-march-2016.

[4] *According to the methodology of the European Systemic Risk Board (ESRB)* https://www.esrb.europa.eu/pub/pdf/recommendations/140630_ESRB_Recommendation.en.pdf?f663b83b3f560906b1e331f048192e92.

2) The last CB increase in the UK was approved in November 2017[5].

Justification. According to FPC estimates, domestic risks in the UK remained at a standard level. The assessment took into account the rapid growth in lending, lower mortgage lending standards and an increase in the number of highly indebted households. The risks of high indebtedness of UK banks to non-residents, revaluation of assets and unscrupulous behaviour were also taken into account.

The decision to increase the CB was influenced by the results of stress testing according to the cyclical scenario, which factored in possible adverse consequences of the UK's exit from the EU. They include adverse changes in trade policy, logistical difficulties and changes in migrant flows.

The combination of the materialisation of Brexit risks with global risks dictated an increase in the CB above 1%; however, the unlikely simultaneous materialisation of all risks and the previous statements of the Bank of England about a gradual increase of the CB to 1% predetermined the current state of the buffer.

As of the date of the decision, the ratio of issued loans to GDP was 149.8%, and the credit gap was -16.5 pp.

Hong Kong

Buffer value	Decision date	Effective date
0.625%	27 January 2015	1 January 2016
1.25%	14 January 2016	1 January 2017
1.875%	27 January 2017	1 January 2018
2.50%	10 January 2018	1 January 2019

1) Hong Kong introduced a countercyclical capital buffer[6] in 2015 (to be implemented by 1 January 2016).

Justification. The significant values of the credit gap (32.8 pp) and the gap between the ratio of real estate prices to rent and its long-term trend (14.2 pp) indicated that in the current conditions it was possible to introduce the maximum value of the CB, 2.5%. In addition to the above indicators, other indicators[7] were considered that characterise the banking sector (for example, lending growth, leverage, the loan-to-deposit ratio etc), the real estate sector (the growth rate of real estate prices, the real estate price-to-income ratio etc), the level of the non-financial sector debt burden, macroeconomic imbalances and external factors. The high level of these indicators (in particular, the household debt-to-GDP ratio, the corporate debt-to-capital ratio and the expectations of US dollar appreciation) also indicated the need to set the CB at 2.5%. Nevertheless, to comply with the principles of phased implementation, an initial CB level of 0.625% was approved (according to the BCBS methodology, this was the maximum possible value for the first introduction of the buffer at that time).

The ratio of private non-financial sector loans to GDP was 224% at the end of 2014[8].

2) In January 2018, the Hong Kong Monetary Authority (HKMA) decided to increase the buffer to 2.5%[9].

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[5] https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-report/2017/november-2017. pdf?la=en&hash=F6D65F714A7DC28394BC4FCC9909CCD39E28AD10.

[6] https://www.hkma.gov.hk/media/eng/doc/key-functions/banking-stability/ccyb/CCyB_announcement.pdf.

[7] https://www.hkma.gov.hk/media/eng/doc/key-functions/banking-stability/ccyb/Current_list_of_Comprehensive_Reference_Indicators_for_CCyB.pdf.

[8] https://stats.bis.org/statx/srs/table/f2.4?p=20182&c.

[9] https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180110e1.pdf.

Justification. In addition to the credit gap (19.3 pp), the gap between real estate prices to rent and its long-term trend (8.3 pp) was taken into account. The values of these indicators evidence increased risks in Hong Kong's economy. According to the BCBS CB Guidelines, with this indicator of the credit gap, the buffer should be 2.25%. However, the HKMA also takes into account the leverage of banks, corporations and households; the ability to service debt; the profitability and terms of fundraising in the banking sector and the macroeconomic environment. Growth in lending exceeded 15%. The ratio of household debt to GDP in 2018 Q2 reached 71.2% of GDP[10]. Based on these indicators taken together, it was decided to set the CB at 2.5%.

