



Macroprudential Diagnostics

fourth quarter of 2017

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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 definition 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. What is more, market participants are thus informed of identified vulnerabilities and risks that might materialise and jeopardise financial stability.

1 Identification of systemic risks

The CNB's assessments suggest that in 2017, economic activity continued to grow at a pace similar to that recorded in 2016. [The increase in real GDP in 2017](#) was to a great extent a result of a rise in the exports of goods and services, which continued their strong upward trend in the first nine months of 2017, reflecting the good performance in the exports of goods and, notably, a record performance in tourism services. Since growth was recorded in all components of domestic demand, it would seem that the 2017 Agrokor crisis had only a limited impact on economic activity, primarily via reduced investments. Strong fiscal adjustment continued throughout 2017, resulting in a further decrease in the general government debt-to-GDP ratio. Other domestic sectors deleveraged as well, causing the external debt to decline substantially.¹ Favourable developments in the domestic economy were

¹ The projection of gross external debt (as a percentage of GDP) for end-2017 is 79.9%, a decrease of 9.9 percentage points from 2016.

positively assessed by the Fitch rating agency, which upgraded Croatia's credit rating in early 2018.

Favourable developments in economic activity are expected to continue in 2018, although at a slightly slower pace than in 2017 (see [Macroeconomic Developments and Outlook No. 3](#)). Medium-term projections point to a slight slowdown in real activity at relatively low rates of potential future growth. Since the positive contribution to the improvement of potential growth through the production factors of labour and capital is limited due to the ageing of the population, emigration by a part of the labour force that is mostly young and educated and investments projected to be significantly lower than those recorded in the pre-crisis period of infrastructural expansion, the domestic economy's growth is predominantly contingent upon higher productivity. However, a distinctly low rise in the productivity of the Croatian economy in the last fifteen years points to the existence of significant structural problems in the domestic economy, which hampers a more efficient use of existing resources (for more information, see [Estimating Potential Growth and Output Gap in Croatia](#)).

As for the systemic vulnerabilities to which the domestic economy was exposed, in most of the sectors identified vulnerabilities (both structural and cyclical) decreased from the previous issue of [Macroprudential Diagnostics](#), thereby reducing the exposures of the entire system (including both the non-financial and the financial sector) to systemic risks. This was primarily a result of positive real developments recorded in the previous year and of the country's more favourable risk perception.² Structural vulnerabilities of the non-financial sector remained unchanged (Figure 1, upper left corner), since, despite the decrease, domestic and external vulnerabilities remained relatively high and the projected rates of potential growth low.

Observed in the short term, the continued decline in interest rates and the rise in disposable income resulting from tax changes could decrease the burden of debt repayment and, consequently, current risks in the household and corporate sector, improving sectors' vulnerability indicators. As a result, the degree of risk exposure of the non-financial sector dropped (from the previous issue of [Macroprudential Diagnostics](#)). Nevertheless, a possible rise in interest rates exposes some debtors repaying loans with variable interest rates to a substantial risk of annuity increase (for more information, see [Macroprudential Diagnostics No. 1 and the results of the Survey on Interest Rate Variability and](#)

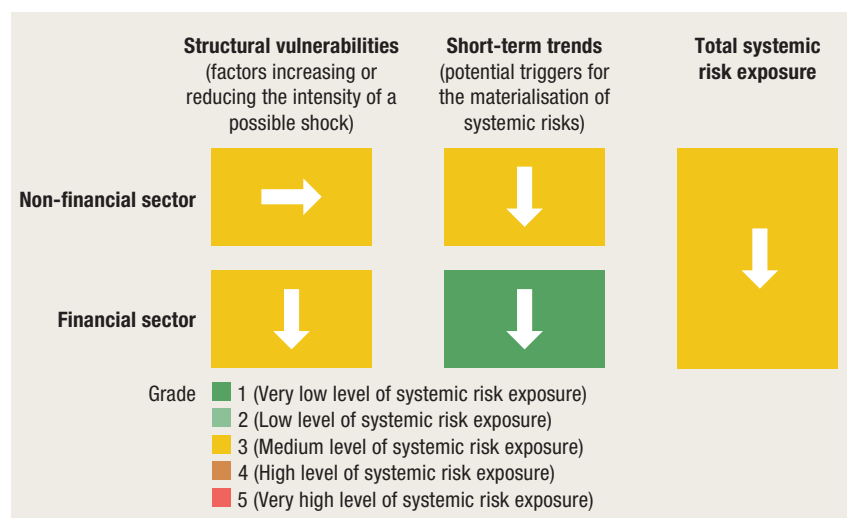
² Although developments in the domestic economy do have an impact on the country's reduced risk perception, the increasingly more favourable economic developments in euro area economies play a more significant role in the trend.

the [Analytical annex to Recommendation to mitigate interest rate and interest rate-induced credit risk in long-term consumer loans](#)).

Moreover, even though no significant negative effects of the restructuring of Agrokor are expected under the baseline scenario, a disorderly and uncertain restructuring of the concern could have a far more unfavourable impact on the business of affiliated enterprises.

