MACROPRUDENTIAL REPORT

2018

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

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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.

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Executive Summary

Act CXXXIX of 2013 on the Magyar Nemzeti Bank vested the central bank with strong authority to prevent and mitigate systemic financial risks. In its annually published Macroprudential Report, the MNB describes and evaluates the operation of its currently applied macroprudential instruments, the adjustment of market participants, and how the instruments impact the sustainable contribution of the financial system to economic growth. At the end of 2018, 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 prevent households from taking on an excessive debt burden and lenders from taking on excessive default risk. The debt cap rules were able to appropriately mitigate these risks last year, even in the context of the increasingly dynamic expansion of household lending. The efforts aimed at circumventing regulatory objectives are still marginal; however, the gradually increasing clustering of new loan contracts around the debt cap limits suggests the growing effectiveness of the regulations. Effective from 1 October 2018, in order to mitigate the interest rate risk of households, the MNB set lower payment-to-income ratio limits than before in the case of household mortgage loans with shorter interest rate fixation periods.*

2. *In the past year, the MNB did not deem it warranted to prescribe a countercyclical capital buffer. Despite the continued pick-up in lending, the cyclical systemic risks related to credit institutions are currently low. The credit cycle is only at the beginning of its expansion phase, with a low level of vulnerability in the Hungarian financial system, while the level of stress remained reassuringly low, despite the falling risk appetite observed on the financial markets of emerging countries.*

3. *The banking sector's short-term liquidity and level of stable funding were both appropriate in the past year. Consistent with the position of the credit cycle, banks comply with the Liquidity Coverage Ratio requirement with substantial surpluses. The Basel standard on the Net Stable Funding Ratio is expected to take effect after 2021, following its implementation in the EU. However, most Hungarian banks would already meet the 100-percent minimum requirement.*

4. *The macroprudential instruments mitigating the external vulnerability of the banking system were rearranged in 2018. The regulation on the Foreign Exchange Funding Adequacy Ratio was primarily changed in the spirit of convergence to the upcoming Net Stable Funding Ratio as of 1 July 2018. The modification did not entail any substantial need for adjustment, but, together with the other instruments of the MNB, the requirement continues to prevent the emergence of excessive maturity mismatches in foreign currency positions. The regulation on the Interbank Funding Ratio, also effective from 1 July 2018, helps prevent the overreliance of the banking system on funds from financial corporations. In line with its preventive nature, the instrument has not required any actual adjustment at the sector level yet. The unchanged regulation on the Foreign Exchange Coverage Ratio limiting the on-balance sheet open foreign currency position was abided by the overwhelming majority of institutions with massive buffers.*

5. *The required minimum level of the Mortgage Funding Adequacy Ratio was raised to 20 percent as of 1 October 2018 to further mitigate the excessive forint maturity mismatch and enhance the Hungarian mortgage bond market. Similar to the earlier 15-percent minimum value, most institutions comply with the new limit with low buffers. Mortgage bond holdings exhibited substantial growth in the past year; the continuation of this trend would be desirable. Banks continue to be the biggest investors on the mortgage bond market, but the regulation amended with effect from 1 October 2018 supports strengthening financing from outside the sector.*

6. *The MNB conducted the annual review of the so-called other systemically important institutions in 2018 as well. As a result, it has left the list of institutions comprising eight banks unchanged, just like the capital buffer rates for 2019 that strengthen the stability of these institutions. The buffer rates, which gradually grow until 2020, required no major adjustment from the banking system whose capital position was stable in 2018.*

7. *With support from favourable property market developments, the MNB's systemic risk buffer requirement continued to encourage the reduction of the systemic risks arising from the banking system's problem commercial property exposures in the past year too. Since November 2014, when the intention to use the capital buffer was announced, banks have cleaned 89 percent of problem exposures, which was heavily supported by the upswing on the property and workout markets. As a result of the portfolio cleaning process, since 1 July 2018, only one bank has had to maintain a systemic risk buffer – at lower level than earlier –, instead of the previous two. Besides managing the residual risks, this instrument may also discourage the repeated build-up of problem stocks in the future.*

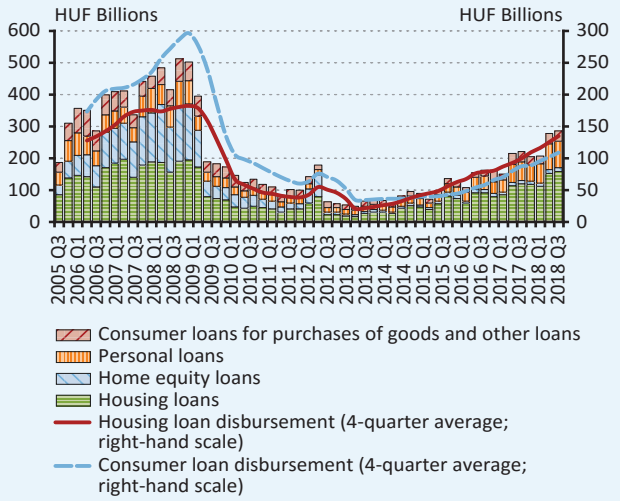
8. *In international comparison, the Hungarian banking system currently operates with low cost efficiency and a relatively high cost base. Due to their inflexibility, inefficient banks are less resilient to shocks, therefore the MNB as a macroprudential authority seeks to foster the financial sector's digitalisation and improve its competitiveness and the widespread use of FinTech solutions taking into account financial stability considerations. Among the first countries in the region, the central bank launched its "MNB Innovation Hub" initiative in the spring of 2018 to promote financial innovations and digital solutions. The goal of the MNB Innovation Hub is to foster information exchange between financial actors, FinTech innovators and regulatory authorities, to provide guidance on the potential uses of the innovative solutions in the current regulatory framework, and to support innovative actors in international cooperation when necessary.*

9. *Recently, no systemic risk issues have emerged in the sectors of non-bank financial institutions. Nevertheless, the MNB stands ready to manage any systemic risks that may arise in the long run. In the insurance sector, this may be facilitated by the future development of the European Union regulatory framework as well as certain regulatory instruments relevant from a systemic risk perspective and already used by the MNB. Investment funds, especially real estate funds, have grown dynamically recently. The MNB monitors the whole sector during its ongoing supervision and the regular comprehensive assessments, and it is also ready to continue implementing the macroprudential approach if this is necessitated by heightened systemic risks.*

1 Debt cap rules

Despite the dynamic growth in lending on the household loan market, no signs of overindebtedness can be identified. The gradually increasing clustering of lending around the regulatory limits and the concentration of mortgage and personal loans in certain debtor groups show the effectiveness of the debt cap rules. The MNB decided to differentiate the payment-to-income ratio limits by interest rate fixation periods from 1 October 2018 to further strengthen households' resilience to shocks. This measure could effectively guide future mortgage lending towards longer interest rate fixation periods, whereas it may have only a negligible negative effect on the volume of lending.

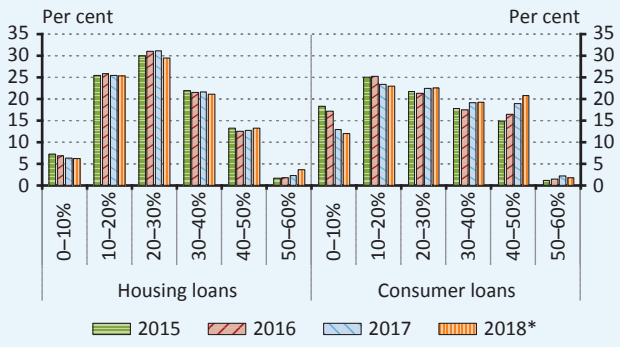
Chart 1
The gross household credit disbursement of credit institutions in real terms by loan type



Note: Without loans granted to private entrepreneurs. The real value of the disbursement represents the nominal values of disbursement at the 2005 price level.

Source: MNB.

Chart 2
Evolution of the PTI distribution of newly disbursed loans by loan type



*Note: Distribution by contract number. Without taking into account the effect of the 85-percent beneficial weight pertaining to the instalments of mortgage loans with an interest rate fixation period of at least 5 years. *The 2018 data refers to the first three quarters of the year.*

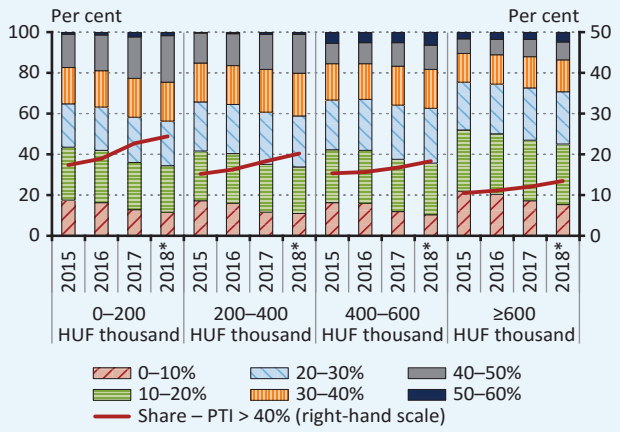
Source: MNB.

1.1 THE TRENDS IN HOUSEHOLD LENDING POINT TO A SOUND STRUCTURE OF THE RECOVERY

The dynamically growing credit outflows observed on the household credit market warrant continuous monitoring. Although in nominal terms household lending has come close to the 2007 value, weaker credit growth typical of 2005–2006 was registered when adjusting for the effect of inflation (Chart 1). The upturn in household lending was driven by the growing volume of housing loans as well as the boom in personal loans. At the same time, consumer loans fall well short of the pre-crisis levels, mainly owing to the reduction in home equity loans disbursed in large quantities earlier. Currently lending is expanding dynamically in forint-denominated transactions typically with the interest rate fixed for a longer period in line with debt cap rules, therefore the main regulatory task is to maintain the sound structure of growth.

The greater indebtedness of overstretched households arises from consumer loans. The average payment-to-income ratio (PTI) of all the household loan contracts signed in the first three quarters of 2018 was 27.8 percent, 0.8 percentage points higher than the average value in 2017. The increase is due to the slowly increasing share of the loans with a PTI value of over 40 percent, which can be deemed high, and this share was 1.2 percentage points higher than in 2017, standing at 22.5 percent among the new household loan contracts in the first three quarters of 2018. In the case of housing loans, the proportion of transactions with a PTI of over 40 percent was much lower, 17.6 percent (Chart 2), representing a slight increase compared to earlier years. The growth of the share of the loans with a PTI of over 40 percent was somewhat stronger among the debtors with a net income of HUF 200,000–400,000 in the first three quarters of 2018, with annual growth of close to two percentage points (Chart 3). The risks stemming from the slowly growing household indebtedness are reduced by the favourable employment and real wage growth developments.

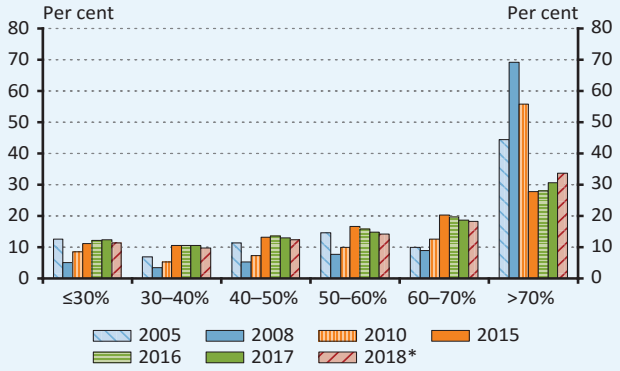
Chart 3
Evolution of the PTI distribution of newly disbursed loans by the net monthly income of borrowers



*Note: Distribution by contract number. *The 2018 data refers to the first three quarters of the year.*

Source: MNB.

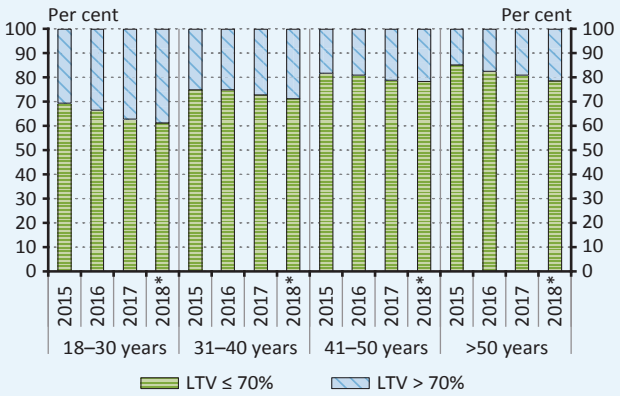
Chart 4
Evolution of the LTV distribution of newly disbursed housing loans



*Note: Distribution by volume of contracts. *The 2018 data refers to the first three quarters of the year.*

Source: MNB.

Chart 5
The LTV of newly disbursed housing loans by age groups



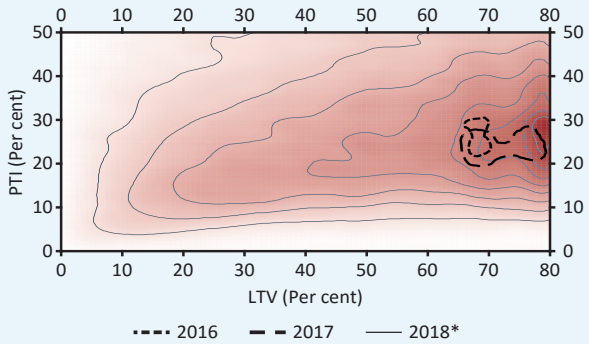
*Note: Distribution by contract number. *The 2018 data refers to the first three quarters of the year.*

Source: MNB.

The encumbrance of real estate collateral for mortgages exhibits a slowly rising trend. Borrowers increasingly finance their property purchases from loans on account of record-low housing loan interest rates and soaring property prices (46 percent of all property purchases were accompanied by borrowing in 2018 Q3). In the first three quarters of 2018, over one-third of new mortgages were disbursed with a loan-to-value ratio (LTV) of over 70 percent (Chart 4). However, as the proportion of properties with a high LTV has grown, the average LTV of new loans weighted by volume increased by merely 0.7 percentage points, to 57.5 percent, in the first three quarters of 2018. The growing encumbrance of real estate collateral is not excessively risky *per se*, but in the regions where property prices have risen above their equilibrium level, this may warrant more cautious risk-taking from lenders.

Due to growing property prices, the LTV limits increasingly affect the younger generations with lower savings. Since 2015, the share of housing loans taken out with an LTV near the limit, of over 70 percent and disbursed in the first three quarters of 2018, has jumped from 30 to 39 percent among those younger than 30 (Chart 5). The growing borrowing suggests that it is becoming increasingly difficult for the younger generation to produce down-payments in the context of the soaring property prices.

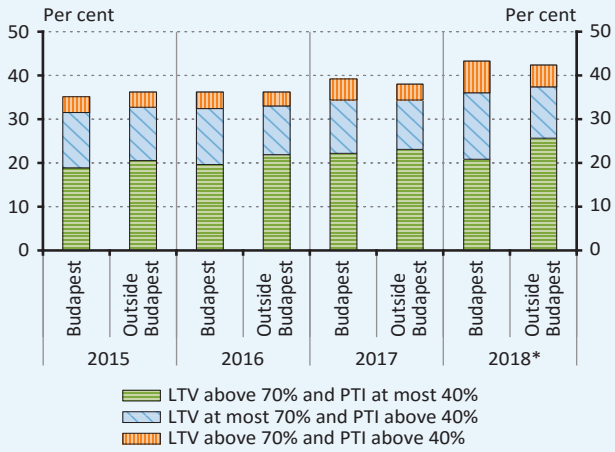
Chart 6
The distribution of newly disbursed housing loans by PTI and LTV value



*Note: Distribution by contract number. Continuous and dashed lines indicate the area where housing loan contracts were concentrated in the corresponding years. *The 2018 data refers to the first three quarters of the year.*

Source: MNB.

Chart 7
The share of housing loans disbursed near the debt cap limits by region



*Note: Distribution by contract number. According to the location of the collateral. *The 2018 data refers to the first three quarters of the year.*

Source: MNB.

Table 1
PTI rules for newly disbursed HUF housing loans from 1 October 2018

Monthly net income	Interest rate fixation period		
	Floating or fixed for less than 5 years	At least 5 years, but less than 10 years	At least 10 years or fixed for the whole term
Limits set for loans denominated in HUF set from 1 October 2018			
Below HUF 400,000	25%	35%	50%
At least HUF 400,000	30%	40%	60%
Limits set for loans denominated in HUF set from 1 July 2019			
Below HUF 500,000	25%	35%	50%
At least HUF 500,000	30%	40%	60%

Note: For housing loans with a maturity of more than 5 years. The PTI limits for housing loans denominated in other currencies have also been modified.

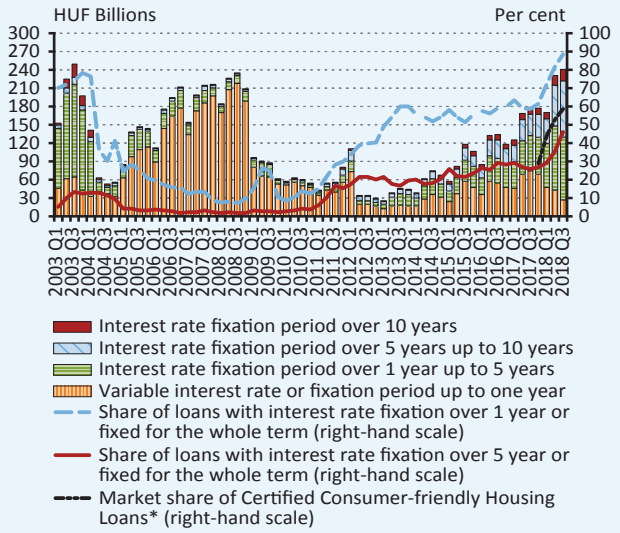
Source: MNB.

