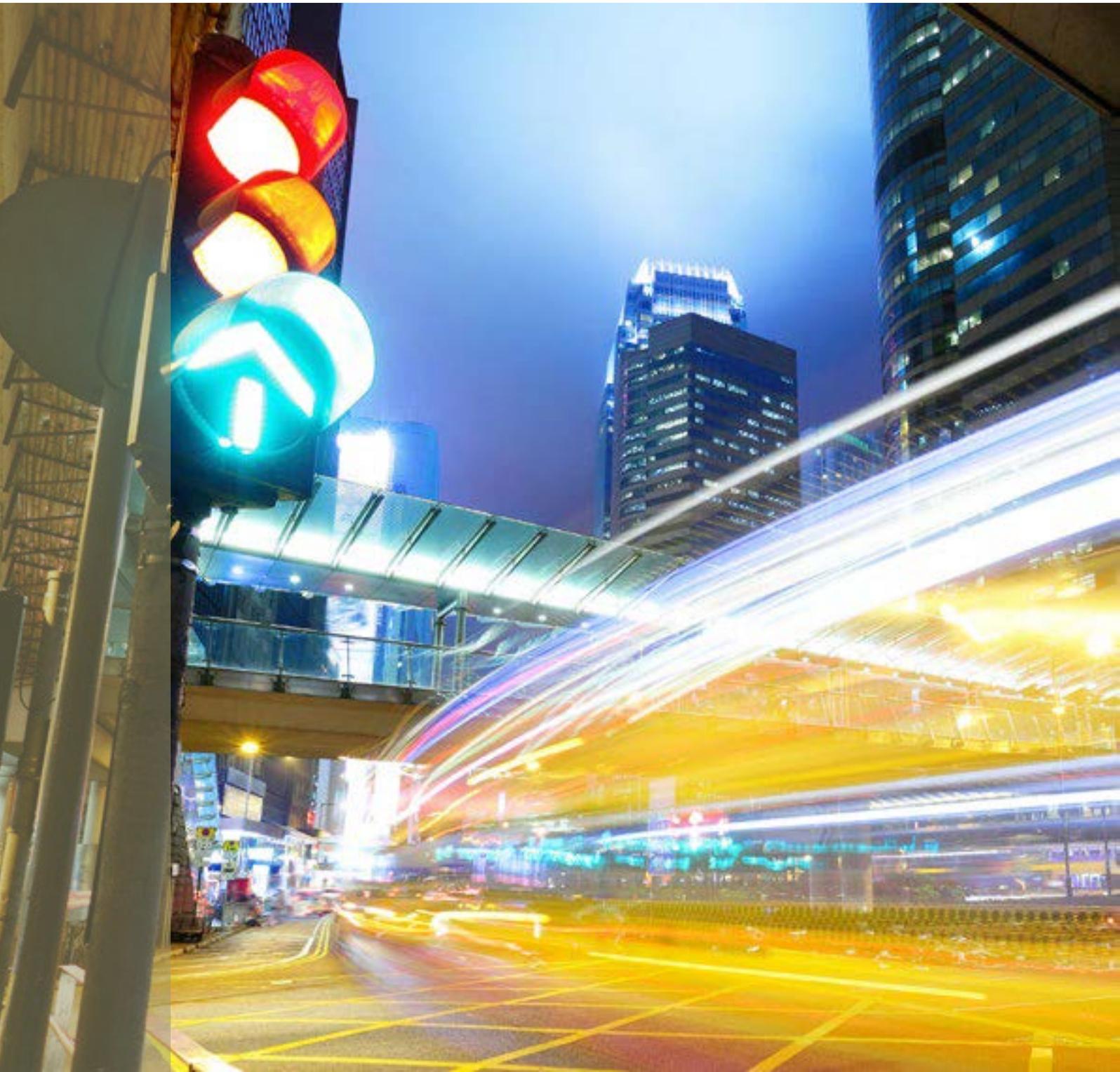




Macroprudential Diagnostics

fourth quarter of 2016

Year I · Number 1 · January 2017



Contents

Introductory remarks	4
1 Identification of systemic risks	4
2 Potential triggers for risk materialisation	7
3 Recent macroprudential activities	9
3.1 Review of the identification of other systemically important credit institutions in the Republic of Croatia	9
3.2 Continued application of the countercyclical capital buffer rate for the Republic of Croatia for the first quarter of 2018	10
3.3 Review of the structural systemic risk capital buffer level	10
3.4 Recommendations of the European Systemic Risk Board (ESRB) published in 2016 and action based on the recommendations	11
3.4.1 At end-October 2016 the ESRB issued a Recommendation ESRB/2016/14 on closing real estate data gaps.	11
3.4.2 In line with Recommendation ESRB/2015/1 of 11 December 2015 on recognising and setting countercyclical buffer rates for exposures to third countries, in December 2016 the CNB informed the ESRB on its action based on the Recommendation.....	12
3.4.3 In 2016, two amendments were made to Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2016/3 i ESRB/2016/4).....	13
3.4.4 In March 2016, Recommendation ESRB/2012/2 was amended with respect to the funding of credit institutions (ESRB/2016/2), and in the course of 2016, the CNB informed the ESRB of the implementation of parts A(1), A(2) and A(3) of the Recommendation in line with requested timelines.....	13
3.5 Overview of macroprudential measures in EU countries	14
Analytical annex: The issue of interest rate risk – a review of the results of the Interest rate survey.	17
Survey results – variable interest rates	18
Survey results – fixed interest rates	20
Glossary	23
List of abbreviations	24
Two-letter country codes	25

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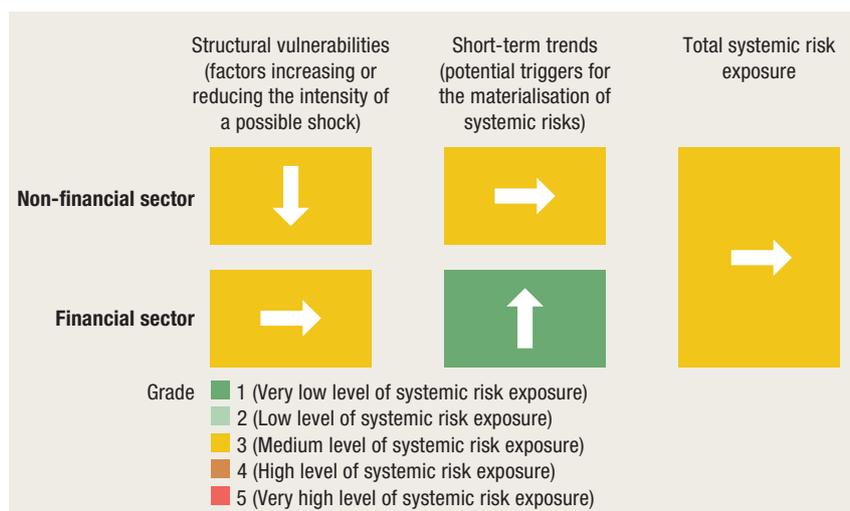
Introductory remarks

The macroprudential diagnostic process consists of assessing the macroeconomic and financial relations and developments that might result in the disruption of financial stability. In the process, individual signals indicating an increased level of risk are detected based on calibrations using statistical methods, regulatory standards or expert estimates. They are then synthesised in a risk map indicating the level and dynamics of vulnerability, thus facilitating the identification of systemic risk, which includes the defining of its nature (structural or cyclical), location (segment of the system in which it is developing) and source (for instance, identifying whether the risk reflects disruptions on the demand or on the supply side). With regard to such diagnostics, instruments are optimised and the intensity of measures is calibrated in order to address the risks as efficiently as possible, reduce regulatory risk, including that of inaction bias, and minimise potential negative spillovers to other sectors as well as unexpected cross-border effects. In addition, market participants are thus informed of identified vulnerabilities and risks that might materialise and jeopardise financial stability.