At the end of 2017, the ratio of private non-financial sector loans to GDP was 244.9%[11].

Denmark

Buffer value	Decision date	Effective date
0%	20 January 2015	1 January 2016
0.50%	14 March 2018	31 March 2019
1%	24 September 2018	30 September 2019

A decision to increase the CB to 1% was made by the Ministry of Industry, Business and Financial Affairs[12] on 24 September 2018 following the recommendation of the Danish Systemic Risk Council[13].

Justification. The Danish economy is in the recovery phase; financial institutions assess risks as low, so their risk appetite is growing. Prices and activity in the residential and commercial real estate markets have increased dramatically in recent years. There have been signs of an increase in lending risks for banks; over the course of a long period, there has been a decrease in corporate lending standards. While overall lending growth has been modest, growth rates vary across the country's regions, industries and borrowers.

Low interest rates, combined with economic recovery, rising asset prices and increased competition for borrowers (especially corporate clients), may lead to a rapid rise in credit risk. This is compounded by the high level of aggregate lending.

The ratio of private non-financial sector loans to GDP was 225.45%, and the credit gap was -31.72 pp.

Iceland

Buffer value	Decision date	Effective date
1.00%	1 March 2016	1 March 2017
1.25%	1 November 2016	1 November 2017
1.75%	15 May 2018	15 May 2019

1) Iceland set a countercyclical capital buffer on 1 March 2016 immediately at the level of 1%.

Justification. The Icelandic Financial Supervisory Authority notes[14] that the credit gap is sending the wrong signal for small volatile economies. Iceland experienced a sustained increases in real

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[10] *https://www.hkma.gov.hk/media/eng/publication-and-research/research/research-memorandums/2018/RM07-2018.pdf*.

[11] *https://stats.bis.org/statx/srs/table/f2.4?p=20182&c*.

[12] *https://em.dk/nyhedsarkiv/2018/september/fastsaettelse-af-kravet-til-den-kontracykliske-kapitalbuffer-for-danmark-groenland-og-faeroeerne-for-3-kvartal-2018-1/*.

[13] *http://www.risikoraad.dk/nyheder/2018/sep/recommendation-increase-of-the-countercyclical-capital-buffer-rate/*.

[14] *https://en.fme.is/supervision/financial-stability/capital-buffers/*.

estate prices and salaries. For this reason, it was decided to introduce a countercyclical buffer at the level of 1%.

At the date of the decision, the loan-to-GDP ratio was 170%, and the credit gap was -50 pp.

2) In May 2018, the CB was increased to 1.75%[15]. Lending growth exceeded GDP growth in 2017, and prices for both residential and commercial real estate increased. The loan-to-GDP ratio was 163.3%[16] at the decision date, and the credit gap was -76.9 pp.

Ireland

Buffer value	Decision date	Effective date
0%	8 December 2015	1 January 2016
1.00%	5 July 2018	5 July 2019

The decision to increase the CB was made by the Central Bank of Ireland on 5 July 2018[17].

Justification. The high economic volatility is exacerbated by the high level of NPL on the balance sheets of banks and the growth of household debt. In the period from August 2017 to August 2018, residential property prices increased by 13% (versus 9.5% in the previous analogous period). At the same time, real estate prices approached the value corresponding to fundamental indicators, so their further growth will pose risks. While remaining negative, the credit gap has an ascending path. Significant growth in mortgage lending continues. Britain's exit from the EU creates an additional risk.

Since the standard measurement of the credit gap is not applicable to Ireland due to the credit boom in the mid-2000s, the Central Bank of Ireland uses an adjusted value. In this measurement, the loan-to-GNI ratio was 91% (or 241% when using the standard approach), and the credit gap was -77 pp (or -87 pp with the standard approach).