In the case of housing loans, the LTV rules continue to be more effective than the PTI limits (Chart 6). In the first three quarters of 2018, 42.5 percent of housing loan transactions were conducted around the debt cap limit, which means a 6.5-percentage-point increase from 2015. With respect to the effectiveness of the debt cap rules, LTV limits are more constraining overall: 25 percent of housing loans are disbursed with a high LTV, 12 percent are disbursed with a high PTI, while 5.5 percent are disbursed with high values in both indicators. The expanding proportion of the housing loans affected by both debt cap limits, which stood at 8 percent in the first three quarters of 2018, shows that the effectiveness of LTV and PTI limits is growing in the capital (Chart 7).

1.2 THE AMENDMENT OF THE DEBT CAP RULES IN OCTOBER REDUCES HOUSEHOLDS' VULNERABILITY

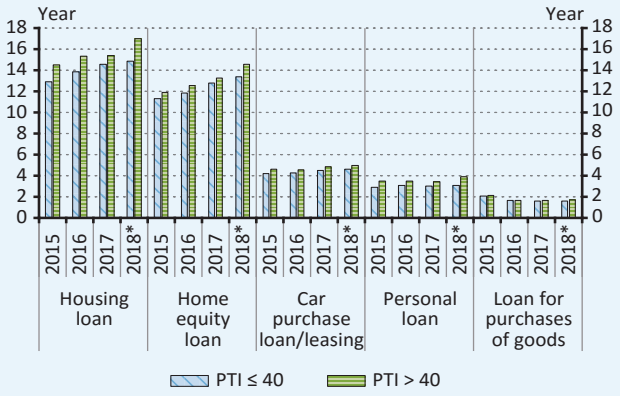
Since October 2018, debt cap rules protect mortgage debtors from the interest rate risk as well. In order to promote the growth in the share of the products with an interest rate fixed for a longer term or for the whole maturity period, which provides more protection against the potential rise in the interest rate environment, a PTI rule differentiated by interest rate fixation period was introduced from October 2018 (Table 1). Taking into account the introduction of the differentiated limits and the growing real wages, the income threshold of HUF 400,000 applicable to higher PTI limits will rise to HUF 500,000 from 1 July 2019. This new PTI requirement may effectively divert debtors towards loans with longer interest rate fixation periods, while the measure's lending impact is expected to be marginal, based on preliminary estimates. This is also corroborated by the fact that the structure of housing loans shifted towards longer fixed interest periods from the end of 2017, and in the third quarter of 2018, the proportion of loans with the interest rate fixed for over 1 year reached 90 percent (Chart 8).

Chart 8
Newly disbursed housing loans by interest rate fixation period



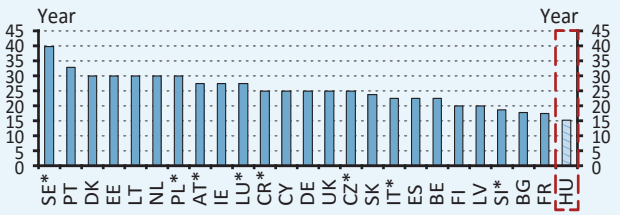
**The CCHL market share was calculated for the mortgage market of bank loans with at least 3 years interest rate fixation period.*
Source: MNB.

Chart 9
Evolution of the average maturity by PTI value and loan type



*Note: Distribution by contract number. *The 2018 data refers to the first three quarters of the year.*
Source: MNB.

Chart 10
Average maturity of newly disbursed housing loans in EU countries (2017)



*Note: Averages by contract number. In case of Portugal data refers to 2016, in case of Hungary to 2018. In case of Ireland, the average maturity of the first home buyers and others. There is no data available for Greece, Malta and Romania. *The middle of the given band.*
Source: European Mortgage Federation (2017), https://www.investujeme.sk

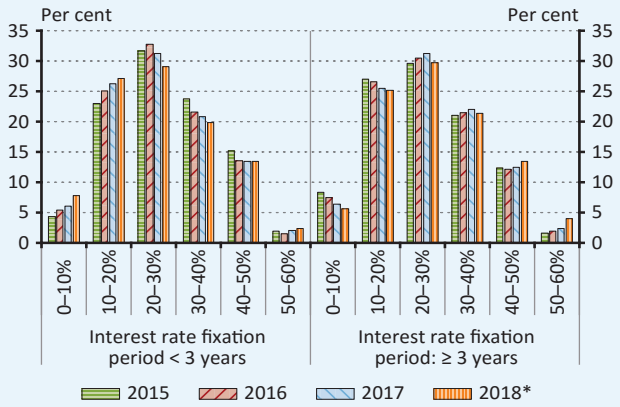
1.3 IN THE CASE OF THE ADJUSTMENT CHANNELS THAT ARE RELEVANT FROM THE PERSPECTIVE OF DEBT CAP RULES, NO MAJOR RISKS CAN BE IDENTIFIED

The strengthening effectiveness of PTI limits goes hand in hand with a slow rise in the average maturity of housing loans. The rise of the average maturity of housing loans has continued, growing to over 15 years in the first three quarters of 2018 (Chart 9). Between 2017 and 2018, the difference between the average maturity of the loans with high and low PTI increased by around one and a half years. The growing maturity of the loans disbursed with high PTI could suggest debtors' adjustment to PTI limits; however, such an adjustment is substantially disincentivised by the fact that as maturity is extended, the drop in the repayment instalments gets lower and lower, while the total repayment amount could rise significantly. The average maturity of housing loans, the loan category disbursed with the longest maturities, is not excessive, even by international standards: the average maturity of 15 years in 2018 falls short by 10 years of the 25 years typical in Europe (Chart 10).

Despite the growing effectiveness of PTI limits, no preference for shorter interest rate fixation periods to reduce repayment instalments can be observed. Even though the interest rate of the housing loans with a shorter interest rate fixation period is lower than in the case of the loans with longer interest rate fixation periods due to the slope of the yield curve, debtors with an overstretched income situation still cannot be seen adjusting to the PTI requirement by shortening the fixed interest rate period. (Chart 11) This suggests that even households with an overstretched income situation do not take on surplus interest rate risk to increase the loan amount. The differentiation of the PTI requirement by the interest rate fixation period from 1 October 2018 also serves to maintain this favourable situation.

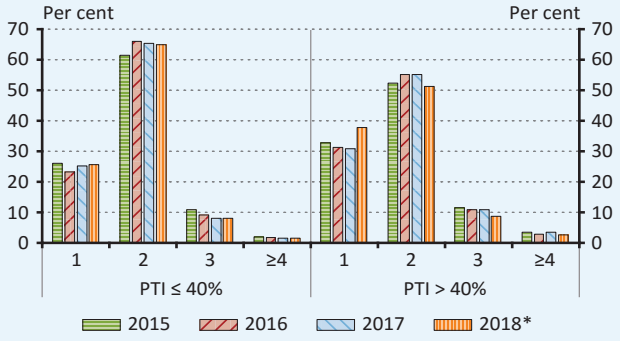
The increasing involvement of co-debtors to achieve more favourable PTI values is also not typical. In connection with the adjustment to the PTI requirement, increasing the encumbered income by adding more co-debtors may be an option. In almost two-thirds of Hungarian housing loans, two people are involved, and adding more co-debtors is not typical in the case of more overstretched debtors either (Chart 12).

Chart 11
PTI distribution of newly disbursed housing loans by the length of the interest rate fixation period



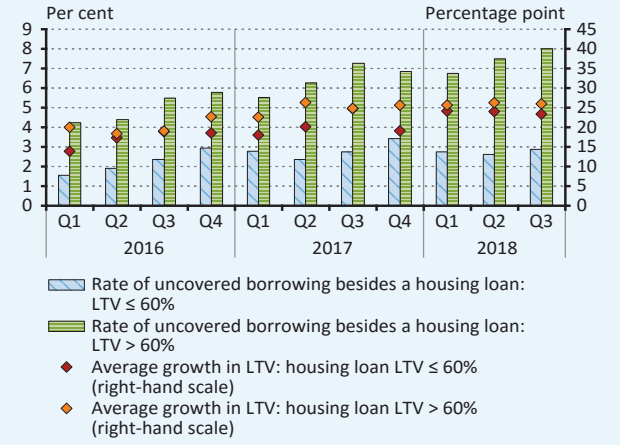
*Note: Distribution by contract number. *The 2018 data refers to the first three quarters of the year. Source: MNB.*

Chart 12
Distribution of newly disbursed housing loans by PTI value and the number of debtors involved in the contract



*Note: Distribution by contract number. *The 2018 data refers to the first three quarters of the year. Source: MNB.*

Chart 13
Estimated evolution of uncovered loans taken besides a housing loan



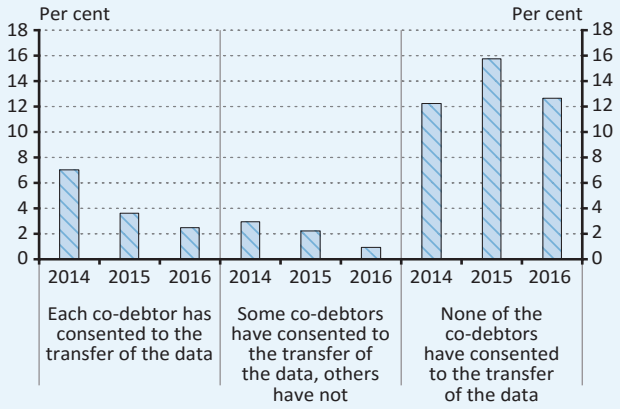
Note: The columns represent the share of those housing loans within the total number of mortgages in each category of LTV for which a personal loan was requested at most 180 days before the disbursement.

Source: MNB.

Debtors can also adjust to the LTV rules through unsecured borrowing. As the effectiveness of LTV limits increases and the interest rate on personal loans drops, certain borrower groups may adjust by taking out personal loans in addition to the housing loan, presumably to supplement their down-payment: by the third quarter of 2018, roughly 8 percent of the housing loans with an LTV of over 60 percent were preceded by taking out personal loans (Chart 13). Assuming, as an upper estimate, that these personal loans are used for the own contribution, and if all of these loans were added to the amount of the subsequent mortgage, the personal loans preceding the housing loans would increase the LTV value of the housing loan taken out later by approximately 25 percentage points, raising the LTV of the debtors concerned above the 80-percent regulatory limit in almost half of the cases. Although these personal loans are often not used as part of the down-payment, such circumvention of the LTV limit can be deemed risky. This practice is continuously monitored by the MNB; however, such an adjustment is only possible for the debtors with the appropriate income buffers, since the broader PTI rules also mitigate excessive unsecured borrowing.

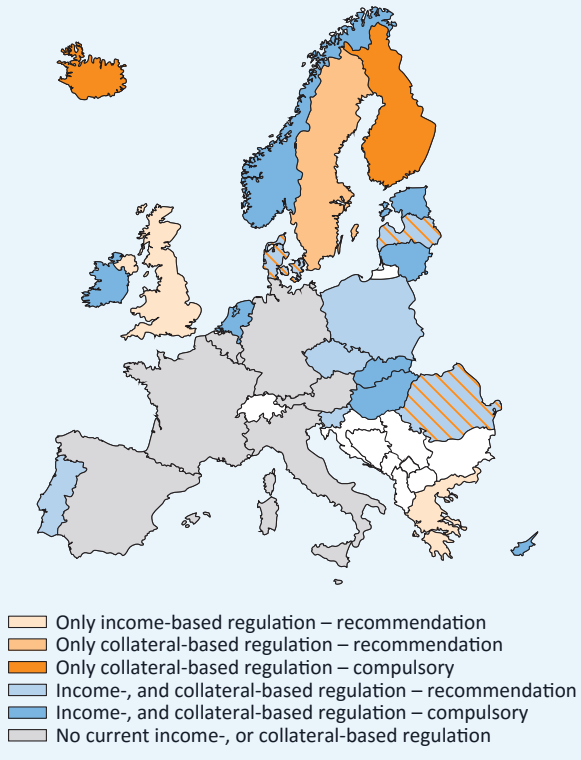
The automatic implementation of the PTI rules is hindered by the fact that access to positive credit history data is subject to consent. While determining the PTI rules, lenders may only enquire about the customer's repayment obligations with the customer's consent, and in the absence of that they must rely on the customer's declaration made under penalty of perjury. In a major portion of disbursed loans, the declaration of consent by at least one of the debtors in the transaction is typically unavailable. The information asymmetry between lenders and borrowers may lead to higher household interest rate spreads on account of the more conservative pricing by lenders or to borrower defaults (Chart 14). Accordingly, a positive debtor list based on compulsory data disclosure could enormously contribute to maintaining the sound structure of lending.

Chart 14
Evolution of default rates by the statement on transferability of positive credit data



Note: All loan types, by the year of borrowing. By contract number.
Source: BISZ Ltd., MNB.

Chart 15
Debt cap rules and recommendations in Europe



Note: In case of Denmark, Romania and Latvia the LTV rules are compulsory and the income-based limit is defined as a recommendation.
Source: ESRB, MNB.

1.4 DEBT CAP RULES ARE INCREASINGLY WIDESPREAD IN INTERNATIONAL PRACTICE, TOO

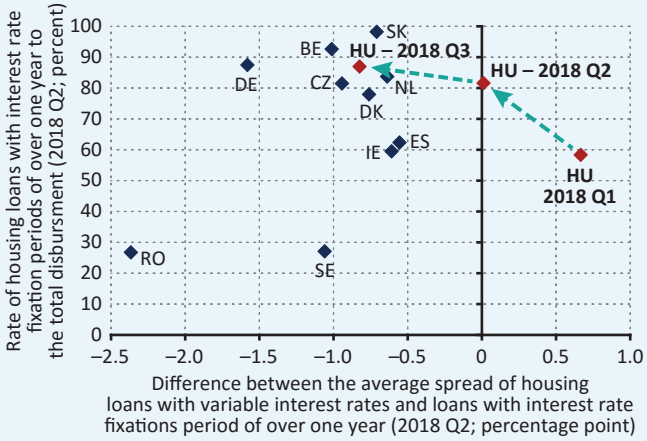
The debt cap rule changes entered into force recently in the EU set more lenient LTV requirements than those in the Hungarian regulation despite the tightening, while the income-based requirements cannot be accurately compared due to their diverging calibration. Since mid-2017, more European regulatory authorities have introduced or tightened debt cap rules. Northern and Central and Eastern European Member States continue to implement these requirements the most actively. (Chart 15) In the European countries where the regulation changed (FI, IE, IS, PT, SK), LTV limits are typically still more lenient (higher) than in Hungary, or a certain portion of the newly disbursed loans is allowed to exceed them. Fewer income-based rules were implemented in the past year, but these cannot be directly compared with the Hungarian regulation, partly because they limit the total outstanding debt (debt-to-income, DTI – IE, SK) or the loan amount (loan-to-income, LTI – CZ), and partly because eligible income means either gross income (IE) or net income less costs of living (SK). The regulation closest to the Hungarian PTI requirements is in effect in the Czech Republic and Portugal since 2018, but even in these cases some portion of the loans may exceed the determined limits. What is certain, however, is that the debt cap rules formulated as recommendations are increasingly replaced by compulsory requirements.

Box 1
The MNB initiatives supporting mortgage lending in a sound structure

The MNB has supported the widespread use of mortgages with longer interest rate fixation periods and the stimulation of market competition. The high share of variable rate mortgages disbursed to retail customers presents a major financial stability risk. The MNB has supported the mitigation of this risk by the amendment of the debt cap rules mentioned above, as well as on both the supply and the demand side.

The Magyar Nemzeti Bank launched the Certified Consumer-friendly Housing Loan (CCHL) initiative in June 2017 to mitigate households' interest rate risk and stimulate market competition. The standardised CCHL products, which can only be disbursed with a longer interest rate fixation period and which have readily comparable parameters, effectively help the reduction of interest rate risk by incentivising the widespread use of products with the interest rate fixed for a longer term or even until the end of the maturity. By October 2018, the share of the certified products among the potentially certifiable housing loans disbursed by banks was around 60 percent.

The share of housing loans with interest rate fixation periods of over one year and the difference between the spreads of housing loans with interest rate fixation periods of over one year and those with variable interest rates in an international comparison



Note: Interest rate spreads above the reference rate for variable interest rate loans were calculated as the difference between the volume-weighted APRC and the 3-month interbank rate, for fixed interest rate loans the IRS yields with the corresponding maturity. In case of Romania data refers to 2018 Q1.

Source: Bloomberg, European Mortgage Federation, MNB, central bank websites

The availability of long-term funding at low prices also helps the longer-term interest rate fixing of mortgages. Based on the Mortgage Funding Adequacy Ratio (MFAR) modified with effect from October 2018, at least 20 percent of mortgages shall be financed by credit institutions from long-term funds, which may support the further spread of mortgages with longer interest rate fixation periods from the supply side. Since January 2018, the increased mortgage bond issues and market activity were also influenced by the MNB's mortgage bond purchase programme. In addition, loose monetary conditions on the longer section of the yield curve were also helped by the monetary policy interest rate swap facility (MIRS) used from mid-January 2018.

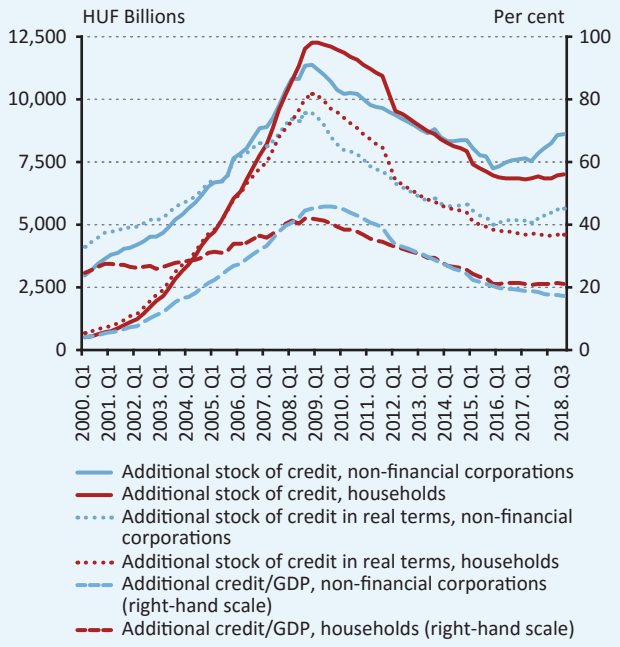
As a result of the MNB's initiatives, the share of housing loans with longer interest rate fixation periods or those with the interest rate fixed until the end of the maturity has increased, and the pricing of these products is already consistent with international practices. With the spreading of housing loans with the interest rate fixed for a longer period, households' resilience to interest rate shocks has considerably improved. Thanks to the spread of certified products and other central bank programmes, the relative pricing disadvantage between housing loans with the interest rate fixed for over one year and those with variable interest rates had disappeared by the summer of 2018. By May, the difference in spreads between the two product groups had been eliminated, and it turned negative by July. As a result, customers can take out safer housing loans with longer interest rate fixation periods at lower interest rate spreads than in the case of variable-rate loans, which is consistent with international trends.

