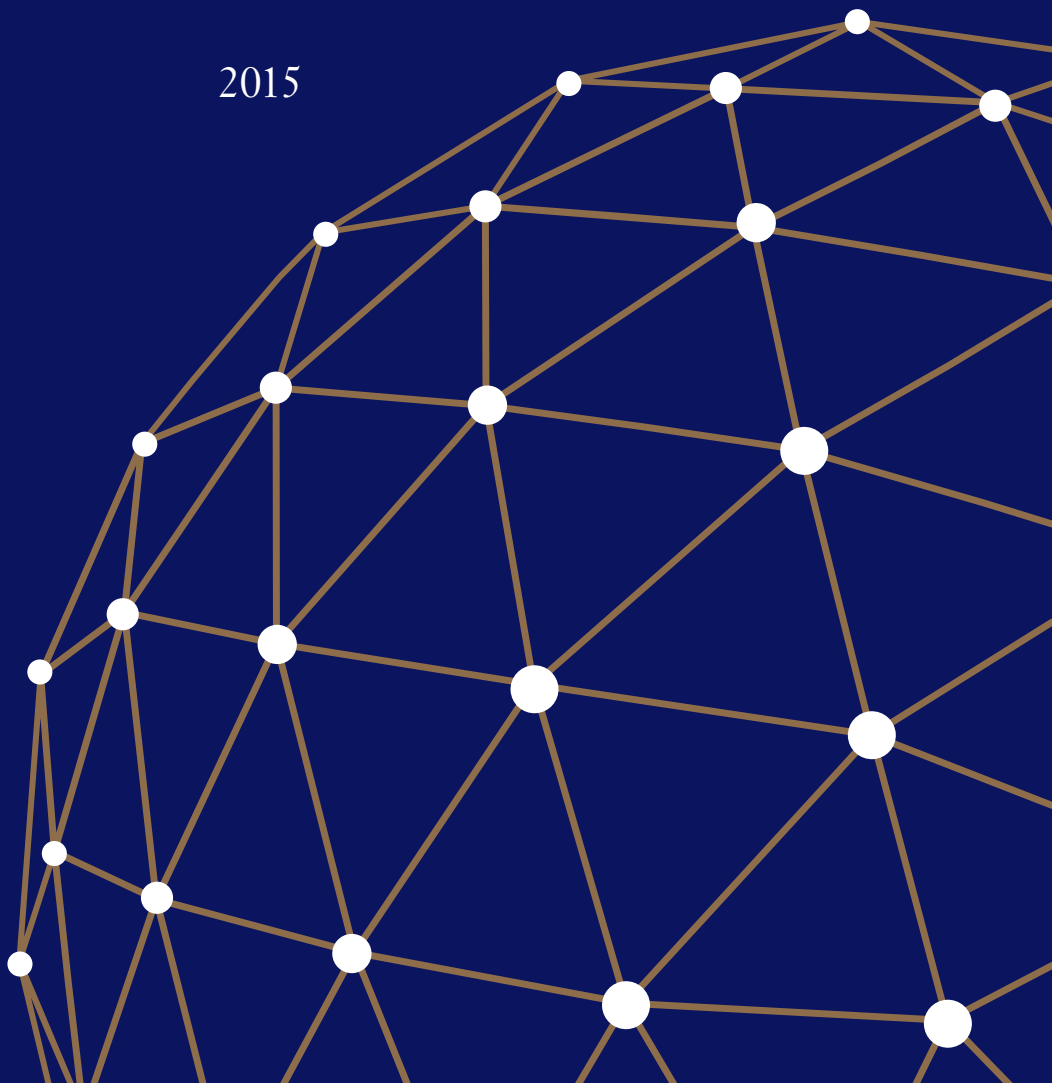Bálint Dancsik, Gergely Fábián, Zita Fellner, Gábor Horváth,
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Comprehensive analysis of the nonperforming household mortgage portfolio using micro-level data
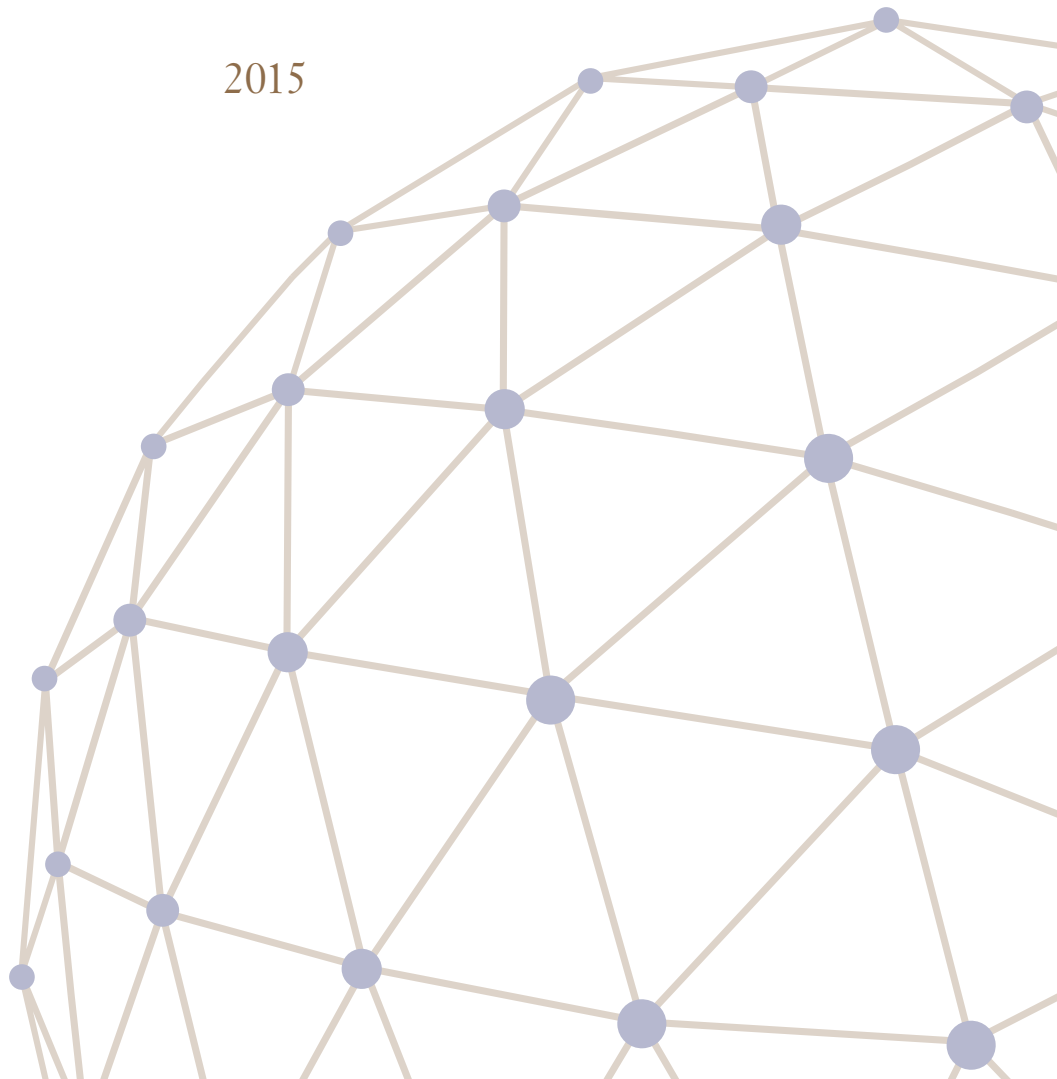
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Comprehensive analysis of the nonperforming household mortgage portfolio using micro-level data

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The views expressed here are those of the authors and do not necessarily reflect
the official view of the central bank of Hungary (Magyar Nemzeti Bank).