In addition, the changes to the International Financial Reporting Standard 9 (IFRS 9), in effect since the beginning of the year, will expectedly have a one-off effect on the business of non-financial corporations via the possible decrease in total assets and comprehensive income (particularly in large and medium-sized enterprises). The effect of the changes to the accounting standards is impossible to quantify precisely as it depends on the degree of risk of claims and financial assets held by corporations, although the standard is expected to have a positive effect on corporate risk management in the long term (see Analytical annex: International Financial Reporting Standard 9 and its financial stability implications). Similarly, the cost of the application of the new standard will affect credit institutions as well (primarily during initial application) through the expected rise in provisioning costs; however, this effect would have been much stronger had [Regulation 2017/2395 mitigating the impact of the introduction of IFRS 9 on own funds](#) not taken effect.

Figure 1 Risk map for the fourth quarter of 2017



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

The banking sector remains stable and highly capitalised, while positive developments³ in the sector reduce the exposure of the financial system to systemic risk. Risks related to the elevated level of non-performing loans of domestic banks are declining as well, primarily under the

³ The support of the EIB to four Croatian banks for the funding of projects with long-term effects (up to a total of EUR 220m) should contribute to positive developments regarding the lending to small and medium-sized enterprises.

influence of sale, which favourably affects the banks' provisioning costs and the continued rise in lending (for more information on such risks, see [Macroprudential Diagnostics No. 3, Box 1 Cyclical movement of loan quality in Croatia](#)). Still, the positive trends in provisioning costs will probably be partially offset by the previously mentioned changes to IFRS 9. Furthermore, the recent rise in the share of loans having fixed interest rates (reducing the vulnerability of the household and the corporate sector by decreasing their exposure to currency and interest rate risk) increases the exposure of banks to interest rate risk, primarily as a result of the rise in kuna lending at fixed interest rates.

In that respect, the intention to adopt the euro in the medium term is also worth noting, as this will, among other things, reduce risks to financial stability and eliminate vulnerabilities stemming from the high level of euroisation, which is one of the major characteristics of the Croatian economy (for more information, see [Strategy for the Adoption of the Euro in Croatia](#)). Moreover, risks will probably be reduced even before the euro is finally introduced, since the effects on perception are materialised gradually.

Moreover, the improvement of the domestic component of the financial stress indicator is contributing to the decrease in the degree of risk in the financial sector (Figure 1, lower right corner) owing to reduced appreciation pressures on the domestic currency (as a result of CNB foreign exchange interventions) and capital market volatility.

2 Potential triggers for risk materialisation

The main potential triggers for risk materialisation in the domestic economy are primarily the external factors related to developments in the economies of the major trading partners. A significant rise in global risk aversion and instability on global financial markets would be expected to increase the country's borrowing costs, and, in consequence, push budgetary interest expenditures up; in addition, it would affect personal consumption and consumption in the tourist industry as well, thus producing a negative impact on the gross domestic product. The materialisation of risks related to the deterioration of established international relations and a potential escalation of terrorism in Europe would have similar effects. Furthermore, the aforementioned scenario would, through the investment channel, have negative effects on the

access of the private sector to both the domestic and foreign capital and hamper it in its debt servicing, which, in turn, could have an unfavourable impact on the stability of the overall banking system. All of the above would increase risks to financial stability.

In addition, unexpected changes in implementation of the monetary policy of the leading central banks could also contribute to the tightening of financing conditions on international financial markets. For instance, a price shock brought about by a rise in the prices of goods and energy products, currently unlikely, could, should it occur, push reference interest rates up. Still, according to the current decisions and expectations of the [Governing Council of the ECB](#), a rise in the ECB's benchmark interest rate is not expected in 2018.

However, in addition to the geopolitical risks and changes in monetary policy implementation mentioned above, the most recent [ECB Financial Stability Review](#) specifies additional triggers that may lead to increased euro area financial market volatility in the future. This includes, for instance, a deterioration in the expected macroeconomic conditions of countries, which could result in increased investor uncertainty, as well as the strengthening of the euro exchange rate, which could, through lower than expected economic growth and increased volatility of asset prices, tend to produce instability in other markets as well.

In the short term, there are risks present in the domestic economy as well, primarily in relation to the restructuring of several enterprises, which even though they do not have a systemic impact, are significant regional employers and partners and participate in Croatia's exports of goods. For example, one current issue is that of the Uljanik shipyard, which, in addition to employing 3.9% of the total number of persons employed in legal entities in the region at end-2016 and accounting for an average⁴ of 4.5% of the operating revenues in the Istria and Primorje region, contributes to the country's exports with an average share of 1.03%.

Observed in the medium and long term, risks stemming from the domestic economy prevail. Continued negative demographic trends and a further outflow of the labour force could have significant and unfavourable effects on the availability of labour in the domestic economy, i.e. affect wage levels.

⁴ Due to marked volatility in operating and export revenues, averages were calculated for the 2012-2016 period.

3 Recent macroprudential activities

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

In January 2018, the CNB as the competent authority in charge of identifying other systemically important credit institutions (O-SIIs) released [the results of the annual review of the identification of O-SIIs](#) in line with the regulatory framework. The procedure of identifying O-SIIs and determining adequate capital buffer levels was in line with the [Credit Institutions Act](#), [European Banking Authority guidelines](#) and [internal methodology](#).

The review identified a total of eight O-SIIs to which the respective capital buffer levels of 0.2% and 2% of the total risk exposure amount are applied, depending on the estimated systemic importance. However, O-SIIs are also required to maintain a [structural systemic risk buffer applied to all exposures](#). As the structural systemic risk buffer is currently [the higher of the two capital buffers](#), O-SIIs are still only subject to the application of the structural systemic risk buffer rate.

