MACROPRUDENTIAL REPORT

2017

'The only road to perfection is one
where people work for the common good.'
Count István Széchenyi

MACROPRUDENTIAL REPORT

2017

Published by the Magyar Nemzeti Bank

Publisher in charge: Eszter Hergár

H-1054 Budapest, Szabadság tér 9.

www.mnb.hu

Foreword

The 2008 international economic crisis fundamentally changed how the maintenance of financial stability was perceived. The painful lesson from the severe disorders in the financial system is that interventions which exclusively target the stability of certain financial institutions with a purely microprudential focus are not capable of maintaining the stability of the financial system. The mitigation of systemic financial risks and hence properly calibrated macroprudential regulations are also needed.

Act CXXXIX of 2013 on the Magyar Nemzeti Bank vested the MNB with strong authority and the proper means to efficiently manage financial systemic risks appearing at the national level, within its capacity as a macroprudential authority. The MNB applies its reinforced mandate proactively and in line with the regulatory framework of the European Union.

The purpose of the Macroprudential Report is to present the macroprudential instruments applied by the MNB to prevent and address the systemic risks identified and communicated in the Financial Stability Report, as well as the effects of those and the adjustment of market participants. In line with the MNB's Statute and macroprudential strategy, the publication intends to make the MNB's macroprudential measures easier to follow and understand both for the actors in the sector and the general public.

Contents

List of Boxes

Executive Summary

Act CXXXIX of 2013 on the Magyar Nemzeti Bank vested the MNB with strong authority to prevent and mitigate systemic financial risks. In its annual Macroprudential Report, the MNB provides a comprehensive description of how the currently applied macroprudential instruments operate and the impact of such on the sustainable financing of the real economy, and evaluates the adjustment of market participants. At the end of 2017, the following key messages can be formulated in respect of the instruments in question:

1. *The purpose of the MNB's debt cap rules is to ensure a sound, sustainable structure in lending to households. As no signs of excessive lending can be observed at the time being, despite the strong dynamics in lending, in 2016 the debt cap rules were restrictive only in the case of a small volume of new, excessively risky loans. Accordingly, the rules had no material negative impact on economic growth even over the short run. Although the level of encumbrance of debtors and collaterals has not increased substantially over the past two years, in parallel with the upturn in lending to households, the debt cap rules are gradually becoming effective, and hence it is highly important to closely monitor the developments and identify potential vulnerability factors.*

2. *Despite the recovery in lending, there is still a significant negative credit gap, and thus there is no reason to increase the countercyclical capital buffer (CCyB), which can be applied since 1 January 2016. In the Hungarian financial system, the degree of financial systemic risks originating from the cyclical recovery is still low, based on both the recovering lending activity, which does not yet show signs of overheating, and the reassuringly low vulnerability of the Hungarian financial system. The efficiency of the potential future application of the countercyclical capital buffer has been improved by several methodological enhancements in the past year.*

3. *The banking sector's short-term liquidity and level of stable funding are both satisfactory. Compliance with both the Liquidity Coverage Ratio (LCR) requirement and the Net Stable Funding Ratio (NSFR) requirement, which will become effective only later within the EU, is guaranteed at the sector level; a significant number of institutions substantially exceed the prescribed levels. Accordingly, at present compliance with these liquidity and stable funding rules does not hinder credit institutions in the sustainable financing of the real economy.*

4. *With the present surplus in foreign currency funds, compliance with the requirements of the Foreign Exchange Funding Adequacy Ratio (FFAR) and the Foreign Exchange Coverage Ratio (FECR), which limits the on-balance sheet foreign currency open position, does not represent a problem for the majority of institutions. Accordingly, the regulations mostly act as a factor preventing the future build-up of risks. However, in the case of a few banks compliance appears to be stretched, which they address by more active liquidity management. On the whole, in the past year these two rules adequately ensured the financing of foreign currency assets, in a manner which is sustainable over the longer run as well.*

5. *In relation to the Mortgage Funding Adequacy Ratio (MFAR), which entered into force on 1 April 2017, mortgage bonds were issued in a net amount of almost HUF 360 billion. All affected institutions comply with the regulation, but, due to the easy forecasting of MFAR compliance, banks hold minimal free MFAR buffers. Revitalisation of the mortgage bond market may be further strengthened by the additional issue of about HUF 150 billion, necessary for compliance with the tightened rules entering into force in 2018, by the mortgage bond indices published at the end of 2017 for the first time, as well as by the central bank's monetary policy measures applicable to the mortgage bond market.*

6. *In the past year, due to the favourable capital position of banks, the capital buffer rates applicable to the other systemically important institutions (O-SII) did not require major adjustment by the banks. The MNB reviewed the list of O-SIIs in 2017 again, as a result of which it identified the same institutions as being systemically*

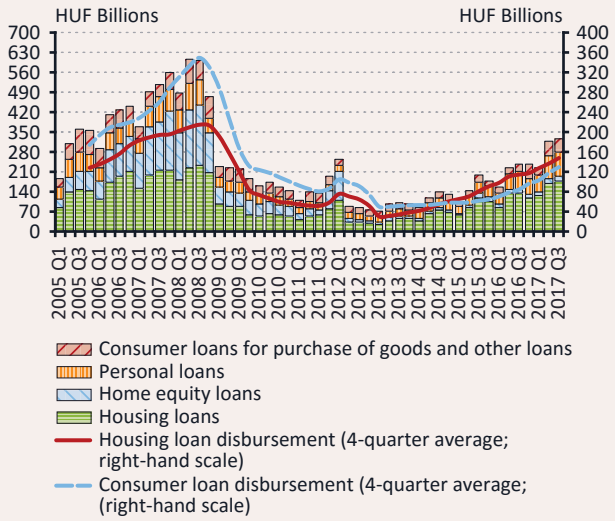
important for 2018 as it did before. The build-up of the capital buffers strengthening the stability of these institutions can continue gradually until 2020.

7. *Between the announcement of the systemic risk buffer (SRB), introduced with a view to managing the structural systemic risks related to problem commercial property exposures and the introduction thereof on 1 July 2017, the problem portfolio of the banking sector decreased by more than 70 percent, with this development also supported by favourable market developments. As a result of the major portfolio cleaning, the degree of the related systemic risk also decreased substantially. In accordance with this, strengthening the shock-absorbing capacity by the capital buffer was necessary only in the case of two banks.*

1 Debt cap rules

In its capacity as a macroprudential authority, the MNB has applied the debt cap rules, which serve to prevent excessive indebtedness, since 1 January 2015. In parallel with the recovery of the economy, the outflow of household loans is also increasing dynamically, and thus the debt cap rules are gradually becoming effective, essentially due to the vigorous expansion of mortgage lending. For certain borrower groups it is the income, while for others it is the down-payment that represents a stronger constraint, but for the time being the number of borrowers stretched both in terms of income and real estate collateral is not high, nor has any substantial increase in their ratio been observed. In addition, no trends suggesting potential circumvention of the existing constraints through the prolongation of maturity or sequential unsecured and collateralised borrowing can be observed. Although no excessive lending can yet be observed, monitoring the developments to facilitate timely intervention is a task of the utmost importance. The risks arising from the high ratio of variable rate mortgage loans within the volume of new loans deserve special attention, as the mitigation of these risks may point to an even more sustainable lending structure over the long run.

Chart 1
Gross household credit disbursement of credit institutions by loan type



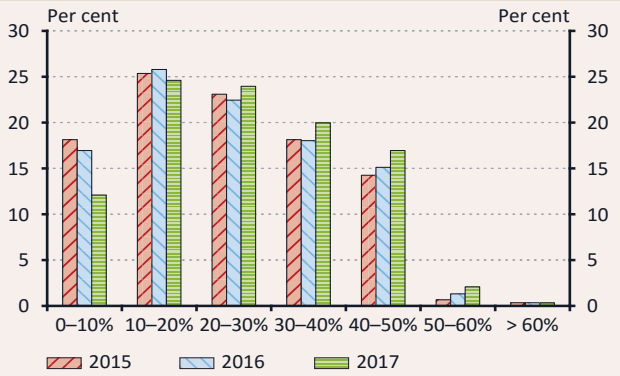
Note: Without loans granted to private entrepreneurs.
Source: MNB

1.1 DEVELOPMENTS IN HOUSEHOLD LENDING REFLECT A SOUND RECOVERY

The dynamically increasing outflow of credits which was observed in the household market justifies continuous monitoring. Following the trough in Q1 2013, the level of new loans has shown dynamic growth, already approaching the values registered in 2005 (Chart 1) over the last one year. In the last eighteen months, the strongest growth was observed in residential mortgage loans, the disbursement of which rose to HUF 179 billion by the third quarter of 2017, from HUF 85 billion in the first quarter of 2016. In the same period, the disbursement of consumer loans also registered more than two-fold growth. Growth in consumer loans was mostly driven by the disbursement of personal loans, while the ratio of mortgage-backed consumer loans remained negligible.

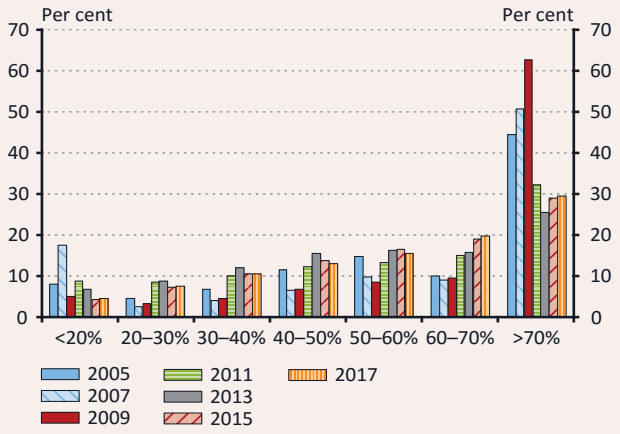
To date, the dynamically expanding household lending has not been accompanied by major indebtedness of households. In the past two and a half years, a somewhat higher ratio of household loans were disbursed close to the limits applicable to the payment-to-income ratio (PTI): in the first half of 2017, already one-fifth of the loans were disbursed to customers indebted to a higher degree, i.e. with PTI values of 40–60 percent, which exceeds the ratio observed in 2015 by 5 percentage points (Chart 2). In parallel with this, the average PTI value rose from 24 to 27 percent between the two dates. On the other hand, with the rise in real wages, the rate of indebtedness

Chart 2
Evolution of the PTI distribution of newly disbursed loans



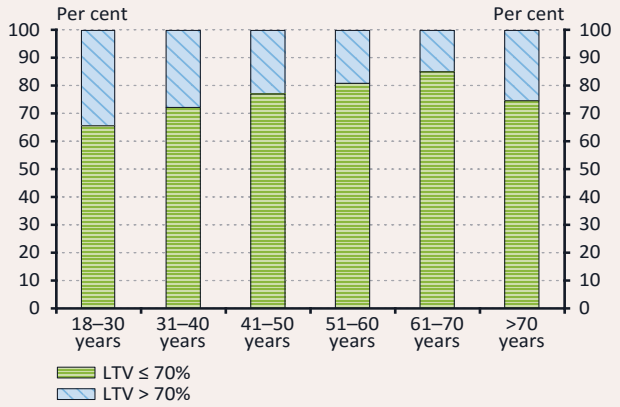
Note: Distribution by contract number. The 2017 data pertains to the first half of the year.
Source: MNB

Chart 3
Evolution of the LTV values of newly disbursed housing loans



Note: Distribution by volume of contracts. The 2017 data pertains to the first half of the year.
Source: MNB

Chart 4
Effect of LTV ratio on newly disbursed housing loans by age groups



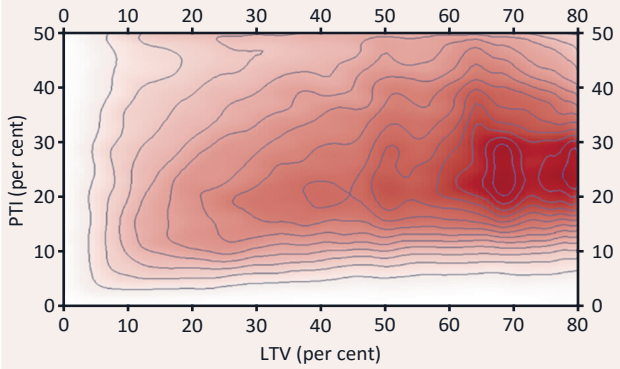
Note: Distribution by number of contracts disbursed between 2015 Q1 and 2017 Q2.
Source: MNB

may also potentially decelerate. On the whole, it can be stated that although the PTI regulation restricts an increasing number of loan transactions, for the time being the transactions are not concentrated to a significant degree close to the regulatory limits.

The encumbrance of real estate collateral for housing loans shows a slow upward trend. Looking back over a longer period, it can be stated that – in parallel with rising property prices – customers cover their real estate purchases to an increasing degree from borrowed funds. After slowly rising since 2013, the ratio of loans secured by real estate encumbered at a ratio exceeding 70 percent of the market value reached 29 percent by mid-2017; however, no clear signs of a further increase can be observed (Chart 3). In the past two years, the encumbrance of real estate collateral was steady on the whole: the average level between 2015 and 2017 was around 55 percent for the entire period. The increasing encumbrance of real estate collateral may be slowed by price appreciation in the housing market resulting from the anticipated surge in home construction, as well as the by the dynamic growth in the disposable net financial assets of households usable as down-payment, thanks to the favourable macroeconomic environment. In the case of contracts disbursed from early 2015 until the end of the first half of 2017, transactions with higher loan-to-value ratios (LTV) were mostly typical for the borrowers of the younger generation, who have lower savings; on the other hand, the difference observed in the distribution of the LTV ratios is stable over time and at present cannot be deemed as excessive, and thus the LTV limit does not significantly restrict the achievement of the younger generations' housing objectives (Chart 4).