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EXECUTIVE SUMMARY

The high ratio of loans over 90 days past due, i.e. nonperforming mortgage loans, is the legacy of the crisis and the excessive lending that preceded it. The volume has continuously grown over the past six years and by the end of 2014 accounted for one quarter of the total mortgage portfolio, affecting approximately 140,000 debtors. The degree of exposure within the entire system of financial intermediation is nearly HUF 1,450 billion, nearly 5 per cent of GDP. Terminated contracts now account for over half of the total portfolio, which may essentially lead to execution and thus the loss of the property for debtors. As a result, this is currently one of the most pressing issues for financial stability and a major social risk in Hungary. A deep analysis and broad understanding of the issue is indispensable for finding the proper solution.

Despite the importance of the matter, we know little about nonperforming mortgage loans. This study aims to provide a comprehensive picture of the attributes of these loans after settlement and forint conversion on the basis of individual data. The data clearly show that the heart of the matter in terms of both wealth and income is the excessive level of debt. For over 80 per cent of customers, the total debt amount (outstanding principal and arrears) exceeds the advanced loan amount. Since the onset of the crisis, the amount of principal debt has increased substantially compared to the real estate collateral pledged, currently amounting to 110 per cent on average or 140 per cent if we calculate the indicator based on total debt. The severity of the issue is further exacerbated by the fact that 70 per cent of nonperforming debtors live in smaller cities and localities, primarily in regions where the marketability of properties is limited. As a result, the prospects of a new start after selling the collateral may be limited for debtors.

In examining nonperforming loan transactions, it is also essential to analyse income positions in depth, mainly in light of the potential rectification of the loan transactions through sustainable restructuring. Nearly two thirds of nonperforming transactions have income subject to personal income tax, but the excessive repayment instalment relative to monthly income is a serious problem in the majority of these cases. Another aspect of the situation is that taxable income (including the income of co-debtors) does not necessarily include all sources of income. The fact that somewhat over one third of debtors with no declared income have partially met their annual debt servicing obligation for last year testifies to this fact. At the same time, it is important to mention that for 10-20 per cent of nonperforming debtors, the underlying cause of nonpayment may primarily be low willingness to pay, as these debtors would be able to meet their debt servicing obligation based on their incomes.

The findings of the analysis show that significant restructuring reserves are visible in the portfolio, and up to 70,000-80,000 debtors could be placed on a sustainable debt repayment trajectory. This, however, would call for a more pronounced and active restructuring practice, while banks must take care to prevent concessions made to nonperforming debtors from eroding the willingness to pay of performing debtors.

A number of administrative burdens, particularly among terminated loans, make the resolution of the problem difficult. Successful restructuring also hinges upon customers' greater willingness to cooperate. A further source of uncertainty is the extent to which customers are willing to cooperate in the course of sustainable restructuring. Based on the findings of the questionnaire-based and the focus group surveys, nearly half of debtors do not see losing their homes as a real threat, despite being aware of the consequences of nonpayment, and nearly one sixth of customers reject all available solutions. Nevertheless, on a positive note, according to the majority opinion, individuals carry responsibility for the prevailing situation, and a solution must be sought in cooperation with creditors.

1. INTRODUCTION

The very high ratio of nonperforming household mortgage loans represents a severe risk for financial stability and is a source of social tension. For financial institutions, financing their nonperforming portfolio involves a cost of funds and managing this portfolio ties down other resources, and may also exert a negative impact on new lending. From a legal perspective, due to the difficult realisation of collateral and the property market's limited absorption capacity, cleaning up the nonperforming mortgage portfolio could result in further potential losses for the banking system. From the perspective of debtors, the mass realisation of collateral may jeopardise their housing status, while a large volume of nonperforming household mortgage contracts may undermine the adequate payment discipline of the currently performing portfolio.

The magnitude of the issue is reflected by both its size and its long duration: after the continuous deterioration seen for almost the past 6 years, the nonperforming portfolio now accounts for nearly one quarter of the total mortgage portfolio, affecting some 170,000 contracts and amounting to principal debt of nearly HUF 1,450 billion. The issue is of key importance due to its consequences, as the vast majority of debtors risk losing their home. In spite of this fact, the trends of recent years show no improvement in the status of the nonperforming portfolio.

Despite the severity of the matter, we know surprisingly little about nonperforming mortgage loans, the related collateral, debtors' income position and conduct. The objective of this study is to remedy these shortcomings and to present a diagnosis of a level of specificity not seen so far on the issue of nonperforming mortgage loans and on banks' restructuring practice up to now. In a unique manner, we used income data based on tax returns filed with the National Tax and Customs Administration (NAV), loan data from the central credit register and individual in-depth data collection performed among banks on problem mortgage loans, coupled with a representative questionnaire-based survey and with focus groups conducted among nonperforming debtors. The aim of this study is to provide in-depth information for decision preparation and social dialogue with a view to resolving the issue, and to present in a transparent manner the information base used by the Magyar Nemzeti Bank when considering potential solutions.

Accordingly, after presenting our methodology, we briefly outline the reasons for nonperformance based on a short summary of the literature and a qualitative assessment. We then present in detail the general characteristics of the problem mortgage portfolio (*4*), before focusing specifically on the features of the nonperforming portfolio. After presenting loan transactions, we analyse the wealth position (*5*) mainly by examining value and marketability of the collateral backing transactions. We attempt to underpin the scenario of sustainable restructuring with an in-depth analysis of debtors' income position (*6*). The investigation of income focuses on defining and distinguishing solvency and the willingness to pay. In the context of presenting the tools currently applied in cleaning up the portfolio (*7*) as well as giving an overview of bank practices (in particular the successfulness of restructuring), we present the NET programme in depth, along with the features and future possibilities for the personal bankruptcy procedure, before summarising the main legal and administrative burdens hampering the cleaning up of the portfolio. To prepare policy proposals, it is vital to harness the experiences of countries facing similar challenges, which we discuss in the chapter on international experiences (*10.1*). Chapter *8* presents the summary of our study and its main findings.

2. METHODOLOGICAL FRAMEWORK

The analysis aims to provide a basis for policy proposals facilitating cleaning up the nonperforming household mortgage portfolio, and its main purpose is to identify the features of solvency and willingness to pay characterising nonperforming transactions using quantitative tools. The primary tool of our quantitative analysis is a database (hereinafter: mortgage loan database) suitable for further development which contains the data of financial institutions describing loan transactions, collateral value, potential restructurings, and the income position of debtors. By comparing the burdens (credit exposure) and income and wealth position of debtors, the mortgage loan database can thus provide a numerical basis for expanding the tools of the central bank (and the government) which are used for cleaning up the portfolio. We supplemented the quantitative analysis with qualitative research to fine-tune the findings of the analysis. The analysis covers the features, characteristics and reasons for the nonperformance of household mortgage loan transactions over 90 days past due, the experiences of successful credit institution (bank) restructurings and restructuring attempts and the experiences of international measures.

Along with our **findings** identifying the directions of the **conceptual** recommendations aimed at expanding the range of portfolio cleaning tools, the key outcome of our analysis is the **segmentation** of the **nonperforming mortgage portfolio** by debtor attitude, (restructuring) risk profile and method of management. In our view, a segmentation of the portfolio along these dimensions is essential for designing regulatory interventions.