Lithuania

Buffer value	Decision date	Effective date
0%	19 June 2015	30 June 2015
0.5%	20 December 2017	31 December 2018
1.0%	20 June 2018	30 June 2019

On 31 December 2018, the countercyclical buffer of 0.5% took effect.[18].

Justification. The decision was made[19] with the aim of generating additional capital to ensure greater resilience of organisations to sudden systemic risks and external economic shocks in the future. The current macroeconomic conditions were characterised by growth of the economy and lending volumes, an upsurge in activity in the real estate market and positive dynamics in the banks' profitability.

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[15] *https://www.fme.is/eftirlitsstarfsemi/fjarmalastodugleiki/eiginfjaraukar/*.

[16] *In the period between the second and third increase in the CB in the country, there was, at first, a decrease in the loan-to-GDP ratio (to 157% in April 2017), after which its growth resumed.*

[17] *https://www.centralbank.ie/docs/default-source/financial-system/financial-stability/macroprudential-policy/countercyclical-capital-buffer/ccyb-rate-announcement-july-2018.pdf?sfvrsn=6*.

[18] *https://www.lb.lt/uploads/documents/files/Resolution%202017%20Q4.pdf*.

[19] *https://www.lb.lt/en/media/force_download/?url=/uploads/publications/docs/19260_fb5b4fc8e1f72a191126de19da1d489b.pdf*.

At the date of the decision, the ratio of private non-financial sector loans to GDP was 64%, and the credit gap was -13.7 pp.

In 2017 Q3, the volume of private non-financial sector loans continued to increase, while the situation in other segments remained ambiguous:
- there was an acceleration in the growth of mortgage lending to 8.2%;
- after growing by more than 7% by mid-2017, the portfolio of corporate loans fell to 6.3% in September;
- the share of loans to construction companies and real estate companies dropped;
- the share of loans to companies engaged in trade, manufacturing and administrative activities increased.

The survey of banks showed that in conditions of growth in the economy and investments, corporate lending may increase in the near future.

According to the data for 2017 Q2 (10.2%), the annual growth in real estate prices remained at the same high level as in 2017 Q1. The increase in real estate prices during the first half of 2017 brought them close to the level corresponding to fundamental indicators.

The last CB increase was approved on 20 June 2018.[20]

Justification. This decision was made in view of continued lending growth and the high level of activity in the real estate market as well as taking into account the stable financial position of banks[21]. At the end of 2017, when a decision was made to increase the CB, the Bank of Lithuania pointed out the possibility of further increasing the CB to 1% if the market dynamics remain unchanged. Loans to the private non-financial sector continued to grow (6.9% YoY at the end of April 2018). The volume of newly issued loans increased in the same period by 12.8%. The increase in mortgage lending (8%) was a significant driver of growth. The growth in lending to private companies has been stable; however, the growth rate has been volatile. The dynamics of lending growth can be attributed to low interest rates, rising household incomes and improved expectations of business and households. In 2018 Q1, the annual growth in real estate prices was 6.9%.

The ratio of private non-financial sector loans to GDP at the time of the decision was 64.9%, and the credit gap was -12.2 pp.

Luxembourg

Buffer value	Decision date	Effective date
0%	30 November 2015*	1 January 2016
0.25%	31 December 2018**	1 January 2020

* http://www.cssf.lu/fileadmin/files/Lois_reglements/Legislation/RG_CSSF/RCSSF_No15-04eng.pdf.
** http://data.legilux.public.lu/file/eli-etat-leg-rcsf-2018-12-31-a1200-jo-fr-pdf.pdf.

The Luxembourg Financial Sector Supervisory Commission introduced a zero countercyclical capital buffer in 2015 (to be implemented by 1 January 2016). Starting in 2020, a CB of 0.25% takes effect.

Justification. The indicators show that the credit gap is increasing rapidly and is approaching 2 pp, upon reaching which it is recommended to activate the CB. The sustained growth in lending is assessed as posing a high level of risk over the medium term and may, therefore, trigger cyclical vulnerability whose growth should be prevented at an early stage.