The continued spread of longer interest rate fixation periods may be incentivised by the amendment of the tender document for the Certified Consumer-friendly Housing Loans effective from the same time as the differentiated PTI regulation. Pursuant to this, the three-year CCHL products offering lower protection against interest rate risk were phased out from 1 October 2018, and the certified housing loans with the interest rate fixed for 15 years were introduced.

2 Countercyclical capital buffer

In the Hungarian financial system, cyclical systemic risks are currently moderate. This is partly attributable to the fact that the reinvigorating lending activity at the beggining of the credit cycle's expansion phase still shows no signs of overheating. On the other hand, the vulnerability of the Hungarian financial system has remained reassuringly low in the recent past. The stress level in the Hungarian financial system reached historic lows in the past year, rising only moderately in June this year. Based on these, the activation of the countercyclical capital buffer (CCyB) applicable since 1 January 2016 has not been warranted.

Chart 16
Additional stocks of credit in different sectors and compared to GDP, 2000-2018



Note: Additional stock of credit comprises the exchange rate adjusted stock of outstanding loans to domestic and foreign non-financial corporations and households granted by domestic financial institutions. Exchange rate adjustment refers to calculating with the nominal exchange rates in the first quarter of 2015. Stock of credit in real terms represents nominal values expressed at 2005 price levels.

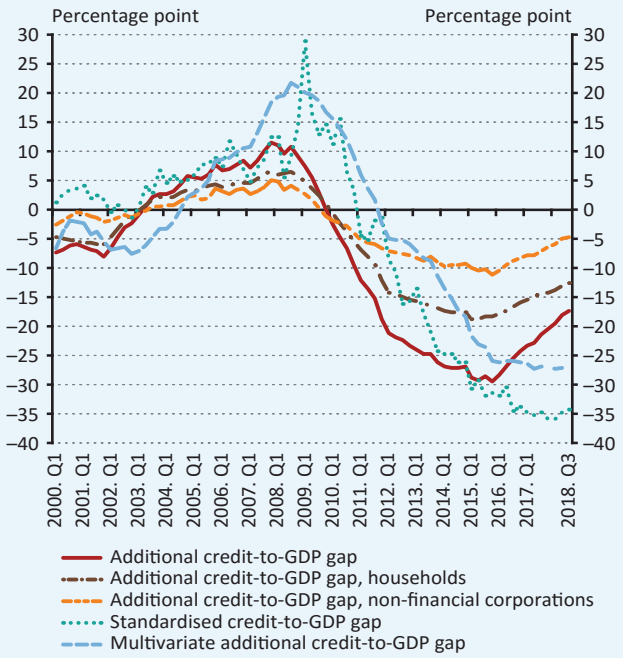
Source: MNB.

2.1 THE CURRENT LOW LEVEL OF CYCLICAL SYSTEMIC RISKS DOES NOT WARRANT AN INTERVENTION

The Hungarian credit cycle has once again entered an expansionary phase, although it is only at its beginning. Last year saw the continued dynamic rise in both corporate and household lending. In line with this, the outstanding credit stock also started expanding from 2016 in the corporate segment, and since 2017 in the household segment (Chart 16). Due to the dynamic economic growth, the drop in the credit-to-GDP ratio since the crisis was only replaced by stagnation in recent years. Among the credit-to-GDP gap measures,[1] which are the main indicators of the credit cycle, the additional credit-to-GDP gap has been closing since 2016 (Chart 17). However, the standardised credit-to-GDP gap and the multivariate credit-to-GDP gap stagnated around their bottom in the past year.

[1] The definitions of the more important monitored indicators are as follows. *Standardised credit-to-GDP gap:* The deviation of the GDP-proportionate lending stock from its long-term trend, 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.en.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/ccyb-methodology-new-en-1.pdf. *Multivariate additional credit-to-GDP gap:* The version of the additional credit-to-GDP gap calculated with the help of the indicators measuring economic developments related to the credit cycle and compiled based on accurate statistical requirements. For more details, see: Kocsis L. and Sallay M. (2018): Credit-to-GDP gap calculation using multivariate HP filter, MNB Occasional Papers, No. 136. https://www.mnb.hu/letoltes/mnb-op-136-final-1.pdf

Chart 17
Development of different credit-to-GDP gaps, 2000-2018



Note: For the definition of different gap measures, see Footnote 1.
Source: MNB.

No signs of excessive lending could be observed in the past year. The outstanding credit stocks relative to GDP were still well below their long-run trend, in other words the lending activity continues to fall short of the extent sustainable in the long run. This observation is supported specifically by the values of the multivariate additional credit-to-GDP gap, since that measure takes into account the effects of several economic developments related to the position of the credit cycle. The other indicators of the MNB's cyclical systemic risk map measuring the overheating of lending also confirm that no excessive lending emerged in the past year, and this is not expected in the near future either (Table 2).

The vulnerability of the financial system to external shocks remains low. The values of the relevant indicators of the cyclical systemic risk map from last year are in a safe distance from the levels indicating the vulnerability of the financial system to external shocks (Table 2). Only the gross external debt-to-GDP ratio, which currently stands at around 60 percent, which is the average level among emerging countries, entails moderate risks. However, this indicator has been steadily falling since 2011, and it has been halved since then. Another thing to take into account is that net external debt is currently merely roughly 10 percent of GDP, and within that the banking system's net external debt is practically negligible (Chart 18).

Table 2
Changes in selected indicators of the cyclical systemic risk map, 2002–2018

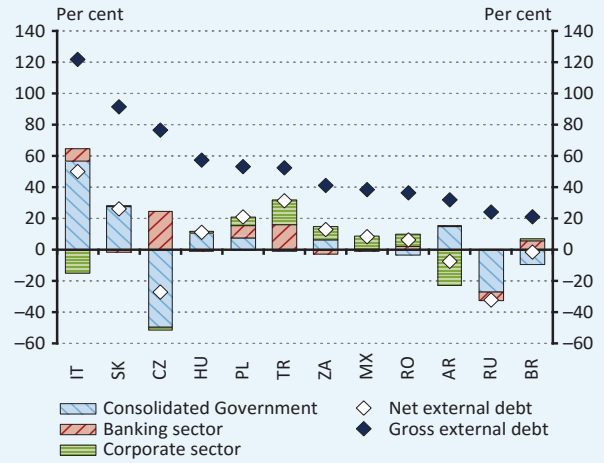
Overheatedness indicators	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Banks' credit-to-GDP gap, exchange rate adjusted																	
Financial institutions' credit-to-GDP gap, exchange rate adjusted																	
Credit-to-GDP gap with ESRB-recommended credit 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 33 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 2018. Yellow signals a medium level of risk, while red indicates a high level of cyclical systemic risk.

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

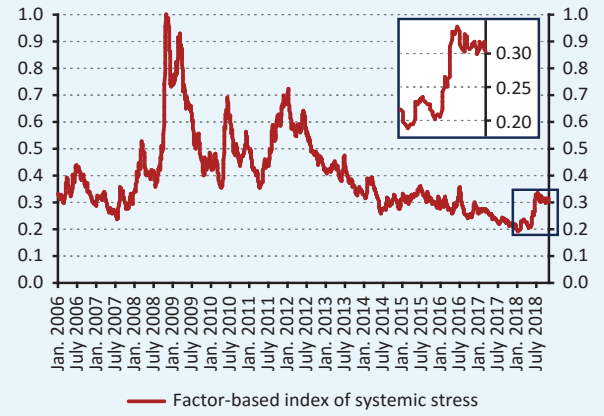
Source: MNB, HCSO, BIS.

Chart 18
Sectoral breakdown of net external debt relative to GDP, end of 2017



Source: IMF, MNB.

Chart 19
Development of the factor-based index of systemic stress



Note: The highlighted part of the graph refers to the period between 1 January 2018 and 31 October 2018.

Source: MNB.

Due to the low level of cyclical systemic financial risks, it is not justified to prescribe a countercyclical capital buffer. Since the introduction of the framework on 1 January 2016, neither excessive lending nor any major vulnerability to external shocks have emerged in the banking system. This is not expected to change much in 2019, which makes it likely that the currently prescribed 0-percent CCyB rate will be maintained in the near future.

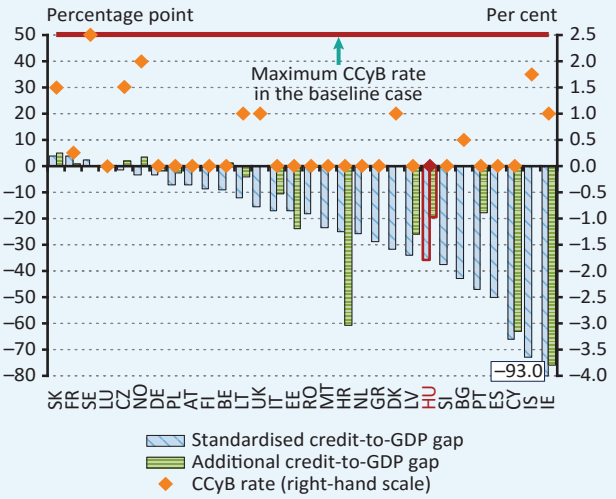
According to the current values of the factor-based financial stress index (FSI),[2] the stress level in the Hungarian financial system remained low in the past year (Chart 19). In 2018 Q2, investors' risk appetite in the financial markets of emerging countries considerably declined. Mainly on account of this, and in the context of unchanged Hungarian monetary policy conditions, the Hungarian interbank and government yield curves have shifted upwards, and the forint depreciated by approximately 5 percent against the euro in parallel with some increased volatility in exchange rates. The FSI, which aggregates financial stress, identified this as a slight increase in stress relative to the historically low level typical in the previous year.

2.2 MORE AND MORE EUROPEAN COUNTRIES PRESCRIBE A COUNTERCYCLICAL CAPITAL BUFFER

Already 11 EEA countries prescribed a countercyclical capital buffer last year (Chart 20). The group of countries deciding to require a positive CCyB rate was joined, in chronological order, by Lithuania, Denmark, France, Ireland and lastly Bulgaria between July 2017 and September 2018. Among the six other countries, the CCyB rate was raised in the Czech Republic, the United Kingdom, Iceland, Sweden and Slovakia; only Norway decided to maintain the level of the buffer rate (at 2 percent). Macroprudential authorities made their decisions on a largely discretionary

[2] For the details of the creation of the index, see Szendrei T. and Varga K. (2017): FISS – A factor-based index of systemic stress in the financial system, MNB Working Papers, No. 2017/9. https://www.mnb.hu/letoltes/mnb-wp-2017-9-final-1.pdf.

Chart 20
Credit-to-GDP gaps and CCyB rates in Europe based on revisions until September 2018



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

Source: ESRB.

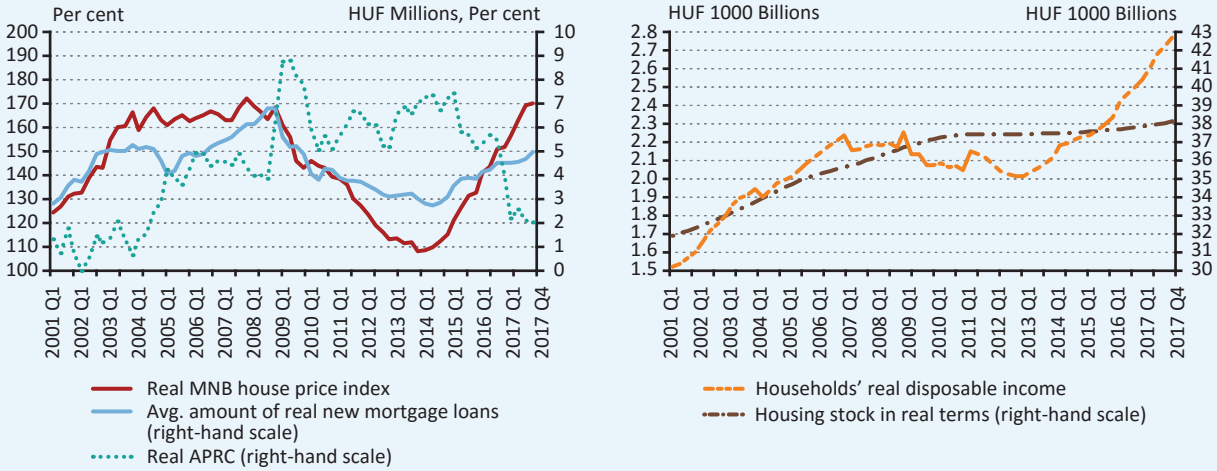
basis, since the buffer rate close to the benchmark rate calculated in accordance with the ESRB's relevant methodological recommendation (ESRB/2014/1) is only required in France and Slovakia. In all other countries, the national macroprudential authorities set higher buffer rates than the benchmark. This is particularly true in Bulgaria, Denmark, the United Kingdom, Ireland, Iceland and Lithuania, where the standardised and the additional credit-to-GDP gap, where the latter exists, are significantly negative. In September 2018, there was no EEA country where the benchmark CCyB rate was positive and still no countercyclical capital buffer was introduced. Countercyclical capital buffers were principally used due to the cyclical systemic risks related to the steadily rising property prices. On the other hand, the precautionary motives are also increasingly widespread, which is attributable to the fact that cyclical systemic risks cannot be accurately measured; furthermore, unforeseen shocks can also occur. Therefore, banks are required to hold buffers by default, which can be released in adverse situations to enable a more rapid recovery after a crisis.

Box 2
The short- and long-run relationship between house prices and housing loans based on Hungarian data

The extent to which the current dynamic rise in house prices in Hungary can heighten the risk of excessive lending should be examined. If house prices are rising, the value of the properties serving as collateral to the housing loans also increases, which allows for larger loan amounts to be taken out. The boom in housing loans may further fuel house prices, as it boosts demand for housing. However, the market house prices may temporarily rise above the equilibrium level on account of market frictions and the bounded rationality of market participants. The so-called financial accelerator effect, which describes the mutually strengthening impact between rising house prices and housing loans, may heighten the risk of excessive lending in such situations. This could mean that too many loans are extended, which may lead to substantial losses for banks due to the depreciation of the collateral as the temporary overvaluation of homes abates.

A vector error correction model (VECM) was used on Hungarian data from between 2001 and 2017 to estimate the strength of the relationship between house prices and housing loans. Besides the MNB real housing price index measuring the development of house prices and the real average loan amount for new homes characterising housing loans, the inclusion of three other variables influencing the relationship between house prices and housing loans turned out to be warranted (annual percentage rate in real values, households' real disposable income, real stock of dwellings). It was worth taking into account the quarterly time series starting in early 2001, because earlier the amount of housing credit was very low, and prior to 1990 house prices and housing loans did not develop in a market economy framework. In international practice, the variable characterising housing loans in VECM models is usually the stock of housing loans or the volume of new housing loans taken out. However, these variables could not be used well on the short Hungarian time series, therefore the average new housing loan amount was used instead. Based on the data utilised, the VECM method identified two so-called cointegration relationships, one with respect to house prices, the other with respect to housing loans. These show the estimated trend values of house prices and housing loans for each quarter based on the values of the other indicators observed in the given quarter. These trend values are the ones that observed values would converge towards in the context of unchanged economic conditions.

Time series used for the estimation of interactions between housing prices and mortgage lending



Note: All time series are deflated with the consumption deflator to the price level of 2005. The value of nominal MNB house price index in the first quarter of 2000 is 100 per cent. APRC: Annual Percentage Rate of Charge. Households' disposable income comprises quarterly aggregate of net earnings and transfers. Housing stock data account both for amortisation and for housing investments thereby also for renewals.

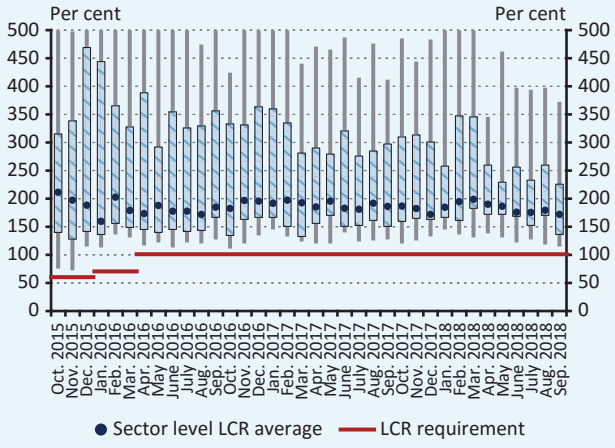
Source: HCSO, MNB.

According to the results, the observed values of house prices and housing loans converge relatively slowly towards their estimated trend values, and cyclical positions are halved after 4–5 quarters. Based on the estimated VECM model, a hypothetical 1-percent rise in house prices increases the estimated trend value of the average new housing loan amount by around 0.7 percent. The reverse long-run relationship is similarly strong, since a 1-percent rise in the average new housing loan amount entails a 0.5-percent increase in the trend value of house prices. These trend values are influenced even more by income, because a hypothetical 1-percent rise in the income measure used raises both by approximately 0.9 percent. Under unchanged economic circumstances, the deviations from the trend values of house prices and housing loans are halved after 4 and 5 quarters, respectively. The model did not show any major cross effect between the cyclical positions, so they do not particularly hinder or stimulate each other's closing. The change in housing loans from one quarter to the next, i.e. their short-term change, is influenced not only by the closing of the cyclical position but also, directly and in a positive direction, by the rising house prices from two quarters earlier. Such long-run relationship could not be identified in the opposite direction. Overall, in Hungary, house prices exerted a more pronounced impact over housing loans in both the short and the long run than in the other direction, therefore monitoring the currently dynamically expanding house prices is crucial from a macroprudential perspective. The VECM model showed negative cyclical positions for end-2017, which confirms the MNB's assessment that currently no signs of excessive lending can be identified.