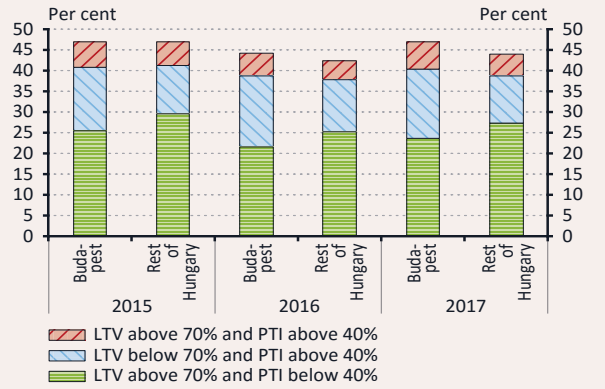
Based on the distribution of mortgage loan transactions by PTI and LTV, a higher concentration around the regulatory limit can be observed in respect of the LTV (Chart 5). Almost one-third of the new loans disbursed in the first two quarters of 2017 were disbursed at an LTV ratio of over 70 percent and one-sixth of them at a PTI ratio exceeding 40 percent, while only 5 percent of the disbursement fell in the intersection of these ranges (Chart 6). No major regional differences can be seen in either income or collateral stretches. In rural areas, residential mortgage loans disbursed at LTV ratios exceeding 70 percent or PTI ratios over 40 percent stabilised at around 45 percent of the outflow of credits by the first half of 2017. New housing loans with high LTV or PTI ratio were disbursed at a similar rate in Budapest as well, but the volume of loans disbursed close to

Chart 5
LTV and PTI distribution of housing loans disbursed between 2016 Q1 and 2017 Q2 by PTI and LTV value



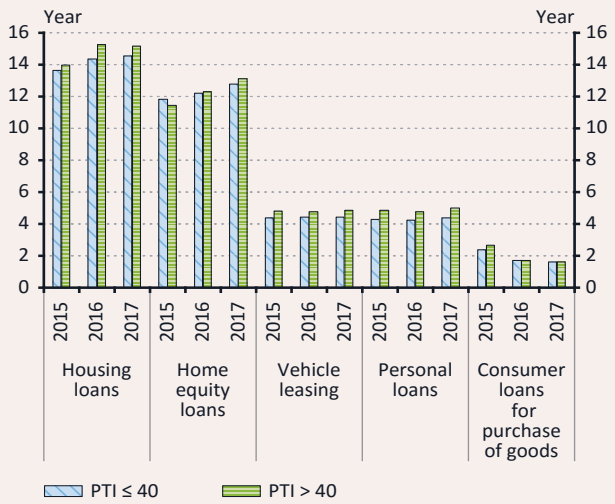
Source: MNB

Chart 6
Proportion of housing loans disbursed around the debt cap limits by region



Note: Distribution by volume of contracts. The 2017 data pertains to the first half of the year.
Source: MNB

Chart 7
Evolution of average maturity by PTI value and loan type



Note: Distribution by contract number. The 2017 data pertains to the first half of the year.
Source: MNB

the PTI limit was slightly higher there (Chart 6). No substantial change was seen in the last two years in respect of housing loans disbursed close to the limits, based on which the risks related to lending for housing purposes cannot be deemed significant even with the dynamic outflow of credits.

Based on the MNB's estimate, the debt cap rules may have reduced the volume of new household loans in 2016 by no more than 2–4 percent, thereby eliminating unsustainable loans. Although application of the debt cap rules may be accompanied by growth sacrifices over the short run, by limiting the disbursement of overly risky loans, the regulations contribute to preventing excessive household indebtedness and to mitigating banks' future losses. Based on the MNB's estimates, in 2016 the Hungarian debt cap rules prevented the disbursement of loans amounting to at most HUF 35 billion, which were mostly classifiable as overly risky. The majority of the estimated impact is attributable to the PTI limits.[1] Based on the distribution fitting used for the calculations, the regulatory limits in respect of the LTV ratios required adjustment from fewer borrowers compared to the PTI values. On the whole, the debt cap rules curbed current economic growth only to a negligible extent.

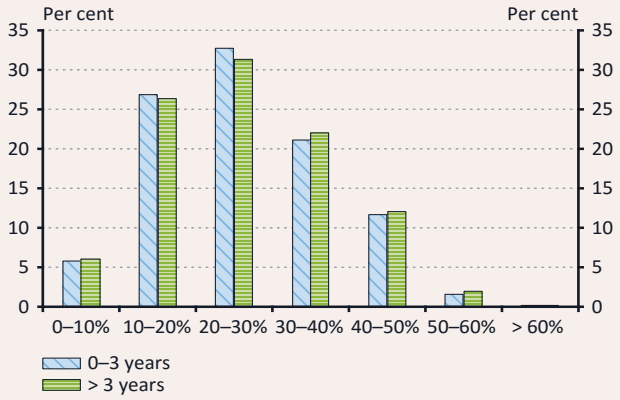
1.2 BORROWERS MAY ADJUST TO THE DEBT CAP RULES, WHICH ARE GRADUALLY BECOMING INCREASINGLY EFFECTIVE, NOT ONLY BY REDUCING THE LOAN AMOUNT

Up to now, the increasing effectiveness of the PTI limits has not caused maturities to become significantly longer. Borrowers may also adjust to the PTI limits by the extension of the maturities, which, however, may substantially increase the amount to be repaid and tie up the borrower's income for an unreasonably long period. Although in the case of residential mortgage loans and personal loans, a minor increase in the average maturity of the loans disbursed at higher PTI values was observed in the past two years, this cannot yet be deemed significant (Chart 7).

No material connection can be seen between the PTI limits and borrowing at a variable rate. The lower interest rate and instalments of variable rate

[1] This is also in line with the result of international research; see, for example, Cerutti, E., Claessens, S., and Laeven, L. (2015): *The use and effectiveness of macroprudential policies: new evidence.* Journal of Financial Stability.

Chart 8
PTI distribution of newly disbursed housing loans by interest rate fixation period



Note Loans disbursed between 2015 Q1 and 2017 Q2. Distribution by contract number.

Source: MNB

Table 1
Main criteria of MNB-certified consumer friendly loans

Main conditions of certified products	Repayment: Only annuity
	Length of interest rate fixation: 3, 5, and 10-year fixed periods or for the whole term
	Interest rate spread: not more than 350 bp
Rules on initial charges and early repayment	Disbursement fee: Max. 0.75 percent of the credit amount, but maximum HUF 150,000
	Early repayment fee: Limited to 1 percent of the repaid amount. In the case of repayment from the home savings account, prepayment is free of charge.
Rules on administrative deadline	Credit assessment: maximum 15 working days
	Disbursement: 2 working days from fulfilling the disbursement conditions
	In case of breaching these deadlines the bank waives a certain amount of disbursement fee

Note: See further information on www.minositetthitel.hu.

Source: MNB

loans may orient borrowers who are close to the limit to these types of loans. So far, this impact has only appeared to a limited degree: the ratio of those opting for a shorter interest fixation period close to the PTI limit is not higher compared to the group not affected by the limit (Chart 8). However, considering the generally higher vulnerability[2] of the households opting for variable rate loans, the reduction of the high ratio of such loans may support sounder lending.

Several of the MNB's instruments are aimed at encouraging the spread of mortgage loans with interest rates fixed for a longer term and thus higher predictability. In the present low interest rate environment, the risk of increases in interest rates and thereby in instalments is significant over the long run, and this risk may be mitigated by the spread of fixed interest loans.

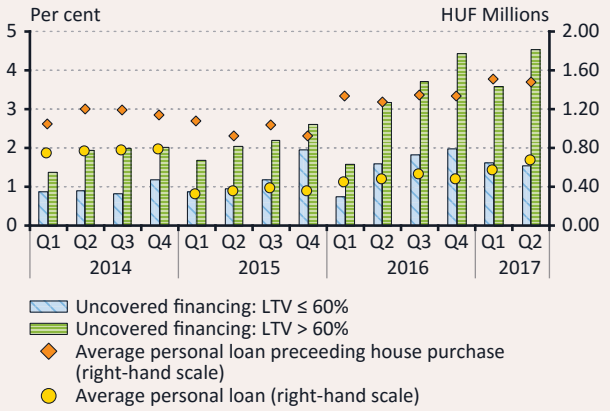
- The amendment of the debt cap rules in May 2016 encourages borrowers to take out loans with minimum 5-year interest fixation periods compared to those with shorter interest fixation periods, since for the purpose of debt service calculation the instalments of these loans are taken into consideration only with a weight of 85 percent, thereby reducing their disadvantage arising from the higher interest rate level upon calculating the PTI value.

- The spread of Certified Consumer-friendly Housing Loans may further reduce the borrowers' interest rate risk. From June 2017, residential mortgage loans which are positively assessed by the MNB can be distributed as Certified Consumer-friendly Housing Loan products. In addition to the fact that the conditions for certification may stimulate competition between banks, the certification specifies limits for the maximum value of the applicable interest rate spread, the administrative deadlines and the fees chargeable. It also prescribes the application of minimum three-year interest fixation periods, thereby encouraging the fixing of interest rates over longer terms in the housing loan market (Table 1).

At present, only a small portion of borrowers adjust to the LTV rules using unsecured borrowing; however, close monitoring of this development is justified. If borrowers do not have sufficient funds for down-payment, but their income position would permit the undertaking of higher debt service burdens, borrowers

[2] For the more detailed analysis of households' decisions on the type of interest rate, see the relevant Box in the Financial Stability Report of November 2017.

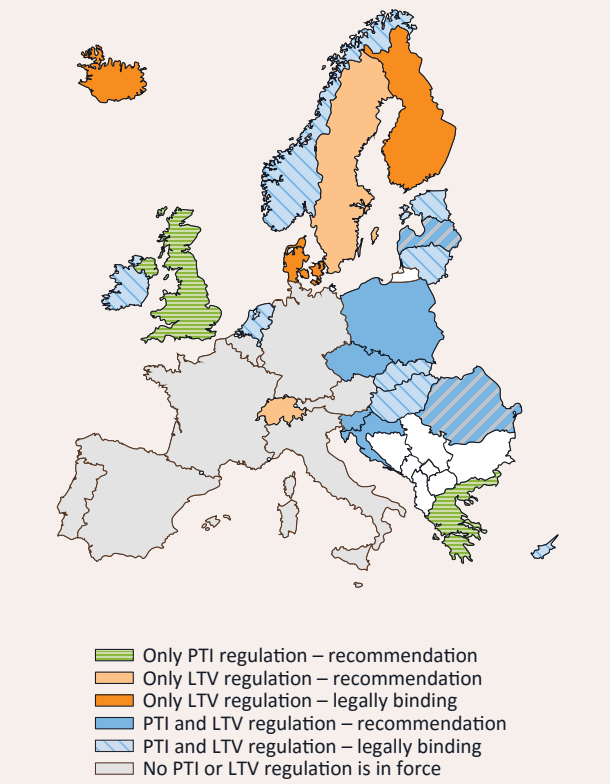
Chart 9
Role of uncovered financing in the housing mortgage market



Note: Uncovered financing: the proportion of housing mortgage loans by contract number within total housing loans in each LTV category between 2015 and 2017 that were preceded by a personal loan taken out by the main debtor at most 90 days before taking out the housing loan.

Source: MNB

Chart 10
Debt cap-type rules and expectations in the Member States of the EEA



Note: In case of Romania and Latvia, the LTV regulation is legally binding, while the PTI regulation is based on recommendation.

Source: ESRB, MNB

who are hindered by the LTV limit may provide the missing equity by taking out an additional personal loan. Due to excessive leverage, this may represent a risk and result in the growth of banks' losses. However, interest rates on unsecured loans are substantially higher, making this type of adjustment very expensive over the short run. In the case of a high loan amount relative to the collateral value, prior to taking out a housing loan, borrowers are also taking out personal loans increasingly often, which may imply a substitution of equity. Although in the past year, the average loan amount of personal loans borrowed prior to the housing loan exceeded the average amount of personal loans by roughly HUF 800,000, this type of adjustment effect cannot yet be deemed strong, since the ratio of such contracts is quite low, and the difference between the two groups is merely three percentage points (Chart 9). Naturally, the possibility of this kind of adjustment by borrowers is also substantially restrained by the PTI regulation; nevertheless, close monitoring of the risks arising from the adjustment by unsecured borrowing is still justified.

1.3 DUE TO THEIR EFFICIENCY, DEBT CAP RULES ARE ALSO BECOMING INCREASINGLY POPULAR INTERNATIONALLY

The more important changes in debt cap rules, which entered into force after 1 July 2016, typically specified a less strict LTV level than the Hungarian requirements, while the PTI requirements cannot be compared unambiguously due to their different calibration. Since mid-2016, debt cap rules have become increasingly widespread or stricter in Europe. The North and the Central and Eastern European Member States still take the lead in the application of such regulations, which – in the case of the latter countries – is not independent of the higher level of the population's financial vulnerability. In the European countries affected by the regulatory changes (CZ, FI, IS, NO, SK), the LTV limits are typically still more lenient (higher) than in Hungary, and it is permitted that a predetermined part of the new loans do not comply with these rules. Fewer PTI type rules have been activated (NO, SK) and they are not fully comparable with the Hungarian regulation, partly because they limit the total outstanding debt, and partly due to the fact that they regard the net income reduced by the cost of living as eligible income. However, it can be stated that recommendations are being replaced by mandatory regulations in an increasing number of countries (Chart 10).