1 Identification of systemic risks

The gradual economic recovery reflected in higher actual and expected rates of economic growth and the decrease in budget deficit reduced the risks for the Croatian economy. Domestic vulnerabilities were further mitigated by the stabilisation of the increase in general government debt as a result of the somewhat stronger than expected consolidation of public finance achieved in 2016. Nevertheless, levels of external and public debt have remained high and still pose significant structural risks. At the same time, external vulnerabilities, although stabilised to some extent, have remained elevated, largely due to the high external debt-to-GDP ratio. Even though the share of external debt decreased in 2016, its level has remained high, making the country extremely vulnerable in the context of a possible change in financing conditions. On the other hand, the achieved current account surplus and the expectations of a continued positive balance contributed to the reduction of external imbalances.

Figure 1 Risk map for the fourth quarter of 2016

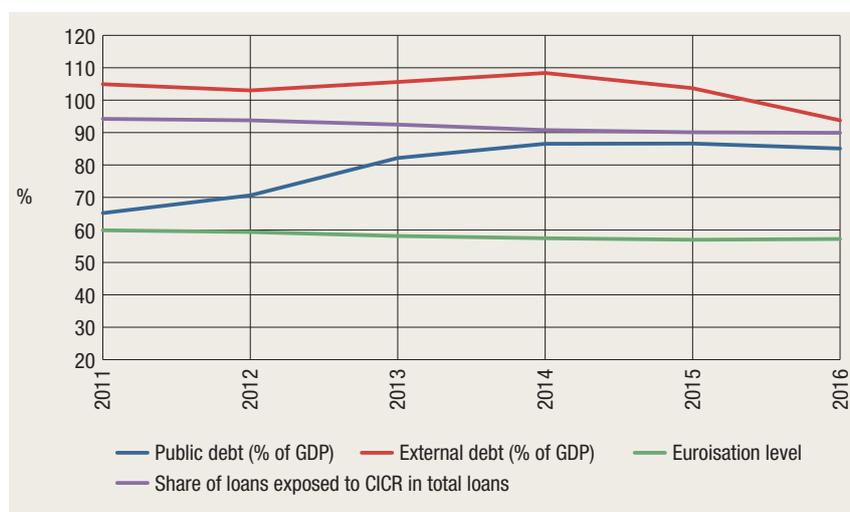


Source: CNB (for details on methodology see [Financial Stability No. 15, Box 1](#) Redesigning the systemic risk map).

Structural weaknesses in the financial sector have mostly remained the same as described in [Financial Stability No. 17](#) and primarily associated with high levels of euroisation and currency-induced credit risk as well as a high level of concentration risk. Concentration risk is significant in bank exposure to groups of affiliated entities from the government and non-financial corporate sectors, but the traditionally high concentration of the banking system is important as well as it increases the risks for the system as a whole. However, the risks have been partially contained by the relatively solid capitalisation of the system supported by the somewhat more favourable business performance of banks.

Developments in financial markets continued to be characterised by eased financial conditions. The continued decline in money market interest

Figure 2 Internal and external imbalances remain pronounced



Note: The level of euroisation has been measured by the share of foreign currency deposits, excluding kuna deposits indexed to a foreign currency in M4. The data refers to June 2016.

Source: CNB.

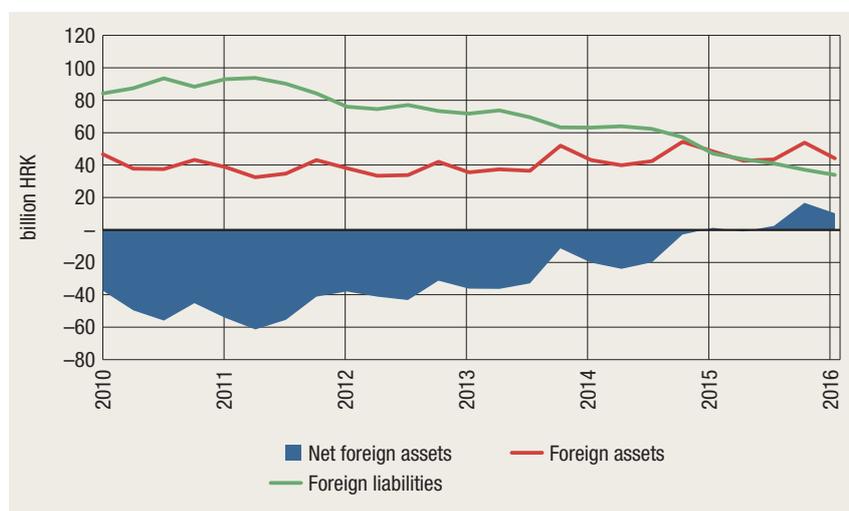
rates and banks' lending rates as well as the stable exchange rate of the kuna against the euro contributed to the improvement of the domestic component of [the financial stress indicator](#), whereas the volatility in international markets, primarily brought about by uncertainties regarding Brexit and, to a somewhat smaller extent, by the US presidential elections and the referendum in Italy, decreased and helped stabilise the foreign component.

Moreover, after the increase of the country's risk premium intensified in the last several months of 2016, spurred by an increase in risk aversion on the financial markets and partially by expectations regarding future interest rate trends, in early 2017 the risk premium sunk to its lowest level recorded in the last several years.

Still, risks associated with short-term developments in international financial markets remain significant, mainly due to a possible increase in risk aversion under the influence of both political and economic events. Such risks may be substantial, particularly considering the long period of extremely lenient financing conditions leading to a higher probability of excessive risk-taking by market participants.

In the real sector, the vulnerabilities of the non-financial corporate sector and the household sector are shrinking as a result of continued deleveraging and good corporate business performance in 2014 and 2015, as well as of the expected favourable corporate business performance in 2016. In the household sector, the increase in disposable income due to wage and employment growth and the rise in liquid financial assets, particularly household deposits, contributed to the gradual reduction of risk. According to the [CNB's projection](#), positive trends are expected to continue in both sectors.

Figure 3 Decline of systemic risks associated with cross-border financing of banks



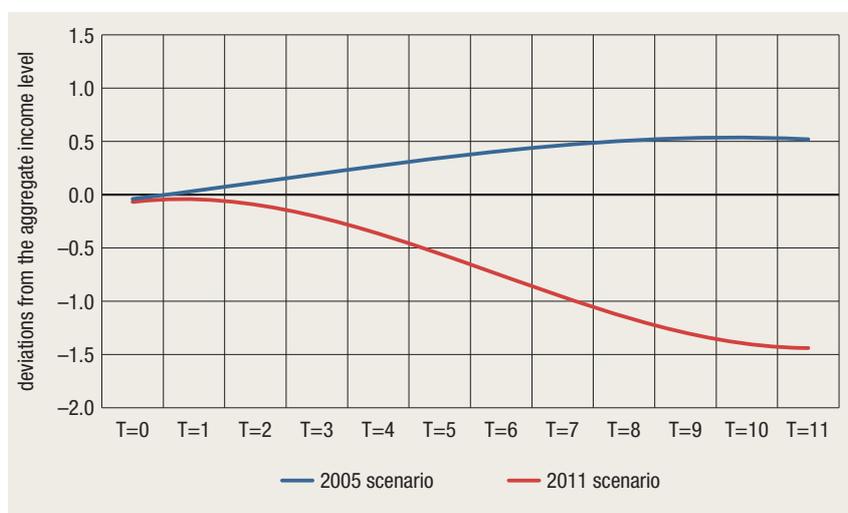
Source: CNB.