2.1. Defining the analytical framework

The primary objectives of the sustainable cleaning up of the portfolio are to restore the solvency of nonperforming debtors, and to create incentives for long-term solvency and willingness to pay. Therefore, in our view, the success and sustainability of these objectives must be based on the identification and understanding of the underlying causes of nonperformance, and a deeper analysis of the experiences from bank restructuring. In accordance with this logic, in preparation for the analysis, we outlined the **hypothetical causal relationship system** of nonperformance and defined the possible factors that, once resolved, could enable debtors' solvency and/or willingness to pay to be restored.

Chart 1: Areas of analysis and key tools of analysis

AREAS OF THE ANALYSIS	MAIN ANALYSIS TOOLS		
• Credit transactions • Income position • Wealth position • Costs of living • Conduct, attitude • Workout tools of banks • Sustainable restructuring • Administrative burdens • Benchmark	*Mortgage loan database*		
	MORTGAGE LOAN DATA	NAV INCOME DATA	CCR DATA
	Debtors		*Banks*
	REPRESENTATIVE QUESTIONNAIRE-BASED SURVEY	FOCUS GROUP	IN-DEPTH INTERVIEWS

We look at the possible causes in a breakdown by topic – *income* position, *wealth* position, *costs* of living, *behavioural* characteristics (conduct, attitude) – and try to identify the relevant factors. The factors thus identified outlined to the **areas of analysis** investigated in the course of the project (*Chart 1*) and, derived from these areas, the **data/information requirement** of the analysis.

2.2. Quantitative analysis tools

The **mortgage loan database** was one of the key tools of analysis of our project. Data from financial institutions describing loan transactions, the income position of debtors, the collateral value and potential restructurings form the 'backbone' of the database. In the course of data reporting,[1] we collected the data of household mortgage loan transactions that were past due in excess of 90 days as of 31 January 2015 or which were restructured at any point[2] held on record as of 30 April 2015 from financial institutions with at least 1,000 nonperforming household mortgage contracts, covering 86 per cent of the nonperforming portfolio. For the sake of uniform terminology, we will hereinafter refer to transactions past due over 90 days as *'nonperforming'* transactions, to restructured transactions not in arrears as *'performing restructured'* transactions, and to these two categories jointly as *'problematic'* transactions.

To shed light on the actual income position and debt servicing of debtors, we obtained data from the National Tax and Customs Administration (hereinafter: NAV) pertaining to debtors' and co-debtors' incomes and tax burdens in past two concluded fiscal years[3] – as stated in their personal income tax returns – as well as any other loan debt of debtors and co-debtors based on the Central Credit Information System. We linked income and debt servicing data with financial institution data reporting records: the Central Bank Act afforded the opportunity to link individual data in the course of which we took due care to ensure the anonymity of debtors.

The project's time framework did not allow us to collect data on the – non-taxable – social transfers constituting a portion of household incomes. The construction of the mortgage loan database and the data connection method allows for the further development of the database by incorporating the data kept on record by the National Office for Rehabilitation and Social Affairs (NRSZH) operating the Cash and In Kind Support System Central[4] (PTR), the Administration of National Pension Insurance (ONYF) operating the Támogatási Életút Bázis Adatok (Support Lifepath Base Data) – Family Support System[5] and the National Health Insurance Fund (OEP).

The mortgage loan database provides the opportunity to investigate bank **restructurings using a classification procedure**, in addition to a descriptive analysis of the problem portfolio. The study focused on the motives behind restructuring decisions ('How can we characterise the contracts in respect of which banks opted for restructuring the transaction?') and their factors of success ('What are the features of restructured transactions regarded as successful?'[6]). We apply the procedure of decision trees (recursive partitioning algorithm), supplemented by the random forest method for the sake of the stability of the outcomes.[7] We created risk profiles based on the factors of success identified during the classification procedure that define – through comparison with the outcomes of attitude-based segmentation – the segment of the nonperforming portfolio with good chances for restructuring (with low risk).

We used the data supplied by the National Asset Management Ltd. for the descriptive analysis of the **NET programme** and for estimating the loan transactions suitable for the programme. In the context of data reporting, we sought information on the value and geographic location of transactions, the lead time of contract conclusion, the financial data of lease contracts, tenants' willingness to pay and payment habits.

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[1] The MNB's Complex Financial Groups and Financial Enterprises Department assisted with the extraordinary data reporting.

[2] Restructured transactions within the meaning of Annex V, Part 2, Point 30 of Commission Implementing Regulation (EU) No. 680/2014 of 16 April 2014.

[3] Fiscal 2013 and 2014.

[4] The PTR contains data on the municipal and central transfers made on the basis of the Social and Child Protection Act.

[5] Contains the data of family support benefits.

[6] Defining successfulness: the debtor has satisfied the requisite terms and conditions of restructuring, the contract was not terminated and the transaction was not past due over 90 days immediately before settlement.

[7] Chapter 10.1 of the Annex presents a detailed description of the methodology.

Supplementing the data supplied by financial institutions, we conducted a **representative**[8] **national questionnaire-based survey** among nonperforming household mortgage debtors. The survey focused primarily on the income and wealth position of households with loans, their costs of living and attitudes regarding the loan and their current position, along with information on the loan transaction and collateral data. The survey also allowed for the attitude-based segmentation of debtors and the broad examination of certain key solution possibilities. We conducted the questionnaire-based survey using the snowball method – due to the low population ratio of the target group – using a targeted respondent search: We used the data from 492 interviews of the 576 face-to-face interviews conducted (*Table 1*).

Table 1: Respondents in a distribution by region and type of locality

	BUDAPEST	CITY WITH COUNTY AUTHORITY	OTHER CITY	MUNICIPALITY	*TOTAL*
Southern Great Plain		3.0%	6.2%	3.4%	*12.6%*
Southern Transdanubia		2.4%	3.2%	4.0%	*9.6%*
Northern Great Plain		3.6%	7.6%	5.0%	*16.2%*
Northern Hungary		3.0%	5.0%	7.4%	*15.4%*
Central Transdanubia		2.8%	4.6%	4.4%	*11.8%*
Central Hungary	12.6%	0.8%	9.0%	4.8%	*27.2%*
Western Transdanubia		2.4%	1.6%	3.2%	*7.2%*
TOTAL	**12.6%**	**18.0%**	**37.2%**	**32.2%**	***100.0%***

Source: MNB representative questionnaire-based survey

2.3. Qualitative analysis tools

The purpose of using qualitative analysis tools is to add nuance to the results of the quantitative analysis on the one hand, and to incorporate the opinions of creditors and debtors, on the other.

For the purposes of investigating of the core causes of nonperformance, identifying the possible solutions and assessing the applicability a few potential portfolio cleaning tools, we also conducted a **focus group** study among nonperforming loan debtors, at a total of seven locations,[9] with 7 to 8 participants at each location.

We supplemented the experiences from banks' data reporting on the restructuring of loan transactions by conducting **thematically structured, in-depth interviews** for the purpose of fine-tuning objective data (mortgage loan database) on one hand, and to gain deeper insight into banks' workout practices on the other hand. Our interview subjects were the leaders and experts of three banks holding 42 per cent of the nonperforming or restructured household mortgage portfolio, and of the household workout and risk management areas of a financial enterprise. During the interviews, we asked the banking experts about the bank practices and the restructuring toolset linked to delinquent and nonperforming transactions, the efficiency of workout activity, the legal and administrative burdens hampering the cleaning up of the portfolio, the comments regarding recent legislative changes and the possible supportive role of the central bank and the government.