Box 1 An overview of the application of the capital buffer for other systemically important credit institutions (O-SIIs) in EU member states, Norway and Island

In line with an EU regulation governing the area of prudential requirements for credit institutions, all EU member states have, as well as taking other steps, introduced the capital buffer requirement for credit institutions identified as systemically important. Among the first to introduce this measure in 2014 were Denmark and the Netherlands. By the end of 2016, it had been introduced in all other member states, Norway and Iceland.

However, transposition into national legislation and identification of O-SIIs does not necessarily mean an active application of this capital buffer. When a country identifies systemically important credit institutions, this constitutes an instrument of macroprudential policy

even if the capital buffer rate is not set (or is set at nominal rate of 0%) because this changes the legal status of the credit institutions in question. Credit institutions identified as O-SIIs are subject to stricter regulatory requirements, such as to a wider scope of reporting, more complex capital quality and liquidity tests, etc.

In addition, there are certain limitations in the activation of the capital buffer for O-SIIs. The [Directive](#) lays down that when applying the structural systemic risk buffer relating to all (domestic and external) exposures, credit institutions shall maintain either a structural systemic risk buffer or a buffer for other systemically important credit institutions, whichever is higher (see the Rules for the combined buffer requirement). If, however, the structural systemic risk buffer relates only to domestic (or only to external) exposures, it may be added to the O-SII buffer. The buffer rate for O-SIIs has a legislative cap of 2%. In addition, the rate for subsidiaries of G-SIIs/O-SIIs with head offices in the EU is also implicitly limited by the rate applied by the parent credit institution. In this case the buffer must not exceed the higher of the following values: 1% of the total exposure to risk or the buffer rate for the parent G-SII/O-SII applied to the group of which the credit institution is a member on a consolidated basis.

Experience has shown that in order to compensate for existing implicit and explicit limitations to the rate of capital buffer for O-SIIs, countries often prefer to use the structural systemic risk buffer for all exposures. For example, in the Czech Republic and Denmark, all credit institutions identified as systemically important are subject to the structural systemic risk buffer instead of the O-SII buffer because unlike the O-SII buffer it can go up to 3% (or up to 5% with prior authorisation from the European Commission). In the Netherlands, the two measures are combined so that the largest three O-SIIs are subject to the structural systemic risk buffer (for all exposures), and others are subject to the O-SII capital buffer.

The capital buffer for O-SIIs is actively applied in 19 EU member states and Iceland. Of this number, six also apply the structural systemic risk buffer only to domestic exposures, so in these countries these two buffers are added up. The remaining 13 do not use the structural systemic risk buffer rate so there is no possibility of them overlapping. Cyprus, Slovenia and Iceland do not apply the structural systemic risk buffer and have announced they would start applying the O-SII capital buffer as of 1 January 2019 (Table 1).

Among the countries actively applying the O-SII capital buffer, most use differentiated capital buffer rates depending on the size of the institution, and half of them use (or will be using after the end of the phase-in

period) the highest legally permitted rate of 2%. Numerous countries among those that activated the O-SII capital buffer used the statutory possibility of the phase-in period during which the initial rate is increased gradually every year until the planned level is attained.

Table 1 An overview of the use of the capital buffer for other systemically important credit institutions (O-SIIs) in EU member states, Norway and Iceland*

	OSII buffer introduced into national legislation (1)	SSRB applied (2)	O-SII buffer actively applied (3)	Of which: O-SII buffer and SSRB are cumulative (3a)	Of which: use the highest permitted O-SII buffer rate (3b)
AT	•	•			
BE	•		•		
BG	•	•	•	•	
CY**	•				
CZ	•	•			
DE	•		•		•
DK	•	•			
EE	•	•	•	•	•
ES	•		•		
FI	•		•		•
FR	•		•		
GR	•		•		•
HR	•	•			
HU	•	•	•	•	•
IE**	•				
IS	•	•	•	•	•
IT	•		•		
LT	•		•		•
LU	•		•		
LV	•		•		•
MT	•		•		•
NL	•	•	•		•
NO	•	•			
PL	•	•	•	•	
PT	•		•		
RO	•		•		
SE	•	•			
SI**	•				
SK	•	•	•	•	
UK	•				
Total number of countries (share in total)	30 (100%)	13 (43%)	20 (67%)	6 (30%)	10 (50%)
Of which: EU member states	28 (100%)	11 (39%)	19 (68%)	5 (26%)	9 (47%)
Of which: CEE member states***	11 (100%)	7 (64%)	8 (73%)	4 (50%)	4 (50%)

* Norway and Iceland have the status of ESRB observers. ** Countries that have announced the application of the O-SII capital buffer as of 1 January 2019. *** For the purpose of this analysis, CEE countries include Bulgaria, the Czech Republic, Estonia, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia.

Note: For a detailed overview of instruments per country see https://www.esrb.europa.eu/national_policy/systemically/html/index.en.html.

Sources: ESRB, CNB, notifications from central banks and web sites of central banks as at 31 December 2017. A list of abbreviations can be found at the end of the publication.