The banking system is stable and highly capitalised, and the increase in domestic sources of financing in the balance sheets of banks, supported by their deleveraging with respect to parent banks, has reduced systemic risks associated with cross-border financing. As a result, foreign assets of credit institutions exceed their liabilities.

2 Potential triggers for risk materialisation

Identified vulnerabilities suggest that one of the most substantial risks for financial stability may be a possible tightening of financing conditions on international markets that might spill over to an increase in the financing costs of domestic sectors. Still, when analysing the increase in interest rates it is necessary to discriminate between two scenarios which may

Figure 4 Simulation of GDP deviations from the level projected in the baseline scenario under the isolated influence of shock on financial variables



Note: Reactions of economic parameters in simulated conditions depend on the intensity of shocks, their temporal distribution, non-linear interactions, distribution effects, policy reactions and the transmission mechanism, all in an open economy. This means that several scenarios are possible, but are much more difficult to qualify considering the dispersion of the probability of their materialisation. In such circumstances, for the purpose of sensitivity analysis, this simulation (which uses a macroeconomic model applied in stress testing) isolates the effect of an increase in Croatia's risk premium such as that recorded as a result of the disturbance in the financial markets in 2011 (the 2011 scenario projecting a shock of 165 b. p. on average), as well as the effect of a EURIBOR increase such as that seen in the money market prior to the onset of the crisis (the 2005 scenario projecting a shock of 81 b. p. on average). In both scenarios, shocks were linked to the developments in foreign demand during the aforementioned past episodes in order to identify the two specified shocks. Therefore, the simulations shown above may be considered indicative in character. In contrast to the simulations provided above, the baseline scenario projects the continuation of the negative interest rate policy in the euro area, with the growth of Croatia's GDP projected at 3.0% in 2017 ([Macroeconomic Developments and Outlook No. 1](#)).

Source: CNB.

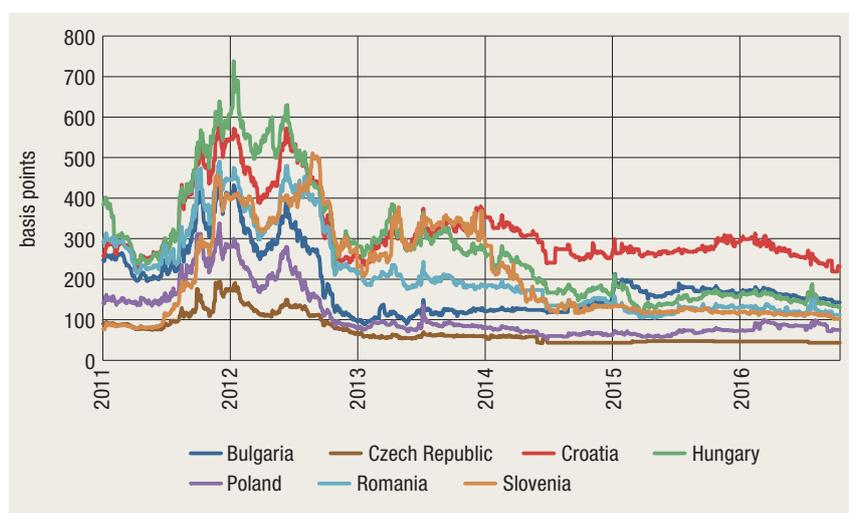
be expected to have different impacts on developments in the domestic economy. An increase in interest rates due to a rise in risk aversion would have more severe consequences for the domestic economy than a hike in ECB benchmark interest rates (Figure 4).

In the first scenario, stronger risk aversion would significantly affect the rise in Croatia's risk premium and thus result in an increase in interest rates for all sectors, due to persisting substantial imbalances. In such a scenario, the rise in uncertainty would result in a likely decline in aggregate demand, which would in turn have unfavourable effects on the domestic income. Planned budget revenues would become uncertain, and risks related to a rise in budget deficit and public debt would become significant again. Therefore, from the perspective of financial stability, i.e. the mitigation of systemic risks, it is reasonable to continue to implement a conservative policy regarding budget expenditures even in the periods of growing budget revenues, having in mind the relatively high level of Croatia's public debt.

In the second scenario, in which interest rates would rise due to the reaction of monetary policy to economic developments, the situation would be different. It is safe to assume that the ECB would initiate the process of raising interest rates only after economic developments had indicated a recovery, i.e. when the expected inflation came close to target inflation. In such a scenario of strong recovery, no negative effect would be expected on the foreign or domestic aggregate demand side, depending on the interconnectedness of business cycles in Croatia and the euro area.

Nevertheless, one should bear in mind that the effect of an interest rate increase on individual debtors in both scenarios depends on the trends

Figure 5 CDS spread developments



Sources: Bloomberg, CNB.

in their individual incomes which may, or may not, be connected with aggregate developments.

The potential for instabilities on financial markets stems from the vulnerability within the European Union and consists of, among other elements, the unfavourable feedback between the low nominal growth of European economies and the high level of public and private debt. In addition, uncertainties related to announced elections in Germany and France and the uncertainties associated with the UK's exit from the EU may also have unfavourable effects. Furthermore, a possible trigger for a substantial long-term rise in the risk premium may come from global geopolitical developments arising from changes in the established relations between the largest states and the unexpected negative effects of the rise in US interest rates on the economic developments in emerging markets.

3 Recent macroprudential activities

3.1 Review of the identification of other systemically important credit institutions in the Republic of Croatia

Since the beginning of 2016, the CNB has required systemically important credit institutions (O-SIIs) to allocate a capital buffer in line with [European](#) and [domestic](#) regulations. This capital buffer serves to protect the financial system and the entire economy from systemic risks that may arise from the malfunction or failure of individual institutions.

In early 2016, the initial identification of other systemically important credit institutions in Croatia resulted in the [identification of nine O-SIIs](#). The O-SII capital buffer must be allocated in terms of common equity tier 1 capital in the amount of 0.2% or 2% of the total risk exposure amount, depending on the estimated systemic importance. Furthermore, in December 2016, the CNB as the competent body released the [results of the annual review of the identification of O-SIIs](#) in line with the regulatory framework. The review identified nine O-SIIs in total, the same that had been identified under the initial identification procedure. Since during the re-identification no significant changes were observed in their order relative to the initial identification and buffer calibration, the proposed levels of O-SII capital buffers remained the same.

However, pursuant to the [Decision on the application of the structural systemic risk buffer](#) OSIs are also required to maintain a structural systemic buffer applicable for all exposures. In line with the provisions of the [Credit Institutions Act](#), credit institutions are required to maintain a structural systemic risk buffer rate or an O-SII buffer rate, depending on which is higher. As the structural systemic risk buffer rate is at the moment the higher of the two, it is still applied.

3.2 Continued application of the countercyclical capital buffer rate for the Republic of Croatia for the first quarter of 2018

Since 1 January 2015, the CNB's [Decision on the countercyclical buffer rate](#) has been in force, providing an instrument to be used in case it is necessary to limit excessive credit growth. It is a variable capital requirement that depends on the cyclical component of the relative private sector credit gap (the ratio of household and corporate loans to aggregate income)¹. Having in mind the subdued credit activity, the Decision set the countercyclical capital buffer rate at 0%.

Based on a recent analytical assessment of cyclical systemic risk evolution, in December 2016 the CNB announced that the [same rate of 0%](#) would continue to be applied in the first quarter of 2018, i.e. as of 1 January 2018. The decision was based on the data for the third quarter of 2016, which showed strong growth in aggregate income and a further decline in the nominal debt of the private non-financial sector. This resulted in the further reduction of the standardised credit-to-GDP ratio, while the credit gap based on this standardised ratio continued to be negative. Moreover, such developments were observed in the specific indicator of relative indebtedness as well (based on a narrower definition of credit, including only the claims of domestic credit institutions considered in relation to the quarterly, seasonally adjusted GDP).