We discussed Hungarian and international experiences, tools and good practices using a benchmark analysis coupled with an analysis of legislation and the literature, and our hypotheses on the economic and social aspects of the mortgage loan issue using **in-depth interviews** with external experts. To examine the current portfolio cleaning tools, we conducted professional interviews with the chief executive officer and experts of the National Asset Management Ltd., and – to gain insight on the experiences of the mentoring service provided in the context of the

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[8] A representative sample of the outstanding loan portfolio according to region and type of locality based on Central Credit Information System data as of 31 May 2015.

[9] Locations: Budapest, Eger, Gödöllő, Hódmezővásárhely, Miskolc, Orosháza, Pécs.

NET programme – with the leaders of the Hungarian Charity Service of the Order of Malta and the Hungarian Reformed Church Aid.

3. THE CAUSES OF INDEBTEDNESS AND NONPERFORMANCE

After the onset of the crisis, many countries faced a substantial increase in the volume of nonperforming household mortgage loans. In most cases, the rise in the ratio of nonperforming loans was driven by clearly delineated macroeconomic developments: recession in the affected economies and a slump in corporate activity typically leading to rising unemployment, which renders compliance with the terms of debt servicing laid down in the loan contract unsustainable for many debtors. To make matters worse, the economic downturn also entails a dip in the value of housing prices – and thus loan collateral – which in extreme cases could result in negative equity. In countries where the legal system allows the waiving of the portion of the loan debt above the secured portion, referred to as 'walk away', falling into arrears may be a rational strategy for debtors with a loan-to-value ratio of over 100 per cent.

In Hungary, debtors with a loan-to-value ratio exceeding 100 per cent continue owing the portion exceeding the collateral sale price to their bank after the sale, in the form of an unsecured loan. As a result, in Hungary a high loan-to-value ratio does not in itself warrant falling into arrears in Hungary, and therefore delinquency logically stems primarily from an insufficient payment-to-income ratio (*overindebtedness from an income perspective*), while a debt amount exceeding property value (*overindebtedness from a wealth perspective*) primarily restricts the available 'exit strategies'. If the debtor's debt exceeds the property's value, selling the property is not a solution.

The severity of the legal consequences of falling into arrears also impacts debtor behaviour, along with their income and wealth position: if nonperformance does not result in a material deterioration in debtors' position (e.g. losing their home), they are able to follow a higher consumption path by suspending their debt servicing without suffering any negative consequences. Therefore – given the necessary moral disposition (tendency for opportunistic conduct) – falling into arrears may also be a rational option even if the debtor's income and wealth position would otherwise allow it to fully meet its debt servicing obligation. The literature refers to the latter as moral hazard.

Chart 2: A hierarchy of the potential causes of default
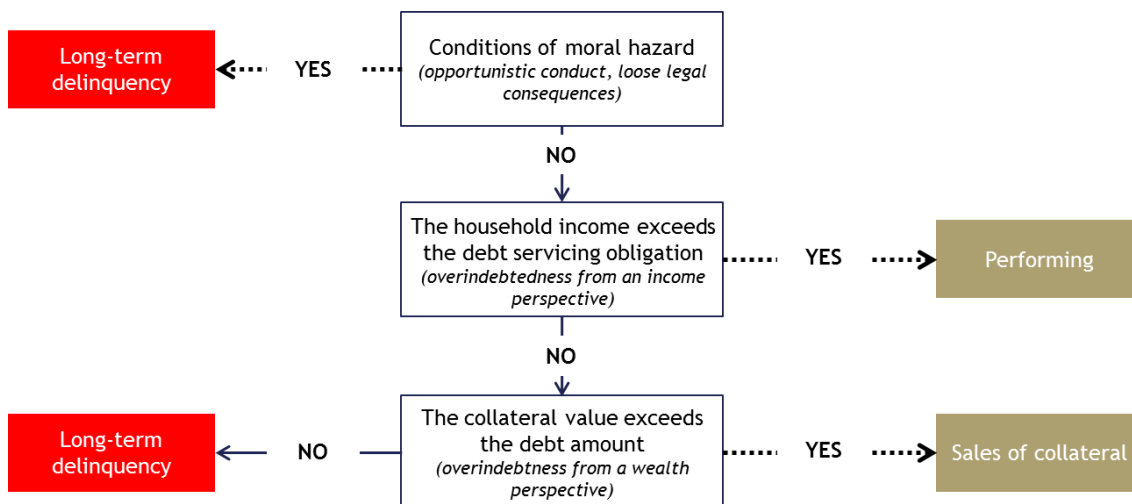
Note: For a more general version of the arrears decision tree, see the Gerlach-Kristen and Lyons (2015) paper.
Source: Authors' compilation

There is a clear hierarchy among the three factors specified above (*Chart 2*). If the circumstances of moral hazard prevail, the debtor may abandon its debt servicing regardless of its income or wealth position. Otherwise, the debtor's payment is primarily determined by its income position, irrespective of the loan amount and the ratio of collateral value. Finally, if the debtor's income is insufficient to cover its monthly debt servicing, it can repay its debt by selling the property provided that the loan amount is smaller than the income from the sale; otherwise, the debtor goes into long-term arrears.

Hungary differs from the majority of international examples in terms of the potential causes of default in several respects. For one, in the years immediately preceding the crisis, households characteristically contracted foreign currency denominated debt,[10] and therefore the sharp depreciation of the forint exchange rate during the crisis significantly increased the forint amount of repayment instalments due. Secondly, due to the earlier shortcomings of the Hungarian legal system, the concluded loan contracts put banks in an excessively dominant position by allowing them to subsequently and unilaterally amend pricing and credit terms, allowing them to offset their declining profitability by hiking interest rates on foreign currency loans.[11] The real economic downturn was thus coupled with the shock of interest and exchange rates for Hungarian debtors, while in other countries, monetary easing characteristically supported debtors' financial position. As a result of the simultaneous impact of the depreciation in the exchange rate on both repayment instalments and loan amounts, debtors run a significant chance of overindebtedness from both income and wealth perspective, substantially restricting their options for emerging from long-term delinquency.

Due to the magnitude of the issue in Hungary, several studies and publications addressed the causes of delinquency among nonperforming loans, including a number of analyses by the Magyar Nemzeti Bank mainly featured in its Financial Stability Reports.[12] The MNB (2012) attempts to identify the underlying causes of nonperformance on the basis of macroeconomic variables using econometric methods: according to the outcomes, the rise in interest and exchange rates and higher unemployment account for half of the cases of nonperformance, mainly due to the former two factors. Gáspár and Varga (2011) use microsimulation methods to reach a similar outcome: according to their study, the primary cause of nonperformance was the rise in repayment instalments, while job loss only contributed to a smaller degree to the exacerbation of the issue. A key finding is that the financial position of roughly half of delinquent debtors was already overextended at the time of loan origination, and they would have fallen into arrears even in the absence of the aforementioned shocks. On the basis of micro-data, Hosszú (2011) and Balás (2013) emphasise that while households' indebtedness does not seem salient based on the aggregate portfolio volume by international standards, the fact that a significant portion of outstanding loans is found on the balance sheets of lower-income households is problematic. Szigel and Fáykiss (2012) focus on the degree of interest paid by households, concluding that the sector's indebtedness is far more severe based on the degree of interest payable than suggested by the volume of outstanding debt.