3.1.1 In November 2017, a report on the compliance of the activity of EU member states with the Guidelines on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD) in relation to the assessment of other systemically important institutions (EBA/GL/2014/10) was released

In December 2014, the European Banking Authority (EBA) released Guidelines on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD) in relation to the assessment of other systemically important institutions (EBA/GL/2014/10, hereinafter: the Guidelines). The Guidelines were implemented in the CNB's internal bylaws and, in line with Item 15 of the Guidelines, the CNB published the [methodology for identifying O-SIIs](#) on its website.

In November 2017, the [EBA published the results of a peer review of the compliance of the activity of EU member states with the Guidelines during O-SII identification](#). In early 2017, relevant authorities of member states received a questionnaire and were required to submit responses to the EBA. The analysis in question encompassed the period of O-SII identification in 2016 based on the data for 2015. The report first provides results referring to the self-assessment of relevant authorities with regard to the manner of their implementation of the Guidelines. After that, results of the independent peer review are presented. In addition, good practices of relevant authorities in O-SII identification are provided to serve as examples for further improvement. The report stresses that the CNB, as the relevant authority for identifying O-SIIs in Croatia, fully or largely applied the EBA Guidelines during the identification process, both according to self-assessment and peer review results.

3.2 Continued application of the countercyclical capital buffer rate for the Republic of Croatia for the first quarter of 2019

Although there has been a slight recovery of lending activity for some time now, the results of the [analytical assessment of the evolution of cyclical systemic risks](#) suggest that there are still no cyclical pressures requiring correction by the CNB. According to the data for the third quarter of 2017, gross domestic product continued to grow, the nominal debt of non-financial corporations and households continued to decline, the standardised credit-to-GDP ratio decreased further, and the credit gap calculated on the basis of the standardised credit-to-GDP ratio remained negative. Such trends were confirmed by the specific indicators of relative indebtedness based on a narrower definition of

loans⁵. Therefore, the countercyclical capital buffer rate of 0% will continue to be applied in the first quarter of 2019.

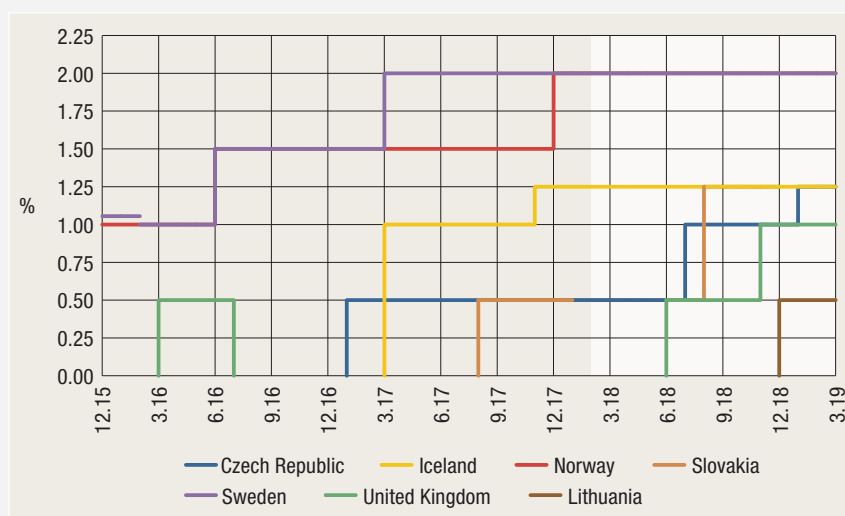
Box 2 Countercyclical capital buffer (CCB) – current application in the EU and the EEA countries

CCB is a part of macroprudential instruments devised to aid in preventing countercyclicalities from arising in the financial system. The specific role of this capital buffer is reflected in its potential to absorb bank losses during the period of economic slowdown, that is, to limit excessive loan growth during periods of rising optimism and strong recovery of the economic cycle. In the territory of the European Union and the European Economic Area⁶ the countercyclical capital buffer is currently used as a macroprudential tool at a rate different from zero by three EU member states (the Czech Republic, Slovakia and Sweden) and two EEA member states (Norway and Iceland) (Figure 1).

As a rule, the introduction and application of the CCB in the mentioned countries has been initiated by strong credit expansion, consequentially linked to the growth in the prices of property, especially commercial and residential real estate property, which accumulates risks that, if materialised, would additionally worsen the effects of recession. Countries using the CCB buffer have indicated the growth in real estate prices and risks associated with it as the main channel for possible materialisation of risks in the banking sector, i.e. as the main reason for the introduction of a countercyclical buffer rate different from zero. The only exception is Great Britain, which, temporarily and occasionally used the CCB as a capital buffer to shield itself directly from a risk not directly or exclusively linked to the level and trend of economic cycle. Its central bank used this macroprudential tool also as protection against risks associated with Great Britain's exit from the EU. Great Britain used the countercyclical capital buffer also because of the assessed possible materialisation of other types of risks that may arise in the banking system.

- 5 This includes only the claims of domestic credit institutions in relation to the quarterly, seasonally adjusted GDP. For detailed methodological explanations, see Box 4 Financial cycles and countercyclical capital buffer calibration, Financial Stability No. 13, July 2014.
- 6 The European Economic Area (EEA) was established on 1 January 1994 by the Agreement signed by the 12 member states of then the EEC (today the EU) and EFTA for the purpose of creating a single market and providing for the free movement of persons, goods, services and capital.