3.3 Review of the structural systemic risk capital buffer level

Pursuant to the [Decision on the application of the structural systemic risk buffer](#), the rate of the structural systemic risk buffer is set by the CNB for all credit institutions or for one or more subsets of credit institutions with

¹ For detailed methodological explanations, see Box 4 Financial cycles and countercyclical capital buffer calibration, [Financial Stability No. 13](#).

the aim of preventing or mitigating structural systemic risks. The structural systemic risk buffer is the regulatory capital that a credit institution is required to maintain in the amount of 1.5% or 3% of the total amount of risk exposure in the form of common equity tier 1 capital as of 1 April 2014.

In 2016, the Croatian National Bank reviewed the requirement to maintain a structural systemic risk buffer for credit institutions having their head office in the Republic of Croatia pursuant to the [Credit Institutions Act](#) and the aforementioned Decision. For the purpose of review, an analysis of structural elements of financial stability and a comprehensive assessment of risks present in the economy were performed. Relevant systemic risk indicators suggested that the level of structural macroeconomic imbalances had not changed significantly over the past year in spite of intensified economic growth and improved external balances. In addition, activity and prices on the real estate market have continued to decline due to the heavy burden of existing loan obligations weighing down on households. At the same time, the high concentration of the financial system increased additionally, significantly exceeding the European average. As a result, [in April 2016 the Croatian National Bank announced that it would not change its Decision on the application of the structural systemic risk buffer](#) and that it would continue regularly to monitor the evolution of structural systemic risks.

3.4 Recommendations of the European Systemic Risk Board (ESRB) published in 2016 and action based on the recommendations

3.4.1 At end-October 2016 the ESRB issued a Recommendation ESRB/2016/14 on closing real estate data gaps.

Since the real estate sector has an important role in the economy and since the developments in the real estate market may have a significant systemic impact on the financial system, due to, inter alia, their procyclical nature, the ESRB adopted the [Recommendation on closing real estate data gaps \(ESRB/2016/4\)](#). The main purpose of this measure was to establish a harmonised framework for monitoring the developments in the real estate market, including the definitions and methods for calculating indicators at the European Union level in order to enable the early identification of vulnerabilities that could lead to future periods of crisis. The recommendation calls for risk monitoring in various real estate market segments (residential, buy-to-let and commercial segments, respectively) and is to be implemented on the principle of proportionality, i.e. the size and the significance of the domestic real estate market and

its segments will be taken into account for each member state, as well as the powers of each national macroprudential authority. The deadline for the implementation of the Recommendation is the end of 2020, whereas the ESRB and the Financial Stability Council are to be informed of the activities performed in line with the Recommendation's purposes by the end of 2018.

The Recommendation was discussed at the [6th Session of the Financial Stability Council](#), where the Council accepted the initiative to set up a working group consisting of the representatives of the Croatian National Bank, the Ministry of Finance and the Croatian Financial Services Supervisory Agency with the aim of a comprehensive implementation of the aforementioned Recommendation within the proposed deadlines.

3.4.2 In line with Recommendation ESRB/2015/1 of 11 December 2015 on recognising and setting countercyclical buffer rates for exposures to third countries, in December 2016 the CNB informed the ESRB on its action based on the Recommendation.

The Recommendation of the European Systemic Risk Board of 11 December 2015 on recognising and setting countercyclical buffer rates for exposures to third countries (ESRB/2015/1) provides the rules for identifying material exposure in third countries for the purpose of recognising or setting countercyclical buffer rates. Deciding on countercyclical capital buffer rates for third country exposures is also laid down in the [Credit Institutions Act](#). In line with the Recommendation and the planned schedule, the Croatian National Bank delivered a list of defined criteria for the assessment of the materiality of relevant third countries to the ESRB in late December 2016. Furthermore, the manner of monitoring the risk of excessive credit growth in material third countries and the compliance with the principles of public communication pursuant to [Recommendation on guidance for setting countercyclical buffer rates \(ESRB/2014/1\)](#) were presented. In conclusion, the ESRB was informed that the aforementioned Recommendation had been implemented in full.

According to the defined analytical framework and schedule, further steps will include the assessment of material exposure in third countries, after which the ESRB will be informed on the list of identified countries in the second quarter of 2017. The process of reviewing the country list will be performed once a year.

3.4.3 In 2016, two amendments were made to Recommendation ESRB/2015/2 on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2016/3 i ESRB/2016/4).

In March 2016, the existing [Recommendation on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures \(ESRB/2015/2\)](#) was amended to allow for an additional reduction of potential negative cross-border effects of macroprudential policy measures. The framework for the voluntary reciprocal application of macroprudential policy measures, laid down in Recommendation ESRB/2015/2, should ensure that all exposure-based macroprudential measures applied in one member state are reciprocated in other member states.

In March 2016, a [Belgian measure](#) was included in the list of macroprudential policy measures recommended to be reciprocated pursuant to Recommendation ESRB/2015/2. The measure, implemented in Belgium under regulations enabling the use of tighter national measures², introduced a 5-percentage-point risk-weight add-on for Belgian mortgage loan exposures of credit institutions using the internal ratings-based (IRB) approach.

In June 2016, at the request of the central bank of Estonia (Eesti Pank) for reciprocation of the adopted systemic risk buffer rate, the General Board of the ESRB decided to include the [Estonian measure](#) in the list of macroprudential policy measures recommended to be reciprocated under Recommendation ESRB/2015/2. The measure consists of a 1% systemic risk buffer rate applicable³ to the domestic exposures of all credit institutions authorised in Estonia.

3.4.4 In March 2016, Recommendation ESRB/2012/2 was amended with respect to the funding of credit institutions (ESRB/2016/2), and in the course of 2016, the CNB informed the ESRB of the implementation of parts A(1), A(2) and A(3) of the Recommendation in line with requested timelines.

On 20 December 2012, the ESRB issued the [Recommendation on funding of credit institutions \(ESRB/2012/2\)](#) with the purpose of incentivising sustainable funding structures for credit institutions and providing implementation guidelines to national macroprudential authorities and the European Banking Authority (EBA) in order to reduce potential systemic risks. In March 2016, the existing [Recommendation was amended](#)

- 2 Pursuant to Article 458(2)(d)(vi) of [Regulation \(EU\) No 575/2013 on prudential requirements for credit institutions and investment firms](#)
- 3 Pursuant to Article 133 of [Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms](#)

in order to extend the time limits for the delivery of reports on the implementation of the Recommendation to the ESRB and the Council. Furthermore, [by amending the Recommendation in September 2014](#) the deadlines for the delivery of the report on the compliance with the Recommendation were further extended.

The CNB delivered the report on the first assessment of the results of the implementation of parts of the Recommendation to the ESRB in July 2016 (Parts A(1) and (2)) and September 2016 (Part A(3)), in line with the provided timeline.

Part A(1) of the Recommendation requires national supervisory authorities to intensify their assessments of the funding and liquidity risks incurred by credit institutions, as well as their funding risk management, within the broader balance sheet structure, whereas Part A(2) of the Recommendation requires national supervisory authorities to monitor credit institutions' plans to reduce reliance on public sector funding sources and to assess the viability of such plans for each national banking system (on an aggregated basis). In addition, Part A(3) of the Recommendation requires the national supervisory authority and the authority with the macroprudential mandate to assess the impact of credit institutions' funding plans on the flow of credit to the real economy.