Box 1

Methodological enhancements facilitating the identification of excessive lending related to the real estate market

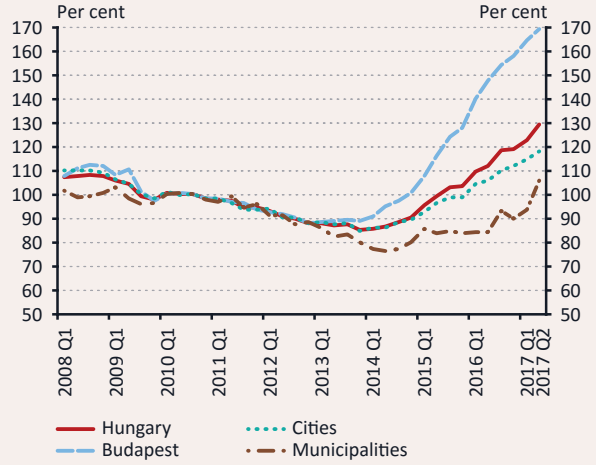
Close monitoring of the current dynamic appreciation in house prices is justified, because over time it may be accompanied by excessive lending. With a view to planning the potential regulatory responses as accurately as possible, the MNB is continuously enhancing its system for monitoring the property market and the related lending. In the past period, there were three important innovations that are worth highlighting:

1. The semi-annual Housing Market Report[3] was published in May 2016 for the first time. It analyses the macroeconomic environment affecting the housing market, as well as current developments in the housing market and residential mortgage loan market.

2. The MNB published the time series of the MNB house price index,[4] which measures the change in average house prices, in October 2016 for the first time. Compared to previous Hungarian house price indices, this index is generated using more information; its countrywide values are available from 1990, and from 2001 it can also be calculated in several breakdowns by regions and settlement types.

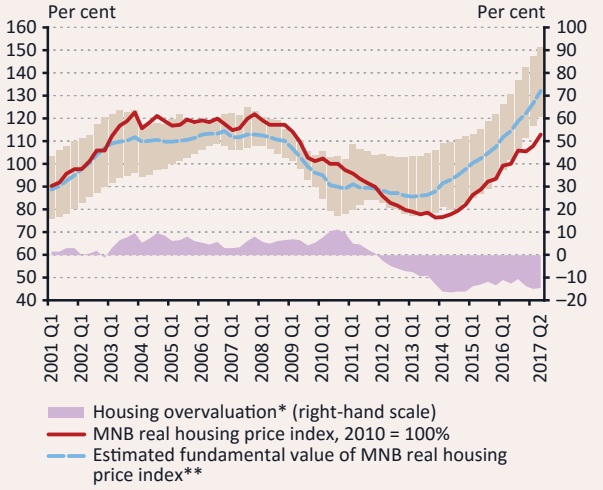
3. The MNB prepared an estimate on the fundamental values for the house price indices and thus on the potential overvaluation of houses. This is important because in the case of overvalued house prices the chances of a future price decrease and thus a depreciation of loan collateral are higher. In countrywide terms, the estimation of overvaluation deemed relevant by the MNB is the arithmetical average of the results of four methods.[5] Due to the large size of the housing market of the capital and the rise in the housing prices in Budapest which is substantially higher than in the countryside, this year the MNB also developed a separate estimate for the overvaluation of house prices in Budapest.[6]

MNB nominal housing price index by settlement type



Note: Average of 2010 = 100%.
Source: MNB

Real housing prices and their overvaluation



**Housing overvaluation is measured by the ratio of the deviation of the MNB real housing price index from the estimated fundamental value and the estimated fundamental value. **Light brown bands show the uncertainty of the estimated fundamental value.*
Source: MNB

[3] https://www.mnb.hu/kiadvanyok/jelentesek/lakaspiaci-jelentes

[4] For the data, see: https://www.mnb.hu/statisztika/statisztikai-adatok-informaciok/adatok-idosorok/vi-arak/mnb-lakasarindex. For details on the methodology, see Banai, Á., Vágó, N. and Winkler, S. (2017): The MNB's house price index methodology, MNB Occasional Papers 127. http://www.mnb.hu/letoltes/mnb-op-127-vegleges.pdf

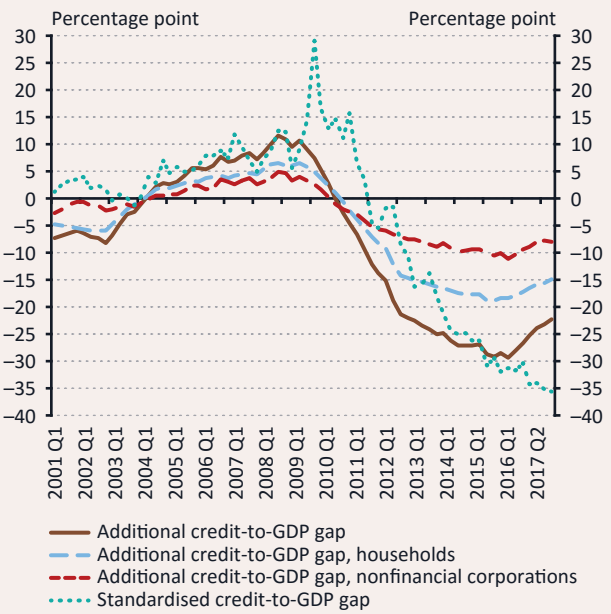
[5] The chart contains the minimum, maximum and (harmonic) average of the fundamental values estimated using the four methods. The four methods for estimating the fundamental values belonging to the real house price index are the following. 1. One obtains a measure of overvaluation by comparing the ratio of domestic real house prices to the real disposable income of households to the average of the ratio for the period 2001–2016. From this measure, it is easy to reach a fundamental value as well. 2. The estimation of the long-term equilibrium of Hungarian house prices given by macroeconomic fundamentals by means of a vector error correction model (VECM). For the detailed methodology, see: Berki, T. – Szendrei, T. (2017): The cyclical position of housing prices – a VECM approach for Hungary, Magyar Nemzeti Bank, Occasional Papers, No. 126., https://www.mnb.hu/letoltes/mnb-op-126-final.pdf. 3. The estimation of the level of Hungarian house prices given by macroeconomic fundamentals by means of a dynamic ordinary least squares (DOLS) model. 4. The aforementioned DOLS estimation using more independent variables.

[6] The estimation of the deviation of house prices in Budapest from their fundamental values is conducted in an OLS modelling framework. See Box 2 in the MNB's Financial Stability Report of May 2017 at http://www.mnb.hu/letoltes/penzugyi-stabilitasi-jelentes-2017-majus-eng.pdf.

2 Countercyclical capital buffer

In the Hungarian financial system, the degree of the financial systemic risks arising from the cyclical recovery is still low. This is partly attributable to the fact that the recovering lending activity still shows no signs of overheating. As a result of new lending, which is expanding in a sustainable manner, the post-crisis turnaround in lending materialised in both the corporate and the household sectors. On the other hand, the vulnerability of the Hungarian financial system has remained reassuringly low in the recent past. Based on the foregoing, the pick-up in lending so far has not justified the activation of the countercyclical capital buffer (CCyB), which can be applied since 1 January 2016. The efficiency of the potential future application of the countercyclical capital buffer has been supported by several methodological enhancements in the past year.

Chart 11
Standardised and additional credit-to-GDP gaps, 2000–2017



Note: For definition of different gap measures, see footnote 7.
Source: MNB

2.1 DUE TO THE CURRENT POSITION OF THE FINANCIAL CYCLE, THE MNB HAS NOT YET PRESCRIBED A COUNTERCYCLICAL CAPITAL BUFFER

Last year, the lending cycle moved out of its trough. Dynamic growth in the volume of new loans commenced in 2013 in the household segment and in 2014 in the corporate segment. However, at the same time, repayment of the loans taken out in the period of excessive lending before 2009 and the cleaning of the large volume of non-performing loans from the balance sheet pointed to a decline in the loan stock. As the combined result of these two trends, in 2016 the volume of outstanding loans to non-financial corporations once again started to rise after the decline observed since the start of the crisis. The reversal in lending in the case of households took place this year. This development is also reflected by the rise in most of the credit-to-GDP gaps,[7] which commenced last year (Chart 11).

For the time being, the upturn in lending has not led to excessive risk-taking. Most of the credit-to-GDP gaps, which are calculated using a variety of methods, are still deep in the negative range, and thus in the near future the development of positive gaps cannot be expected. Last year, the standardised credit-to-GDP gap stagnated, which was caused by the decline in outstanding loans received from abroad, granted by non-financial corporations. The loan-to-GDP trend calculated using the multivariate HP filter was around

[7] The definition of the more important monitored indicators are as follows: Standardised credit-to-GDP gap: The deviation of the GDP-proportionate outstanding loan stock from its long-term tr,end, calculated in accordance with the baseline scenario specified in the ESRB methodological recommendation (ESRB/2014/1, https://www.esrb.europa.eu/pub/pdf/recommendations/140630_ESRB_Recommendation.hu.pdf). Additional credit-to-GDP gap: A version of the standardised credit-to-GDP gap calculated in accordance with a methodology modified for the special features of the Hungarian financial system. For more details, see: https://www.mnb.hu/letoltes/ccb-modszertan-uj-hu.pdf.

70 percent in the past four years, implying that the level of lending sustainable according to the macroeconomic fundamentals over the long run is consistently higher than the actual level (Box 3). Other indicators in the MNB's cyclical systemic risk map which measure the overheating of lending also confirm that no excessive lending has evolved in the past period (Table 2).

The financial system's resilience to external shocks improved further over the last one year. On the whole, the vulnerability indicators of the cyclical systemic risk map (Table 2) moved further away from the values implying systemic risk. Of these indicators, gross external debt as a percentage of GDP is the only one that still carries medium risk corresponding to the 2005 level. However, this indicator has been improving continuously and substantially since 2011, and this trend is expected to continue in 2017 as well.

Due to the low level of cyclical systemic financial risks, it is still not justified to prescribe the countercyclical capital buffer. Since the implementation of the framework on 1 January 2016, neither excessive lending nor significant vulnerability to external shocks has developed in the banking sector. This situation is unlikely to change in 2017, which assumes the maintenance of the present 0 percent CCyB rate. In line with this, the countercyclical capital buffer will

Table 2
Changes in selected indicators of the cyclical systemic risk map, 2002–2017

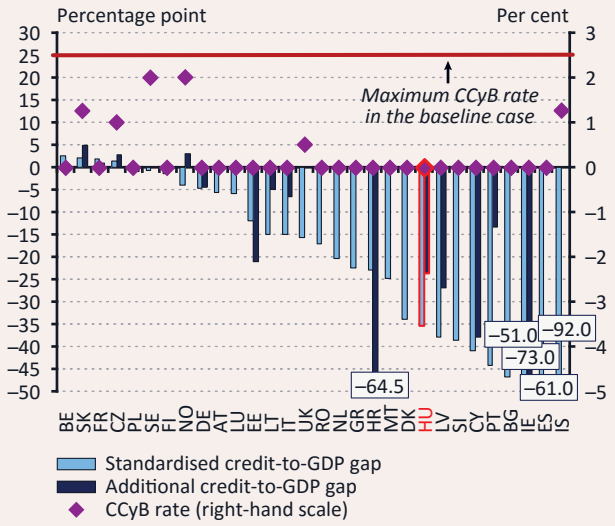
Overheating indicators	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Banks' credit-to-GDP gap, exchange rate adjusted																
Financial institutions' credit-to-GDP gap, exchange rate adjusted																
Credit-to-GDP gap with ESRB-recommended credit def.																
Credit-to-GDP gap computed by multivariate HP-filter*																
Banking sector leverage (assets/equity)																
Vulnerability indicators	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Global credit-to-GDP gap recommended by ESRB																
Debt service burdens / disposable income (hh.)																
Gross external debt as a percent of GDP																

Note: In addition to the standardised and the additional credit-to-GDP gap, the MNB monitors changes in another 31 indicators on a quarterly basis. Together, these constitute the cyclical systemic risk map. Part of the indicators measure excessive credit expansion, while another part of them characterise the financial system's general resilience to shocks. The last observations stem from the third quarter of 2017. Yellow signals a medium level of risk, while red indicates a high level of cyclical systemic risk.

**Developed in MNB, Hosszú, Zs., Körmendi, Gy. and Mérő, B. (2015): Univariate and multivariate filters to measure the credit gap. MNB Occasional Papers 118.*

Source: MNB, HCSO, BIS

Chart 12
Credit-to-GDP gaps and CCyB rates in Europe based on the last revisions until July 2017



Note As different countries decide on the CCyB rates at somewhat different dates, a comparison at a specific date is not possible.

Source: ESRB

presumably not yet restrain the continued recovery in lending, which the debt cap rules in the household segment are already helping to keep on a sustainable path.