Other indicators, such as lending dynamics and the high cost of real estate, indicate the existence of systemic risks associated with excessive lending growth. According to the analysis by the Central Bank and the Financial Sector Supervisory Commission of Luxembourg, further lending growth can

[20] https://www.lb.lt/uploads/documents/files/EN/our-functions/financial-stability/Resolution_2018_Q2(1).pdf.

[21] https://www.lb.lt/en/media/force_download/?url=/uploads/publications/docs/20020_cfe9e60927189c5d1fbde40e8e74c584.pdf.

be a potential source of systemic risk. At the same time, the study says that the banking system remains stable.

The ratio of private non-financial sector loans to GDP was 104.7% in 2018 Q3, and the credit gap was -0.2 pp.

In connection with the above, the CB was revised upward to 0.25%.

Norway

Buffer value	Decision date	Effective date
1.00%	12 December 2013	30 June 2015
1.50%	18 June 2015	30 June 2016
2.00%	15 December 2016	31 December 2017
2.50%	13 December 2018	31 December 2019

1) The decision to set a positive countercyclical buffer in Norway was made in December 2013 by the country's Ministry of Finance, taking into account the opinion of the Central Bank[22].

Justification. Despite the fact that over several quarters preceding the decision to raise the CB the growth of household debt slowed down, it still outstripped income growth. Continued DTI growth was recognised as one of the vulnerabilities in the financial system. The cost of housing continued to grow. There was also evidence of banks lowering mortgage lending standards.

At the date of the decision, the ratio of private non-financial sector loans to GDP was 200%, and the credit gap was 5 pp.

2) In December 2018, it was decided to increase the CB to 2.5%[23].

Justification. In 2018, the risks to financial stability in Norway increased, mainly because of the increase in prices for commercial real estate. The stress test of 2018[24] showed that Norwegian banks will have to completely exhaust the CB as well as some other buffers, if risks materialise in the commercial real estate market.

At the date of the decision, the ratio of private non-financial sector loans to GDP was 199.7%, and the credit gap was -4.86 pp.

Slovakia

Buffer value	Decision date	Effective date
0% *	7 October 2014	1 November 2014
0.50% **	26 July 2016	1 August 2017
1.25% ***	10 July 2017	1 August 2018
1.50% ****	3 July 2018	1 August 2019

* https://www.esrb.europa.eu/pub/pdf/other/141107_Notification_Bank_of_Slovakia.pdf?80e226f218d947dbd5d10b8adc85892c.
** http://www.nbs.sk/_img/Documents/_Legislativa/_FullWordingsOther/EN_ROZ_20_2016.pdf.
*** https://www.nbs.sk/_img/Documents/_Dohlad/Makropolitika/8_2017_EN.pdf.
**** https://www.nbs.sk/_img/Documents/_Dohlad/Makropolitika/WEB_rozhodnutie_vankus__TRA-EN_July_2018.pdf.

1) In July 2016, the National Bank of Slovakia decided to set a CB of 0.5% effective 1 August 2017.

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[22] https://static.norges-bank.no/contentassets/53f33130a4684bfc9187fa45e3360ee5/monetary_policy_report_3_14.pdf?v=03/09/2017123530&ft=.pdf.

[23] https://www.regjeringen.no/en/aktuelt/countercyclical-buffer-increases/id2622440/.

[24] https://static.norges-bank.no/contentassets/1afe861c5f1c43afaf61fb57082e7c7a/fs2018_report.pdf?v=11/23/2018133919&ft=.pdf.

Justification. The decision to increase the countercyclical buffer was taken as a preventive measure to prevent the materialisation of risks in the future. At the end of 2015, the National Bank of Slovakia mentioned that the decision to establish a non-zero CB would depend on lending growth dynamics[25]. The CB was established based on the values of the credit gap, the Cyclogram indicator[26] and leverage. As of the end of March 2016, the (standard) credit gap was 0 pp, and the value of the national credit gap was 0.25 pp. The ratio of private non-financial sector loans to GDP was 84.1%.