3.5 Overview of macroprudential measures in EU countries

Most EU countries have adopted and put to use the new institutional and technical aspect of capital and liquidity risk management policies in the domestic financial system enabling the prevention, mitigation and avoidance of systemic risks and the strengthening of the system's resilience to financial shocks. Table 1 provides an overview of macroprudential measures currently applied in EU countries in order to maintain financial stability in their systems, while Table 2 provides an overview of macroprudential measures applied in Croatia, including those outside the CNB's mandate as the macroprudential authority.

Table 1 Overview of macroprudential measures in EU countries

	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Capital and liquidity buffers																													
CB			•	•	•		•	•		•			•			•	•	•	•	•		•	•	•	•	•		•	•
CCB	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
G-SII						•			•		•										•					•			
O-SII	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SSRB	•		•		•		•	•					•	•							•	•			•	•		•	
Liquidity ratio			•											•								•	•			•			
Caps on prudential ratios																													
DSTI				•				•						•			•						•		•			•	
LTD																											•		
LTI															•														•
LTV				•	•		•	•		•				•	•		•		•	•	•	•	•		•	•		•	
Loan amortisation																					•	•				•		•	
Loan maturity								•									•						•		•			•	
Other measures																													
Pillar II			•		•															•						•	•		
Risk weights		•								•			•		•			•					•		•	•	•		•
LGD																						•							
Stress/sensitivity test			•	•											•		•	•					•		•			•	•
Other			•		•		•							•	•								•		•		•		

Disclaimer: of which the CNB is aware.

Note: Listed measures are in line with EU regulations, namely with Regulation (EU) No 575/2013 on prudential requirements for credit institutions and investment firms (CRR) and Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms (CRD IV). A list of abbreviations and their explanations is provided at the end of the publication.

Sources: ESRB, CNB, notifications from central banks and official web sites of central banks as at the end of November 2016.

Table 2 Implementation of macroprudential policy and overview of macroprudential measures in Croatia

Measure	Year of adoption	Primary objective	Description	Basis for standard measures in Union law	Activation date	Frequency of revisions
Macroprudential measures implemented by the CNB prior to the adoption of CRD IV						
Prior to the adoption of CRD-IV, the CNB used various macroprudential policy measures, of which the most significant ones are listed and described in: a) Galac, T. and E. Kraft (2011): http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-5772 b) Vujčić, B. and M. Dumičić (2016): https://www.bis.org/publ/bppdf/bispap86i.pdf						
Macroprudential measures envisaged by CRD-IV and implemented by the competent macroprudential authority						
CB	2014	Credit growth and leverage following Recommendation ESRB/2013/1	Early introduction: at 2.5% level	Art. 160(6) CRD	1 Jan. 2014	Discretionary
CB	2015	Credit growth and leverage following Recommendation ESRB/2013/1	Exemption of small and medium-sized investment firms from the capital conservation buffer	Art. 129(2) CRD	10 Jun. 2015	Discretionary
CCB	2015	Credit growth and leverage following Recommendation ESRB/2013/1 and implementing Recommendation ESRB/2014/1	CCB rate set at 0%	Art. 136 CRD	1 Jan. 2016	Quarterly
CCB	2015	Credit growth and leverage following Recommendation ESRB/2013/1	Exemption of small and medium-sized investment firms from the countercyclical capital buffer	Art. 130(2) CRD	10 Jun. 2015	Discretionary
O-SII	2015	Limiting the systemic impact of misaligned incentives with a view to reducing moral hazard following Recommendation ESRB/2013/1	Identification of nine O-SIIs with corresponding buffer rates: 2.0% for O-SIIs: Zagrebačka banka d.d., Zagreb, Erste&Steiermärkische Bank d.d. Rijeka, Privredna banka banka Zagreb d.d., Zagreb, Raiffeisenbank Austria d.d., Zagreb, Soci�t� G�n�rale-Splitska banka d.d., Split, Addiko Bank d.d., Zagreb; 0.2% for O-SIIs: OTP banka Hrvatska d.d., Zadar, Sberbank d.d., Zagreb, Hrvatska poštanska banka d.d., Zagreb	Art. 131 CRD	1 Feb. 2016	Annually
SSRB	2014	Credit growth and leverage following Recommendation ESRB/2013/1	Two SSRB rates (1.5% and 3%) applied to two sub-groups of banks (market share <5%, market share >5%). Applied to all exposures	Art. 133 CRD	19 May 2014	Annually
Risk weights for exposures secured by mortgages on residential property	2014	Credit growth and leverage following Recommendation ESRB/2013/1	Maintaining a stricter definition of residential property for preferential risk weighting (e.g. owner cannot have more than two residential properties, exclusion of holiday homes, need for occupation by owner or tenant)	Art. 124, 125 CRR	1 Jan. 2014	Discretionary
Risk weights for exposures secured by mortgages on commercial property	2014	Mitigating and preventing excessive maturity mismatch and market illiquidity following Recommendation ESRB/2013/1	CNB's recommendation issued to banks (non-legally binding measure) on avoiding the use of risk weights of 50% to exposures secured by CRE during low market liquidity	Art. 124, 126 CRR	1 Jan. 2014	Discretionary
Risk weights for exposures secured by mortgages on commercial property	2016	Mitigating and preventing excessive maturity mismatch and market illiquidity following Recommendation ESRB/2013/1	Decision on higher risk weights for exposures secured by mortgages on commercial immovable property. RW set at 100% (substituted the CNB's recommendation from 2014, i.e. has been effectively increased from 50%)	Art. 124, 126 CRR	1 Jul. 2016	Discretionary
Other measures and policy actions whose effects are of macroprudential use and are implemented by the macroprudential authority						
Consumer protection and awareness	2013	Raising risk awareness and creditworthiness of borrowers following Recommendation ESRB/2011/1	Decision on the content of and the form in which consumers are provided information prior to contracting banking services (banking institutions are obliged to inform clients about details on interest rates changes and foreign currency risks)		1 Jan. 2013	Discretionary
Consumer protection and awareness	2013	Raising risk awareness and creditworthiness of borrowers following Recommendation ESRB/2011/1	Amended Decision from 1 Jan. 2013 (banking institutions were also obliged to provide information about the historical oscillation of the currency in which the loan is denominated or is indexed to against the domestic currency over the past 12 and 60 months)		1 Jul. 2013	Discretionary
Structural repo operations	2016		Market operations are aimed at providing banks with longer-term sources of kuna liquidity at an interest rate competitive with interest rates on other kuna liquidity sources of banks, with debt securities of issuers from Croatia to be accepted as collateral		1 Feb. 2016	Discretionary
Consumer protection and awareness	2016	Financial stability concerns regarding risk awareness of borrowers	Borrowers are strongly recommended (publicly) by the CNB carefully to analyse the available information and documentation related to the products and services offered prior to reaching a final decision, as is customary when concluding any other contract		1 Sep. 2016	Discretionary
Other measures whose effects are of macroprudential use implemented outside the scope and mandate of the CNB						
Consumer protection and awareness	2013	Financial stability concerns due to interest rate risk and currency risk	Amended Consumer Credit Act: fixed and variable parameters defined in interest rate setting, impact of exchange rate appreciation for housing loans limited, upper bound of appreciation set to 20%		1 Dec. 2013	Discretionary
Consumer protection and awareness	2014	Financial stability concerns due to interest rate risk and currency risk	Amended Consumer Credit Act: banks are obliged to inform their clients about exchange rate and interest rate risks in written form		1 Jan. 2014	Discretionary
Consumer protection and awareness	2015	Financial stability concerns due to currency risk	Amended Consumer Credit Act: freezing the CHF/HRK exchange rate at 6.39		1 Jan. 2015	Discretionary
Consumer protection and awareness	2015	Financial stability concerns due to currency risk	Amended Consumer Credit Act: conversion of CHF loans		1 Sep. 2015	Discretionary

Note: A list of abbreviations and their explanations is provided at the end of the publication.