2.2 IN THE EUROPEAN COUNTRIES, THE COUNTERCYCLICAL CAPITAL BUFFER IS PRIMARILY APPLIED IN RESPECT OF RISKS RELATED TO HOUSING MARKET DEVELOPMENTS

In the European Economic Area, still only a few countries prescribed a countercyclical capital buffer during the last year (Chart 12). The current level of cyclical financial systemic risks remained low in most the member states. The average values of the standardised and additional credit-to-GDP gaps have not changed, and the major differences between the countries also remained in place over the past one year. Between July 2016 and July 2017 the group of countries setting a positive CCyB rate expanded to include the United Kingdom. Of the other five countries, the Czech Republic, Iceland, Norway and Slovakia raised their rates, while Sweden left its CCyB rate unchanged. The macroprudential authorities mostly decided on a discretionary basis, as only the Czech Republic and Slovakia prescribed a buffer rate close to the benchmark buffer rate calculated pursuant to the relevant methodological recommendation of the ESRB (ESRB/2014/1).[8] In the case of the United Kingdom, Iceland and Sweden, the benchmark rate is zero; moreover, in the first two of these countries the standardised credit-to-GDP gap is also significantly negative. In July 2017 there was not a single EEA member state where the benchmark CCyB rate was positive, but the authorities did not decide on the accumulation of the countercyclical capital buffer. The countercyclical capital buffer is still primarily prescribed due to cyclical systemic risks related to the continuous rise of house prices. The mutually reinforcing effects of high household indebtedness and rising real estate prices may generate significant debt problems and bank losses in the affected countries in a potential financial stress situation.

[8] https://www.esrb.europa.eu/pub/pdf/recommendations/140630_ESRB_Recommendation.en.pdf

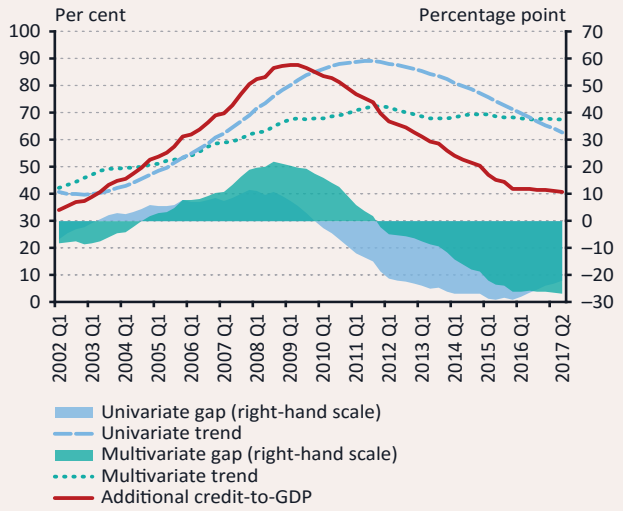
Box 2

Methodological enhancements facilitating the determination of the CCyB rate

In the past year, the MNB enhanced its methodology supporting the application of the countercyclical capital buffer in three main directions. The countercyclical capital buffer is a comprehensive tool serving the management of cyclical financial systemic risks. Accordingly, the proper application thereof necessitates the extensive analysis of systemic risks, which justifies the continuous enhancement of the relevant methodologies.

1. A multivariate credit-to-GDP gap created with the use of independent variables has been enhanced. The calculation method of the current additional credit-to-GDP gap essentially follows the relevant ESRB recommendation (ESRB/2014/1),[9] which proposes the use of a univariate one-sided HP filter. The method calculates the value of the credit-to-GDP gap at a given point in time based on the values of the credit-to-GDP time series until that date. Due to the absence of other independent variables impacting the cyclical position, the method is rather simple, and due to its one sided nature it is also robust, as the gap values are not overwritten as a result of incoming credit-to-GDP data from later periods. This latter feature greatly supports the consistency of the required CCyB rate in terms of time, but as the time series of the credit-to-GDP gap is always built exclusively on information from the currently past period, it is only able to inaccurately depict the cyclical position of lending. Hence, the use of other independent variables affecting the cyclical position in the one-sided HP filtering process may have substantially improved the accuracy of the methodology. The information content of the relevant independent variables related to the lending cycle helps to determine the current value of the credit-to-GDP gap more accurately even if we can only rely on the past values thereof.[10]

Trend-cycle decomposition of additional credit/GDP computed by univariate and multivariate HP-filter, 2002–2017



Source: MNB

2. Starting from 2017, the decisions on the accumulation of a countercyclical capital buffer are also supported by the nowcast values of the indicators in the cyclical systemic risk map. In the past, it was only possible to consider the available quarterly actual data, which were usually from two quarters earlier compared to the date of the decision on the current revision of the CCyB rate. Nowcasting of the indicators resolves this difference, providing the MNB with significant assistance in more accurately monitoring the development of cyclical systemic risk over time, in the countercyclical capital buffer framework. The applied methodology is based on the fact that – at the time of the decision – the preliminary data and actual data of higher-than-quarterly frequency are already available for the period after the latest quarterly data. In addition, the method also uses 92 independent variables, in total, moving together with the indicators: these include data from the monthly data supply of financial institutions, money and capital market indicators, confidence indicators and real economy variables. We produce several nowcasts for each indicator in a variety of combinations of the independent

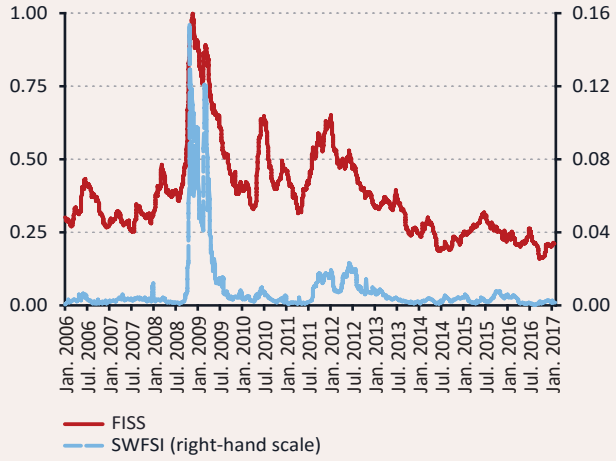
[9] https://www.esrb.europa.eu/pub/pdf/recommendations/140630_ESRB_Recommendation.en.pdf

[10] A so-called multivariate credit-to-GDP gap similar to the one developed now was previously estimated by MNB staff, the results of which are also used in the cyclical systemic risk map: Hosszú, Zs., Körmendi, Gy. and Mérő, B. (2015): Univariate and multivariate filters to measure the credit gap, MNB Occasional Papers 118. http://www.mnb.hu/letoltes/mnb-op-118-final.pdf

variables employed and the time series analysis methods which are applied. The final nowcast of the given indicator is obtained by taking the average of the results of the nowcasting procedures best approximating the indicator's latest quarterly actual data. The procedure minimises the error of the final nowcasting.

3. Decisions on the release of the countercyclical capital buffer are supported by the MNB's new, factor-based financial stress index (FISS). The CCyB requirement needs to be eased when the degree of cyclical financial systemic risks declines from a high level. An extreme form of this is when negative events triggering the systemic financial stress ensue, as a result of which excessively high risk-taking is suddenly replaced by overly low risk appetite. In such cases, the entire CCyB requirement must be released, and the accurate timing of this is of the utmost importance. Accordingly, it is necessary to be able to identify the systemic stress situation as accurately as possible. Thus, in addition to the System-wide Financial Stress Indicator (SWFSI),[11] the MNB's new, factor-based financial stress index (FISS) has also been developed, which has a number of favourable attributes. On the one hand, the daily FISS, which aggregates 19 core indicators, can be flexibly expanded to incorporate additional indicators. On the other hand, the Bayesian dynamic factor model, used for the aggregation of the core indices, is a more general and flexible method, which is able to more accurately capture the information related to the degree of the financial stress in the core indicators.

The factor-based index of systemic stress (FISS) and the system-wide financial stress index (SWFSI), 2006–2017



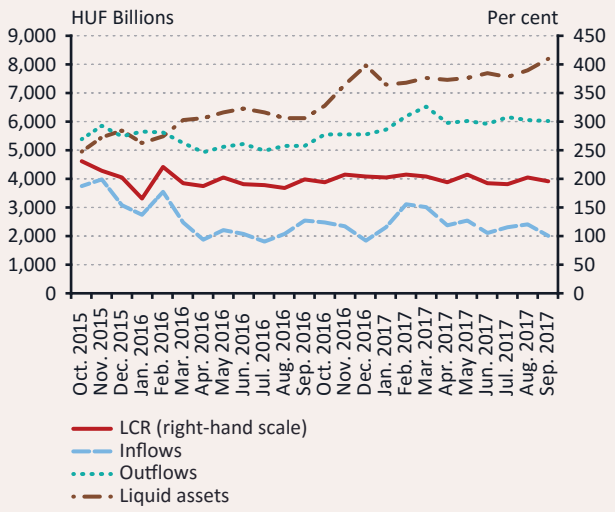
Source: MNB

[11] Holló, D., Kremer, M. and Lo Duca, M. (2012): CISS – A Composite Indicator of Systemic Stress in the Financial System, ECB Working Paper, No. 1426. For the Hungarian adaptation, see Holló, D. (2012): A System-wide Financial Stress Indicator for the Hungarian Financial System, MNB Occasional Papers, No. 105. http://www.mnb.hu/letoltes/op105.pdf

3 Liquidity Coverage Ratio and Net Stable Funding Ratio

The banking sector's short-term liquidity is ensured by the Liquidity Coverage Ratio (LCR), which is significantly over-fulfilled by the majority of institutions. The banking sector keeps the funds received as a result of the increase in deposits in liquid assets, and thus the liquidity position of the institutions is continuously strengthening. The Net Stable Funding Ratio (NSFR) requirement, which is not yet effective within the EU, will require the institutions to finance their long-term assets using sufficiently stable funds. As a result of their business model, the majority of Hungarian institutions already currently comply with the NSFR requirements. At present, compliance with these liquidity and stable funding rules does not hinder banks in the further expansion of lending.

Chart 13
Development of sector-level LCR



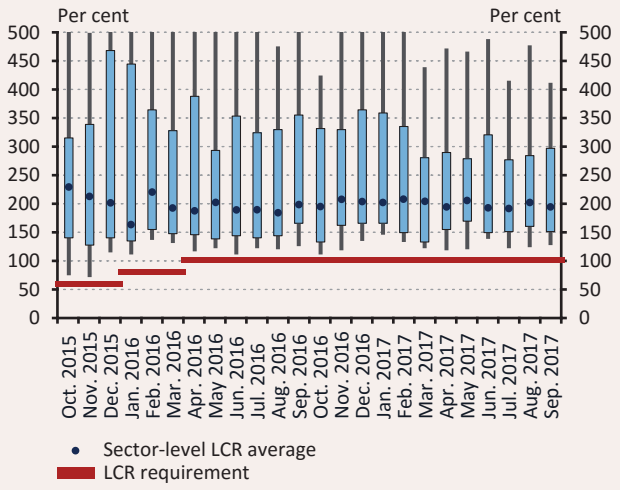
Source: MNB

3.1 THE BANKING SECTOR'S PERSISTING STABLE SHORT-TERM LIQUIDITY SITUATION HAS BEEN MOSTLY INFLUENCED BY THE TRANSFORMATION OF THE CENTRAL BANK'S SET OF INSTRUMENTS

The banks satisfy the liquidity coverage ratio by providing substantial surpluses. At present, the LCR at the sector level is 200 percent and has not changed significantly over the last one year. The relatively high outflow weight allocated to corporate deposits has also considerably increased the total outflow due to the expanding portfolio, but this was offset by the rise in liquid assets (Chart 13). The vast majority of the liquid assets held by banks still consist of government securities and central bank deposits.

Between July 2016 and September 2017, the banking sector's liquid assets rose substantially, by almost HUF 1,750 billion. The larger part of this appeared as a result of the dynamic growth in incoming household and corporate deposits, but the quantitative restriction of the central bank's main policy instrument also contributed substantially to the rise in the liquidity buffers. Previously, the value of the three-month central bank deposits appeared as an inflow of the banking sector's LCR; however, the institutions typically invested the portfolio crowded out through the restriction applicable to the instrument in government securities or MNB overnight deposits, which increased the banking sector's total liquid assets. Only deposits expiring in the next thirty days can be indicated as inflows, and thus although the portfolio of almost HUF

Chart 14
Development of institutions' LCR



Note: The 10th and 90th percentile, first and third quartile values and averages are represented.

Source: MNB

Chart 15
Structure of the NSFR

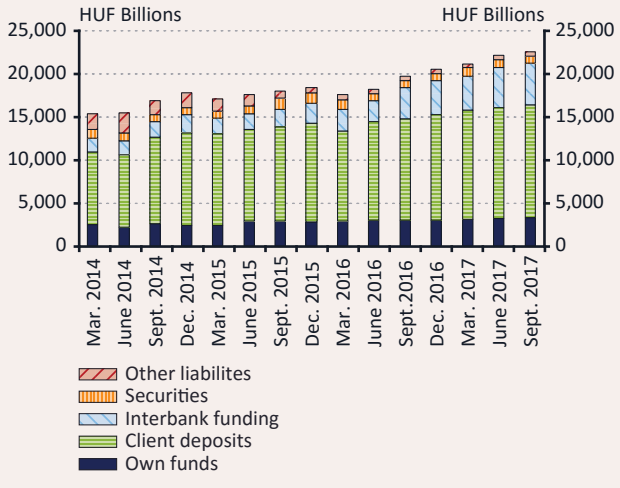
$$\text{NSFR} = \frac{\text{Available Stable Funding}}{\text{Required Stable Funding}}$$

ASF factors:
Own funds: 100%
Liabilities over one year: 100%
Retail deposits: 90–95%
Corporate deposits: 50%
6-12-month interbank deposits: 50%
0-6-month interbank deposits: 0%

RSF factors:
Central bank reserves: 0%
Other Level 1 liquid assets: 5%
0-6-month interbank deposits: 10%
6-12-month encumbered liquid assets: 50%
6-12-month interbank deposits: 50%
Mortgage loans: 65%
Other customer loans: 85%
Interbank deposits over one year: 100%
Assets over one year encumbered: 100%

Source: BIS

Chart 16
Elements of available stable funding



Source: MNB

1,500 billion, which was crowded out from the main policy instrument during the period under review, reduced the value of inflows, liquid assets were able to rise in excess of the decrease in inflows.