To supplement the findings of earlier analyses, we examined the causes of indebtedness and nonperformance by conducting a focus group study of debtors. The experiences from the focus groups broadly confirmed our theoretical reasoning: based on the credit history outlined by debtors, the direct cause of nonperformance was typically a drastic increase in the payment-to-income (PTI) ratio, stemming primarily from the sharp **rise in the exchange rate.** This was all exacerbated by the sudden change in respondents' labour market position – typically **job loss**, decline in income stemming from **illness** or **raising children** and the subsequent **difficulties reintegrating** the labour market – as well as the continuous decline in the **real value of incomes** (mainly during the period following loan origination based on the accounts).

Debtors attributed a major role to banks in the emergence of unsustainable PTI ratios, mainly on account of the absence of fair information, the unilateral contract amendments and changes to credit terms, and insensitivity to individual life situations and personal needs. The symbol of what was referred to as 'the fine print' was a notable phenomenon, referring to the lack of transparency of loan transactions[13] and the feeling of being misled, strongly eroding trust and reinforcing **resistant attitudes** vis-à-vis banks. The latter bears great significance in our view

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[10] This paper does not address the emergence and causes of foreign currency lending; for more on these topics, see Bauer et al. (2013) and Csajbók et al. (2010).

[11] Interest rate hikes by banks are in part explained from an economic perspective by the rise in funding costs, the special taxes levied on the banking sector and the rise in provisioning needs (Pitz – Schepp, 2013). However the change in interest rates was clearly asymmetrical: when the above factors would have warranted interest rate cuts, the rates did not change according to the aggregate statistics.

[12] See: MNB (2015).

[13] The word association game, which asked focus group participants to associate thoughts with the word 'contract', yielded interesting results. Participants associated positive thoughts in five cases and negative thoughts in 45 (!) cases.

because it carries a significant risk in terms of the successful cleaning up of the portfolio: the participants of the debtor focus group **did not contest individual responsibility for the prevailing situation,** and even emphasised that **the solution should be found in a consensual manner together with banks.**

In terms of individual responsibility, the focus group participants mentioned the **inadequate assessment of risks** at the time of loan origination (attributable on the one hand to unfair information by banks and to the absence of complex financial literacy on the other hand), as well as '**excessive spending**' conduct (or the 'loosening' of the family budget). Responsible borrower conduct was mentioned in several instances, that is the undertaking of the (initial) repayment obligation adapted to income that 'emotionally' justified the fierce resistance to repayment instalments that multiplied in value. It is important to note that based on the experiences of focus groups, the motive for borrowing was to 'stay afloat' in lagging regions, while the motive in wealthier regions was to elevate already middle-class living standards, which entails a different approach to potential portfolio cleaning tools (and most likely, a different degree of success).

The occurrence of certain unexpected events were also mentioned as the cause of nonperformance – typically failing **relationships** or (long-term) illness, exerting a strong negative impact on solvency. In this regard, welfare services, the absence of a **state protection net** and the shortcomings of a state insensitive to individual risks (problems) were mentioned. The direct responsibility of the state and the European Union (as an institutional system) received relatively little mention among the causes – when prompted by the moderator, **weak regulatory oversight** was most commonly mentioned.

4. A GENERAL CHARACTERISATION OF THE PROBLEMATIC PORTFOLIO

While numerous studies have examined the causes of nonperformance in recent years,[3] their common shortcoming was that they are based primarily on the analysis of aggregates, i.e. using incomprehensive micro-level databases lacking key variables. For the sake of a more in-depth analysis of the issue, the MNB requested contract level data during the summer of 2015 from the main market players holding the largest portfolio of nonperforming mortgage loans. In the context of extraordinary data reporting, 14 financial institutions – 12 banks, one branch office and one financial enterprise – provided data for the mortgage loan database. The **database** contains **229,000 problematic mortgage contracts** (*Table 2*) with principal debt amounting to over HUF 1,600 billion as of 30 April 2015, and over HUF 1,780 billion including overdue interest and fees. Nearly half of the contracts listed in the database, that is 109,000 contracts were at least 90 days past due as of 30 April 2015. However settlement strongly distorts this value, as the measure primarily reduced debtors' oldest arrears, and so many were temporarily reclassified among non-delinquent loan transactions. In our view, the positive impact of settlement will only be temporary for the majority of nonperforming debtors,[14] so we performed the breakdown of the mortgage loan database without arrears on the basis of **delinquency categories prior to settlement** in respect of nonperforming and performing contracts. On this basis, 63 per cent of the contracts listed in the database – a total of **144,000 contracts** – qualify as **nonperforming**, while 37 per cent – **85,000 contracts** – qualify as **performing restructured.** The mortgage loan database covers a substantial portion of the problematic mortgage portfolio within the system of financial intermediation: based on the data contained in the CCIS in late 2014, it covers 86 per cent of the 171,000 nonperforming mortgage loans within the system of financial intermediation and 93 per cent of the banking system's volume of nonperforming mortgage contracts (including branch offices).

Table 2: Outstanding principal debt of nonperforming and performing restructured mortgage loans listed in the mortgage loan database and the number of contracts in a breakdown by delinquency prior to settlement

HUF Bn	Performing restructured			Nonperforming			Total		
	Gross	Net	Number of contracts	Gross	Net	Number of contracts	Gross	Net	Number of contracts
Valid contracts	**493.0**	**442.2**	**83,979**	**500.8**	**258.9**	**64,997**	**993.7**	**701.1**	**148,976**
CHF	364.6	333.3	52,562	408.7	204.8	47,926	**773.4**	**538.1**	**100,488**
EUR	25.0	22.3	3,774	47.5	27.1	6,756	**72.6**	**49.3**	**10,530**
HUF	99.6	83.2	27,243	38.9	22.6	9,698	**138.5**	**105.8**	**36,941**
JPY	3.7	3.4	400	5.6	4.4	617	**9.3**	**7.9**	**1,017**
Terminated contracts	**2.7**	**1.4**	**808**	**621.0**	**333.8**	**78,809**	**623.7**	**335.2**	**79,617**
CHF	0.8	0.4	87	524.6	268.4	56,433	**525.4**	**268.9**	**56,520**
EUR	0.1	0.0	8	21.8	9.4	3,400	**21.9**	**9.4**	**3,408**
HUF	1.8	0.9	713	60.1	42.7	17,538	**61.9**	**43.6**	**18,251**
JPY	0.0	0.0	0	14.5	13.3	1,438	**14.5**	**13.3**	**1,438**
Total	**495.7**	**443.6**	**84,787**	**1,121.7**	**592.7**	**143,806**	**1,617.5**	**1,036.3**	**228,593**

Note: Outstanding principal debt amounts as of 30 April 2015. The breakdown by currency only serves analytical purposes, as foreign currency denominated loans essentially ceased to exist from the time of conversion.
Source: MNB mortgage loan database

A necessary condition for effectively addressing the issue of nonperforming loans is to have a clear picture of their basic attributes. While aggregate information on performance presents the magnitude of the issue, the distribution of loan contracts based on different dimensions may shape potential recommendations and the costs thereof.

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[14] The ratio of nonperforming household mortgage loans of the banking system decreased by the settlement to 16 per cent in 2015 Q2 from 20 per cent of end-2014, then it increased to 19 per cent at the end of August.

Distribution by interest rates and residual maturity defines the available leeway for potential restructuring. In the course of the analysis, we looked at terminated loans and valid contracts separately in view of the fact that many credit features (maturity, interest rate) can no longer be interpreted for the former, and thus calls for a different approach when examining debtor solvency and willingness.