Source: CNB.

Analytical annex: The issue of interest rate risk – a review of the results of the Interest rate survey

The amendments to the [Consumer Credit Act](#) made at the end of 2013 have provided a detailed legal framework for the setting and changing of variable interest rates for household loans. The variable interest rate is thus defined as a sum of the agreed variable parameter and the bank's fixed margin which is not allowed to increase over the period of loan repayment and which has to be agreed along with the variable parameter ([Consumer Credit Act, Article 11.a, paragraph 2](#)). Legally prescribed variable parameters which may be used in setting the interest rate include the following rates: EURIBOR, LIBOR, [NRR – the national reference rate](#), yield on the T-bills of the Ministry of Finance and the average interest rate on household deposits in the respective currency.

The aforementioned legal amendments have significantly improved the transparency of interest rate setting and changing, enabling consumers to find out, at any point, of which components the interest rate that they are being charged is made: the fixed component which remains the same throughout the credit relationship and the variable component which fluctuates according to the set permitted variable parameters. However, considering the specific context in which the Act was amended and in which it entered into force, there is potential for future interest rate disturbances, i.e. risk to which particular client segments may be exposed as the choice of the variable parameter in interest rate structure results in the specific exposure of consumers to interest rate risk, i.e. to the nature and the dynamics of its materialisation.

Primarily, parameters set as the basis for the calculation of variable interest rates in credit operations have stood at record lows over the last few years, particularly EURIBOR. Having in mind the (expected) change of course in the monetary policies of leading central banks, this suggests that the probable increase in reference interest rates in the upcoming period may be a significant source of risk for consumers. Furthermore, it is worth noting that, due to the application of the aforementioned legal provisions, the invariable component of interest rates in EURIBOR-linked loans implicitly contains, among other elements, the country's risk premium valid at the moment the interest rate was agreed/set, implying that its future changes (in terms of both increase and decrease) will not be automatically reflected in the change of interest rate level and thus in the final interest rate expense of the client. On the other hand, in case of loans where the interest rate is linked to the NRR, variations in the country's risk premium will cause the reference variable parameter, in which it is

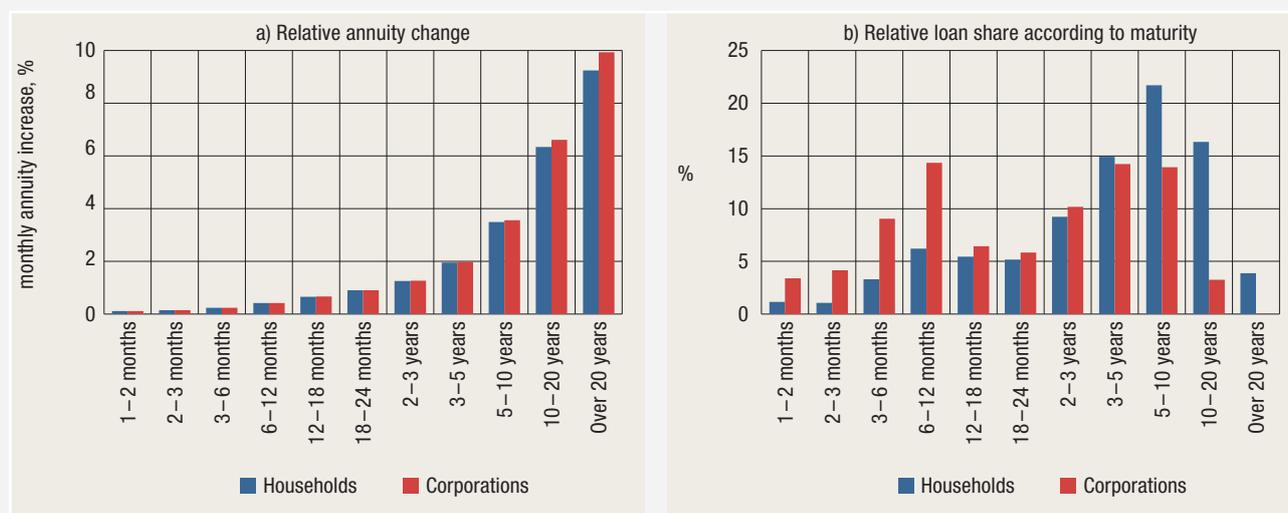
implicitly contained, to change, thus changing the level of the interest rate itself. The CNB warned the public of such risks on several occasions: [Financial Stability No. 12](#), [Financial Stability No. 15](#), [Box 2 Interest rate risk in the Republic of Croatia](#) and [Risks to the consumer in the credit relationship](#).

In mid-2016, the Croatian National Bank conducted a [survey](#) of credit institutions' business practice in defining interest rates in the segment of private non-financial sector funding within its regular risk monitoring activities associated with the stability of the financial system. The aim of the survey was to gain insight into the interest rate structure in the credit relationships of households and corporations and their consequential exposure to interest rate risk. In the survey, credit institutions were asked to distribute the gross amount of relevant exposure according to individual credit instruments, the currency in which the instrument was granted and interest rate type, depending on the reference interest rate, including the amount of interest charged, as at 31 March 2016. Credit institutions were asked to categorise foreign currency-indexed kuna loans according to the foreign currency they are indexed to. The survey covered only loans granted to resident households and non-financial corporations.

Survey results – variable interest rates

The results of the conducted survey confirm that credit institutions mainly charge variable interest rates for the financing of households and non-financial corporations, which, in the case of a significant increase in

Figure 6 Increase in the amount of monthly loan annuity according to its remaining maturity in the event of a one-percentage-point increase in interest rates



Note: For every category of remaining maturity shown on the x axis, the relative change in the amount of loan annuity was calculated for a loan with a remaining maturity calculated as category average in case of a one-percentage-point increase in interest rates.
Source: CNB.

reference variable parameters, exposes these sectors to the risk of an increase in the loan servicing burden (interest rate risk), and which, on the other hand, exposes banks to the risk of being unable to collect claims (on time and/or in full), i.e. to interest rate-induced credit risk. In addition to the change of interest rate level itself, the materialisation of interest rate-induced credit risk is also affected by the level of client income, or, more precisely, the client's debt service-to-income ratio (DSTI). Clients with loans having longer remaining maturities are more exposed to significant changes in the amount of loan repayment as a result of changes in interest rate level due to the fact that interest rate expense constitutes a greater share of the amount to be repaid for loans with longer remaining maturities where the share of interest in the repayment decreases as the loan matures (Figure 6).

At the end of March 2016, 81% of all corporate loans were granted with a variable interest rate. Although their number was slightly smaller, loan agreements with variable interest rates were also predominant in the household sector, in which 67% of loans were granted with variable interest rates. A similar variable-to-fixed-interest-rate loan ratio is observed when supervisory data on exposure to [interest rate risk in the non-trading book](#) are considered, for according to them 85% of non-financial corporate loans and 71% of household loans were granted with a variable interest rate.