3 Basel liquidity and funding requirements

Banks meet the the Liquidity Coverage Ratio (LCR) requirement with a huge surplus, therefore the LCR regulation serves as a risk-prevention instrument for now. Liquidity buffers have remained high thanks to the growth in liquid assets in parallel with increased outflows. The 100-percent minimum requirement for the Net Stable Funding Ratio (NSFR), which is expected to take effect after 2021, following its implementation in the EU, and which facilitates institutions' stable funding, is already satisfied by most Hungarian banks.

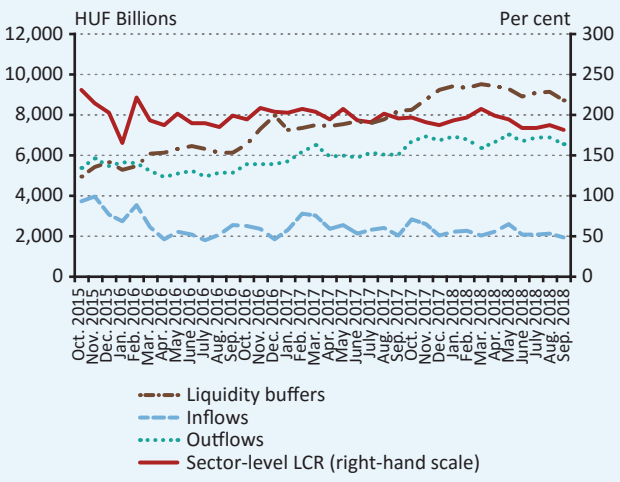
Chart 21
Development of institutions' LCR



Note: The 10th and 90th percentile, first and third quartile values and averages are represented. Without mortgage banks and building societies.

Source: MNB.

Chart 22
Development of sector-level LCR



Source: MNB.

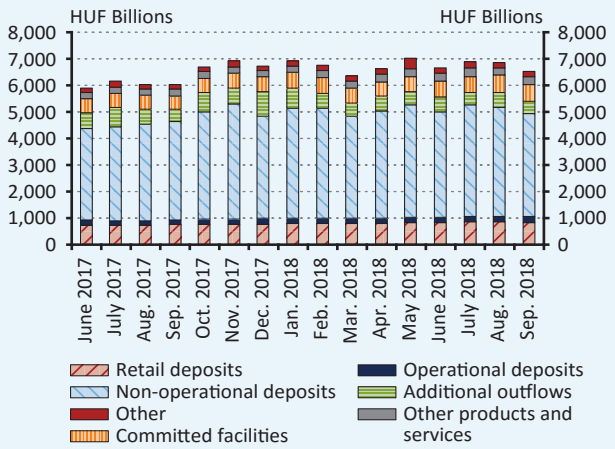
3.1 BANKS SATISFY THE LIQUIDITY COVERAGE REQUIREMENT WITH A MAJOR SURPLUS

Banks meet the requirement for the Liquidity Coverage Ratio (LCR) with huge surpluses. Similar to the previous year, the LCR, the required minimum level of which is 100 percent in all EU Member States since 1 January 2018, fluctuated between 170 and 200 percent on average in the Hungarian banking system in the first three quarters of 2018 (Chart 21). The overwhelming majority of institutions meet the minimum requirement with a buffer of over 30 percent, although there are some market participants where a more stretched liquidity situation can be observed.

In the context of growing net outflows, banks kept liquidity buffers high by increasing their holdings of liquid assets (Chart 22). Banks can adjust to the LCR requirement by maintaining or increasing the level of liquid assets or reducing net outflows. The LCR adjustment in Hungary typically took place through the first channel: the primary reason behind the growth in liquid assets was that the increase in deposits, which was even greater than the expansion in credit, translated into a rise in liquid assets.

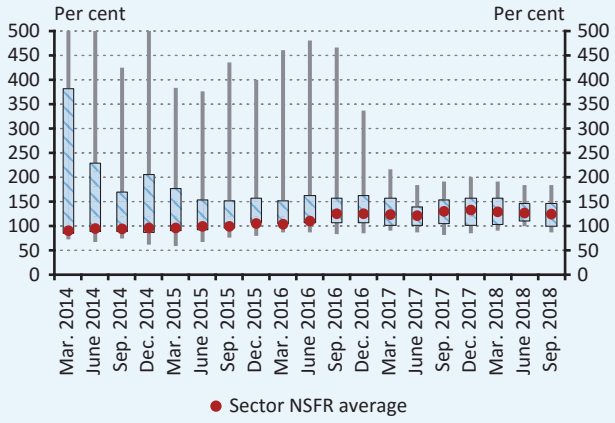
In the past one year, banks' net outflows have climbed as inflows were reduced and outflows increased. The main driver of the increased outflows was the growth of non-operational, typically short-term corporate deposit outflows, which comprised the majority of outflows (Chart 23). On account of the calculation that takes into account the existing deposits and fixed outflow rates depending on the stability of the deposit, the nominal growth in deposits led to an expected increase in the assumed deposit outflows for a 30-day period.

Chart 23
Development of LCR outflows



Source: MNB.

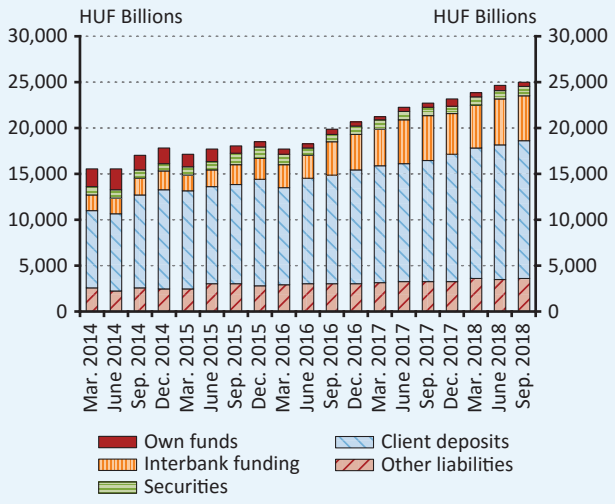
Chart 24
Development of institutions' NSFR



Note: 10th, 25th, 75th and 85th percentile values and the weighted average.

Source: MNB.

Chart 25
Elements of available stable funding



Source: MNB.

Consistent with the position of the credit cycle, liquidity buffers are high, and the LCR continues to serve as a risk-prevention instrument. The growth in net outflows was accompanied by the rise in liquid assets, which continue to be mainly comprised of government securities. However, the continued expansion in credit may lead to a gradual decline in the buffers in the long run.

3.2 COMPLIANCE WITH THE NSFR REQUIREMENT INDICATES A STABLE BANK FUNDING STRUCTURE

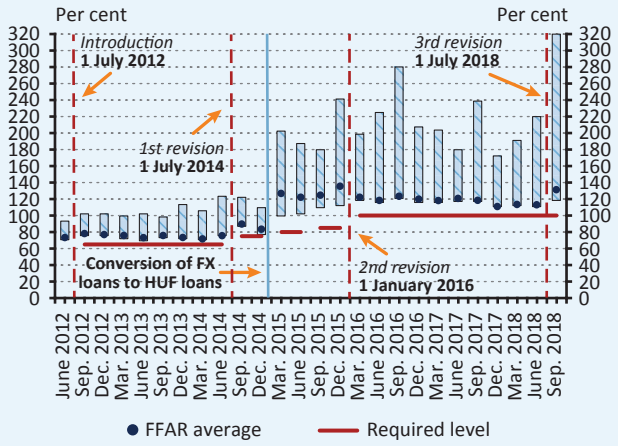
The sector-level average of the Net Stable Funding Ratio, which is expected to take effect after 2021, following its implementation in the EU, increased somewhat over the past year. Most Hungarian banks already meet the expected 100-percent minimum requirement (Chart 24). At the end of September 2018, the sector-level average NSFR was 124 percent, and only a few smaller market participants, based on their balance sheet total, have an indicator below the 100-percent minimum requirement.

The major factor in the moderate growth in the NSFR was the expansion in client deposits, which dominated the stable funding items. In the case of Hungarian banks, the greatest item requiring stable funding is still loans to non-financial customers, which is followed by loans to financial customers. 60 percent of the stable funding items comprise client deposits, while the deposits by financial customers and components of equity represent 20 percent each. This means that client deposits play a dominant and constantly increasing role (Chart 25). Owing to the existing buffers and the growing deposits, meeting the NSFR requirements currently does not act as a strong limit on continued credit expansion.

4 Macroprudential requirements reducing external vulnerability

The macroprudential instruments reducing the external vulnerability of the banking system were rearranged in 2018. In the spirit of preparing for the stable funding requirement to be introduced in the EU, the Foreign Exchange Funding Adequacy Ratio (FFAR) started to converge towards the EU's future requirements. The amendment that took effect on 1 July 2018 did not present any major adjustment requirement for banks. The MNB also decided to introduce a new, targeted macroprudential measure to prevent the over-reliance on funds from financial corporations, namely the Interbank Funding Ratio (IFR), effective from 1 July 2018. Due to the preventive nature of this measure and in the light of the current low level of these funds, no substantial adjustment requirement emerged in the banking system. The Foreign Exchange Coverage Ratio (FECR), which limits the on-balance sheet open foreign currency position, continues to ensure the sustainable financing of foreign currency assets, and it also prevents the build-up of excessive foreign currency swap market exposures. These complementary instruments continue to ensure the adequate funding of foreign currency assets at the sector level and to keep external vulnerability moderate.

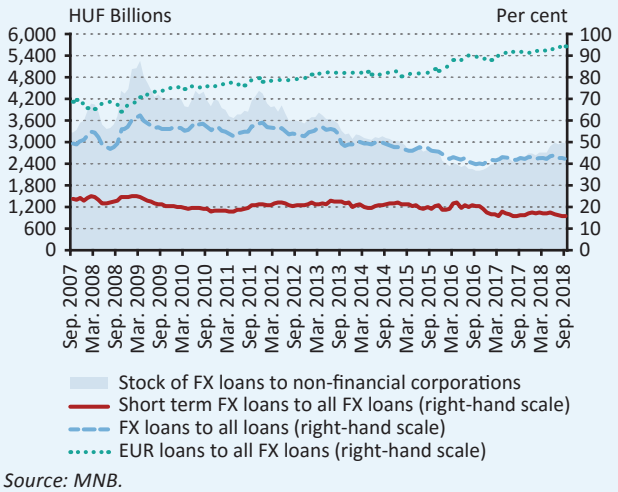
Chart 26
The development of institutions' FFAR



Note: First and third quartile values.

Source: MNB.

Chart 27
The development of FX lending to corporations



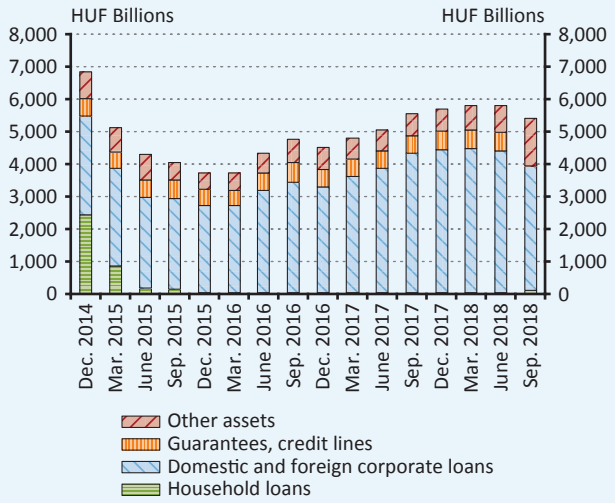
Source: MNB.

4.1 THE MNB'S REQUIREMENTS ON FX FUNDING ENSURE THAT EXTERNAL FUNDING RISKS REMAIN AT SAFE LEVELS

Overall, the Hungarian banking system operates with a significant stable FX financing surplus. In 2018, the sector-level FFAR decreased (Chart 26), mainly on account of corporate lending in euros (Chart 27). In the past year, the sector-level required stable funding increased firstly and generally due to the rise in FX corporate loans, including project loans, and secondly due to the rise in FX loans to non-residents in the case of one institution (Chart 28). The stock of stable FX funds only partly reflected the growth on the asset side. The share of more stable financing within the stock, such as funds with maturities of over one year and client deposits, somewhat increased (Chart 29).

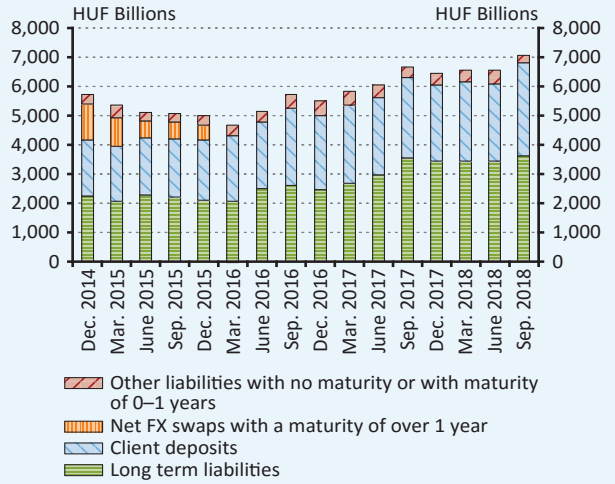
The revised FFAR regulation took effect on 1 July 2018. The review of the regulation was warranted from numerous perspectives. The main reason behind the modification of the indicator was convergence to the future NSFR. On the other hand, the MNB also took into consideration the changes in banks' balance sheet structure and FX funding practices while undertaking the modification.

Chart 28
Items requiring long term funding



Note: Taking into account the actual weights of FFAR.
Source: MNB.

Chart 29
Items providing long term funding



Note: Taking into account the actual weights of FFAR.
Source: MNB.

The required FFAR level and the basic formula of its calculation remained unchanged. The main amendments arose from the expansion of the maturity categories and the modification of the weight of the individual items (Table 3). Moreover, the weight of the guarantees used so far was substantially reduced, and the net stable funding requirement arising from derivative positions was also included.

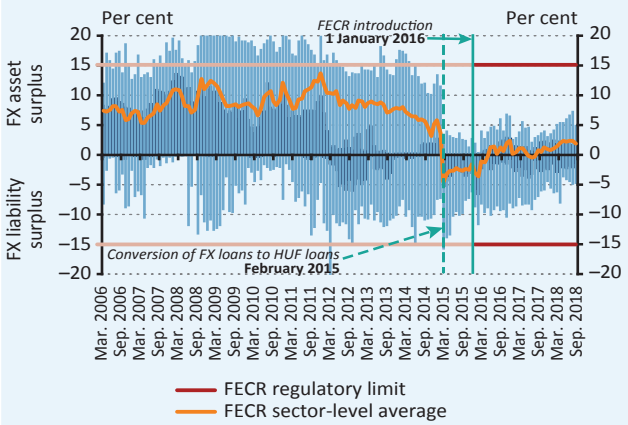
The convergence of the FFAR to the NSFR helped compliance at both the individual and the sector level. By the end of September 2018, the sector-level FFAR had climbed over 130 percent on account of the modifications. The indicator of most banks increased, with only a few exceptions with special business model. Thus, the modified requirement generated no major adjustment requirement either at the individual bank level or the sector level. Some funding realignment was observed on account of the revision of the FFAR in favour of client deposits. The revised FFAR regulation continues to work as a preventive FX funding requirement inhibiting the emergence of the relevant systemic risks. Together with the MNB's old and new liquidity and funding requirements, the revised instrument is able to ensure adequate stable FX funding for the banking system's FX assets and preserve the current low level of external vulnerability.

Table 3
Main changes in the FFAR regulation

Areas	Regulation prior to 1 July 2018	Revised FFAR
Maturity categories	Differentiation between maturities of under and over one year	3 maturity categories: 0–6, 6–12, 12+ months
Weighting	based on the original Basel standard*	based on the EU Commission's CRR proposal**
Fund weights (ASF) – stable deposits – less stable deposits	 90% 80%	 95% 90%
Asset weights (RSF) – for performing loans with maturities of over one year – for guarantees	 100% 0-100%	 85% 1%
Derivatives (primarily FX swaps)	not recorded on either the assets or the liabilities side***	all cash flow items should be reported; netting across currencies, ASF 0%, RSF 100%

**BCBS, Basel III: the net stable funding ratio, December 2009, **COM/2016/0850, ***with the exception of central bank instruments on the liability side*
Note: The stricter approach is marked with blue.

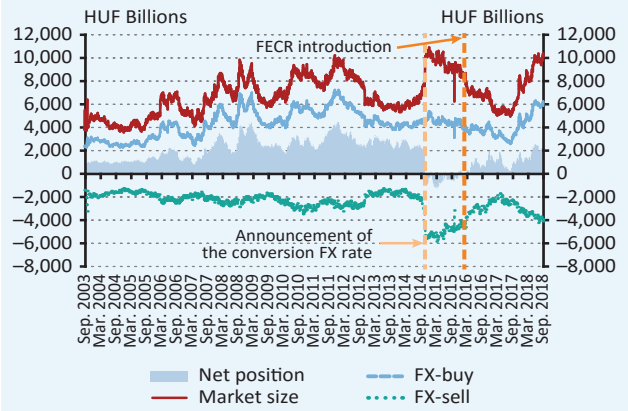
Chart 30
The development of institutions' FECR



Note: First and ninth decile, and first and third quartile values.

Source: MNB.