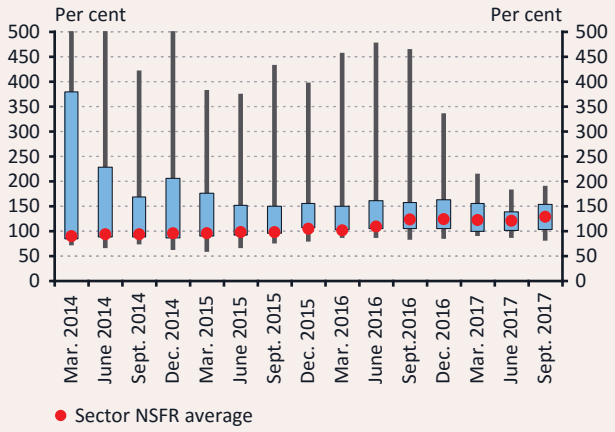
Only a few – mostly small – banks pursue stretched liquidity management, but even they are able to satisfy the minimum requirement of 100 percent. However, the real liquidity situation of these institutions is typically more favourable than implied by the indicator, as the banks cannot take into consideration their inflows in full due to the inflow limit set to 75 percent of the outflows. The free buffer of the bank with the lowest LCR among the large banks reaches 20 percentage points (Chart 14), and thus due to the stable liquidity position of the institutions, compliance with the short-term liquidity requirement does not hinder the further expansion of lending.

3.2 BANKS' STABLE FUNDING POSITION IS ADEQUATE

The net stable funding ratio will ensure the stable funding of the institutions over a horizon of one year. According to the requirement related to the ratio, long-term assets will have to be financed by stable funds after the regulation's entry into force (Chart 15). On the asset side, in addition to the actual maturity, the indicator also considers the marketability of and the possibility of encumbering the assets. Thus, for example, long-term securities with liquid markets do not require stable funding, and household loans that can be used as collateral for the issuance of mortgage bonds, which therefore simplify funding, also receive a preferential weight. On the liability side, the typical rollover feature of the individual items is also taken into consideration, and thus, for example, household deposits receive a weight of 90 or 95 percent, depending on their stability classification. The regulation related to the indicator is included in the Basel III package of recommendations, which will be also applicable in Hungary after its implementation in the EU, presumably after 2020.

The institutions' business models already currently guarantee an NSFR of over 100 percent in most cases. Customer deposits have represented an increasing weight in the financing of the Hungarian banking sector for years (Chart 16), which should be considered as stable funding for the purpose of NSFR calculation. For the time being, lending is unable to keep pace with the inflow of deposits; the difference appears in liquid assets, and thus the stable funding requirement rises

Chart 17
Development of institutions' NSFR



Note: 10th, 25th, 75th and 85th percentile values and also the average are represented in the chart.

Source: MNB

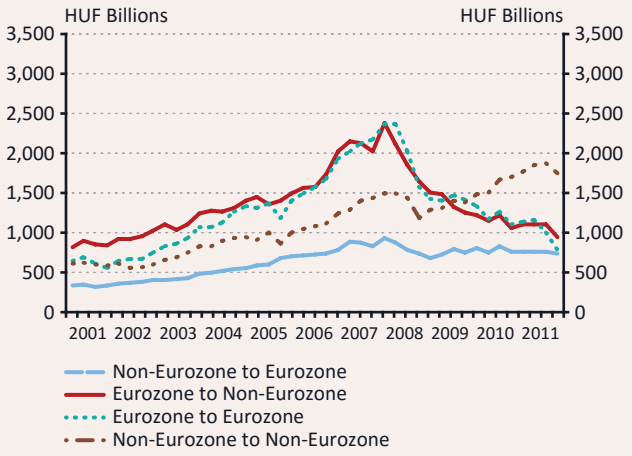
only moderately. The high NSFRs of the institutions are also attributable to the FFAR requirement, developed earlier based on the NSFR, which in the case of foreign currency items already prescribes sufficiently stable funding.

The institutions have prepared for the new regulation's entry into force. During the initial period of relevant reporting, the sector-level average was below 100 percent; however, large banks raised the stable funding necessary for compliance gradually, boosting the average of the sector to 100 percent by end-2015 (Chart 17). The pick-up in lending, under the extremely high indicators of smaller institutions, may somewhat reduce the average at the sector level as well.

Box 3:
Financial systemic risks accompanying wholesale funding

The 2008 financial crisis highlighted the fact that excessive reliance on wholesale funding may entail significant systemic risks. Several empirical studies have highlighted that excessive reliance on wholesale funding was one of the key reasons for the vulnerability of banks observed during the crisis.[12] The best-known cases of individual banks, such as the examples of Continental Illinois, Northern Rock or Bear Sterns, and the difficulties experienced by the euro area banks in 2008–2009 in raising short and long-term interbank funds,[13] highlighted the fact that consequences of these risks may be severe both for the entire financial system and the real economy.[14] The most important systemic risk related to wholesale funding is that in the case of a crisis, due to the general loss of confidence, interbank funds not only may become more expensive and be gradually withdrawn, but they may also disappear in full.[15] Moreover, due to the relatively small number of participants in the interbank market, all of this may also take place in the event of a more significant deterioration in the perception of a few participants' risks. The more interconnected the participants are in the interbank market, the higher this systemic risk is.[16]

Developments in international interbank lending



Source: BIS.

[12] See, for example: IMF (2013): Global Financial Stability Report, Transition Challenges to Stability, October 2013, Chapter 3 : Changes in bank funding patterns and financial stability risks http://www.imf.org/External/Pubs/FT/GFSR/2013/02/

[13] Caruana, J. – Van Rixtel, A. (2012): International financial markets and bank funding in the euro area: dynamics and participants, Bank for International Settlements http://www.bis.org/publ/othp18.pdf

[14] European Commission, Directorate-General for Economic and Financial Affairs (2009): Impact of the current economic and financial crisis on potential output, Occasional Papers 49, June 2009 http://ec.europa.eu/economy_finance/publications/pages/publication15479_en.pdf

[15] Hördahl, P. – King, M.R. (2008): Developments in repo markets during the financial turmoil, BIS Quarterly Review, December 2008 http://www.bis.org/publ/qtrpdf/r_qt0812e.pdf

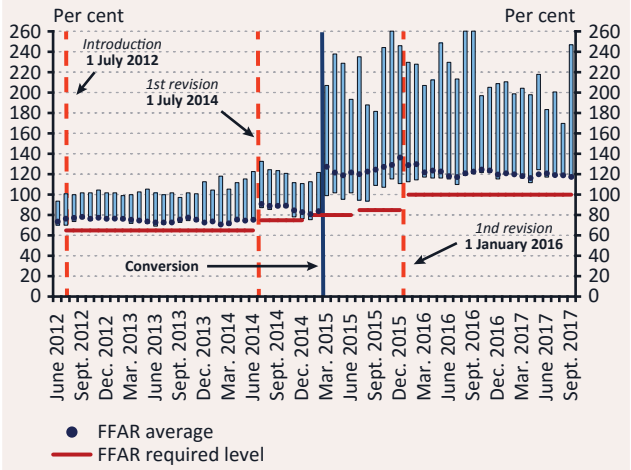
[16] Iyer, R. – Peydró, J.L. (2010): Interbank contagion at work – Evidence from a natural experiment. ECB Working Paper Series, January 2010

Reducing the risks of major wholesale funding by regulatory instruments should be considered. In the Hungarian banking sector, at the end of 2017 Q2, the stock of funds received from financial institutions was significant, exceeding HUF 10,000 billion and representing almost 30 percent of the balance sheet total of the Hungarian banking sector. Although the currently available liquidity and funding requirements efficiently strengthen banks' shock-absorbing capacity, it may be necessary to take measures that can manage the financial stability risks arising from the instability of wholesale funding in a more targeted manner, by minimising the number of the potential channels of adjustment, differentiating between the tenors, denomination and other risk dimensions.

4 Foreign Exchange Funding Adequacy Ratio and Foreign Exchange Coverage Ratio

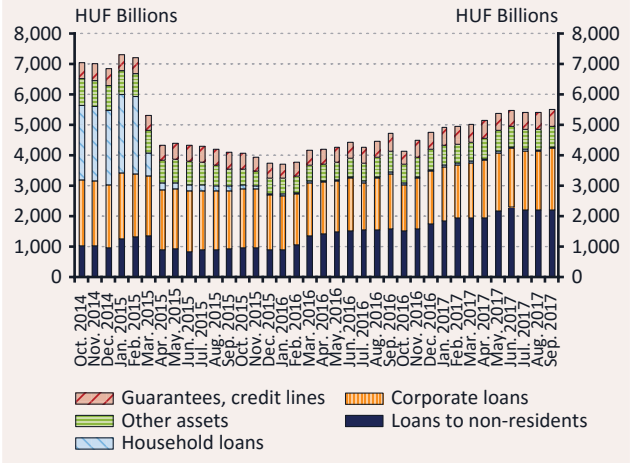
The Foreign Exchange Funding Adequacy Ratio (FFAR), which is aimed at the financing of foreign currency assets with stable foreign currency liabilities, and the Foreign Exchange Coverage Ratio (FECR), limiting the on-balance sheet open foreign currency position, ensure the sustainable financing of foreign currency assets. After the conversion of the foreign currency denominated household mortgage loans into forints, the regulation is primarily of a preventive nature, hindering the build-up of risks. Accordingly, at present compliance with these rules does not restrict banks' lending activity.

Chart 18
Mean, distribution and required level of FFAR



Note: First and third quartile values.
Source: MNB

Chart 19
Elements of required stable foreign exchange funding



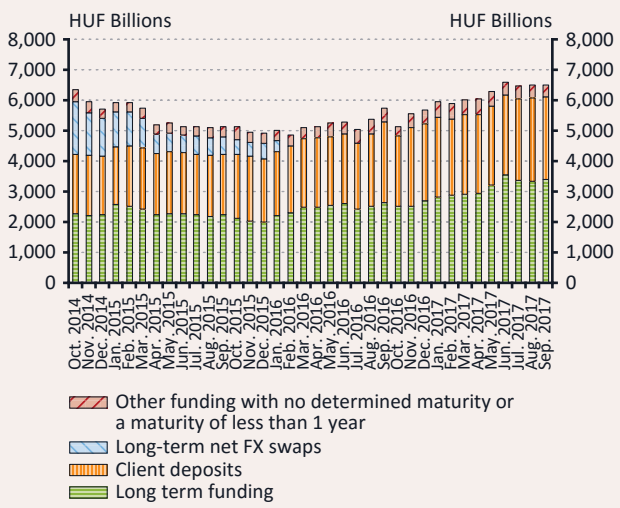
Note: Amounts weighted according to the FFAR regulation.
Source: MNB

4.1 THE MNB'S MACROPRUDENTIAL INSTRUMENTS AIMED AT ENSURING THE CURRENCY AND MATURITY MATCH HELP TO CURB FUNDING RISKS

The FFAR ensures the denomination and maturity match in foreign currency in the banking sector, both at an individual and a systemic level. Tightening of the FFAR in 2016 contributed to preserving the stable foreign currency surplus that developed after the conversion of foreign currency denominated household mortgage loans into forints in 2015 Q1. The low level of systemic risks is indicated by the average and steady foreign currency liability surplus of 20 percent (Chart 18). With the present foreign currency liability surplus, most of the institutions easily comply with the requirement, and thus the regulation primarily has the role of preventing the future build-up of risks. However, stretched compliance can be observed in the case of a few banks, addressed by more active liquidity management, among others, through the intra-month monitoring of the ratio, the forecasting of large-value disbursements and the readily available parent bank credit facilities, repayable over one year.

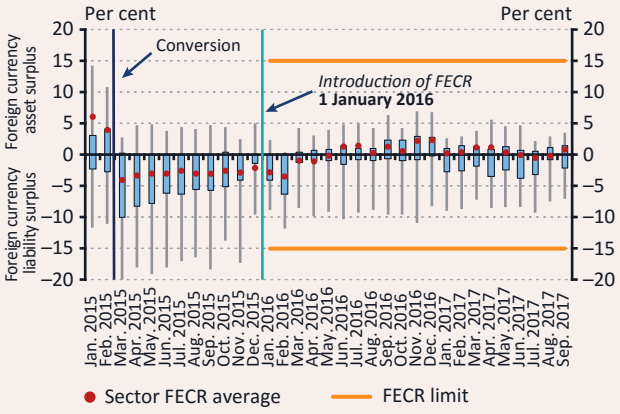
Since the beginning of 2016 banks ensured compliance under essentially steady stable liability structure and volume of funds. Since 2016, the sector-level data show that the banking sector matched the increasing foreign currency exposure on the assets side, generated by the dynamic foreign (corporate) lending (Chart 19), by maintaining adequate stable liability surpluses (Chart 20). However, the growth both on the assets and liabilities sides is mostly the result of the activity of a single institution. The majority of the

Chart 20
Elements of available stable foreign exchange funding



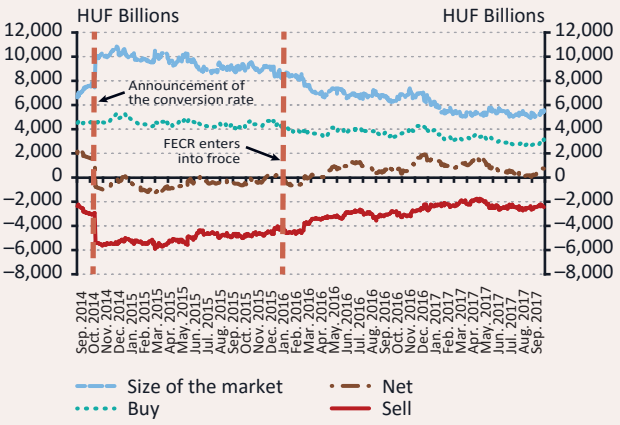
Note: Amounts weighted according to the FFAR regulation.
Source: MNB

Chart 21
Development of the FECR



Note: First and ninth decile values and first and third quartile values are represented on the graph.
Source: MNB

Chart 22
Swap market volumes



Note: Only FX swaps against HUF.
Source: MNB.

sector's participants are characterised by stagnation in the assets requiring foreign currency funding, and – due to the foreign currency FGS – by a minor growth in corporate loans and a decrease in foreign loans. On the liability side, in the absence of an adjustment pressure, the prevailing trend is the stagnation of stable funding, and within that the increasing role of customer deposits and the funding received within the framework of the foreign currency FGS.