Chart 3: Distribution of terminated mortgage contracts by year of termination
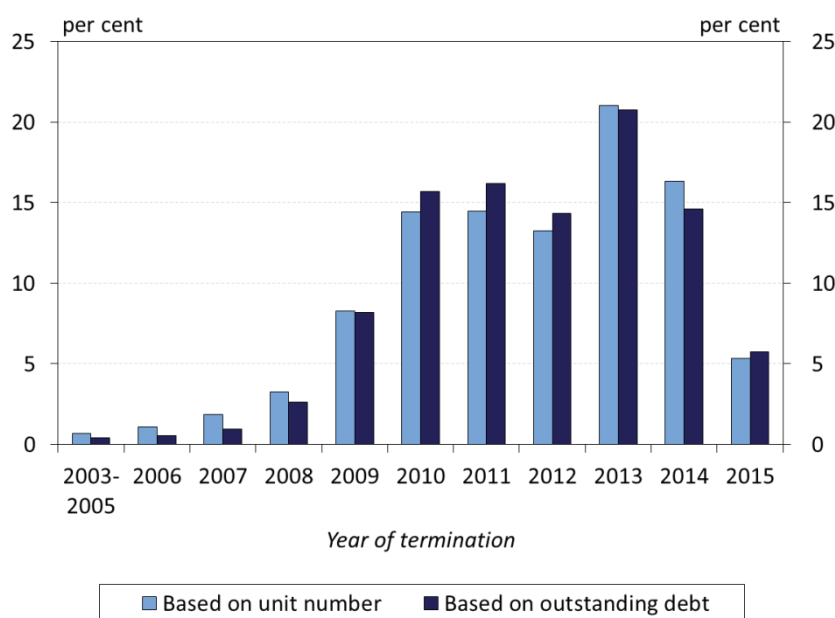
Approximately 55 per cent (80,000 transactions) of the 144,000 **nonperforming contracts** listed in the database are **terminated** loan transactions, while **30 per cent are under execution procedure** (43,000 contracts). The median total debt for terminated transactions is somewhat higher (HUF 6.5 million) compared to valid contracts. Ninety-three per cent of the contracts were terminated after 2008 – and a particularly large number in 2013 (21 per cent, nearly 1,600 contracts, *Chart 3*). The outstanding debt only decreased between 2014 and 2015 for a mere 6 per cent of terminated transactions.

The median outstanding total debt among **nonperforming valid transactions** is HUF 6 million, while the **average total debt stood at HUF 8.6 million** in April 2015. Within average total debt, the amount of principal debt not yet due stood at HUF 7.2 million, while overdue debt was HUF 1.4 million. Some **72 per cent** of nonperforming debtors **owed less than HUF 10 million**, but loans featuring a higher debt amounts account for over 60 per cent of the outstanding portfolio (*Chart 4*). The amount of debt according to the oldest arrears shows a rising tendency, in line with expectations: while the median debt of debtors 91-180 days past due is HUF 4.9 million, this figure is HUF 7.4 million among debtors over two years (721 days) past due. The causal relationship may be two-way in this case: while higher debt amounts may characteristically mean higher repayment instalments and thus a larger burden for households, the fact of nonperformance and the persistence of arrears may in and of themselves contributes to the accumulation of debt.

Chart 4: Distribution of nonperforming valid mortgage contracts in a distribution by total debt
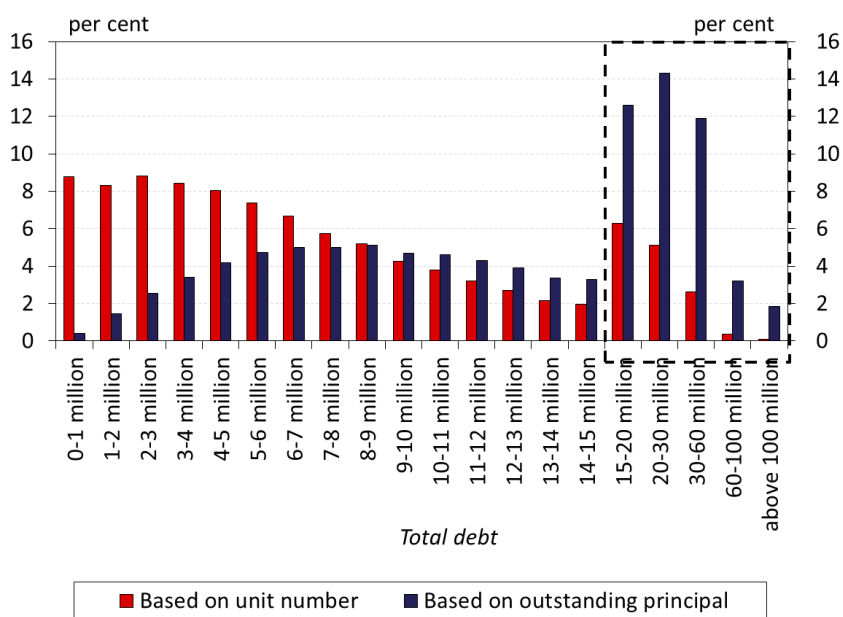
Source: MNB mortgage loan database

Chart 5: Distribution of problematic mortgage contracts based on number of contracts
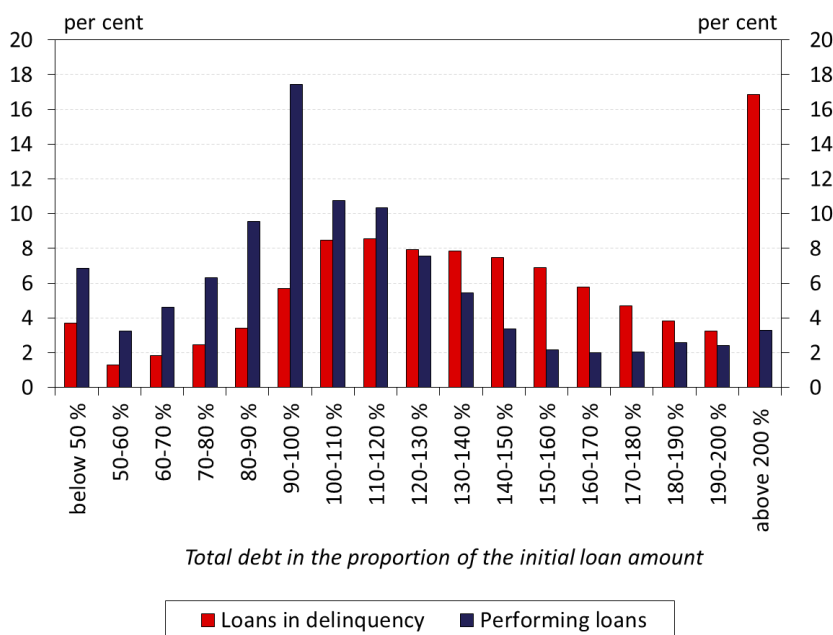
Source: MNB mortgage loan database

The debt amounts, which have increased substantially in the wake of the exchange rate depreciation, may have a negative impact on debtors' willingness to pay. **For 82 per cent of nonperforming contracts**, the **current total debt is higher than the initial loan amount**, but this ratio also stands at 52 per cent among performing restructured loans (*Chart 5*). In light of these figures, there may be numerous debtors coming to face the fact that after years of fulfilling their payment terms, their debt expressed in forint is higher than the contracted loan, which may have prompted many debtors to opt for nonpayment.