Bank loans (both to households and to companies) increased in 2016 Q1 with an annual growth rate of 10.4%. The growth in lending was reflected in the level of household debt, which increased in 2016 Q1 by 0.5 pp to 35.8% of GDP. The annual increase in the volume of loans to the non-financial sector was 7.5% according to the data for 2017 Q1 (versus 9% in the previous quarter). The growth in lending was largely due to the increase in investment loans (40% of the total loans issued to the non-financial sector), which was recorded as the highest for five years. The Cyclogram indicator showed a gradual overheating of the economy as it continued to grow in 2016 Q1, but the growth was more moderate as compared to 2015 Q4. In addition to increases in household and business loans and the level of non-performing assets, housing prices also increased. The Cyclogram indicator reached its highest level in the post-crisis period.

2) Starting from 1 August 2019, the CB value will be increased to 1.5%[27].

Justification. The increase in the CB value is associated with growth in the volume of loans (to households and to companies), which remained one of the highest in Europe. According to the data for 2018 Q1, annual lending growth approached double-digit indicators. In addition, the ratio of non-financial sector debt to GDP increased to 59.8% in the first quarter, which was one of the highest among the countries of Eastern Europe. The Cyclogram indicator remained high and close to the values recorded in 2008.

As of the end of March 2018, the value of the (standard) credit gap was 3.87 pp, and the national credit gap was 5.12 pp (dropped by 0.7 bp over the quarter). The ratio of private non-financial sector loans to GDP was 98.5%.

France

The authority to establish a countercyclical capital buffer is vested in the High Council for Financial Stability (HCSF). The countercyclical capital buffer value is determined based on research conducted by the Bank of France, taking into account the debt burden to GDP ratio, the credit gap and expert opinions.

Buffer value	Decision date	Effective date
0%	30 December 2015*	1 January 2016
0.25%	29 June 2018**	1 July 2019
0.50%	3 April 2019***	2 April 2020
* https://www.economie.gouv.fr/hcsf/coussin-fonds-propres-contra-cyclique.		
** https://www.legifrance.gouv.fr/eli/decision/2018/6/29/ECOT1816944S/jo/texte/fr.		
*** https://www.economie.gouv.fr/files/files/directions_services/hcsf/HCSF20190318_-_Decision_D-HCSF-2019-2.pdf.		

1) In 2016, a zero countercyclical capital buffer was introduced. In 2015 Q1, the credit gap was 5.6 pp. [28]The ratio of private non-financial sector loans to GDP as of the date on which the zero buffer

[25] http://www.nbs.sk/_img/Documents/_Dohlad/Makropolitika/Quaterly%20commentary_2015_October.pdf.

[26] A Cyclogram is a composite indicator that takes into account a number of factors, such as the national credit gap (loans only to national borrowers), lending growth, non-performing loans (NPL), debt of households and private non-financial companies, growth in real estate prices, unemployment rate etc.

[27] https://www.nbs.sk/_img/Documents/_Dohlad/Makropolitika/WEB_Stvrtrocny_komentar_TRA-EN_July_2018.pdf.

[28] https://www.economie.gouv.fr/files/communique_de_presse_relatif_a_la_decision_du_hcsf_du_30_decembre_2015.pdf.

was established was 92.4%. In March 2018, the countercyclical capital buffer was revised[29] upward to 0.25% (effective 1 July 2019).