4.2 GROWTH IN EXCESSIVE DEPENDENCE ON OFF-BALANCE SHEET INSTRUMENTS IS RESTRICTED BY THE FOREIGN EXCHANGE COVERAGE RATIO (FECR)

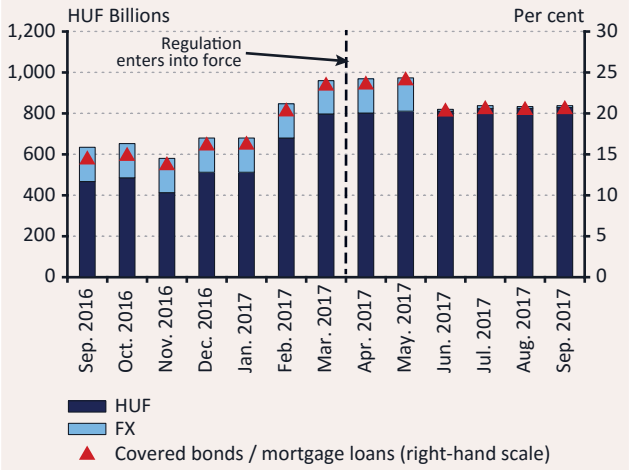
The majority of the institution do not even come close to the FECR limit. Upon the introduction of the FECR, effective since 1 January 2016, limiting the denomination mismatch between the banks' foreign currency assets and liabilities in 15 percent of the balance sheet total, several institutions were forced to make major adjustment; however, since then the participants are mostly well below the regulatory limit (Chart 21). However, in the case of business models involving large volatility in the balance sheet total, some actors did come close to the limit in the past period.

The banking sector's gross foreign exchange swap portfolio is declining. As a result of the forint conversion, the banking sector's on-balance sheet foreign currency position turned from the former foreign currency asset surplus into a modest foreign currency liability surplus, as they were unable to convert or repay the long-term foreign currency liabilities immediately. The banking sector's gross swap portfolio rose as well, because for a while it was also increased by the transactions concluded for the closing of the currency position opened by the conversion (Chart 22). The foreign currency liabilities are gradually expiring since the conversion, as a result of which the banking sector's on-balance sheet currency position was practically closed. The former foreign currency raising swap transactions and those concluded with the MNB at the time of the conversion are gradually expiring, which results in the decrease of the banking sector's gross swap portfolio.

5 Mortgage Funding Adequacy Ratio

Compliance with the Mortgage Funding Adequacy Ratio (MFAR), which entered into force on 1 April 2017, has been completed. In the case of banking groups with no mortgage credit institutions, the issuance of mortgage bonds for the purpose of compliance and the conclusion of refinancing loan contracts was completed by March 2017. In addition to the net issuance of mortgage bonds in the amount of roughly HUF 360 billion to date which is attributable to the regulation, the tightened regulations entering into force in 2018 necessitate the issuance of another HUF 150 billion, and the required maturity of the funds to be raised will also increase.

Chart 23
Outstanding amount of mortgage bonds



Note: MFAR reporting was introduced only when the regulation entered into force. Mortgage bonds / mortgage loans represents a good proxy for stable funding, but has an upward bias due to the preferential treatment of retained bonds.

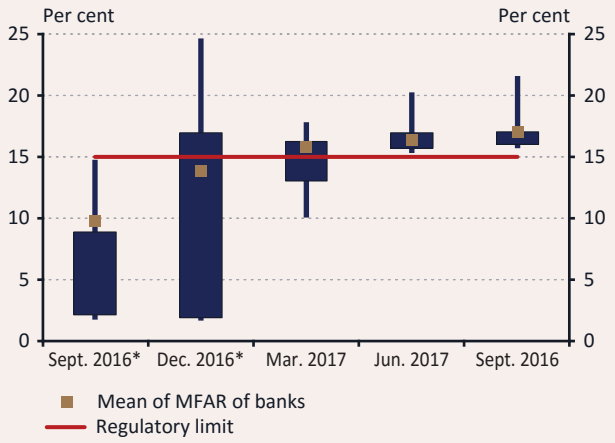
Source: MNB

The institutions raised stable funding secured by mortgages only up to the necessary degree, but the net issuance of mortgage bonds nevertheless amounted to roughly HUF 360 billion in relation to MFAR, which entered into force on 1 April 2017. Two new mortgage banks were established, in addition to the existing three. Between 1 October 2016 and 30 September 2017, the five institutions together issued new mortgage bonds in the amount of HUF 360 billion, in addition to the rollover of expiring bonds. As a result of this, the Hungarian mortgage bond portfolio expanded significantly (Chart 23). Banks, including institutions without a mortgage bank that ensure compliance by taking on refinancing loans, settled for the maintenance of low MFAR buffers, as the volatility of MFAR is low.[17] Thus, at present, only the stable funding necessary for compliance has been raised (Chart 24). The surplus at the sector level was HUF 66 billion at the end of June; excess amounts can be typically observed in the cases where financing by mortgage bonds was relied on substantially even before the introduction of MFAR. For the purpose of compliance with MFAR, banks usually opted for the issuance of new bonds instead of selling their proprietary mortgage bonds. This decision may be justified by the fact that the interest rates on bonds issued earlier are well above those typical in the current market environment.

Banks appeared as major investors in the mortgage bond market. Over the short run, the adjustment inevitably entailed the raising of new funds: the stable funding which has appeared has not replaced other funds over the short run, and thus the institutions'

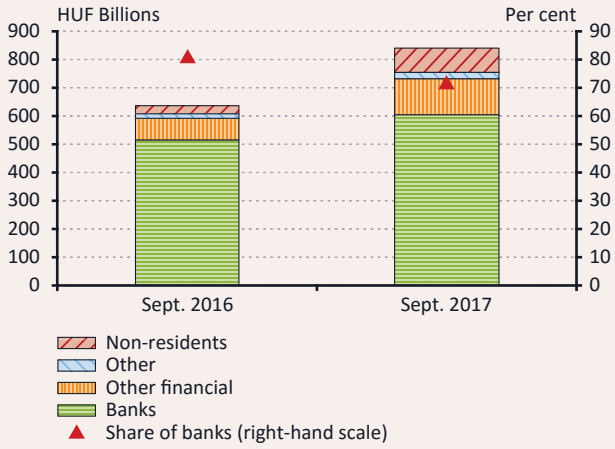
[17] The stock of stable funding can be forecast accurately; in the case of the mortgage loan portfolio included in the denominator, the expiry of the former foreign currency loan-related portfolio is substituted.

Chart 24
Changes in MFAR compliance



Note: Mean, 10th and 90th percentile, 1st and 3rd quartile.
**Estimation only for large banks.*
Source: MNB

Chart 25
Outstanding amounts by investors



Source: MNB

balance sheet total increased and the equivalent of the issued bonds and refinancing loans appeared in the financial markets as banks' demand. Due to this, banks also played a major role as investors in the mortgage bond market. More than 40 percent of the mortgage bonds issued since September 2016 have been purchased by banks. Nevertheless, the sector's share has declined on the whole. Insurers, mutual funds and foreign banks also appeared as investors, in addition to domestic banks, and even the EBRD purchased Hungarian mortgage bonds in the amount of HUF 40 billion.[18]

Due to mortgage bonds' marketability and eligibility for MNB repos, the financing situation at the sector level is improving even in spite of the high ratio of mortgage bonds held by the banking sector. This is a favourable development, but it reduces the funding risks at the sector level only to a lesser degree. In terms of stable funding at the systemic level and the development of mortgage bond market activity, it is unfavourable that in some cases the refinanced banks also subscribed to issuances funding their own loans, and hence the share of the banking sector in the mortgage bond portfolio is still high (Chart 25).

At the end of 2016, the MNB decided to tighten the mortgage bond regulation in 2018. The MNB provided market participants with a sufficiently long transitional period for compliance with the MFAR regulation, i.e. for the completion of the tenders necessary for the refinancing loans, and for the development of the procedures. In order to provide the institutions with sufficient time for preparation, already at the end of 2016,[19] the MNB announced the exact legal framework for the tightened regulations entering into force in October 2018, which facilitates the deepening of the market and is feasible after the completion of the initial adjustment. The changes that enter into force in 2018 are the following:

- The expected level increases by 5 percentage points, which necessitates the expansion of the mortgage bond portfolio by roughly HUF 150 billion.

- Depending on their stock exchange listing, 10–15 percent of the mortgage bonds held as assets will be deducted from the numerator, in order to discourage cross-financing and facilitate the raising of systemic stable funding.

[18] http://www.ebrd.com/work-with-us/projects/psd/investment-in-otp-mortgage-bank-covered-bonds.html
[19] The amendments were included in the MFAR regulation by MNB Decree 55/2016 (XII.22)

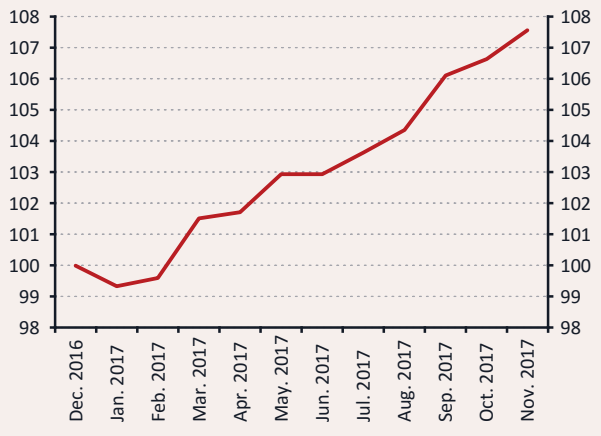
- The expected maturity increases from 1 to 2 years, which requires no adjustment, but efficiently prevents the future shortening of mortgage bonds' maturities;
- The range of allowances provided to building societies will be broader, in view of their stable funding structure, which is also ensured by legislative provisions.

Box 4:
Advantages of the introduction of the Hungarian mortgage bond indices

Due to the mortgage bond issuances that took place in 2017 and are expected in 2018, and the related secondary market activity, the need to develop mortgage bond indices emerged both in the market and at the regulatory authority. A forward-looking mortgage bond yield index could serve as a benchmark for the investors (e.g. asset managers, insurers) for the pricing of mortgage bond portfolios, and over the longer run – via more accurate monitoring of banks' funding costs – it could facilitate the pricing of household mortgage loans with longer interest periods as an interest rate change indicator. In addition, a total return index, measuring past yields, could support the subsequent assessment of the portfolios' performance, by showing a mortgage bond's reference portfolio yield.

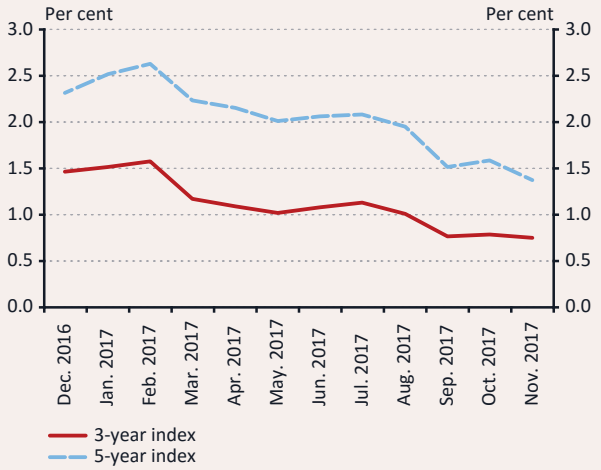
In cooperation with BSE and the market participants, the MNB developed the calculation method for both types of mortgage bond indices. Both types of indices include listed, HUF-denominated, fixed rate mortgage bonds and are based on quotes. Initially, the frequency of the index calculation is monthly; the frequency may increase with deepening of the market and an increase in the number of quotes. Bearing in mind the aforementioned objectives, the structure of the mortgage bond market and the market activity in the past period, it was justified to design the yield index in a breakdown by maturity categories, using the average of the yield of the individual mortgage bonds calculated until the current maturity, weighted by the outstanding portfolio. The total return index, following the principle of the MAX index in the government securities market, measures the performance of the mortgage bonds, assuming reinvestment of the interest paid by the bonds. The BSE published the indices for the first time at the beginning of December 2017, retrospectively to December 2016.[20] Wider use of the indices will be preceded by a test period of 6-12 months, during which the potential fine-tuning of the indices may be performed in cooperation with market participants.

BSE Mortgage Bond (BMBX) Total Return Index



Source: BSE, MNB.