For **81 per cent** of debtors, the **monthly repayment** instalment **is less than HUF 100,000**, while the median repayment instalment was HUF 50,000 in April (*Chart 6*). Among the features characterising repayment instalments, the **interest rate** on most contracts is between 3 and 7 per cent, with the median rate at 5.8 per cent in April 2015, that is, after settlement (*Chart 7*). No clear tendency can be identified between the interest rate and the duration of arrears based on the number of days in arrears, although the interest rates of those over two years past due departs somewhat from other categories of arrears (*Table 3*). The bulk of loans was disbursed in 2007 and 2008, and **residual maturity exceeds 10 years** for two thirds of loans (with the median residual maturity being 12 years). It should be emphasised that the above values represent a fairly new situation, as both the interest rate and the outstanding debt among the determinants of repayment instalments underwent material changes in 2015 Q1 in the wake of settlement (*Box 1*). Table 3 provides a more in-depth overview of the main credit characteristics of the current nonperforming valid loan contracts.

Chart 6: Distribution of nonperforming valid mortgage loan contracts in a distribution by repayment instalment
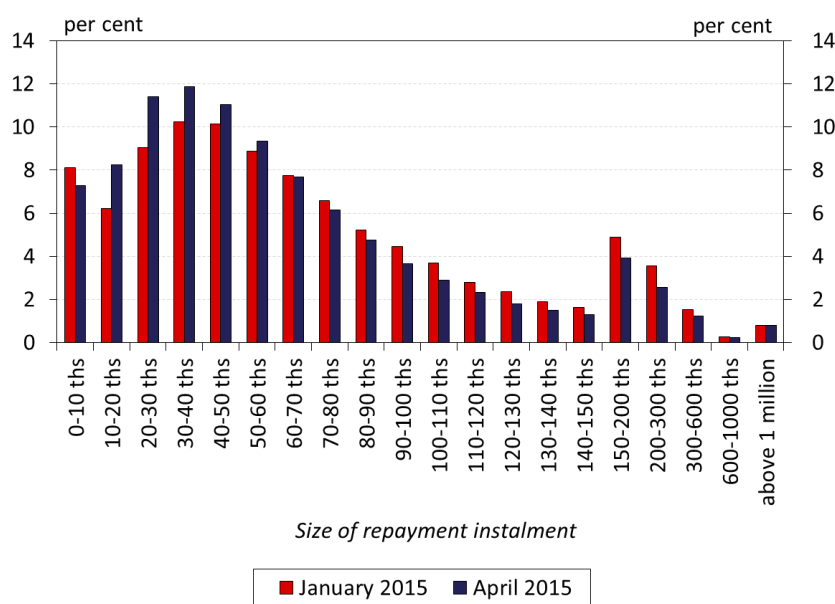
Source: MNB mortgage loan database

Table 3: Median and average value of the main characteristics of nonperforming valid mortgage loan contracts by delinquency category

Longest delinquency	Outstanding debt (HUF million)		Repayment instalment (HUF)		Residual loan term (year)		Interest rate *(%)*	
	Median	Average	Median	Average	Median	Average	Median	Average
91-180 day	4.91	6.98	47,838	90,179	12	12	5.4	5.57
181-360 day	5.07	7.16	48,429	87,780	12	12	5.51	5.61
361-720 day	5.69	7.95	51,114	88,350	12	13	5.75	5.73
721+ day	7.40	10.40	51,869	95,973	13	14	6.17	6.43
Sum	**6.04**	**8.61**	**50,155**	**91,292**	**12**	**13**	**5.8**	**5.93**

Source: MNB mortgage loan database

Chart 7: Distribution of nonperforming valid mortgage loan contracts in a distribution by interest rate
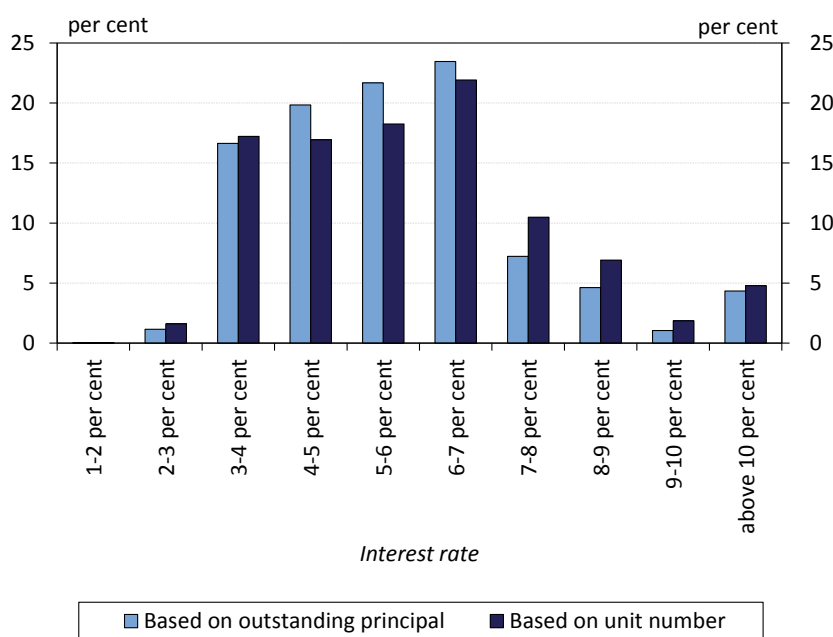
Source: MNB mortgage loan database

BOX 1: THE IMPACT OF SETTLEMENT ON REPAYMENT INSTALMENTS, PRINCIPAL NOT YET DUE AND TOTAL DEBT SIZE

In 2014 Q4, in the wake of the Curia's uniformity decision issued in June, several pieces of legislation primarily impacting the situation of foreign currency debtors were passed. While the forint conversion act prevented the payable burdens from increasing compared to their November level by fixing the conversion exchange rate used for repayment instalments, settlement brought a tangible reduction in repayment instalments for customers, at least for the majority of debtors.

Distribution of the impact of settlement on repayment instalments and debt due for nonperforming but valid contracts
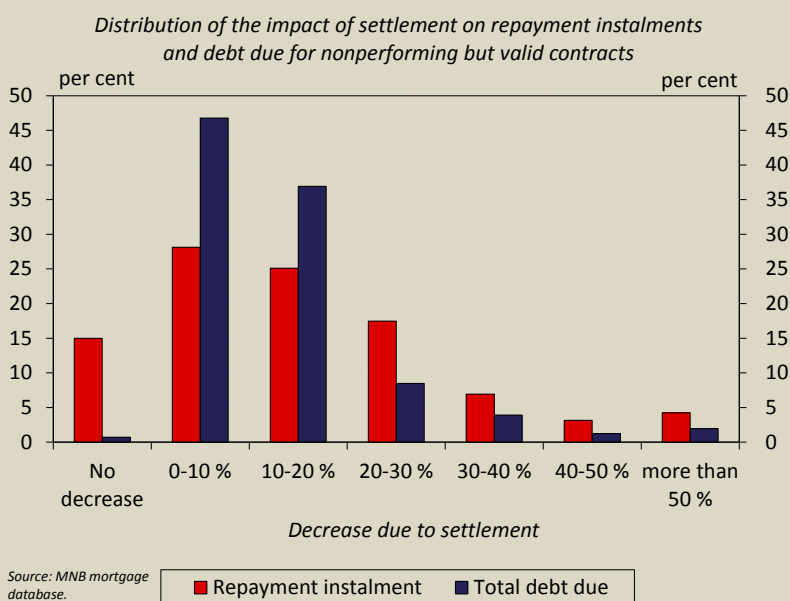
Source: MNB mortgage database.