Figure 1 An overview of the EU and the EEA member states that use (or have used) the countercyclical capital buffer (CCB) at a rate different from zero



Notes: The unshaded area indicates the expected level of the CCB in the upcoming period. The rate indicates the end-of-the-month balance.

Sources: ESRB, Announced CCyB rates and data processed by the CNB.

Table 1 An overview of the applied CCB rates and reasons for application by country

Country	Applied rate	Announced rate changes	Reasons for introduction of the CCB rate	Rate determination manner
Sweden	2.00%	2.00% (as of 19 March 2017)	The CCB rate of 1% was introduced in September 2015. A CCB rate of 2% is currently applied. The reason for maintaining the existing rate is the long-term lending growth linked to the continued growth of the price of real estate (some 9% at an annual level) and the fact that the rate of loan growth continued to outstrip GDP growth. In 2017, total debt (non-financial corporations and households) grew 6.6%, pushing loans of these two institutional sectors to the level of 148% of BDP.	When the CCB was introduced, the Swedish regulator implemented the CRR Directive (2013/36/EU) into Sweden's legal system. The CCB is determined pursuant to the amount of credit gap, i.e. loan to GDP ratio and the divergence of this ratio from its long-term trend. In addition to quantitative, the competent macroprudential authority, takes into account the qualitative reasons for the introduction and determination of the CCB rate.
Norway	1.50%	2.00% (as of 31 December 2017)	The latest data indicate that loans to households and non-financial corporations continued to grow. The long-term growth of real estate prices also continued, at a faster rate than income. However, over the last months the ratio has been declining. High real estate prices and continued growth of the household debt ratio indicate the possible growth of financial imbalances. Therefore, requirements associated with home (mortgage) loans have been made stricter. Some additional macroprudential measures have also been introduced.	The CCB rate in Norway is determined pursuant to four criteria: a) total loan (households and non-financial corporations) to GDP ratio, b) ratio of real estate prices to available income of households, c) trends in the prices of commercial and residential real estate and d) total financing ratios for credit institutions. When introducing and determining the CCB the central bank relies on ESRB recommendations within the framework of CRD IV.
Iceland	1.25%	1.25% (as of 1 November 2017)	According to the latest available data, Iceland's credit growth, at an annual level, is 4.7%. The prices of real estate grew in line with the growth of debt of institutional sectors to banks, although the growth slowed down in the last months. Since mid-2016 real estate prices have been growing faster than the average wage growth, purchasing parity indicator and rent costs.	Iceland's Financial Stability Council relies on four indicators when determining the CCB rate: 1) debt to GDP ratio, 2) real growth rate of loans to households and non-financial corporations, 3) real growth of prices of residential and commercial real estate and 4) divergence of the loan to GDP ratio from its long-term trend (pursuant to Article 136(2) and Directive EU 2013/36/EU).

Country	Applied rate	Announced rate changes	Reasons for introduction of the CCB rate	Rate determination manner
Czech Rep.	0.50%	1.00% (as of 1 July 2018); 1.25% (as of 1 January 2019)	The Czech Republic has been registering a rise in loans for residential and commercial real estate for quite some time. Strong credit growth has also continued in the segment of companies managing and dealing in real estate development. According to central bank's analysts further growth of loans in the mentioned institutional sectors might spur further increase in the level of systemic risks.	The determination of the CCB rate is based on the prescribed methodology in line with ESRB recommendations, paired with other (optional) indicators. The introduction and the determination of the CCB rate is based on the divergence of the loan to GDP ratio from its long-term trend (pursuant to Article 136(2) and Directive EU 2013/36/EU). Also taken into consideration are: 1) cyclical and loan trends, 2) changes in the loan to GDP ratio and 3) other specifics of the national economy.
Slovakia	0.50%	1.25% (as of 1 August 2018)	The annualised amount of loans granted to households continued its strong growth in 2017 (+13.4%), non-financial corporations registered only a slightly lower growth (+10%). The strong growth in these institutional sectors continued for the tenth quarter in a row. The ratio of total domestic loans (granted to households and non-financial corporations) to GDP remained lower than 1 (0.94).	The methodology used for the introduction of the capital buffer and determining the CCB rate is in line with the ESRB recommendation, applying other (optional) indicators for measuring system risks. The CCB rate is based on the changes in the rate of loans to GDP, i.e. on the divergence of this rate from its long-term trend. Other specifics of the national economy are taken into consideration when assessing the CCB rate.
Lithuania	0.00%	0.50% (as of 31 December 2018)	The majority of indicators used for assessing imbalances in the financial system reflect exceptionally favourable developments. The loan to deposit ratio is the lowest in the last two years (103.8%). Recently, loans to households and corporations have continued growing strongly, as well as the prices of residential and commercial real estate. Therefore, in addition to economic growth and good bank profitability, central bank analysts estimate that the time is suitable to increase the elasticity of the financial system to potential cyclical shocks.	The CCB rate in Lithuania is determined on the basis of the gap between loans granted in Lithuania and its GDP, i.e. its divergence from the long-term trend, given the ESRB recommendation for the assessment and calculation of this indicator. Additional (optional) indicators are used, which are, according to the opinion of the Bank of Lithuania, important for the timely monitoring of cyclical systemic risks.
United Kingdom	0.00%	0.50% (as of 27 June 2018); 1.00% (as of 28 November 2018)	The competent authority (Bank of England's Financial Policy Committee (FPC)) increased the CCB at the end of December 2017 from 0.50% to 1.00% as at 28 November 2018, thus creating a CCB in the nominal amount of GBP 11.4bn. Determining the CCB and PRA buffers does not necessarily require banks to strengthen their capital positions towards the earlier established level of individual capital buffers but to use the possible surplus of regulatory capital from other capital buffers and make up for capital positions where there is an established shortage. The purpose of CCB application is to stimulate uninterrupted functioning of real economy amid the expected GDP decline.	When introducing and determining the CCB rate, the British authority has relied on the regulatory framework for banks – Basel III and the EU legislative framework. The CCB is calculated as the gap of the ratio of loans to GDP. The competent macroprudential authority uses and widens a set of key macroeconomic indicators, supervisory and market indicators, and information obtained through stress testing. In addition to determining the CCB for the banking system, the competent authority also uses stress test results to determine capital buffers for individual banks (the so-called PRA Buffers or Pillar 2B Buffers).