BSE Mortgage Bond (BMBX) 3-Year and 5-Year Yield Indices



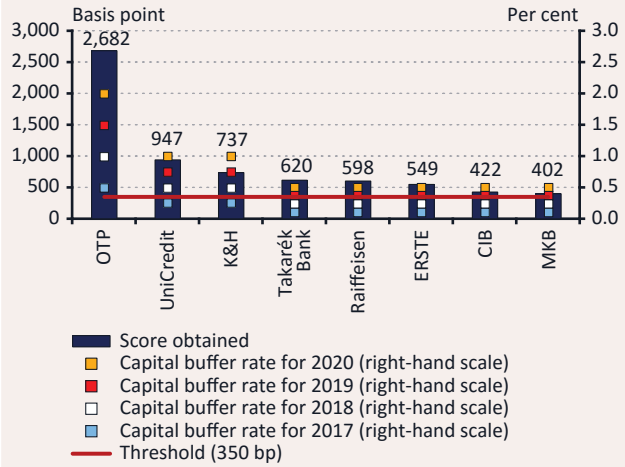
Forrás: BSE, MNB.

[20] https://www.bse.hu/Products-and-Services/Indices/Mortgage-bond-incides

6 Capital buffer for other systemically important institutions

Having reviewed the group of other systemically important institutions (O-SII) in 2017, the MNB left the set of identified institutions and the capital buffer rates for 2018 unchanged. The capital buffer rates defined for 2017 did not require substantial adjustment by the banks, thanks to the high capitalisation level at domestic banks.

Chart 26
Banks classified by the MNB as systemically important and their capital buffer rates



Note: Based on the audited consolidated data of 31 December 2016, according to MNB's methodology.

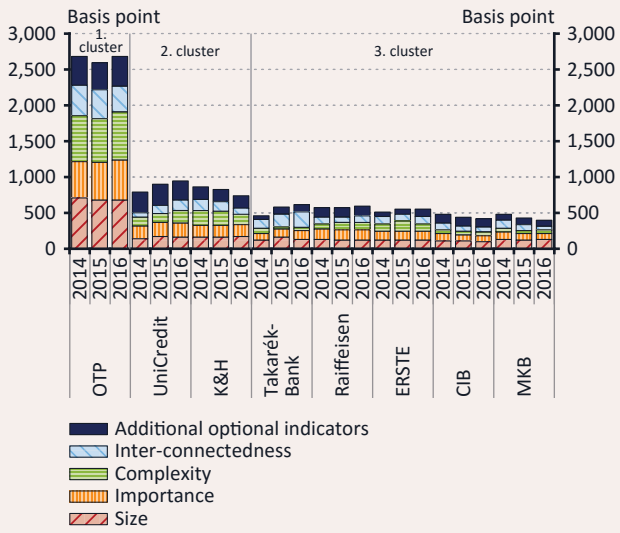
Source: MNB

The set of other systematically important institutions and their buffer rates did not change after the regular annual review. In accordance with its statutory obligation, in 2017 the MNB performed again the identification of other systemically important institutions headquartered in Hungary, relying on the data from the end of 2016. In the course of identification, the scores – representing the systemic importance – were obtained also in 2017 as the weighted averages of ten core indicators and five supplementary indicators.[21] The scores calculated as a result of the identification (Chart 26) exceed the threshold value of 350 basis points at eight banking groups this year again. The spread of the IFRS-based supervisory reporting resulted in a major improvement in the consistency of the scores, as the scores of the Hungarian systemically important institutions can be compared more accurately among themselves and also at an international level.

The current scores measuring importance did not justify the amendment of the buffer rates for the other systemically important institutions. During the identification process performed in 2015, the MNB separated three groups of systemically important institutions, and allocated to those groups the rates of 2, 1 and 0.5 percent from the end of the transitional period ending in 2020 (Chart 26). In the past two years, certain banks in the groups of institutions measured as having similar systemic importance based on the scores, moved away from each other, while certain members between the groups came somewhat closer to each other (Chart 27). The largest shift can be observed in the case of K&H, belonging to Cluster 2, as its score decreased by almost 11 percent compared to end-2015. The most outstanding member of the cluster comprising the institutions of relatively lower

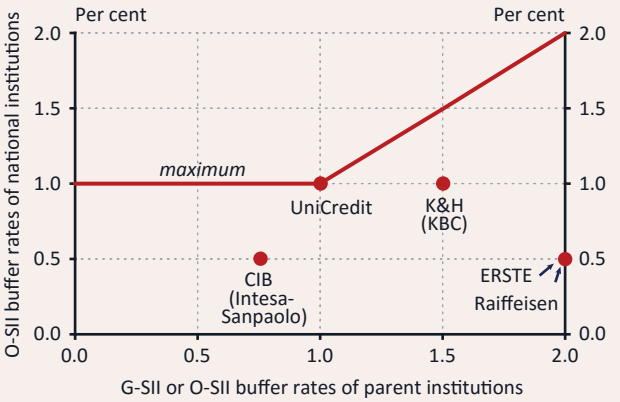
[21] For more information on the identification methodology and the methodology of calibrating the capital buffer rates of the other systemically important institutions, see the MNB's Methodological Guide at: http://www.mnb.hu/letoltes/modszertani-tajekoztato-en-honlap.pdf.

Chart 27
Changes in the scores of other systemically important institutions



Source: MNB.

Chart 28
Upper limits on the O-SII buffers applicable to domestic subsidiaries of EU parent institutions subject to SII buffer(s) and their indicative final buffer rates



Source: MNB, ESRB.

systemic importance, Takarékbank, came closer to K&H; Takarékbank's systemic importance rose by 6.5 percent in one year by the end of 2016. However, for the time being the change in the scores cannot be viewed as a long-term trend. The changes in the last three years were partly attributable to developments in reporting, and partly to changes at individual institutions, and do not yet suggest longer-term trends. Based on the analysis of the indicators driving the change in the scores and calibration assessments, the buffer rate paths published in 2016 remain valid. In light of the foregoing, compared to its earlier announcement, the MNB has not changed the buffer rates for other systemically important institutions for 2018.

The capital position of the institutions classified as systemically important in Hungary is stable. The aggregated group O-SII capital buffer of the eight institutions which were identified as systemically important amounted to HUF 52.6 billion, based on the total exposure values at 30 June 2017. The prescription of the buffer did not require significant adjustment by the banks. The gradual introduction of the final value of the buffer rates between 2017 and 2020 also supports the lending activity of the institutions, in parallel with managing the risks of systemically important institutions arising from misaligned incentives, as it provides sufficient time to prepare for compliance with the buffer.

The integration of the Hungarian systemically important institutions in the European financial system does not restrict the efficiency of the domestic regulation. The Hungarian systemically important institutions are dominated by subsidiaries the parent companies of which are also systemically important. Based on the European legislation, upon determining the O-SII buffer rates applicable to the systemically important subsidiary banks operating domestically, it must be taken into consideration that they must not exceed one percent or the buffer rate applicable to the systemically important parent company in the EU, if the latter is higher than one percent. However, in the past period, the buffer rates prescribed for the parent banks did not represent an effective constraint for the MNB in the calibration of the O-SII buffer (Chart 28).

The ECB prescribes positive O-SII buffer rates for the systemically important institutions identified in the SSM countries. In most of the EU Member States, an O-SII buffer was introduced from 2016. In 2016, the ECB prepared its standard O-SII buffer calibration

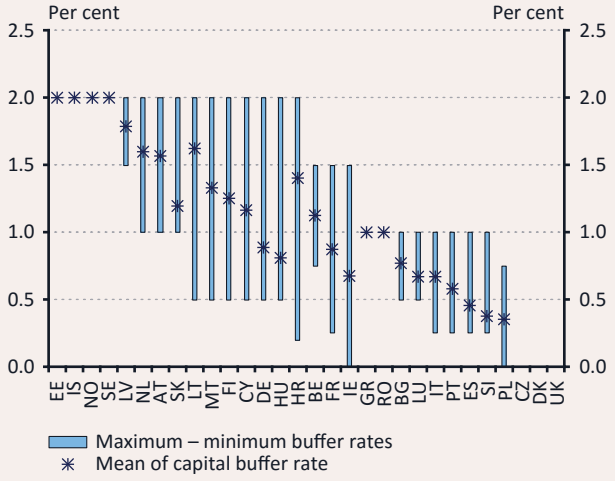
Table 3
O-SII buffer calibration methodology of the ECB

Cluster	Points	Minimum O-SII buffer
4	over 2900	1.00%
3	1950–2900	0.75%
2	1250–1950	0.50%
1	1250 or less	0.25%

Note: Institutions whose score is at the border of two cluster are to be allocated to the larger cluster.

Source: ECB

Chart 29
Final buffer rate prescribed to EU O-SIIs at the end of the country-specific planned provisional periods



Note: Ireland (IE) has set a capital buffer rate of 0 per cent for an institution in liquidation whose systemic important activity is no longer significant. The arithmetic mean of final buffer rates the EBA was notified of by April 2017.

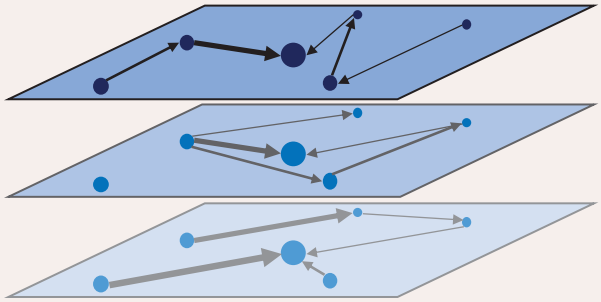
Source: MNB

methodology for the SSM countries, stipulating a rate of 0.25 percent as a minimum lower threshold (Table 3). Accordingly, the countries that initially set a rate of 0 percent must activate the capital buffer on a mandatory basis from 1 January 2022 at the latest. By 2017, the number of EU Member States that apply the O-SII buffer increased further (Chart 29); however, Denmark, the Czech Republic and the United Kingdom[22] continue to manage the risks arising from systemic importance solely with the application of the systemic risk capital buffer.

[22] In Great-Britain, the SRB is prescribed primarily for the independent, ring-fenced, organisational units within credit institution group, performing lending and deposit collection activity for the households and the real economy.

Box 5:
Measurement of institutional interconnectedness

Multilayer illustration of three types of transactions



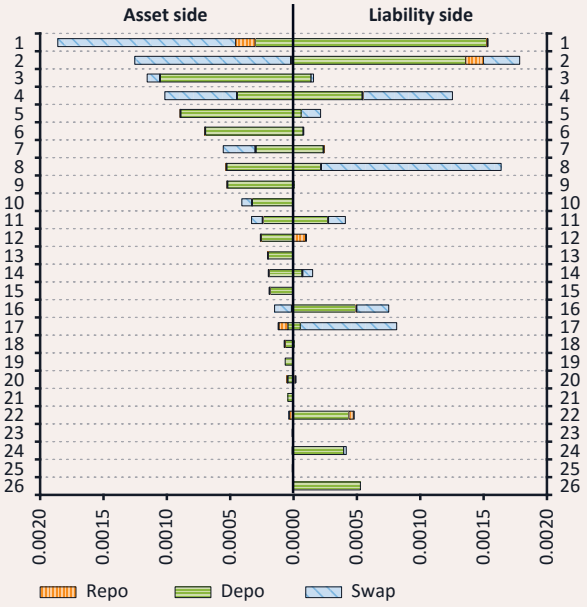
Note: Different layers indicate different types of transactions. Nodes are institutions which are identical on each layer. Arrows show the direction of transactions, their thickness is proportional to the values of transactions.

The MNB applies and enhances the relevant methodological innovations in relation to the identification of systemically important institutions. The quantification of the interconnectedness of the financial system, i.e. of the effects of financial contagion exerted through interbank transactions, is analysed by network methods, which is applied and researched actively in the literature. The central bank's staff examined the interaction of the financial institutions in relation to unsecured interbank loans.[23] In line with the international literature, they found that only a few of the widely used centrality indicators are able to provide a relatively accurate measurement of the individual institutions' contribution to the intermediation of interbank contagions. In addition, certain centrality indicators proved to be suitable for improving the explanatory power of the models used for the identification of financial stress situations.

The MNB is also carrying out a study that considers a wider range of interbank transactions, in order to measure systemic importance more accurately. Based on a novel international research trend,[24] it is reasonable to analyse the networks using a multilayer approach, i.e. considering several layers and various financial transactions. Thus, in addition to the unsecured interbank loans, potential data sources may also include foreign exchange swaps, repurchase agreements and interest rate swap (IRS) transactions. The method applied quantifies the role of these interbank assets or liabilities in the operation of banks, taking into consideration not only the immediate, but also the indirect effects of a hypothetical shock in the financial system. This happens in such a manner that the changes occurring as a result of the immediate effect impact all actors in the financial network.

Based on the preliminary calculations performed on Hungarian data, repurchase agreements still play a negligible role in the institutions' interbank financing, despite the moderate expansion observed in the market in recent years. Since the interbank asset of an institution is the liability of another bank, it is justified to examine financial institutions' interconnectedness on the asset and the liability side separately. Accordingly, we calculated asset and liability side indices, which determine the given institutions' interbank systemic importance on the asset or on the liability side. In the case of the larger actors, it can be observed that those with substantial interbank loans on the liability side usually have higher importance on the asset side in the swap instruments.

Liability and asset side systemic importance measures



Note: Vertical axis denotes financial institutions, higher values on horizontal axis means higher interconnectedness. Based on data from 2016.