Justification. The monitoring of indicators (the dynamics of indebtedness of non-financial organisations, real estate prices and the dynamics of financial, macroeconomic and monetary indicators) confirmed the presence of significant systemic risks. At the meeting on 11 June 2018, the HCSF noted that the debt of the non-financial private sector reached 130.2% of GDP[30] in 2017 Q4 (of which households accounted for 58.4%, and non-financial organisations accounted for 71.8%). The debt level in France exceeded the euro area level. For non-financial organisations, the increase in debt was caused by the increase in both market and bank lending (+ 5.1% per year as of April 2018). Lending growth was typical of companies of different sizes. For this reason, on 11 May 2018, macroprudential measures were introduced to limit loans from systemically important French banks to overindebted non-financial organisations which are residents of France to 5% of their authorised capital. Loans to households also grew by 5.7% over the year (as of April 2018). Real estate prices increased by 3.9% during 2017 Q4; such dynamics can be attributed to eased terms of lending.

When the countercyclical capital buffer was increased, the ratio of private non-financial sector loans to GDP was 130.2%[31], and the credit gap in 2017 Q4 was 3.8 pp.[32]

2) In April 2019, the HCSF announced an increase in the countercyclical capital buffer to 0.5% effective 2 April 2020. According to the published press release[33], the credit gap which was taken into consideration in setting the buffer value was 2.9 pp (as of 2018 Q3). The ratio of private non-financial sector loans to GDP remained high and amounted to 133.3% (as of 2018 Q3) (of which households accounted for 59.2%, and non-financial corporations accounted for 74.1%). The debt of non-financial companies increased by 6% compared to the previous year, and the growth rate of household debt was 5.5% (with mortgages being the main driver)[34]. There was a high SMB lending rate: in 2018 it grew by 6.3%.

Czech Republic

Buffer value	Decision date	Effective date
0%	28 August 2014	1 October 2015
0.5%	3 December 2015	1 January 2017
1.0%	25 May 2017	1 July 2018
1.25%	6 December 2017	1 January 2019
1.5%	17 May 2018	1 July 2019
1.75%	29 November 2018	1 January 2020

[29] *https://www.economie.gouv.fr/files/files/directions_services/hcsf-en/HCSF_20180611_-_Press_release.pdf*.

[30] *https://www.economie.gouv.fr/files/files/directions_services/hcsf-en/HCSF_20180611_-_Press_release.pdf*.

[31] *https://www.economie.gouv.fr/files/files/directions_services/hcsf/HCSF_20180611_Communique_de_presse.pdf*.

[32] *https://www.esrb.europa.eu/national_policy/ccb/html/index.en.html*.

[33] *https://www.economie.gouv.fr/files/files/directions_services/hcsf/HCSF20190318_-_Communique_de_presse_CCyB.pdf*.

[34] *https://www.economie.gouv.fr/files/files/directions_services/hcsf/HCSF20190318_-_Communique_de_presse.pdf*.

The decision to activate the countercyclical capital buffer was made by the National Bank of the Czech Republic in December 2015[35]: effective 1 January 2017 it should have been 0.5%.At the time of the decision, the ratio of private non-financial sector loans to GDP was 75.6%, and the credit gap was 3.1 pp.

Justification. The lending market of the Czech Republic was characterised by high growth rates, especially in certain sectors. In September 2015, the growth rate of loans to non-financial corporations was 10.8% (significantly higher than the average annual value for 10 years) and 7% for households (below the average annual value for 10 years). New lending in the non-financial corporate sector was moderate at 4.4%, while new lending to households increased by 13.8% (in particular, there was an increase in new mortgage lending). In addition to the credit gap, in increasing the CB, the Czech National Bank took into account the increase in the household debt to income ratio, the decline in lending standards and the rise in prices for residential real estate caused by mortgage lending growth. Another risk factor was the economic recovery in the context of low interest rates, where investors were optimistic about investments in the real estate market (both residential and commercial).

2) The last increase in the CB took place at the end of 2018, to the level of 1.75%.[36] The ratio of private non-financial sector loans to GDP was 89.2%, and the credit gap was -2.2 pp.