Note: Other EEA member states have not used the CCB.

Source: CNB.

3.3 Recommendations of the European Systemic Risk Board (ESRB)

3.3.1 In October 2017, an amendment was made to Recommendation ESRB/2015/2 on the assessment of the cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2016/3 ESRB/2017/4).

Recommendation on the assessment of cross-border effects of and voluntary reciprocity for macroprudential policy measures (ESRB/2015/2) was adopted by the ESRB in December 2015 to ensure that all exposure-based macroprudential policy measures applied in one of the member states are reciprocated in other member states and to encourage member states to assess the cross-border effects of the macroprudential policy measures they apply.

However, the existing framework on voluntary reciprocity did not provide guidelines on the threshold to be used by the relevant authorities to determine the materiality of exposure. When a relevant authority wishes to exempt an individual financial service provider with non-material exposure, it may adopt the threshold it deems appropriate, creating potential divergences in the application of the *de minimis* principle. To avoid such potential divergences, the ESRB published in October 2017 amendments to the Recommendation ESRB/2015/2 (ESRB/2017/4). This amendment defines the materiality threshold⁷, and the relevant activating authority should propose a maximum materiality threshold at the financial service provider level when requesting reciprocation.

If reciprocation by other member states is deemed necessary to ensure the effective functioning of the relevant measures, the relevant activating authorities are recommended to submit a request for reciprocation to the ESRB, together with the notification of the measure. The request should include a proposed materiality threshold.

3.4 Overview of macroprudential measures in EU countries

Table 1 below shows macroprudential measures currently applied by EU member states in order to ensure the financial stability of the system (Table 1) and an overview of macroprudential measures applied in Croatia (Table 2), including those outside the CNB's mandate as the

⁷ Materiality threshold means a quantitative threshold below which an individual financial service provider's exposure to the identified macroprudential risk in the jurisdiction where the macroprudential policy measure is applied by the activating authority can be considered non-material.

macroprudential authority and their amendments from the last issue of Macroprudential Diagnostics No. 3.

Table 1 Overview of macroprudential measures in EU countries

Disclaimer: of which the CNB is aware.

	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IS	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	•		•	•	•		•							•	•			•			•			•		•		•	•	•	

Notes: 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). Definitions of abbreviations are provided in the list of abbreviations at the end of the publication. Green indicates measures that have been activated since the last version of the table, while red indicates measures that have been deactivated.

Sources: CNB, ESRB and notifications from central banks and websites of central banks as at 15 January 2018.

For more details see: https://www.esrb.europa.eu/national_policy/other/html/index.en.html.

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/pub/bppdf/bispap861.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	Article 130(2)	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 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

Measure	Year of adoption	Primary objective	Description	Basis for standard measures in Union law	Activation date	Frequency of revisions
O-SII	2018	Limiting the systemic impact of misaligned incentives with a view to reducing moral hazard following Recommendation ESRB/2013/1	Identification of eight O-SIIs with corresponding buffer rates: 2.0% for O-SIIs: Zagrebačka banka d.d., Zagreb, Erste&Steiermärkische Bank d.d., Rijeka, Privredna banka Zagreb d.d., Zagreb, Raiffeisenbank Austria d.d., Zagreb, Splitska banka d.d., Split, Addiko Bank d.d., Zagreb, OTP banka Hrvatska d.d., Zadar; 0.2% for O-SIIs: Hrvatska poštanska banka d.d., Zagreb	Art. 131 CRD	13 Feb. 2018	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
SSRB	2017	Credit growth and leverage following Recommendation ESRB/2013/1	The level of two SSRB rates (1.5% and 3%) and the application to all exposures have remained unchanged. Decision OG/78/2017 changes the method for determining the two sub-groups to which the SSRB is applied. Sub-groups are determined by calculating the indicator of the average three-year share of assets of a credit institution or a group of credit institutions in the total assets of the national financial sector (indicator < 5%, indicator > 5%)	Art. 133 CRD	17 Aug. 2017	On a biannual basis at a minimum
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 (not legally binding) 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 CNB's recommendation from 2014, i.e. 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 rate 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 (credit institutions were also obliged to provide information about the historical oscillation of the currency in which credit is denominated or indexed to against the domestic currency over the past 12 and 60 months)		1 Jul. 2013	Discretionary
Consumer protection and awareness	2017	Raising risk awareness of borrowers following Recommendation ESRB/2011/1 and enhancing price competition in the banking system	The Information list with the offer of loans to consumers, available on the CNB's website, provides a systematic and searchable overview of the conditions under which banks grant loans. With the Information list, standard information available to the consumers are extended with information regarding interest rates		14 Sep. 2017	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 banks' kuna liquidity sources, with debt securities of issuers from Croatia to be accepted as collateral		1 Feb. 2016	Discretionary
Structural operations	2017		The aim of structural operations is to provide banks with longer-term sources of kuna liquidity. The Decision on monetary policy implementation of the Croatian National Bank (OG 94/2017) envisages the use of a pool of eligible assets as collateral for all central bank credit operations, including structural operations, thus opening up the possibility of using short-term securities for long-term CNB operations		20 Sep. 2017	Discretionary
Consumer protection and awareness	2016	Financial stability concerns regarding risk awareness of borrowers	Borrowers are strongly recommended (publicly) by the CNB to carefully analyse the available information and documentation on the products and services offered prior to reaching their final decision, as is customary when concluding any other contract		1 Sep. 2016	Discretionary
Consumer protection and awareness	2017	Mitigation of the interest rate risk in the household sector and the interest-induced credit risk in the banks' portfolios and enhancing the price competition in the banking system	The CNB issued the Recommendation to mitigate interest rate and interest rate-induced credit risk in long-term consumer loans by which credit institutions providing consumer credit services are recommended to extend their range of credit products to fixed-rate loans, while minimising consumer costs		26 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