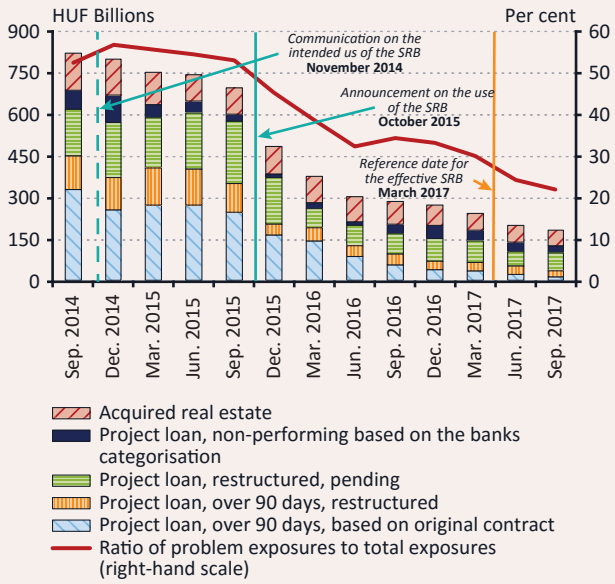
Source: MNB

[23] Fukker, G.: Harmonic distances and systemic stability in heterogeneous interbank networks, MNB Working Papers 2017/1.
[24] Aldasoro, I. – Alves, I: Multiplex interbank networks and systemic importance: An application to European data. Journal of Financial Stability (2017)

7 Systemic risk buffer

The MNB managed the structural macroprudential risks arising from the accumulation of problem commercial real estate exposures after the outbreak of the financial crisis, and their excessive concentration with the application of the systemic risk buffer (SRB). In the adjustment period starting with the announcement of the capital requirement and ending with the effective introduction of the capital buffer from 1 July 2017, the banking sector undertook significant portfolio cleaning, which was also supported by favourable market developments. Accordingly, the banking sector's problem portfolio decreased by more than 70 percent before the entry into force of the requirement, and only two banks, which were less active in balance sheet adjustment, were forced to strengthen the systemic shock absorbing capacity by building capital buffers. In addition, the capital buffer may hinder the renewed evolution of problem portfolios in a boom period in project financing.

Chart 30
Changes in problem CRE project loans and real estate exposures by the components of the SRB definition



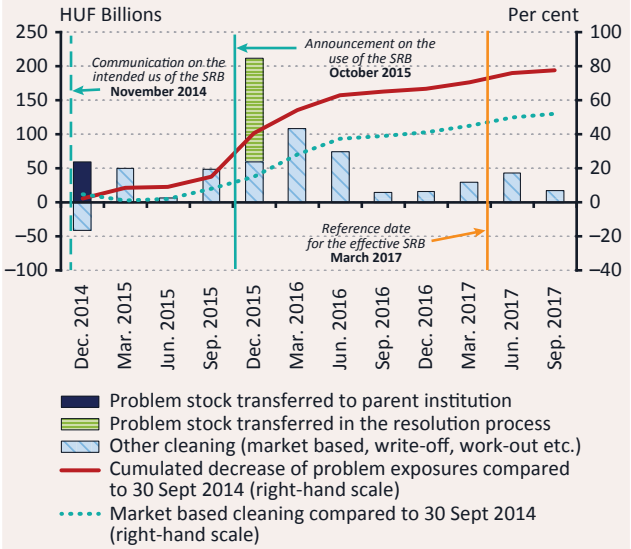
Source: MNB.

7.1 THE SYSTEMIC RISK BUFFER CONTRIBUTED SIGNIFICANTLY TO REDUCING SYSTEMIC RISK LINKED TO PROBLEM COMMERCIAL REAL ESTATE EXPOSURES

After the announcement of the SRB requirement, which serves as a tool for managing the systemic risk related to problem commercial real estate exposures, significant portfolio cleaning was performed and the targeted systemic risk declined considerably. During the nearly three years that elapsed between the announcement of the measure in 2014 and the end of the reference period that serves as the basis for the recognition of the capital buffer, i.e. 31 March 2017, and the roughly eighteen months available after the determination of the detailed conditions, the banks reduced their problem portfolio to a great degree, i.e. from HUF 821 billion at the announcement to HUF 241 billion, representing a decline of 71 percent (Chart 30). As a result of the introduction of the capital buffer with an adjustment period, the capital buffer was applied in practice only in the case of two institutions, and hence the measure essentially does not restrict lending at a sector level. Moreover, the cleaning of the non-performing portfolios will improve the banking sector's profitability and lending capacity over the longer run.

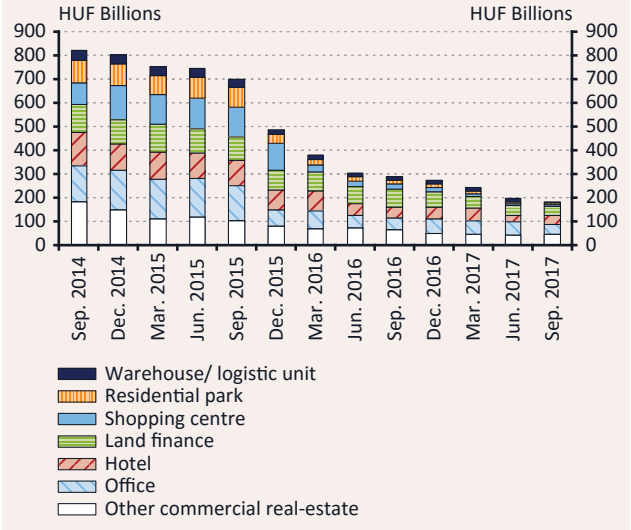
The reduction of the problem exposures took place in a favourable market environment at an adequate rate and with proper timing at most banks. Portfolio cleaning exceeded 50 percent of the problem portfolio even at the least active banks, but there are also examples of institutions that performed almost full cleaning. Until 31 March 2017, the most typical forms

Chart 31
Composition and timing of quarterly changes of problem exposures



Source: MNB.

Chart 32
Problem stock by type of real estate collateral



Source: MNB.

of portfolio cleaning included market sales, write-offs and enforcement, accounting for roughly 64 percent of total cleaning. Transferring outside the scope of the Hungarian accounting consolidation requirement,[25] which does not fall within the scope SRB, took place in a larger amount in one case. The sale of the loans was also supported by the recovery of the commercial real estate market, and thereby the strengthening of market demand for non-performing receivables and underlying collaterals (Chart 31). To an above-average extent, the cleaning affected CHF-denominated project loans, condominium and shopping centre transactions (Chart 32), items past due over 90 days under the original contracts and restructured loans (Chart 30).

7.2 THE SHOCK ABSORBING CAPACITY AGAINST THE REMAINING SYSTEMIC RISK IS PROVIDED BY THE REQUIRED CAPITAL BUFFERS

The shock absorbing capacity against the remaining systemic risk is provided by the capital buffers maintained by the affected institutions. In the case of two banks, despite the significant portfolio cleaning, the degree of adjustment fell short of the relative portfolio level that would not entail a capital buffer. Accordingly, the MNB obliged them to recognise and maintain an SRB from 1 July 2017.[26]

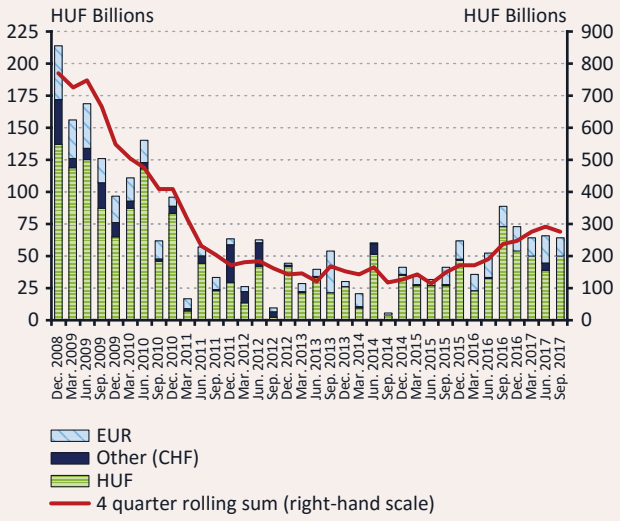
Due to the additional cost of capital, the recognised systemic risk buffer continues to serve as an incentive to keep up the cleaning of problem portfolios. This seems to be confirmed by the 2017 Q2 and Q3 data, as the problem portfolio at the sector level declined by roughly another HUF 47 billion at the institutions burdened by the capital buffer, and by about HUF 14 billion at the other large banks, accounting for almost 7.5 percent of the total initial problem portfolio.

The capital buffer may also represent a strong disincentive against a renewed build-up of problem portfolios in a boom period in project financing. The vacancy and occupancy data, the disbursement of new project loans (Chart 33) and the announced new, or restarted commercial property market investments signal market recovery. Bank competition in the conditions of financing commercial real estate may

[25] In this case, items outside the scope of accounting consolidation mean the project financing risk assumptions appearing in a form other than project financing loan, particularly: (a) exposures outstanding through mutual fund shares issued against real estate funds or loans granted or (b) loans granted to facility management or property development companies owned by the parent bank or other entity.

[26] MNB press release: With a view to managing the risks stemming from problem project financing loans, the MNB prescribed systemic risk capital buffer for two banks – https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2017-evi-sajtokozlemenyek/a-problemas-projekthitelekbol-eredo-kockazatok-kezelese-erdekeben-az-mnb-ket-bankra-rendszerkockazati-tokepuffert-irt-elo

Chart 33
New credit in the commercial real estate project loan market



Note: Non-consolidated sectoral amounts by 7F report.
Source: MNB

Table 4
EU practice of the application of the SRB

Reason for implementation	Country groups/countries		
	Central and Eastern Europe	Eurozone core countries	Scandi-navian countries
Early substitution of O-SII buffer and/or complementing its maximum rates	CZ, EE, HR, SK	AT, NL	DK, SE
of this in additional relation to the O-SII buffer	EE, SK	–	
Capital requirement reducing effect of changes in CRD/CRR	BG, CZ, EE, HR		
of this in additional relation to the O-SII buffer	BG, EE		
Volume and concentration of risky exposures	HU	–	DK*
of this in additional relation to the O-SII buffer	HU	–	
EU and geopolitical risks, integration level of the banking system	PL		
of this in additional relation to the O-SII buffer	PL		

**SRB applicable to exposures in Faroe Islands for Danish banks.*
Source: ESRB, own compilation

swiftly lead to excessive risk-taking. The applied SRB may serve as an adequate disincentive for the excessive easing of lending conditions in the commercial property market, as the central bank shows low tolerance in respect of the systemic burdens of irresponsible project financing.

7.3 IN THE EU, THE SRB STILL PRIMARILY SERVES AS A TOOL FOR MANAGING THE SYSTEMIC RISK OF SYSTEMICALLY IMPORTANT INSTITUTIONS

The EU Member States primarily use the SRB for the substitution of the O-SII buffer or to supplement its maximum rate. According to the intention of the regulatory authorities, the majority of the countries applying the SRB for the management of structural macroprudential risks – due to the flexible and easier use thereof – prescribe it for other systemically important institutions with a view to countering misaligned incentives. However, most of the Central and Eastern European countries that use an SRB prescribed the requirement not only for the O-SII institutions, but for the entire banking sector, primarily in order to maintain the capital level preceding the Single Rulebook (Table 4).

In the past year, changes occurred both in the range of countries applying the buffer and in the conditions of application. The SRB rate was reduced in Estonia and Slovakia, while the Czech Republic increased the SRB rate and expanded the range of affected banks. Romania withdrew the planned and announced, but not yet effective SRB. On the other hand, Denmark, which already applied the SRB, introduced an additional SRB of 1 percent for the structural risk related to the Danish banks' exposures in the Faroe Islands, exceeding the "de minimis" limit, together with the already effective institution-specific SRB. As a new actor, Poland activated the SRB due to the major EU and global political and economic risks, and the international integration of the Polish banking system. From 2018, all Polish banks must maintain an SRB of 3 percent for domestic exposures.

Count István Széchenyi

(21 September 1791 – 8 April 1860)

Politician, writer, economist, minister for transport in the Batthyány government whom Lajos Kossuth referred to as 'the greatest Hungarian'. His father, Count Ferenc Széchényi established the Hungarian National Museum and Library; his mother, Julianna Festetich was the daughter of Count György Festetich, the founder of Georgikon, an institution for the teaching of agricultural sciences.

With his ideas – whose message remains relevant even today – and his activities both as a writer and a politician, István Széchenyi laid the foundation for modern Hungary. He is one of the most eminent and significant figures in Hungarian politics whose name is associated with reforms in the Hungarian economy, transportation and sports. He is also known as the founder and eponym of numerous public benefit institutions, a traveller all across Europe and an explorer of England as well as the champion of economic and political development at the time. István Széchenyi recognised that Hungary needed reforms in order to rise, and considered paving the way for a Hungary set on the path of industrialisation and embourgeoisement to be his calling in life.

Published in 1830, his Credit outlined the embourgeoisement of Hungary and summarised its economic and social programme. Count Széchenyi intended this writing to make the nobility aware of the importance of the country's desperate need for a social and economic transformation. Another work of his, Stádium [Stage of Development] (1833) listed the cornerstones of his reform programme in 12 points, including the voluntary and compulsory liberation of serfs; the abrogation of avicitas (inalienable status of noble property); the right of possession for the peasantry; and the freedom of industry and commerce. This work of Széchenyi already conveyed the idea of equality before the law and the general and proportionate sharing of taxation.

After the revolution in 1848 István Széchenyi joined the Batthyány government and as minister embarked vigorously on implementing his transportation programme.

MACROPRUDENTIAL REPORT

2017

Print: Pauker–Prospektus–SPL consortium

H-8200 Veszprém, Tartu u. 6.

mnb.hu

H-1054 BUDAPEST, SZABADSÁG SQUARE 9.