Justification. When making its decision, the Czech National Bank took into account the continuing high growth rates of household mortgage loans, the increase in newly issued loans and the growth of unsecured consumer loans and loans to non-financial corporations. Despite the rise in interest rates, credit terms are still soft. This factor as well as low supply in the primary housing market stimulates the growth of real estate prices (above the average annual value over the long term). The perception of credit risk by banks is overly optimistic (reflected in reduced loan loss provisions).

Sweden

Buffer value	Decision date	Effective date
1.0%	8 September 2014	13 September 2015
1.5%	22 June 2015	27 June 2016
2.0%	14 March 2016	19 March 2017
2.5%	18 September 2018	1 January 2020

1) A countercyclical capital buffer was introduced [37]in Sweden at 1% starting from 13 September 2015.

Justification. The reason for setting a non-zero CB was increased lending growth (higher than the GDP growth rate). At the time of the establishment of the CB, the ratio of total private non-financial sector loans to GDP in Sweden was 151.3% (a historical maximum for 2014). It was also noted that the growth in total private sector debt in Sweden was mainly due to household borrowings (they also have a high household debt to disposable income ratio of 175%). After the financial crisis, household lending and corporate lending rates slowed down: in 2013, total lending grew by almost 4% versus almost 12% in 2007 (when the credit expansion of the 2000s was close to its peak). In 2000–2013, corporate sector lending showed increased volatility, which can be a signal of its procyclicality. The credit gap that was taken in establishing the CB was 6 pp.

The further increase in the CB level pursued by Sweden in 2015, 2016 and 2018 was associated with continued lending growth (see below).

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[35] *https://www.cnb.cz/en/financial_stability/macroprudential_policy/countercyclical_capital_buffer/provision_2016_04.html.*

[36] *https://www.cnb.cz/en/financial_stability/macroprudential_policy/countercyclical_capital_buffer/provision_2018_04.html.*

[37] *https://www.fi.se/contentassets/d81b438c6b90436eb1301e167622e659/decision-memorandum-fs1433.pdf.*

2) The last increase in the[38] CB was announced in September 2018: the CB will be 2.5% starting from 19 September 2019.

Justification. Among the reasons for the CB increase is an increased level of risks due to the low level of interest rates and risk premiums. This situation stimulates growth in risk appetite. A factor indicating an increased level of risks is the increased growth rate of loans to non-financial companies and households: over the last 5 quarters, the average level of this indicator was 7.7% (in 2016, when the buffer was raised to 2%, the average growth rate of such loans was 6.4%).

The loan-to-GDP ratio was almost 158.7% at the time the buffer was increased (an increase of 8 pp since 2016). The main share of loans falls on household loans; however, after the CB was increased to 2% in 2016, the share of such loans decreased slightly. The credit gap amounted to 2.34 pp; however, the Commission notes that the credit gap is assigned a low weight in calculating the buffer value, and in addition to it other indicators and recommendations of the ESRB are used.

Assessment of the effect of increasing the CB. The buffer increase is expected to increase the resilience of the banking system and contribute to the greater stability of the Swedish financial system. According to the Commission's estimates, an increase in the countercyclical capital buffer from 2% to 2.5% could lead to a 0.01–0.015 bp increase in the mortgage rate, if the entire value of additional funds raised is transferred to borrowers. Such an increase in the interest rate will only slightly affect the cost of household loans and, accordingly, their demand for loans. The impact of the CB increase on the lending rate for non-financial companies is also assessed as insignificant.