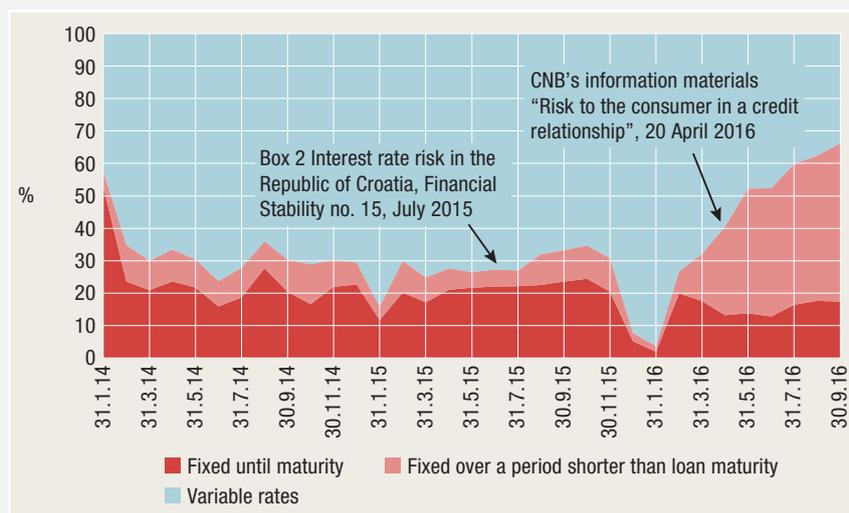
As for the variable parameter to which the changes in interest rates are linked, EURIBOR and the NRR are almost evenly distributed among household variable interest rate loans (47% of household variable interest rate loans are linked to the NRR, while 43% of such loans were granted with reference to EURIBOR). The NRR predominates in the segment of the increasingly popular kuna household loans (71%), while 57% of euro loans were granted with a variable interest rate linked to EURIBOR and 40% were linked to the NRR. Non-financial corporate loans granted with a variable interest rate are predominantly linked to EURIBOR as the variable parameter (45%), while the share of NRR-linked variable interest rate loans in the corporate loan portfolio (5%) is significantly smaller than in household loans. As the legal framework for interest rate setting, structure and change in non-financial corporate lending is not as detailed as in consumer lending (in the case of non-financial corporations, lending is regulated by the Civil Obligations Act and the Act on Financial Operations and Pre-Bankruptcy Settlement), credit institutions, according to survey results, still relatively frequently use other reference parameters in the financing of non-financial corporations, as well as reference rates set on the basis of a decision by the bank's management (almost 36% of variable interest rate loans granted to non-financial corporations were linked to another variable parameter with a significant share of non-financial corporate loans granted with an interest rate that may be changed

according to a decision by the bank's management, i.e. with a so-called administrative interest rate).

Survey results – fixed interest rates

Fixed interest rates were reported in 19% of non-financial corporate loans and 33% of household loans. In this segment, almost all loans to the private non-financial sector were granted with an interest rate that is invariable throughout the entire duration of the credit relationship (until loan maturity). Only around 4% of the invariable interest rate loans granted to the private non-financial sector (6% of household loans and only 0.2% of corporate loans) included interest rates invariable over a limited period of time shorter than loan maturity. Upon the expiry of the initial period of fixed interest rate application, interest rates in such loans will become variable, and, according to survey results, they will primarily be linked to the NRR, while a smaller share will be linked to EURIBOR. To some extent, such loans are expected to see a hike in interest rate level in the transition from the fixed level to the new one, determined by the ratio between the variable parameter and the fixed margin, which is a specific characteristic of risks in such arrangements.

Figure 7 Increase of fixed interest rate share in newly-granted loans

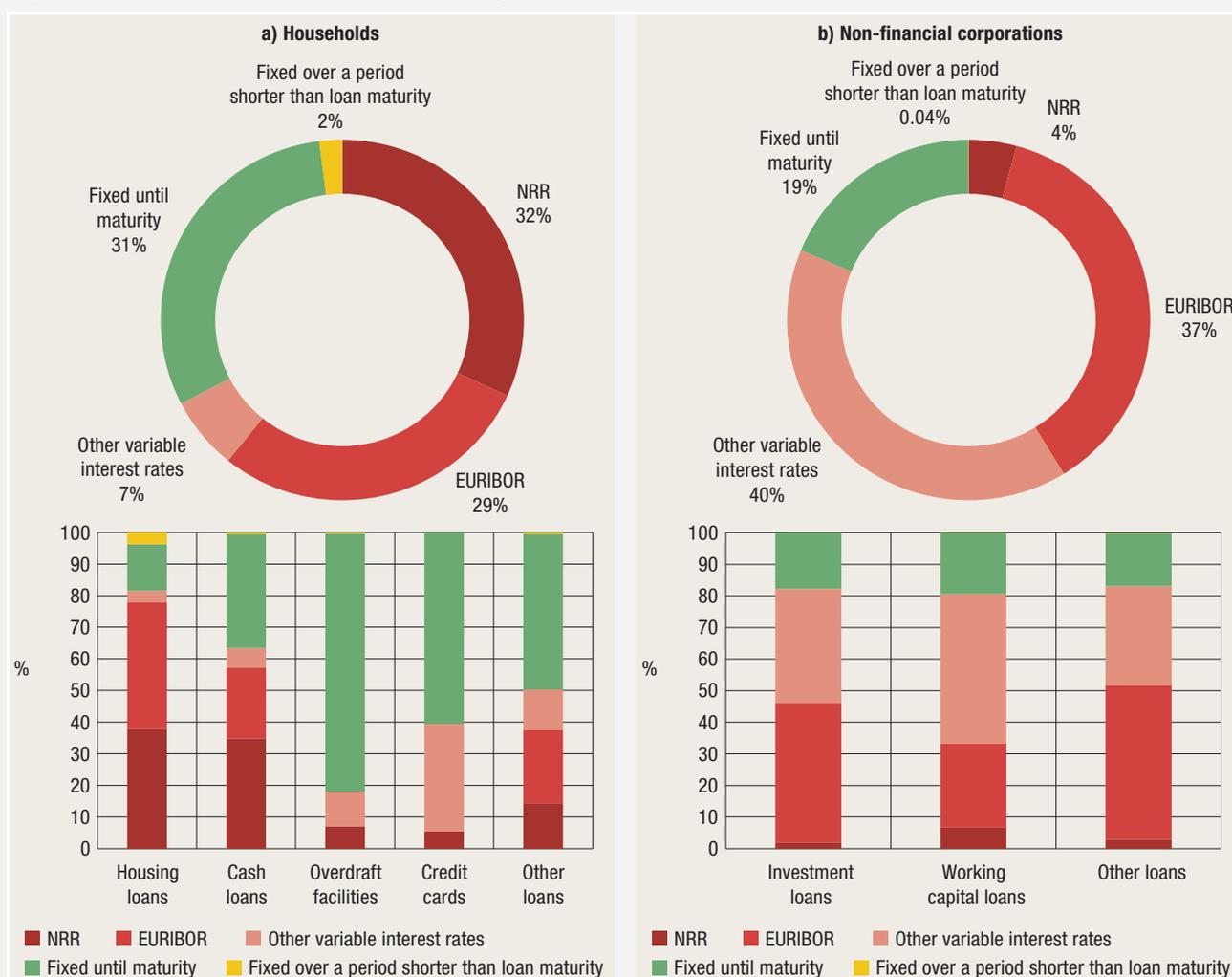


Source: CNB.

Interest rates that are fixed over a period of time shorter than loan maturity are primarily associated with housing loans (one fifth of fixed interest rate housing loans, or only around 4% of total housing loans, were granted with an interest rate which is invariable over a limited period of time starting from the moment the loan was granted and lasting mostly up to five years). As of mid-2015, the share of loans with interest rates fixed

over a period of time shorter than loan maturity in total housing loans offered by banks has been growing almost continuously. The trend was particularly pronounced around mid-2016 when almost 40% of new housing loans were granted with this kind of interest rate. Such trends confirm that clients have become more reluctant to assume interest rate risk, which prompted the banks to adjust their products in the environment of relatively slow credit growth. This was partly a result of the CNB's long-standing efforts to warn consumers of risks deriving from credit relationships, including the interest rate risk (particularly within the context of the reference variable parameter) through both its regular publications and special information materials (Figure 7).