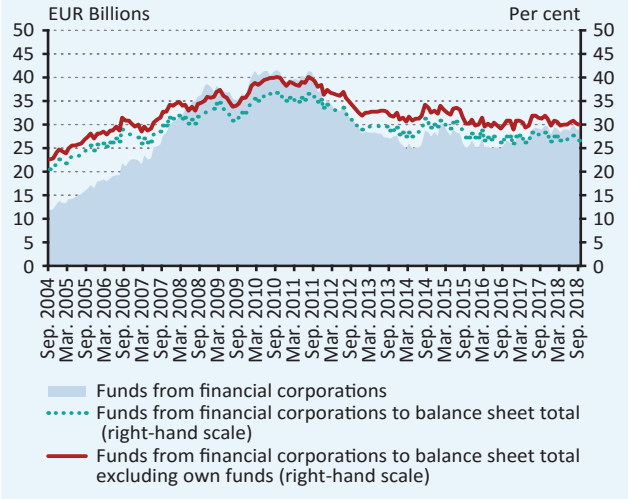
Chart 31
Swap market volumes



Note: Only FX swaps vis-á-vis HUF.

Source: MNB.

Chart 32
Financing originating from financial corporations



Note: Excluding foreign, non-bank partners.

Source: MNB.

4.2 THE FOREIGN EXCHANGE COVERAGE RATIO (FECR) LIMITS OFF-BALANCE SHEET FX FUNDING RISKS

The regulation ensuring denomination matching works as a preventive instrument not hindering normal banking operations. The FECR requirement effective from 1 January 2016 reduces the open on-balance sheet foreign exchange position and the excessive swap market dependence that helps to close it.

The overwhelming majority of institutions are far from the FECR limits (Chart 30). Although the shares of the banks with an FX liability surplus and those with an FX asset surplus are quite similar, a slow realignment can be observed at the sector level in the wake of the pick-up in corporate FX lending towards the on-balance sheet FX asset surplus. Banks may still have some room for widening the on-balance sheet open positions, and for closing them through the appropriate FX swap market transactions. Although these developments need to be closely monitored, the size of the sector-level open position and its relatively low dispersion among institutions do not indicate a substantial FX funding risk yet.

The banking sector's stock of gross FX swaps has been steadily growing for a year, but this exerted only a limited impact over FECR and FFAR compliance. The size of the FX swap market almost doubled in a year. This is attributable to the combined effect of multiple factors. On the one hand, the MNB's swap programme providing forint liquidity and the FX-generating swap operations on the banking market based on that substantially expanded the market. On the other hand, banks once again increasingly use FX swaps to meet the growing funding requirement of the upswing in corporate FX lending. However, besides the increase in market size, the growth in net swap exposures was mostly influenced by non-residents' transactions providing FX funds to Hungarian banks (Chart 31). Overall, the on-balance sheet FECR positions were not considerably influenced by the FX swap market trends observed.

4.3 THE MNB MITIGATES THE OVER-RELIANCE ON FINANCIAL SECTOR FUNDS WITH A NEW TARGETED INSTRUMENT

The over-reliance on the funds from the financial sector may cause considerable vulnerability in the banking system in turbulent times. According to international experiences, the growth of funds that are traditionally considered more stable, mostly client deposits, cannot keep up with the expansion in assets in times of dynamic

Chart 33
The construction of the IFR

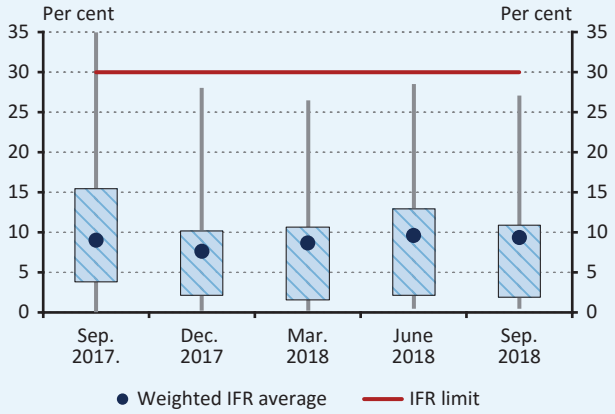
$$\text{IFR} = \frac{\text{Weighted stock of funds from financial corporations}}{\text{Total liabilites} - \text{Equity}}$$

Weights (%)	0–1 year	1–2 years	2+ years
FX	100	30	0
Forint	70	20	0

Note: These are the factors of non-preferential funds, while the preferential funds have 20 percentage points lower, but minimum 0-percent factors.

Source: MNB Decree 10/2018 (III. 27).

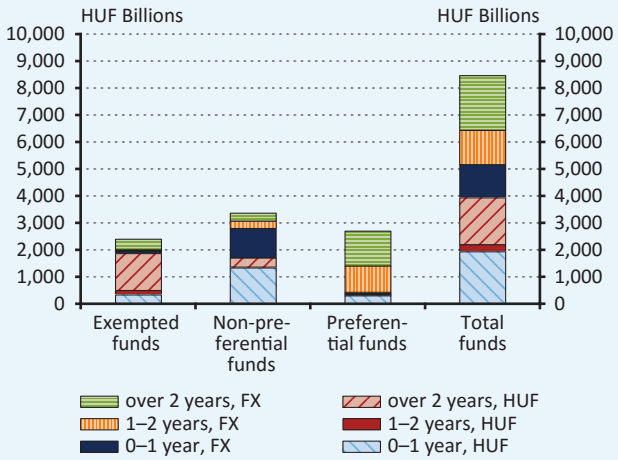
Chart 34
Development of banks' IFR



Note: First and ninth decile values and first and third quartile values. Data for quarters before June 2018 are estimates.

Source: MNB.

Chart 35
The structure of banking system's funds originated from financial corporations from an IFR perspective



Note: Based on September 2018 data. By residual maturity, by item groups differentiated by IFR regulation.

Source: MNB.

lending, therefore banks turn towards other sources of financing, primarily from banks but also from other financial corporations (e.g. insurers, pension funds and investment funds). Under normal conditions, the market of financing from financial corporations is liquid and efficient. However, refinancing these funds through the funding channels may prove difficult in certain cases, may become very expensive or even impossible. This is the case when a shock affects multiple market participants or the whole financial system, as it was experienced during the 2008 financial crisis.

The MNB introduced the Interbank Funding Ratio (IFR) from 1 July 2018. The regulatory management of the risks stemming from funds from financial corporations was warranted in Hungary, too. Prior to the crisis, the volume and share of these funds rose steeply, reaching historic highs in 2010 at 40 percent of the banking system's liabilities (Chart 32).

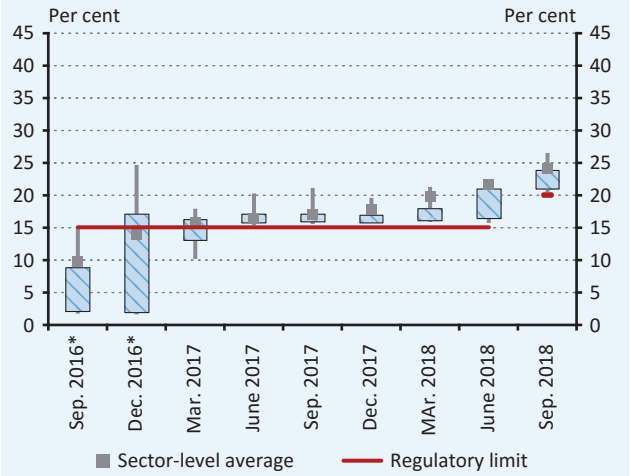
The new regulation affects the risks of the funds stemming from the financial sector in a targeted manner. The IFR caps the funds from financial corporations in a weighted form by currency and residual maturity, at 30 per cent of the balance sheet total less equity (Chart 33). The indicator shall incorporate all funds from financial corporations, but the exceptions and haircuts ensure that the regulation does not materially influence normal banking operation or clash with the aims of other MNB regulations. The new regulation prevents banks' over-reliance on the funds from financial corporations and the build-up of the systemic risks resulting from this.

Due to its preventive nature, the IFR has generated no substantial adjustment requirement in the Hungarian banking system. The 30-percent cap for the indicator did not force the overwhelming majority of banks to adjust (Chart 34). At the same time, it acts as an effective limit on the banking system's excessive exposure to the systemic risks and external vulnerabilities arising from the disproportionate amount of funds from financial corporations in the future, especially FX and short-term funds (Chart 35). If banks get near the limit in a credit boom, they may reduce mainly the share of short-term funds, specifically those denominated in foreign currency.

5 Mortgage Funding Adequacy Ratio

Pursuant to the amendment to the Mortgage Funding Adequacy Ratio (MFAR) requirement effective from 1 October 2018, at least 20 percent of the mortgage loans need to be financed by banks from longer-term mortgage-backed funds; the actors in the sector have successfully adapted to this change. New mortgage bond issuances of approximately HUF 360 billion were undertaken in the first three quarters of 2018 in connection with the increase of the limit. The raising of the MFAR level mitigates the excessive forint maturity mismatch and effectively supports the growth of the Hungarian mortgage bond stock; there is still room for the latter by international standards and also based on past Hungarian data. Banks have remained the largest investors on the mortgage bond market, but their share may diminish in the wake of the MFAR tightening, as the modification that took effect on 1 October 2018 reduces cross-financing within the banking sector.

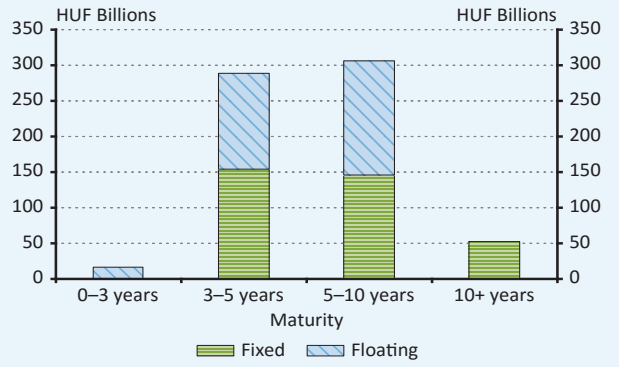
Chart 36
The development of institutions' MFAR compliance



*Note: Minimum and maximum and 1st and 3rd quartiles. Up to June 2018, the limit effective since April 2017, afterwards the limit effective from October 2018 is shown. *Estimation only for large banks.*

Source: MNB.

Chart 37
Mortgage bond issuances between 1 January 2017 and September 2018 by maturity and interest rate



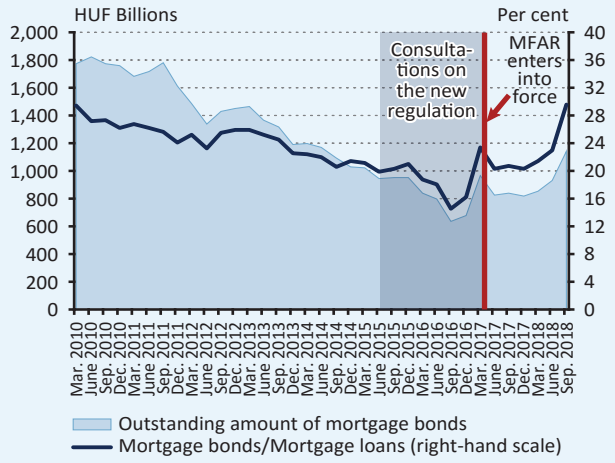
Source: MNB.

The Mortgage Funding Adequacy Ratio (MFAR) effective from 1 April 2017 and requiring a higher, 20-percent level since 1 October 2018 is met by most institutions with a low buffer. Although the average sector-level compliance was close to 25 percent in September 2018, institutions vary widely with respect to the buffers held in excess of the minimum requirement (Chart 36). While several banking groups with a mortgage bank have more long-term funds than the regulatory minimum, the institutions complying with the regulation by taking out refinancing loans typically hold a low buffer of 1–2 percentage points.

The volume of mortgage bonds increased significantly between 1 October 2016 and 30 September 2018, with net mortgage bond issuances of HUF 500 billion. During the adjustment to the 5-percentage point limit increase effective from 1 October 2018, new mortgage bond issuances of around HUF 360 billion occurred in the first three quarters of 2018. The necessary mortgage bond issuances happened exclusively in forint in line with the MFAR requirements, and most maturities were between 3 and 10 years (Chart 37). 53 percent of the mortgage bonds issued since 2017, and 70 percent of the whole stock of mortgage bonds have a fixed interest rate, which may support the long-term fixing of the interest rate of mortgage loans.

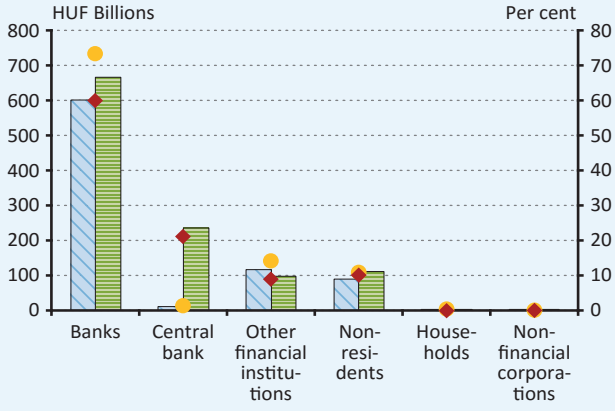
Since the announcement of the MFAR regulation, the volume of mortgage bonds started to expand, but there is still ample room for further deepening. The amendments that took effect on 1 October 2018 enable the further deepening of the market and support the better matching between assets and liabilities. Although banks have become more active in terms of mortgage bond issuances since the introduction of the MFAR, the mortgage loan stock's coverage with mortgage-backed funds has not significantly

Chart 38
Development of domestic outstanding amount of mortgage bonds and mortgage bond/mortgage loan rate



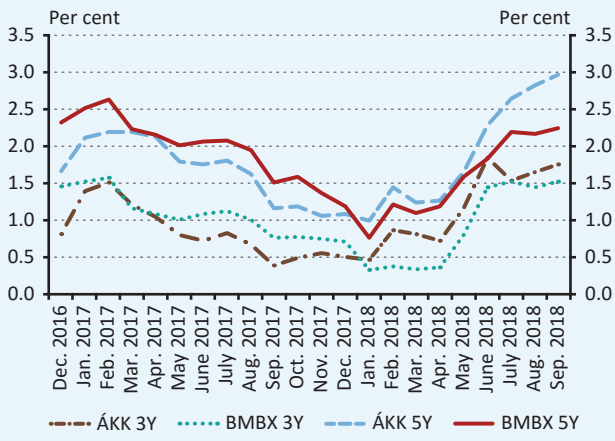
Source: MNB.

Chart 39
Outstanding amount of domestic mortgage bonds by owner sectors



Source: MNB.

Chart 40
Development of government bond and mortgage bond yields



Source: BSE, MNB.

exceeded the minimum requirements, especially in the case of the institutions complying through refinancing loans. The total outstanding stock of mortgage bonds on 30 September 2018 was roughly 30 percent of the total retail mortgages, which means a considerable shift from the historic low in September 2016; however, the outstanding stock of mortgage bonds still falls well short of the 2010 value (Chart 38).

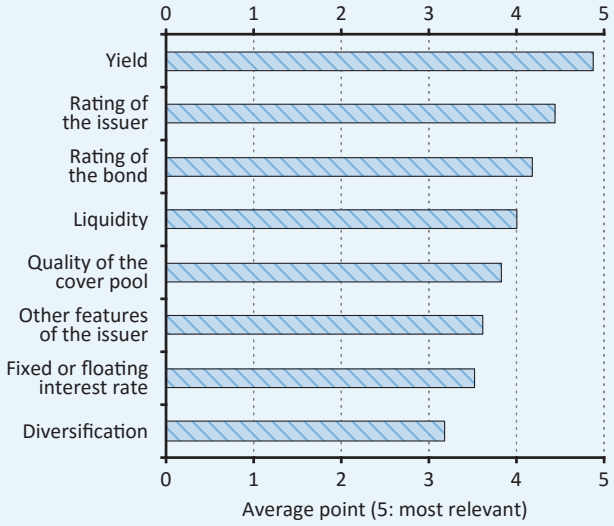
Banks have remained the most important investors on the mortgage bond market, but their share may contract in the wake of the October 2018 amendment to the MFAR regulation. In the short run, the adjustment to the higher level entailed raising of new funds, therefore institutions' balance sheet total increased, and the value of the bonds issued appeared on financial markets as demand from banks. Therefore, banks play a significant role on the mortgage bond market as investors, too. Since cross-holdings do not provide new long-term funds at the sector level, these holdings were disincentivised in the MFAR regulation, as well. The holding of mortgage bonds by banks is constrained by the fact that on account of the amendment that took effect on 1 October 2018, cross-financing reduces the value of eligible funds when calculating the MFAR. As a favourable development, banks' holdings already diminished in 2018, partly on account of the MNB's mortgage bond purchase programme (Chart 39).

After taking a nosedive since February 2017, mortgage bond yields have recently started rising again. The previously positive spread of mortgage bonds over the government securities market yields turned negative in early 2018, which can be attributed to the launching of the MNB's mortgage bond purchase programme. Although both government securities market yields and mortgage bond market yields started soaring in May 2018, mortgage bond spreads remained negative until the end of September (Chart 40).

Box 3
Investor demand for mortgage bonds

The raising of the MFAR level and the constraining of banks' cross-holding could considerably increase mortgage bond purchases outside the banking system. The demand side of the mortgage bond market is worth examining: who are the potential investors and how could the mortgage bonds, providing favourably priced long-term funds, be made even more attractive to investors? Among Hungarian actors, with banks' role expected to decline, the significance of investment funds, insurers and pension funds may increase among mortgage bond purchasers. The MNB has conducted a survey among these market participants regarding their mortgage bond investments and their proposals for enhancing the mortgage bond market.