Notes: Definitions of abbreviations are provided in the List of abbreviations at the end of the publication. Green indicates measures that have been activated since the last version of the table.

Source: CNB.

Analytical annex: International Financial Reporting Standard 9 and its financial stability implications

The mandatory application of the International Financial Reporting Standard 9: Financial Instruments (IFRS 9) starts from 1 January 2018 onwards, for credit institutions and for the majority of non-financial and financial corporations in Croatia. The main characteristic of IFRS 9 is the recognition of the value of financial instruments pursuant to the assessment of their future fair value and expected credit losses and not pursuant to realised loss as under IAS 39. The new way of assessing credit risk may result in the improvement of the portfolios of credit institutions and affect the pricing of credit risk.

The ESRB conducted an analysis of the impact of IFRS 9 on financial stability at EU level as part of their report *Financial stability implications of IFRS 9 (July 2017)*. The report elaborates on the application of the standard to credit institutions, its long-term implications on their profitability and own funds and the so-called day-one effects at the very beginning of its application from 1 January 2018. The report establishes that consequent implementation of IFRS 9 and of the approach based on expected credit loss may contribute to transparency and improvement of long-term financial stability. However, the possible unwanted consequences of the implementation of this framework should also be kept in mind, in particular:

- 1 Modelling risk – the calculation of expected credit loss entails a large degree of complexity that poses a challenge to credit institutions related to the lack of additional knowledge and skills and available data, which may be reflected in increased costs of implementation and/or diminished reliability of resulting reports for the end users, auditors and investors. This might be a special issue for smaller credit institutions.
- 2 Lending – there is a risk for some credit institutions, depending on their market competitiveness, related to adjusting the price of their placements in accordance with new value adjustments and capital cost, potentially shifting credit risk to entities not subject to IFRS 9.
- 3 Procyclicality – although consequent implementation of IFRS 9 may contribute to financial stability because of timely recognition of expected credit losses during recession when expected credit losses are greatly increased, there may be a reduction in bank lending and significant deleveraging of the non-financial sector. The effect of

procyclicality in these situations may be softened through prudential measures and existing regulatory buffers.

Aiming to reduce the day-one effect, the European Parliament and the Council adopted [Regulation \(EU\) 2017/2395](#), published in the Official Journal of the European Union of 27 December 2017 as regards transitional arrangements for mitigating the impact of the introduction of IFRS 9. Credit institutions (and investment firms) have been given an option to apply a transitional period of up to five years during which the institution may neutralise the cost of increased provisions for expected credit loss on capitalisation indicators by increasing Tier 1 capital by the portion of increased provisions.⁸ During the period until 1 January 2023 this portion shall decrease gradually down to zero. Credit institutions intending to apply transitional arrangements are required to announce this to the regulator and publicly disclose their own funds, capital ratios and leverage ratios both with and without the application of these arrangements. However, irrespective of the decision to apply these transitional arrangements, the application of IFRS 9, in force since the beginning of the year, will undoubtedly affect the operating results of credit institutions through a certain amount of additional costs of provisions for expected credit loss.

In addition to the expected positive impact on financial stability in the long-term, Croatia, like other EU countries, faces the risks associated with the transition from IAS 39 to IFRS 9. The introduction of this financial reporting standard will cause changes in the classification of exposures of credit institutions in Croatia, pursuant to the new [Decision on the classification of exposures into risk categories and the method of determining credit losses \(OG 114/2017\)](#), which may result in additional provisioning costs as compared to the period up to 31 December 2017 and the applicable IAS 39. In addition to the mentioned impact on credit institutions, we may expect a one-off effect of the application of IFRS 9 on the operation and possible increase in the riskiness of the sector of financial and non-financial corporations. Namely, depending on the structure of corporate assets (the share of financial instruments) and its riskiness, the application of IFRS 9 may result in a reduction of the value of total assets, an increase in financial expenses and a reduction of the overall corporate profit. This outcome can be expected in the segment of medium-sized and large enterprises. In addition to the mentioned effect, the application of IFRS 9 might result in the spillover of the total or a part of the increased cost of value impairment of financial instruments on end prices. Although these effects are impossible to estimate at the moment due to the lack of relevant data, the nature of financial assets of non-financial corporates, dominated by short-term financial instruments