Figure 8 Loan portfolio structure according to interest rate type (as at the end of March 2016)



Note: The colours and their intensity in the figures indicate interest rate risk associated with individual types of interest rate. Interest rates which expose clients to interest rate risk (variable interest rates) are shown in red, with darker tones indicating a somewhat smaller interest rate risk. Interest rates that are fixed until loan maturity and do not expose clients to interest rate risk are shown in green, while interest rates that are fixed over a period shorter than loan maturity are shown in yellow and refer to the delay of clients' exposure to interest rate risk. The majority of such interest rates will be linked to the NRR as the variable parameter after the initial period in which they are fixed expires.

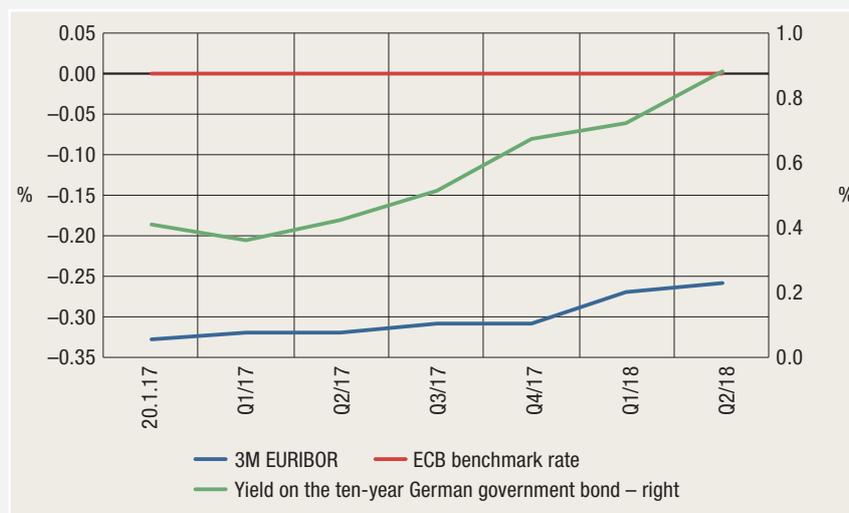
Source: CNB, Survey on interest rate variability.

Every loan, irrespective of the type of interest rate it is associated with, exposes borrowers to potential unfavourable outcomes depending on the future developments in reference interest rates. Since invariable interest

rates determine the loan servicing burden regardless of the changes in reference rates, their potential decrease does not affect borrowers in terms of lower repayment amounts. On the other hand, variable interest rates result in a certain degree of uncertainty in terms of future loan repayment amounts which may be higher or lower than the current ones depending on the direction the reference variable parameters move in.

Therefore, a possible increase in reference variable parameters constitutes a significant source of risk for clients considering the marked predominance of variable interest rates in private non-financial sector financing. The probability of risk materialisation is increased in the context of historically low, even negative, reference interest rates and the recent change of course in the Fed's monetary policy, which may, in the medium term, be seen in the euro area as well. Such developments would directly affect the interest rate expense in the financing of the domestic private sector considering the predominance of EURIBOR as the reference parameter and the current level and structure of interest rates, particularly those agreed/set in long-term credit relationships with consumers.

Figure 9 Individual interest rate projections



Source: Bloomberg.

As previously stated, interest rate risk materialisation significantly depends on the type of variable parameter to which interest rate dynamics are linked. Changes in an international reference interest rate such as EURIBOR could spill over to a rise in lending interest rates relatively fast and thus increase the clients' amounts of repayment. On the other hand, the NRR is a rate formed in the domestic market, but is primarily affected by the cost of financing of several major banks and is likely to react more slowly to change (see: [Financial Stability No. 15](#), Box 2 Interest rate risk in the Republic of Croatia).

It is necessary to stress that the dynamics of EURIBOR and NRR increase are curbed in the short term by the provisions on the maximum allowed level of interest rate and by effective interest rate limitation (Consumer Credit Act, Articles 11.a, 11.b, 11.c and Article 20.a). However, if the pressures on the increase in overall interest rate levels become more persistent, the aforementioned factor may bring a certain inertia to the change of interest rates, but will not prevent interest rate increase in the long term. What is more, interest rate limitations do not have a linear effect, but rather influence loans whose interest rates are closer to the limit. For some loans, or clients, even a relatively moderate increase in reference interest rates could significantly hamper the servicing of assumed loan obligations if not offset by a relative reduction of the bank's fixed margin⁴ or an equivalent increase in current income from which loan expenses are serviced. Interest rate risk is particularly significant if it occurs simultaneously with another macroeconomic shock (e. g. a depreciation of the domestic currency and/or a slowdown in the domestic economy, which has negative effects on household income), as evidenced by the recent experience with Swiss franc-indexed loans.

Glossary

Financial stability is characterised by the smooth and efficient functioning of the entire financial system with regard to the financial resource allocation process, risk assessment and management, payments execution, resilience of the financial system to sudden shocks and its contribution to sustainable long-term economic growth.

Systemic risk is defined as the risk of an event which could, through various channels, disable the provision of financial services or result in a surge in their prices, as well as jeopardise the smooth functioning of a larger part of the financial system, thus negatively affecting real economic activity.

Vulnerability, within the context of financial stability, refers to structural characteristics or weaknesses of the domestic economy, which may make the economy less resilient to possible shocks or intensify the negative

⁴ The Consumer Credit Act explicitly prohibits the increase of a previously agreed bank margin during the period of loan duration (Article 11.a paragraph 2), but does not prohibit its decrease (although legal provisions imply that a one-off decrease of the bank's margin prevents its later increase).

consequences of such shocks. This publication analyses *risks* related to events or developments that, if materialised, may result in the disruption of financial stability. For instance, due to the high ratios of public and external debt to GDP and the consequentially high demand for debt (re)financing, Croatia is very vulnerable to possible changes in financial conditions and is exposed to the risks of interest rate or exchange rate change.

Macroprudential policy measures imply the use of economic policy instruments that, depending on the specific features of risk and the characteristics of its materialisation, may be standard macroprudential policy measures. In addition, monetary, microprudential, fiscal and other policy measures may also be used for macroprudential purposes, if necessary. Having in mind that despite certain regularities, the evolution of systemic risk and its consequences may be difficult to predict in all of their manifestations, the successful safeguarding of financial stability requires not only cross-institutional cooperation within the field of their coordination, but also the development of additional measures and approaches, when needed.

List of abbreviations

GDP	gross domestic product
b. p.	basis points
CB	capital conservation buffer
CCB	countercyclical conservation buffer
CDS	credit default swap
CHF	Swiss franc
CICR	currency-induced credit risk
CNB	Croatian National Bank
CRD IV	Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms
CRR	Regulation (EU) no. 575/2013 on prudential requirements for credit institutions and investment firms
d.d.	dioničko društvo (joint stock company)
DSTI	debt-service-to-income ratio
EBA	European Banking Authority
ECB	European Central Bank
ESRB	European Systemic Board Risk
EU	European Union
Fed	Federal Reserve System

G-SII	global systemically important institution buffer
HRK	Croatian kuna
LGD	loss-given-default
LTI	loan-to-income ratio
LTV	loan-to-value ratio
NRR	national reference rate
O-SII	other systemically important institution buffer
O-SIIs	other systemically important institutions
SSRB	structural systemic risk buffer

Two-letter country codes

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LV	Latvia
LU	Luxembourg
MT	Malta
NL	The Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