Aspects determining investors' mortgage bond purchase decisions



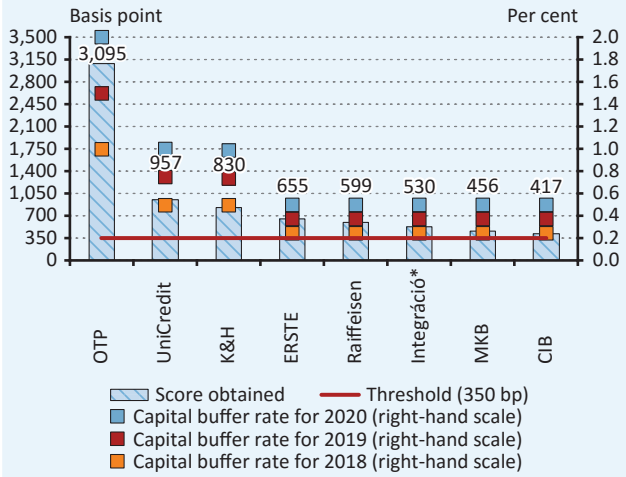
Source: MNB survey.

Most surveyed investing institutions currently hold much lower amounts of mortgage bonds in their portfolios than enabled by law or their internal limits. The main reason behind the low level of holdings was identified as low yields and low liquidity, as market participants believe that the ask spreads are high due to the low secondary market activity, and it is difficult to sell larger quantities at the same time. Another reason cited was the lack of genuine market making, the small transaction sizes typical of these and the broad bid–offer spreads. Moreover, marking-to-market issues may also arise, since stock exchange transactions are typically rare. **According to the responses, the main consideration when building mortgage bond portfolios is the expected yield of the securities.** Investors also deem important the rating of the issuer and the securities. Another major aspect is the liquidity of securities as well as the underlying cover pool, in other words the quality of the mortgage loans included as collateral. Therefore, the development of the mortgage bond market and the sector-level financing through these funds should be supported through increasing mortgage bond market liquidity and transparency, and encouraging market making. Taking into account the preferences of foreign investors too, another factor that may help is to require more detailed disclosures than in the current practice, helping the assessment of the portfolios' quality and including uniform data about the collateral of mortgage bonds.

6 Capital buffer for other systemically important institutions

After reviewing the group of the so-called other systemically important institutions (O-SIIs) in 2018, the MNB left the set of the identified institutions and the capital buffer rates required for 2019 unchanged. In 2018, the gradually growing buffer rates required no major adjustment from the banking system, as it has stable capital position.

Chart 41
Banks classified by the MNB as systemically important and their capital buffer rates



*Note: Scores based on audited consolidated data as of 31 December 2017, according to MNB's methodology. *The Szövetkezeti Hitelintézetek Integrációs Szervezete is legally equivalent to the Magyar Takarékszövetkezeti Bank Zrt.'s (TakarékBank) prudential consolidation level.*

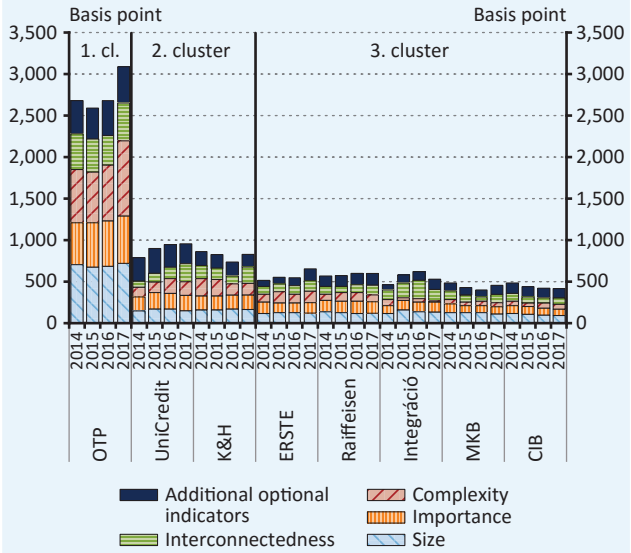
Source: MNB.

The set of other systemically important institutions and their buffer rates have remained unchanged, even after the regular annual review. In accordance with its statutory obligation, in 2018 the MNB conducted again the identification of other systemically important institutions located in Hungary, using end-2017 data. The scores representing the systemic importance in 2018 were derived as the weighted averages of ten core indicators and five supplementary indicators.[3] The scores calculated as a result of the identification (Chart 41) continued to exceed the 350-basis point threshold in the case of eight banking groups. Similar to last year's identification process, the transition to the IFRS supervisory reporting and the further changes to the reporting content played a key role in the change in scores.

The current scores measuring importance did not warrant the modification of the O-SII buffer rates. During the identification procedure conducted in 2015, the MNB classified the systemically important institutions into three groups based on their importance score, assigning rates of 2, 1 and 0.5 percent from the end of the phase-in period lasting until 2020. According to the experiences of the last three identifications, the change in the scores from one year to the next did not cause a major realignment of any O-SII's relative position or systemic importance that would necessitate the modification of the previously determined buffer rates, as they can still be deemed consistent with the systemic importance (Chart 42).

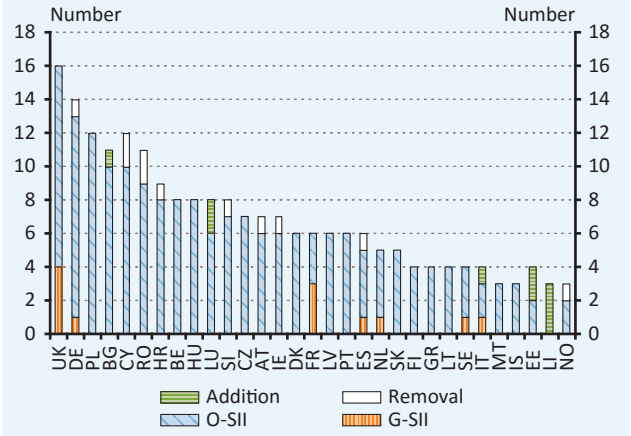
[3] For more details on the identification methodology and the methodology for calibrating the capital buffer rates of other systemically important institutions, see the MNB's Methodological note: https://www.mnb.hu/letoltes/modszertani-tajekoztato-en-honlap.pdf.

Chart 42
Changes in the scores of other systemically important institutions (between 2014 and 2017)



Source: MNB.

Chart 43
The development of the number of other systemically important institutions after the reviews in 2017



Source: MNB, ESRB.

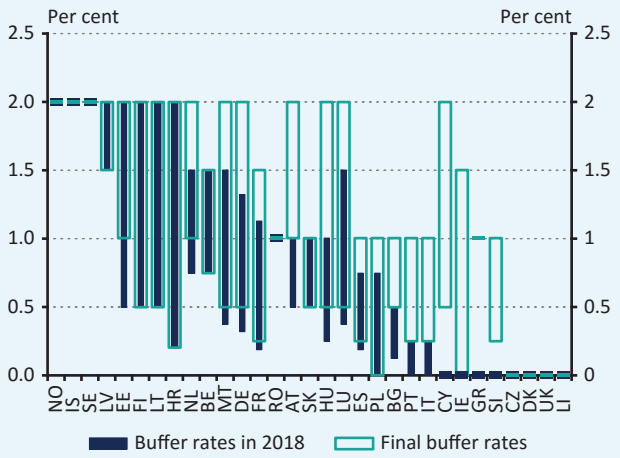
There was no major realignment in the importance of the institutions concerned. The relative position of the OTP classified into the first cluster with its outstanding systemic importance increased. The two other groups of the institutions with medium or low scores are still appropriately distinguishable. In the latter group, after the annual realignment of the relative positions also observed earlier, Erste came close to, but did not make it into the second cluster. The average score increased in all of the groups, therefore the importance of O-SIIs in the credit institution sector has increased compared to previous years.

The capital position of the Hungarian O-SIIs is stable. The group-level aggregate capital buffer of the eight O-SII institutions identified as systemically important was HUF 122 billion based on the total risk exposure values for 30 June 2018. The preset increase in the buffer in 2018 did not require any major adjustment from banks, and it did not constrain lending activity. The gradual introduction of the final buffer rates until 2020 manages the risks of systemically important institutions arising from misaligned incentives while allowing sufficient time to prepare for compliance, and therefore does not inhibit continuing the lending activity of institutions.

In several EU countries, the group of other systemically important institutions changed slightly, but their main characteristics remained the same. The number of O-SIIs identified in the EU, including the EFTA members, during the 2017 review is over 200, most of which are credit institutions. The O-SII lists are relatively stable, changes (Chart 43) were typically caused by organisational revamps or the modification of the methodology. Around half of the institutions are members of the 26 international banking groups, which deserves special attention from a financial stability perspective. The largest cross-border presence through a subsidiary can be observed in the case of Unicredit, Raiffeisen, Erste, KBC and Société Générale.

There are still large differences in the O-SII buffer rates across the EU (Chart 44). This is partly caused by the differences in the methodologies used and the introduction periods. On the other hand, on account of the legal constraints on O-SII buffer rates, several countries use other or supplementary instruments to ensure the optimal capital protection of systemically important institutions. Most Member States introduce the O-SII buffer after 2–4 years of gradual increases, often at different times. In 2018, the final buffers had to be maintained in 12 countries, and from 2022 all Member States will have ultimate buffer rates in effect. During last year's reviews, the changes in the scores also warranted modified rates in some cases.

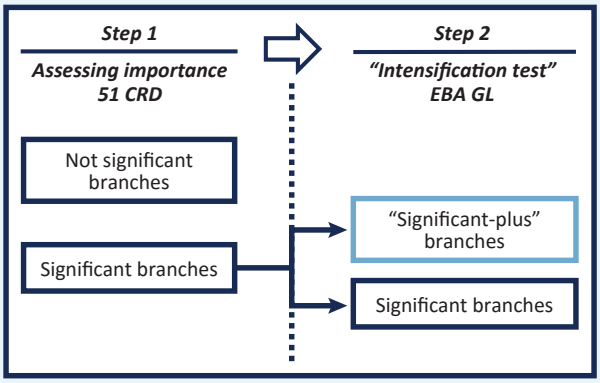
Chart 44
O-SII buffer rates in force in 2018 and their final values in the EU



Note: The difference in the interval of the rates in Estonia and Poland is due to reviews of the rates, not a phasing-in period.

Source: MNB, ESRB.

Chart 45
The process of identifying the significant-plus category



Source: MNB, EBA.

In its relevant guideline, the EBA established a framework for the intensified and coordinated supervision of the largest systemically important branches. The CRD IV only stipulated minimum requirements regarding the classification of the significant branches. Besides the methodology of designation, the supervision of the branches identified as significant also varied. The EBA prepared a guideline[4] to ensure that the significant branches with the same, potentially higher risk profile receive the same supervisory treatment. To harmonise the regulation, the new, so-called "significant plus" category has been introduced (Chart 45), where the EBA recommends a coordinated and intensified supervisory approach. The MNB conducted the test in the EBA guideline, based on which no branch received a "significant-plus" designation.

[4] https://www.eba.europa.eu/documents/10180/1699755/EBA-GL-2017-14++%28Final+Report+on+Guidelines+on+supervision+of+significant+branches%29.pdf/924c0b19-0229-47f2-ad64-2b145bfd7c69

Box 4
The process of resolution planning and the establishment of the MREL framework in Hungary

In Hungary, resolution planning is the task of the MNB, as the resolution authority. Resolution planning aims to ensure that the MNB is prepared to effectively manage financial institutions' potential crises with resolution tools. This way, the MNB protects financial stability and the preservation of the critical functions of the institutions that are failing or likely to fail, while generating the smallest possible costs to customers and taxpayers. Resolution planning is largely conducted in international cooperation. Pursuant to the stipulations of the BRRD[5] and the Resolution Act,[6] the resolution authorities need to prepare a resolution plan for all credit institutions and investment firms. In the case of the Hungarian subsidiaries of international banking groups, the MNB cooperates with partner authorities and actively takes part in the work of the resolution colleges. Acting as the home authority responsible for the group-level resolution, the MNB created the OTP's resolution college in 2015, as the first one in the European Union. In the case of the credit institutions and investment firms operating exclusively in Hungary, the resolution plan is prepared and developed by the MNB alone.

Elements of resolution planning

Source: MNB.

The MNB determines the resolution strategy forming the basis of the resolution plans based on the institution- and group-specific analysis of the aspects in the relevant European Union and national laws. The international practice distinguishes between "Single Point of Entry" (SPE) and "Multiple Point of Entry" (MPE) strategies. The former assumes resolution only at the parent institution, while the latter does so at the subsidiaries as well. The MNB favours neither strategy in general, and the decision on the preferred strategy is based on the group's business and operating model and structure, as well as the individual analysis of the relationships among the group members. Currently, most resolution plans of the international groups with a Hungarian presence follow an SPE strategy, although there are examples for the MPE strategy, too.

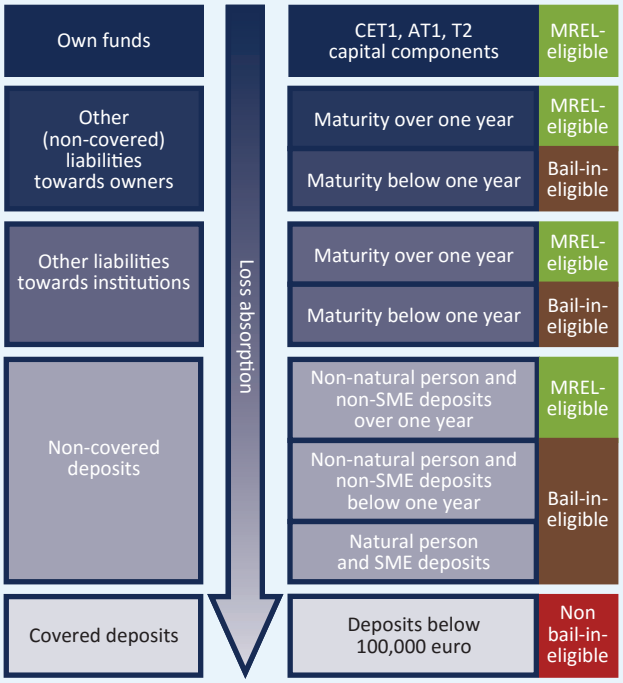
The MNB seeks to finalise the resolution plans of all financial institutions concerned by 2020 the latest. As a first step in the planning, the group of institutions that would be liquidated in a potential crisis in the absence of critical functions and public interest should be determined. In the case of the other institutions, where resolution action is warranted, a detailed resolution strategy is developed in the resolution plans. Here, planning is conducted in annual review cycles, and the content of the plans gradually deepens. The MNB made important steps in 2018 to reinforce the financial stability safety net through resolution planning. In 2018, the critical functions were identified, the existence of the public interest was assessed and the methodology for determining the loss-absorbing and recapitalisation capacity (the required MREL level) necessary in resolution was developed. In the upcoming planning cycles, the methodological work will be supplemented by the analysis of the application of the resolution tools and the enhancement of the methodologies for assessing the obstacles to resolvability.

[5] Bank Recovery and Resolution Directive (BRRD): Directive 2014/59/EU establishing a framework for the recovery and resolution of credit institutions and investment firms.
[6] Act XXXVII of 2014 on the Further Development of the System of Institutions Strengthening the Security of the Individual Players of the Financial Intermediary System.

The Magyar Nemzeti Bank published its methodology on prescribing the Minimum Requirement for Own Funds and Eligible Liabilities (MREL) in November 2018.[7] In a crisis, the MREL eligible funds may be written down in part or full, or converted to capital, thereby ensuring that primarily owners and then lenders absorb the losses and that they contribute to the recapitalisation.

In terms of functionality, the MREL requirement consists of two parts. The loss-absorption amount ensures that the institutions' funds provide coverage for the losses in a potential crisis. The recapitalisation amount is needed for meeting the prudential capital requirement after the write-off of losses, during and following the resolution procedure. Within the recapitalisation amount, besides the compulsory capital requirement, the amount necessary for restoring and preserving market confidence, a so-called market confidence charge, can be distinguished. Currently, the supervisory capital requirements and macroprudential capital buffers adequately cover the risks, therefore they do not have to be adjusted when determining the MREL loss-absorption amount. If the institution ceases operating after the resolution measures (in a simplified resolution), it is generally not required to prescribe the recapitalisation amount and the market confidence charge. In the case of large banks, the resolution plan assumes that the institution continues operating after the resolution, therefore it has to comply with the supervisory capital requirement during and after the resolution as well. Prior to the resolution, the institution is expected to absorb heavy losses, and the tools used during resolution may also reduce its size. When determining the recapitalisation amount, the MNB takes into account these effects. The MNB does not deem it necessary to determine any requirement within the recapitalisation amount, in excess of the capital requirement expected after the resolution, to maintain market confidence.

The order of loss absorption of the MREL eligible liabilities



Source: MNB.

The MNB does not see major risks in meeting the MREL requirements. The MNB will set the adjustment time available for meeting the MREL requirement as up to 4 years following the prescription expected in 2019. The previously assessed potential MREL requirement is forecast to be HUF 300–500 billion. Typically, large, complex institutions will be required to adjust. It is estimated that sufficient investor demand can be expected for the funds necessary to raise for compliance.

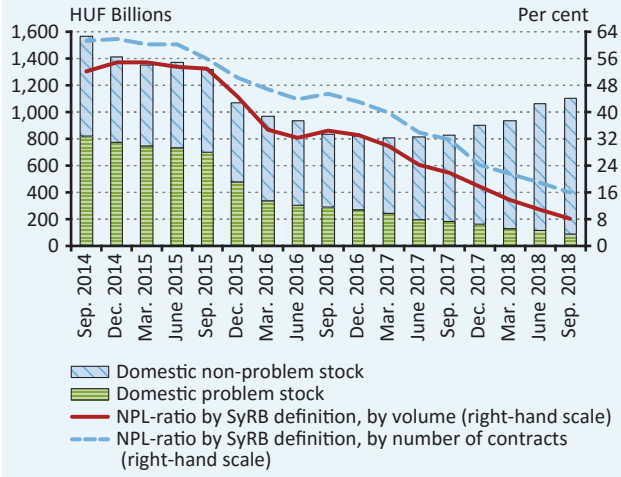
The review of the European regulations on determining the MREL requirement and the eligible liabilities to meet the requirement (BRRD, CRR/CRD IV) is under way. However, the resolution authorities have started prescribing the requirements and publishing the corresponding methodologies. As these happened in a changing legal environment, they are expected to be modified later.