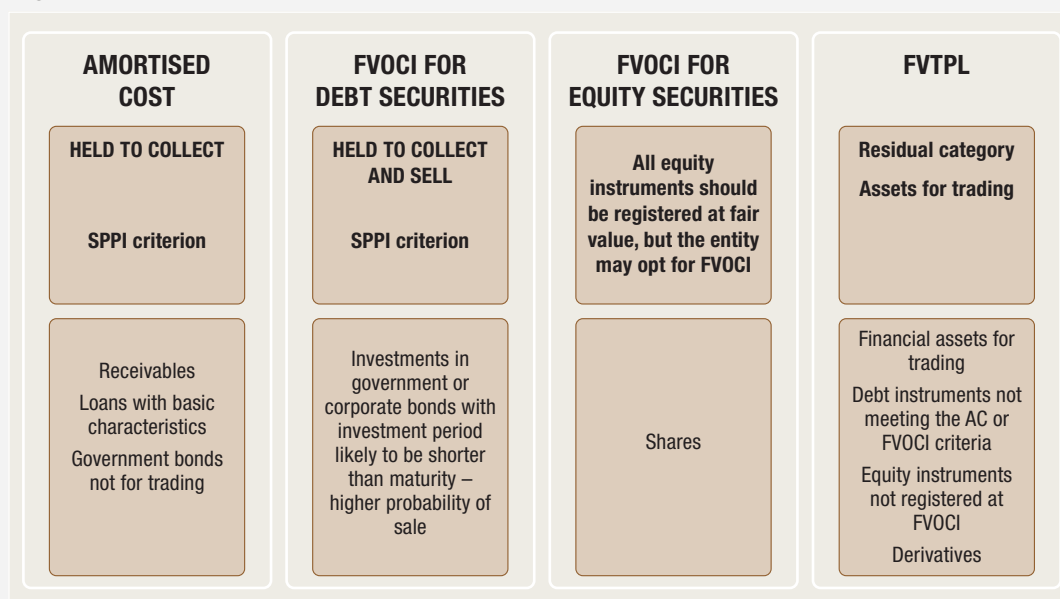
8 95% of increased provisions due to the application of IFRS for 2018.

(such as trade credits), the direct impact of the application of expected credit losses and IFRS 9 is not expected to be as prominent as in the context financial institutions.

Basic principles of IFRS 9

Recognition models, i.e. models of value impairment of financial instruments, in the IFRS 9 are based on the classification of financial instruments. Financial instruments are classified into one of the following three categories: financial instruments at amortised cost (AC), financial instruments at fair value through other comprehensive income (FVOCI) and financial instruments at fair value through profit or loss (FVTPL). The basis for classification of instruments into any of these categories depends on the business model and contractual cash flow characteristics. There are two main business models: the held-to-collect (HTC) business model and the hold-to-collect and sell (HTCS) business model⁹.

Figure 1 Classification of financial instruments under IFRS 9



Source: CNB.

⁹ Financial instruments not classified into one of the two business models above or contractual cash flow characteristics do not meet the criterion of the “contractual cash flows solely for payments of principal and interest on the outstanding amount of principal in accordance with the initial agreement” (the so-called SPPI test (Solely Payments of Principal and Interest test)) are classified into other business models and their fair value is valued through profit or loss (FVTPL).

Expected credit loss (ECL) is calculated in accordance with Basel III guidelines, i.e. Regulation (EU) 575/2013 of the European Parliament and the Council:

$$ECL = PD \cdot LGD \cdot EAD$$

where probability of default (PD) may be estimated for a one-year period (PD_{1-y}) or for the entire life of the financial instrument (the so-called lifetime probability of default (PD_{lt})). The same concepts apply to the loss given default (LGD_{1-y} and LGD_{lt}). Under IFRS 9, off-balance sheet claims are a part of total exposures, i.e. exposure at default (EAD).

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 that might, through various channels, disrupt 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 it less resilient to possible shocks or intensify the negative 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 interest rate and exchange rate change risks.

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. Although the evolution of systemic risk and its consequences may be difficult to predict in all of their manifestations, despite certain regularities, 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

Art.	Article
bn	billion
b.p.	basis points
CB	capital conservation buffer
CCB	countercyclical capital buffer
CHF	Swiss franc
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
EBITDA	earnings before interest, taxes, depreciation and amortisation
ECB	European Central Bank
ESRB	European Systemic Risk Board
EU	European Union
Fed	Federal Reserve System
FINA	Financial Agency
GDP	gross domestic product
G-SII	global systemically important institutions buffer
HANFA	Croatian Financial Services Supervisory Agency
HRK	Croatian kuna
IRB	internal ratings-based
LGD	loss-given-default
LTD	loan-to-deposit ratio
LTI	loan-to-income ratio
LTV	loan-to-value ratio
NBB	National Bank of Belgium

no.	number
OG	Official Gazette
O-SII	other systemically important institutions buffer
O-SIIs	other systemically important institutions
Q	quarter
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
IS	Iceland
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