Use of a sectoral countercyclical capital buffer

Switzerland

The CB value for the residential real estate sector	Decision date	Effective date
1%	13 February 2013	30 September 2013
2%	January 2014	30 June 2014

1) A countercyclical capital buffer of 1% for the residential real estate sector was initially established in February 2013. This decision was made due to a number of factors. In 2011–2013, there was an increase in imbalances in the real estate and mortgage markets (the main risks for Swiss banks focused on the domestic market); in certain segments and in several regions of Switzerland, the real estate market showed signs of overheating. The mortgage and real estate markets were characterised by rapid growth, and one of the reasons for such growth was low interest rates. In 2012, growth in outstanding mortgage debt to Swiss banks focused on the domestic market was 5%. Due to the fact that the share of this category of banks in mortgage lending was about 65% and given the slowdown in the growth of the Swiss economy, there was a significant increase in the ratio of mortgage loans to GDP to 142.7% (at the end of 2012, the ratio of total lending to GDP was 158.4%). The credit gap (for total non-financial sector loans) was 15.2 pp at the end of 2012.[39]

Since 2011, the Swiss Financial Market Supervisory Authority (FINMA) has been stress-testing banks' mortgage portfolios to determine the amount of possible losses in the event of a crisis in the real estate market. Stress tests determine the value of possible losses as a result of changes in key economic parameters (interest rates, unemployment, real estate prices, GDP). According to the results of stress testing (2012), the total volume of possible losses for the mortgage portfolio over a five-year period in a recession scenario was 2 to 4% of mortgage loans. In the event of a more

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[38] *https://www.fi.se/globalassets/media/dokument/fffs-bilagor/2018/beslutspm-fffs-2018-17_eng.pdf*.

[39] *https://stats.bis.org/statx/srs/table/j?m=C&p=20174&c*.

extreme scenario (a drop in real estate prices in a number of regions by 30–40%), it was found that potential losses could exceed 5%.

Impact assessment. In 2015, BIS experts issued a report[40] with an assessment of the effects of the introduction of a CB at the level of 1%. In general, the introduction of the buffer helped achieve the desired effect – a shift in mortgage lending from less stable banks to more stable ones; however, stricter capital requirements did not discourage less financially stable banks from undertaking high-risk mortgage lending. It was also noted that the CB is changing the composition of supply in the mortgage market as banks with relatively limited capital and specialising in mortgage loans raise interest on loans to a greater extent than their competitors.

2) In 2014, the Federal Council of Switzerland raised the countercyclical buffer for the residential real estate sector from 1 to 2%. In 2014, the euro area experienced weak economic growth, and the European banking sector remained relatively vulnerable. Moreover, a prolonged period of low interest rates was a factor in the emergence of risks to financial stability. The continuation of the period of low interest rates could lead to an increase in the existing imbalances and to the emergence of new ones, for example, in the securities market and the real estate market. The mortgage market was characterised by uncertainty, while in 2014 there was a slight slowdown in mortgage lending growth rates. At the same time, low interest rates continued to be the main growth driver in the real estate market. In 2013, there was an increase in risks associated with the slow amortisation of mortgage loans. There were risks to the solvency of borrowers, including a possible default.

As of January 2014, when the decision was made to increase the CB, the aggregate ratio of private non-financial sector loans to Switzerland's GDP was 223.7%[41], and the ratio of mortgage loans to GDP was about 110%[42].

The credit gap (for total non-financial sector lending) was 11.7 pp at the end of 2013.[43]

Efficiency assessment. FINMA notes[44] that as a result of measures taken in 2013–2014[45], there was a decrease in the growth rate of real estate prices (although the prices as well as the mortgage debt level remained at a historically high level). FINMA plans to continue stress-testing of mortgage loan portfolios, based on which additional measures may be taken (thus, the sectoral buffer is set with consideration for stress testing results).

[40] *https://www.bis.org/publ/work511.pdf*.

[41] *https://stats.bis.org/statx/srs/table/f2.1*.

[42] *https://www.imf.org/external/pubs/ft/scr/2014/cr14269.pdf*.

[43] *https://stats.bis.org/statx/srs/table/j?m=C&p=20174&c=*.

[44] *https://www.finma.ch/FinmaArchiv/gb2014/download/2014/en/Downloads/Finma_AR14_En.pdf*.

[45] *In addition to the CB increase in 2013, FINMA increased the risk ratios for mortgage loans with an LTV of over 80% from 75 to 100%.*