[7] For more details, see: https://www.mnb.hu/szanalas/mrel.

7 Systemic risk buffer

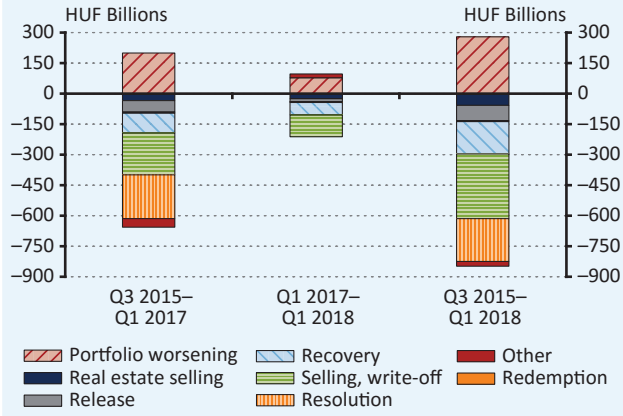
The Systemic Risk Buffer (SyRB) applied by the MNB helped reduce the structural macroprudential risk arising from the excessive concentration that stemmed from the problem commercial real estate exposures built up during the financial crisis, and this was heavily supported by the recovering property and workout markets. In the period after the announcement of the intention to use the capital buffer, banks cleaned out 89 percent of their problem exposures. Following the continued portfolio cleaning, instead of the previously two banks maintaining capital buffers, since 1 July 2018, only one credit institution needs to do so in order to ensure the appropriate systemic shock-absorbing capacity. Besides managing the remaining risks, this instrument may also mitigate the risk of the repeated build-up of problem stocks in the future.

Chart 46
Development of problem commercial project loans and real estate collateral



Source: MNB.

Chart 47
The structure of sectoral cleaning of problem exposures by stages of cleaning



Source: MNB.

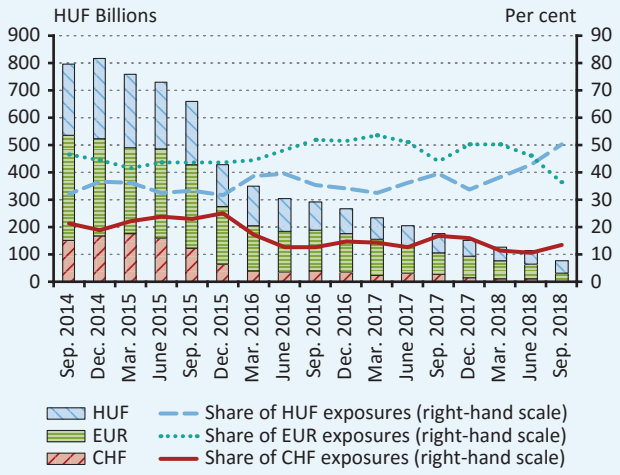
7.1 THE SYSTEMIC RISK RELATED TO PROBLEM COMMERCIAL REAL ESTATE EXPOSURES HAS DROPPED TO A LOW LEVEL

The MNB's systemic risk buffer helped in the management of the systemic risks arising from problem commercial real estate exposures. After the communication of the measure, the cleaning of banks' problem exposures started, and, in parallel with the favourable developments on the commercial real estate market and a major resolution measure, it gained momentum after the capital buffer was announced in 2015 (Chart 46). The problem stock of 2014 Q3 had diminished by 89 percent by the end of 2018 Q3. The greater portion of the adjustment occurred before the reference date of the capital buffer being first prescribed in July 2017, but the instrument continued to encourage the ongoing balance sheet cleaning even in the one and a half years after that. The share of the problem portfolio relative to the total sank to single digits, partly also on account of the upswing in project financing. Overall, the targeted banking system vulnerability plummeted, which entails an improved lending capacity for the banking system.

The wind-up of problem exposures occurred under favourable market conditions, to an adequate extent at the majority of banks, and in a form consistent with the regulatory objective. In the period from the quarter when the application of the SyRB was communicated until the end of the quarter forming the basis for the review of the capital requirement, over 60 percent of the total balance sheet adjustment happened through selling problem projects (Chart 47). Within sales, 60 percent of the cleaning comprised sales to market participants, and 40 percent comprised sales to the Resolution Fund during the resolution of a bank.[8] Sales to companies outside the scope

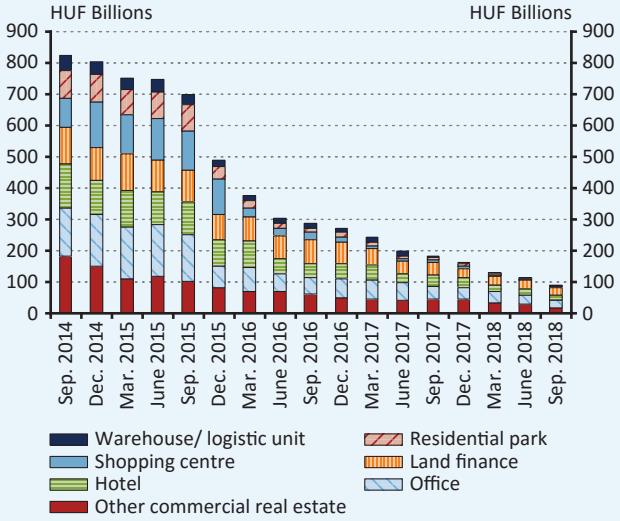
[8] Since then, the portfolio transferred to the Resolution Fund has also been sold on the market.

Chart 48
Problem stock by currency



Source: MNB.

Chart 49
Problem stock by type of real estate



Source: MNB.

of consolidation but related to the banking group were not typical. In addition, 18 percent of the reduction in problem exposures was the result of the projects recovering in the case of several banks. The selling of the non-performing projects was supported by the upswing on the commercial real estate market and the recovery on the workout market, while the transactions were turned into performing ones by the considerable improvement in economic activity. Thanks to the cleaning, the share of problem Swiss franc transactions (Chart 48) and the shopping mall and residential park projects are negligible in banking books (Chart 49).

7.2 THE INSTRUMENT CONTINUES TO BE A PREVENTIVE LIMIT ON THE BUILD-UP OF SIMILAR RISKS IN THE FUTURE

The shock-absorbing capacity in the face of the remaining systemic risk is ensured by the capital buffer of the institution concerned. The SyRB rate fell from 2 to 1 percent in the case of CIB, and from 1.5 to 0 percent in the case of Raiffeisen from 1 July 2018[9]. Fortunately, other banks have also reduced their problem stocks recently by taking advantage of the favourable market conditions. The systemic risk buffer keeps encouraging the further cleaning of the problem stocks on account of the additional capital costs. Together with the MNB's recommendations on preventing the build-up of non-performing stocks,[10] the instrument can effectively hinder the build-up of future risks, which is especially important on account of the growing disbursement of project financing loans due to the upswing on the commercial real estate market and the overall favourable economic activity.

[9] MNB press release, Az MNB egy bankot továbbra is rendszerkockázati tőkepuffer tartására kötelez a problémás projekthitelek kapcsán (The MNB requires one bank to keep a systemic risk buffer related to the problem project loans), http://www.mnb.hu/en/pressroom/press-releases/press-releases-2018/mnb-maintains-the-systemic-risk-buffer-requirement-for-one-bank-in-relation-to-problem-project-loans

[10] MNB recommendations on reducing the high level of non-performing stocks, on assessing project loans and certain issues related to their management, and on managing financial institutions' risks related properties

Table 4
EU practices of the SyRB's usage

Reason for introduction	Country groups/countries		
	Central and Eastern Europe	Euro area core countries	Nordic countries
Early replacement of the O-SII buffer and/or supplementing its maximum rate	CZ, EE, HR, SK	AT, NL	DK, FI, SE
of this in additional relation to the O-SII buffer	EE, SK		
The national economy relevance of the banking system, overall banking system vulnerability, the banking system's international integration	EE, HR, PL	AT	FI
of this in additional relation to the O-SII buffer	EE, PL		
Capital requirement reducing effect of the CRD/CRR change	BG, CZ, EE, HR		
of this in additional relation to the O-SII buffer	BG, EE		
Volume and concentration of risky exposures	HU, RO		DK*
of this in additional relation to the O-SII buffer	HU		

**SyRB applicable for exposures of Danish banks in the Faroe Island*
Source: ESRB, own collection.

7.3 IN THE EU, THE SYRB IS STILL MAINLY USED FOR SYSTEMICALLY IMPORTANT INSTITUTIONS

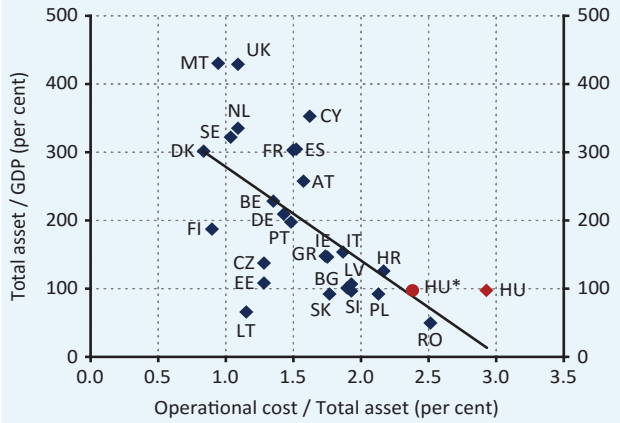
Besides replacing the O-SII buffer or supplementing its maximum value, EU Member States also use the SyRB to manage other structural systemic risks. Most countries continue to use the SyRB, which – according to the original regulatory intention – can be used for structural risks, but in a flexible manner, for other systemically important institutions or for all banks to maintain the capital level that prevailed before the Single Rulebook (Table 4). In contrast to earlier practice, the latest uses of SyRB aim to mitigate other structural systemic risks that cannot be addressed with other instruments.

The group of countries using the SyRB was further expanded in the Central and Eastern European and the Scandinavian region, whereas in euro area core countries, mostly the conditions of application changed. The SyRB is still not widely used in the euro area core countries. Among CEE countries, which had already used the systemic risk buffer actively, further SyRB activations could be observed. Romania has been using the SyRB to be maintained depending on the NPL ratio and the coverage of NPLs with provisions to prevent a repeated rise in NPLs and on account of macroeconomic imbalances. In Poland, the SyRB improving the overall shock-absorbing capacity related to geopolitical uncertainties and the banking system's considerable global integration took effect in January 2018. In the past year, Austria saw a change in connection with the instrument, which was justified by the authority citing the constraints inhibiting intra-group capital allocation in a potential crisis in the case of major international banking groups headquartered in Austria. The group of Scandinavian countries using the SyRB was joined by Finland in 2018, where the capital buffer requirement was prescribed due to the banking system's major significance in the national economy and the higher risks of systemically important institutions.

8 Bank efficiency and competitiveness

In international comparison, the Hungarian banking system operates with low cost efficiency. The low cost efficiency and the high cost base are more likely to lead to financial stability issues due to the more difficult adjustment to FinTech innovations and the potential reduction in revenues. Therefore, the MNB continuously supports and encourages the safe adoption of FinTech innovations that make the financial system more efficient. Within this framework, the MNB was among the first in the region to launch the MNB Innovation Hub initiative in the spring of 2018.

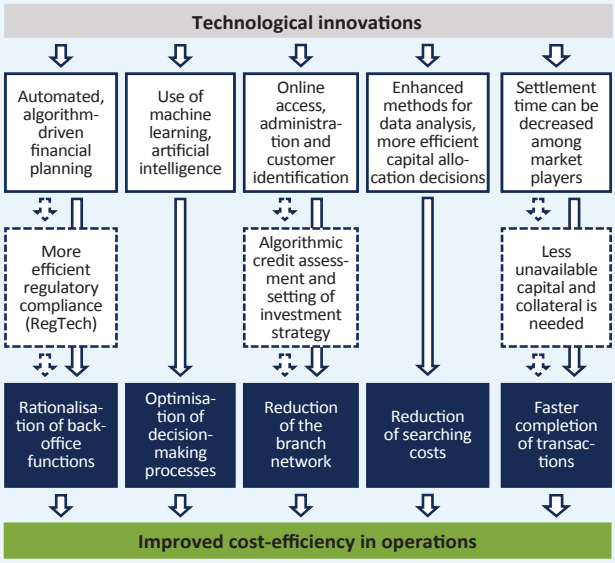
Chart 50
Bank assets and operational costs in EU countries



Note: Operational costs in some countries can partially or fully include banking tax. Data based on 2017 consolidated banking statistics. HU refers to data without foreign affiliates, banking tax and transaction duty, which are included among operational costs.*

Source: MNB, ECB.

Chart 51
Possible channels for reducing operational costs



Source: BIS, FSB.

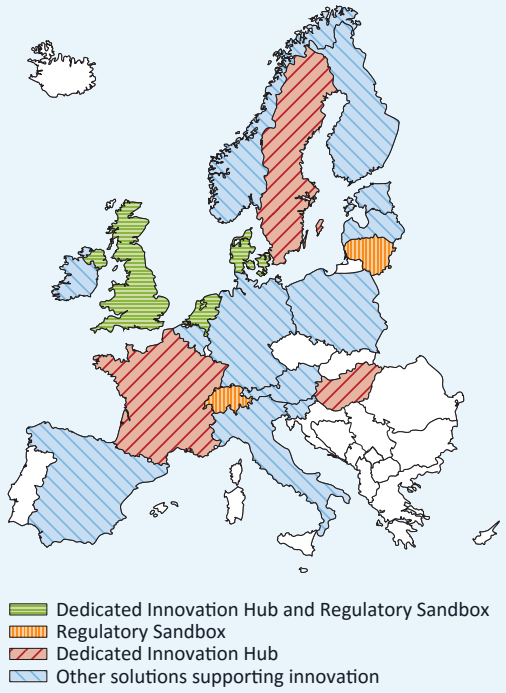
8.1 THE HIGH COST BASE AND LOW EFFICIENCY TYPICAL OF THE BANKING SECTOR MAY CAUSE FINANCIAL STABILITY ISSUES

By international standards, the Hungarian banking system operates with low cost efficiency. According to 2017 data, the Hungarian banking system's costs-to-assets ratio is still high relative to the banking systems of European Union Member States (Chart 50). Since there is an inverse relationship between the size of banking systems and their costs-to-assets ratio, in Hungary, there is still ample room for improving the banking system's cost efficiency, while deepening the financial intermediary system.

The low cost efficiency and the high cost base characterising the Hungarian banking system may pose financial stability risks. A competitive banking system may provide more effective support to the operation of the real economy, and it also bolsters the stability of the financial system through banks' increased resilience to unexpected events, such as potential shocks. On the side of customers, more competitive and efficient banking operations could lead to direct advantages through more competitive, lower prices. The MNB supports banks' cost-reducing and efficiency-improving efforts along these considerations. The integration of the innovations or FinTech solutions aimed at the technological advancement of financial services into the operation of banks may facilitate the achievement of these goals, because they can improve banks' cost efficiency through various channels (Chart 51).

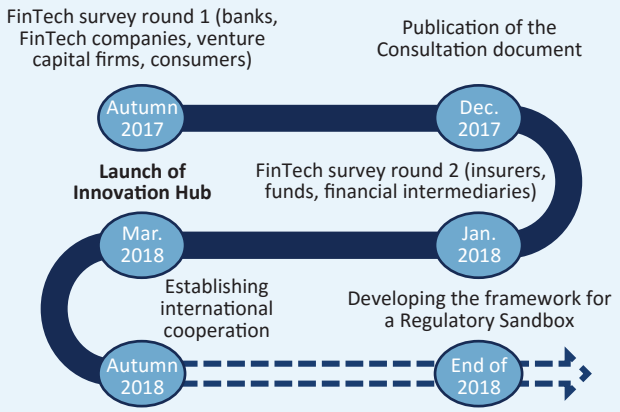
The emergence of disruptive FinTech innovators may entail financial stability risks. A major portion of the FinTech solutions belong to the so-called "disruptive" innovations. These make financial intermediation more efficient while at the same time transforming its traditional processes and business models. In the countries with less efficient and more costly banking systems, such "disruptive" innovations are more likely to be adopted. Since, on the one hand, the

Chart 52
Innovation Hubs and Regulatory Sandboxes in Europe



Source: MNB, EBA.

Chart 53
FinTech initiatives of the MNB



Source: MNB.

strong external competition may cause serious operational hiccups in the banking system and, on the other hand, the regulation of non-bank financial intermediaries is not quite developed yet, this process could entail financial stability risks. The banking system's resilience to cyber risks deserves special attention. In banks operating with greater costs and lower efficiency, the outdated IT systems are more vulnerable to external attacks. However, FinTech innovations should also be adopted with care, since, due to their novelty, they are not always mature enough, therefore they may be vulnerable to cyberattacks. Consequently, the MNB supports the transformation of the regulatory environment to stimulate the safe use of FinTech innovations making traditional banking operations more efficient on the one hand, and to facilitate the flexible adaptation of the banking system to the disruptive FinTech innovations on the other.

8.2 THE MNB SUPPORTS THE SAFE SPREADING OF FINTECH INNOVATIONS IN VARIOUS WAYS

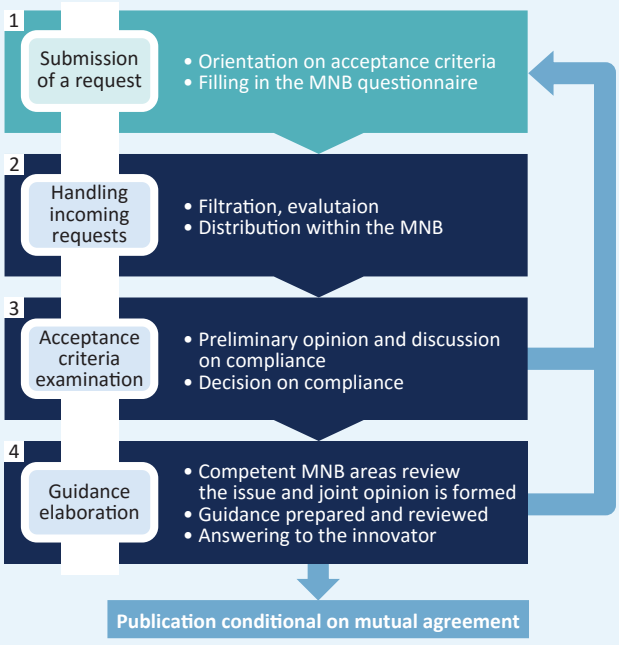
Strengthening the cooperation between regulatory authorities and the users of FinTech innovations yields benefits to both parties. In the course of the cooperation, regulators can get a clearer picture about the risks entailed by the current FinTech innovations. This knowledge may be used to shape the regulatory environment pertaining to the innovation, which makes the innovation process easier for the users of FinTech innovations. Based on international examples, one promising form of cooperation is when regulatory authorities create a so-called "Innovation Hub", where market participants can get guidance from the regulatory authority on the potential uses of the innovative solutions in the current regulatory framework. The other possible solution encouraging FinTech innovation is the introduction of the so-called "Regulatory Sandbox" framework. This helps in testing innovative financial products and business models for a predetermined period, in an environment controlled by the regulatory authority, on a limited number of real consumers and exempt from specific regulatory requirements. Both forms are increasingly popular abroad; Regulatory Sandboxes operate in over a dozen countries. In the European Union, these dedicated frameworks are less widespread, but Innovation Hubs and other regulatory initiatives have already been created in several Member States (Chart 52).

Table 5
Functions of the Innovation Hub

	Information Repository	Legal requirements can be easily identified with it
Hub	Communication Hub	Information-sharing platform
?	Regulatory support platform	Guidance can be requested to clarify the legal questions regarding innovations
	International cooperation platform	Cooperation and information exchange with relevant foreign authorities

Source: MNB.

Chart 54
The operation of the MNB's Regulatory Support Platform



Source: MNB.

The MNB intends to support the safe adoption of FinTech innovations in the Hungarian financial system through its active engagement. The central bank has been developing its framework supporting FinTech innovations since 2017, and it started the work by assessing Hungarian actors' needs and best international practices (Chart 53).[11] Based on feedback from market participants, there is a major need for closer cooperation with the regulator. The MNB decided to establish an Innovation Hub and a Regulatory Sandbox by taking into account international experiences and the needs of the Hungarian market.

The Innovation Hub set up in 2018 Q1 is already actively used by market participants. The MNB Innovation Hub, one of the first to be created in the region, helps the safe spreading of FinTech innovations through various functions (Table 5). Through the Regulatory Support Platform that operates as part of the MNB Innovation Hub, the MNB has provided guidance to a large number of institutions, and this helps innovators in developing and implementing FinTech solutions (Chart 54).

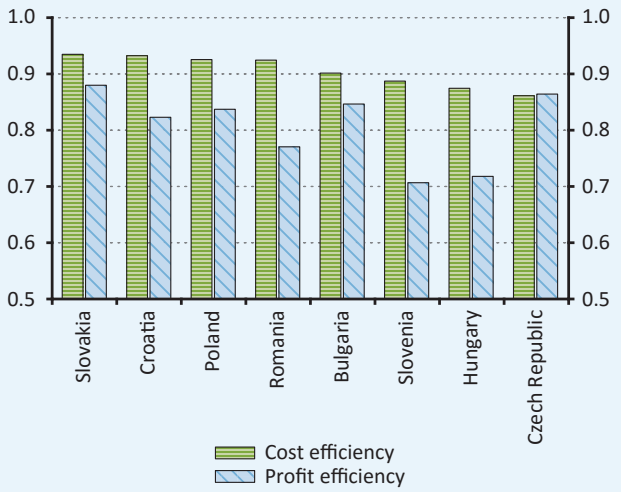
The Hungarian Regulatory Sandbox to be created would also effectively support innovation efforts. Based on feedback from the market, there is significant demand for operating a Regulatory Sandbox alongside the Innovation Hub, as several Hungarian market participants already have a business solution ready for testing. From the perspective of the Hungarian financial system's competitiveness, the act-level regulation of the Regulatory Sandbox framework could prove beneficial, as it would allow market participants to test their innovative solutions exempted from certain legal provisions – under predetermined conditions – in a controlled environment for a limited time with real customers.

[11] MNB November 2017 Financial Stability Report, Box 6: Overview of fintech innovation in Hungary, https://www.mnb.hu/letoltes/stabilitasi-jelentes-2017-november-eng.PDF. MNB (2017): Innovation and Stability: Overview of FinTech in Hungary, Consultation document, https://www.mnb.hu/letoltes/consultation-document.pdf.

Box 5
The efficiency of the Hungarian banking system in regional comparison

A recently published MNB study[12] examines the Hungarian banking system's performance by quantifying the unutilised resources. First, the minimum cost level or maximum profit level that would have been achievable with optimal operation is estimated for each bank. Efficiency is defined based on the shortfall from this ideal level by arranging the realised and the optimal result in a fraction. The indicator calculated in this manner can take on a value between 0 and 1, where the maximum value shows that the bank follows the ideal practice. During the establishment of these ideal cost and profit levels, all factors need to be taken into account that may affect banks' profits but that are independent from their decisions. This procedure, the *Stochastic Frontier Analysis* (SFA) allows the comparison of banks' realised profits to an ideal level that reflects their actual possibilities. The study used the data from a total of 104 institutions from the region.

Efficiency of banking systems in CEE between 2010 and 2016



Source: Székely (2018).

Based on the indicator calculated in this manner, the efficiency of the Hungarian banking system falls well short of the regional average, irrespective of whether costs or profits are taken as the measure of performance. However, when interpreting these results, it should be borne in mind that the SFA analyses efficiency from a different perspective than traditional indicators. These usually focus on the realised profits, while the SFA quantifies the significance of the unutilised resources. The results therefore show that Hungarian banks fall short of the ideal cost and profit levels determined by the economic circumstances more than banks in neighbouring countries from the ideal results achievable for them.

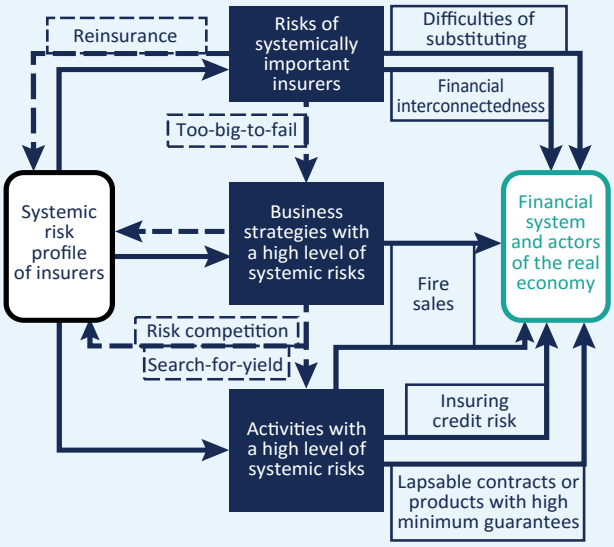
There is also an opportunity for examining which factors encourage banks to function more efficiently. This attests that a high market share has a positive impact on banks' profits, even though it is negatively correlated with efficiency in SFA terms. There is no contradiction here: the calculation based on the traditional indicator shows that a greater market share confers an advantage on banks through bigger market power. The SFA helps ascertain that these circumstances do not provide adequate incentives to utilise the thus expanded opportunities. Furthermore, one might wonder in connection with CEE banking systems whether the best practices introduced by foreign owners are manifested in greater banking efficiency. The SFA analysis confirms that on average, foreign-owned banks were not more efficient than those in Hungarian hands in recent years. Thus, even if there used to be such an effect, nowadays it does not materially affect efficiency in banking.

[12] Székely, B. (2018): Bank Efficiency Differences Across Central and Eastern Europe, MNB Working Papers, No. 2018/3, https://www.mnb.hu/letoltes/mnb-wp-2018-3-final-1.pdf.

9 Systemic risks of non-bank financial institutions

The broad or rapidly expanding range of activities of non-bank financial intermediaries may also lead to the emergence or heightening of systemic risks. Non-bank financial organisations may have direct financial ties to the banking sector, or they may exert an indirect effect on the profit of other financial institutions through the markets for financial instruments. Furthermore, they can perform financial functions critical at the system level, whose stable availability may be supported by macroprudential policy. Although the systemic risks in the Hungarian insurance sector are moderate, the future development of the European Union regulatory framework and certain regulatory instruments that are already used by the MNB and are relevant from a systemic risk perspective may enable the management of potential risks emerging in the long run as the sector develops. The MNB has been monitoring the recent dynamic expansion of investment funds from a macroprudential perspective as well, and it is prepared to implement the macroprudential approach when heightened risks prompt their management.

Chart 55
Systemic risks of the insurance sector affecting other economic actors and risk-amplifying mechanisms within the insurance sector



Note: The solid arrows represent systemic risks of the insurance sector affecting other economic actors, while the dashed arrows represent the mechanisms within the insurance sector amplifying systemic risks.

Source: MNB based on EIOPA (2017): Systemic risk and macroprudential policy in insurance

9.1 THE MACROPRUDENTIAL FRAMEWORK PREPARES FOR MANAGING THE SYSTEMIC RISKS OF THE INSURANCE SECTOR, TOO

The large and mature insurance sectors may lead to systemic risks. This may be caused by the excessive concentration of the insurance sector's investment positions, which heightens the systemic risk of securities market stress. Second, insurers and the financial conglomerates also active in the insurance sector may enter into a systemic relationship with credit institutions, either directly through financing or ownership ties, or indirectly through the assumption of the credit risk. Third, the insurers providing a broad range of insurance services are institutions performing financial activities critical at the macroeconomic level, as they contribute to the efficient risk sharing related to damages, and several insurance products can be among households' long-term savings (Chart 55).

Insurers are subject to macroprudential supervision and regulation only partly, even in the international regulatory framework, but the options for enhancing supervision and regulation are discussed at the global and European level, too. A global regulatory framework for identifying global systemically important insurers (G-SIIs) and strengthening their loss-absorbing capacity as well as controlling their group-level supervision and resolution plan is in place and

Table 6
Provisions of Solvency II and the MNB which may contribute to the implementation of financial stability goals

Relevant regulatory elements of the Solvency II Directive
Symmetric adjustment mechanism
It helps avoid the sudden mass shedding of investment instruments due to a change in the capital requirement arising from a shift in equity market prices.
Volatility adjustment
It is also designed to reduce procyclicality on the market, and it may mitigate the effect of certain temporary interest rate spread shifts on the capital position.
Article 138 of Solvency II
It allows to extension of the period available to insurers with a large market share that do not comply with capital adequacy requirements to re-establish the level of own funds.
The MNB's relevant regulatory elements
MNB 54/2015 (XII. 21.) on the maximum technical interest rate
It limits, at the sector level, insurers' room for offering guaranteed yields in the competition for customers whose future achievement is too risky.
MNB Recommendation No. 6/2016 (VI.14.) on holding the volatility capital buffer ensuring continuous capital adequacy
It is designed to prevent the volatility of the own funds from causing capital adequacy issues to the insurers in the Solvency II system with the change in the economic environment or its development diverging from the expectations.

Source: MNB.

it is being developed.[13] In the European Union Member States, several regulatory areas in the Solvency II Directive (2009/138/EC) also have macroprudential implications, although the Directive does not provide for a dedicated macroprudential regulatory framework.[14] The MNB has also already introduced a recommendation and a decree on the insurance sector that have microprudential goals and also foster the stability of the financial system as a whole (Table 6). The assessments published by EIOPA and the ESRB in 2018 also considered the introduction of further dedicated macroprudential instruments in the regulation of insurers, including capital add-ons calibrated based on the contribution of the individual institutions to systemic risk.[15]

Currently no systemic risk issue has emerged in the Hungarian insurance sector. The size of the Hungarian insurance sector calculated from the balance sheet total amounted to HUF 2,775 billion, 7.27 percent of GDP, at the end of 2017, in contrast to the approximately 100-percent aggregate balance sheet total of the credit institution sector in terms of GDP. The concentration of the Hungarian insurance market is also moderate (Chart 56). Currently, nine institutions operate in the sector whose gross written premium is over the HUF 40 billion threshold, which roughly corresponds to the largest, 4.25-percent share used for determining the systemic importance of credit institutions. However, the market share of the largest institutions is significant in the individual insurance lines of business. Insurers' direct financial ties to the banking sector at the sector level are also less important systemically. In the Hungarian financial system, insurers do not typically assume large credit risk from credit institutions.

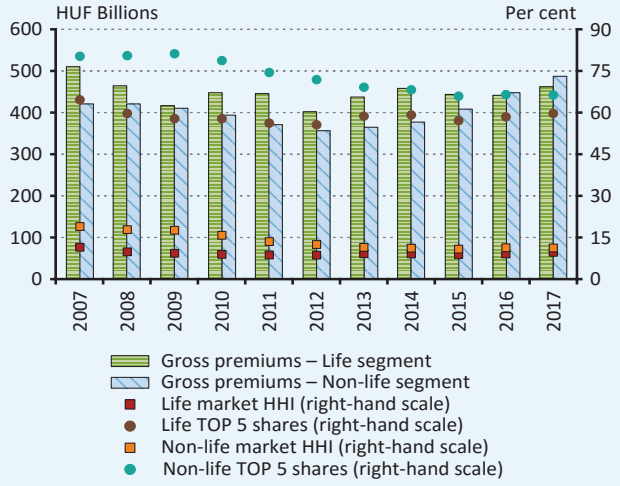
The change in the contribution of the insurance sector to systemic risks should be monitored in the future, too. Although currently the systemic importance of the insurance sector and its individual institutions is moderate, the MNB also seeks to implement the macroprudential approach during the risk-identification and regulation of the insurance sector. This may be supported by the potential future expansion of the macroprudential monitoring and regulatory instruments available to European Union Member States.

[13] The Financial Stability Board (FSB) created by the G20 cooperates with the International Association of Insurance Supervisors (IAIS) to develop the G-SII regulatory framework; the rules on strengthening their loss-absorbing capacity are expected to be stipulated from 2022 on an ICS 2.0 basis. The IAIS plans to launch the consultation phase aimed at finalising its currently ongoing work of expanding the regulatory framework at the end of 2018, which would supplement the G-SII framework with an activities-based regulation. https://www.iaisweb.org/page/consultations/closed-consultations/2018/activities-based-approach-to-systemic-risk

[14] https://eiopa.europa.eu/Publications/Reports/Solvency%20II%20tools%20with%20macroprudential%20impact.pdf

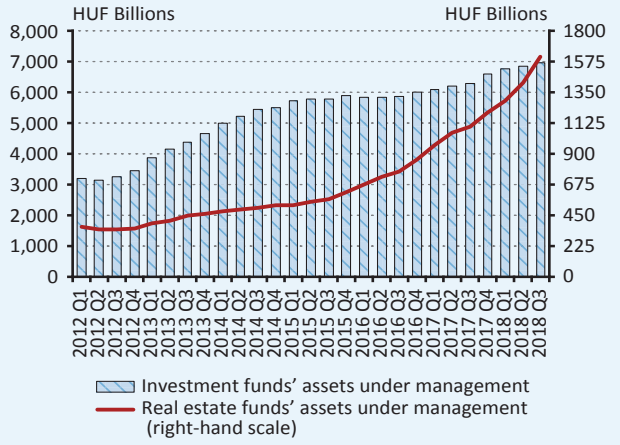
[15] https://eiopa.europa.eu/Publications/Reports/EIOPA%20Other%20potential%20macroprudential%20tools.pdf
https://www.esrb.europa.eu/pub/pdf/reports/esrb.report181126_macroprudential_provisions_measures_and_instruments_for_insurance.en.pdf?e28256bdaaf558010800a275f1c7af66

Chart 56
Gross premium and concentration in the insurance sector



Note: HHI: Herfindahl– Hirschman Index.
Source: MNB.

Chart 57
The development of the stock of investment funds and real estate funds



Note: Net asset value.
Source: MNB.

9.2 THE DYNAMIC GROWTH OF INVESTMENT FUNDS HAS BEEN MONITORED BY THE MNB FROM A MACROPRUDENTIAL PERSPECTIVE AS WELL

The systemic disruptions in the operation of investment funds may amplify financial contagion and undermine efficient capital market intermediation. The financial contagion spreading through the ownership, financing or reputation channels to investment funds or arising from the fire sales of investment instruments by the funds may increase the losses of the banking system and other financial intermediaries. Moreover, the systemic difficulties in the operations of funds may disrupt the efficient allocation of capital intermediated on capital markets.

The systemic risk stemming from the activities of investment funds is primarily the large-scale asset sales necessitated by the mass, simultaneous redemption of investment units. The unfavourable expectations of the customers purchasing the investment units of open-ended funds regarding the solvency of the fund can generate major redemptions in a short time. If there is a run on the fund, where customers redeem their investments, the fund needs to cover the sudden money outflows from "fire sales".

In recent years, investment funds have seen a large growth in their stocks, and in the case of real estate funds especially high capital inflows can be observed. By 2018 Q3, the net asset value of investment funds had increased by HUF 660 billion in a year. Based on stock data calculated at net asset value, 90 percent of the assets in the funds in Hungary is invested in public funds. Within this, the capital inflows are exceptional in the case of real estate funds (Chart 57). The number of public real estate funds is low, and they are characterised by a very strong institutional concentration. Moreover, although almost half of their assets are liquid, they operate in an open-ended form from the perspective of redemptions. The continued expansion of investment funds, especially real estate funds, as well as their liquidity and financing structure are monitored by the MNB from a systemic risk perspective, too. In the course of the ongoing supervision and the regular comprehensive assessments, there is a special focus on checking liquidity risks, which also facilitates the management of systemic risks.

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.

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