In the context of settlement, the cumulated amounts stemming from overpayments due to unilateral interest rate hikes and the application of an exchange rate spread by banks were repaid to debtors. The repayable amounts on valid contracts (consumer claims) were settled against outstanding (primarily overdue) debt, while interest rates reverted to their original levels or just below. Nonperforming debtors' repayment instalments due were typically only reduced to a smaller extent compared to their performing peers, fundamentally due to two reasons: for one, the amount reclaimable following settlement is

ceteris paribus lower in their case, as many did not accrue overpayments due to the lower repayments made. Moreover, due to the order of fulfilment, the lion's share of the generated consumer claim is 'absorbed' by arrears, thus the basis of the repayment instalment, i.e. the principal debt not yet due, did not decreased materially.

While typical debtors fulfilling their contractual terms typically saw a 20-25 per cent decrease in their debt and a 25-30 per cent reduction in their repayment instalments, for their nonperforming peers, total debt shrank by 13 per cent on average while principal not yet due decreased by barely 9 per cent, and the repayment burden by 16 per cent.[15] It should be added that due to the individual attributes of nonperforming debtors, many even saw their repayment instalments and/or outstanding debt increase rather than decrease. One such idiosyncrasy could be a repayment instalment already reduced in the context of restructuring, or the conversion of arrears into principal, which could also increase the amount of repayment instalments due. However, settlement cannot in and of itself result in a higher repayment instalment or higher debt.

Impact of settlement on principal and repayment instalment not yet due by delinquency category

	Decrease in total debt	Decrease in principal not yet due	Change in repayment instalment
91-180 day	-16.7%	-14.4%	-18.1%
181-360 day	-15.3%	-11.2%	-15.8%
361-720 day	-12.9%	-7.1%	-13.9%
721+ day	-9.9%	-6.3%	-17.4%
SUM	-12.9%	-8.9%	-16.4%

Source: MNB mortgage loan database.

Looking at the impact of settlement by delinquency category, the aforementioned expectations are fulfilled in the case of total debt and principal debt not yet due: the longer the customer has failed to meet the contractual terms, the smaller the consumer claim 'accrued' by it relative to debt. However, according to the change in repayment instalments, debtors with at least two years of arrears experienced almost the same reduction on average as those 91-180 past due. A possible explanation may lie in the other important determinant of repayment instalments: developments in interest rates. It is possible that those with longer arrears saw a greater decline in their interest rate in the wake of settlement compared to their peers with less overdue debt.

Debtors with nonperforming mortgages **also have a great deal of other credit debt**, for the most part in the form of personal loans (*Chart 8*). Our analysis factored in **all credit debt** when investigating debtor solvency and willingness to pay, giving us a more accurate picture of the regular loan repayment obligations of debtors listed in the problematic mortgage portfolio.

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[15] We estimated the impact of settlement based on the changes in data for January and April 2015. For all three calculations, we eliminated transactions where the debt, the principal not yet due or the repayment instalment increased.

Chart 8: Number of contracts and volume of the other loan contracts of debtors with a nonperforming mortgage loan
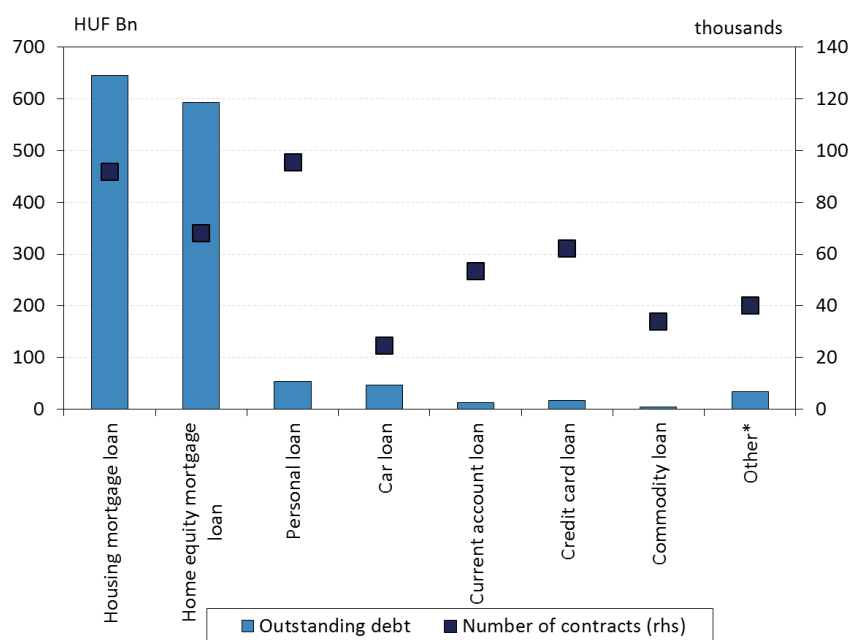
Note: The miscellaneous category also includes factoring receivables.
Source: MNB, CCIS

We analysed the distribution of debtors by age using data from the representative questionnaire-based survey. We established that **over two thirds** of nonperforming loan debtors[16] **are over the age of 40**, therefore, comparing this with the residual maturity calculated based on the mortgage loan database, the majority will see their loan contract expire after reaching the age of 53, while **one-fifth** will already be **retired at the time of expiry** of the loan transaction (*Chart 9*). The 'age tree' of debtors therefore restricts potential bank restructuring, as nearly half of debtors will have reached retirement age in 20 years, and a quarter will have reached the age of 70.

In terms of the highest educational qualification of the debtors (also based on the representative questionnaire-based survey), **three quarters hold secondary qualification** (vocational school, vocational secondary school, high school, secondary technical school), while only 11 per cent hold a college or university degree (*Chart 10*). Beyond impacting current and expected income relations, education may also be an important explanatory factor in terms of the successfulness of the portfolio cleaning measures implemented so far. Distribution by education carries an important message for regulators: the proposed solutions must be adapted to the actual life situation of the target segment and be clearly comprehensible. In terms of the latter, one of the key findings of the attitude survey was the confusion and lack of transparency of the government measures taken so far (debtor rescue packages).

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[16] The interviews were conducted with the person contracting the loan for the most part (93 per cent).

Chart 9: Distribution of borrowers by age
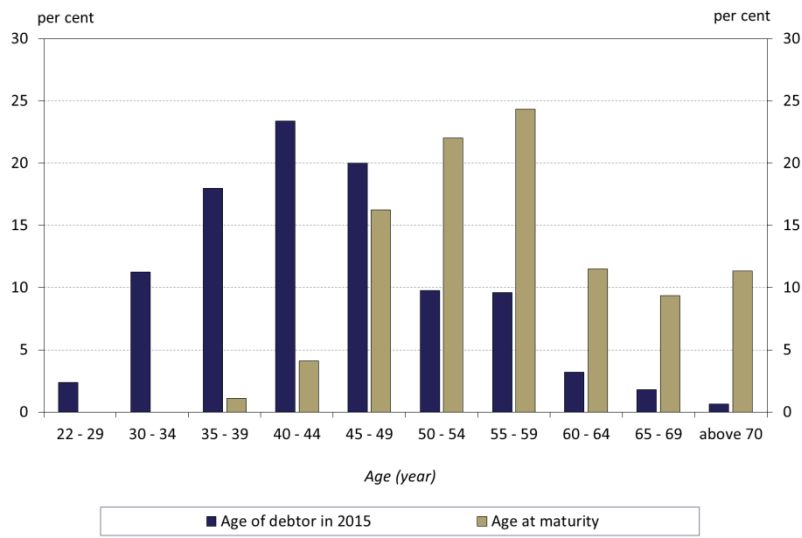
Source: MNB representative questionnaire-based survey

Chart 10: Distribution of borrowers by education
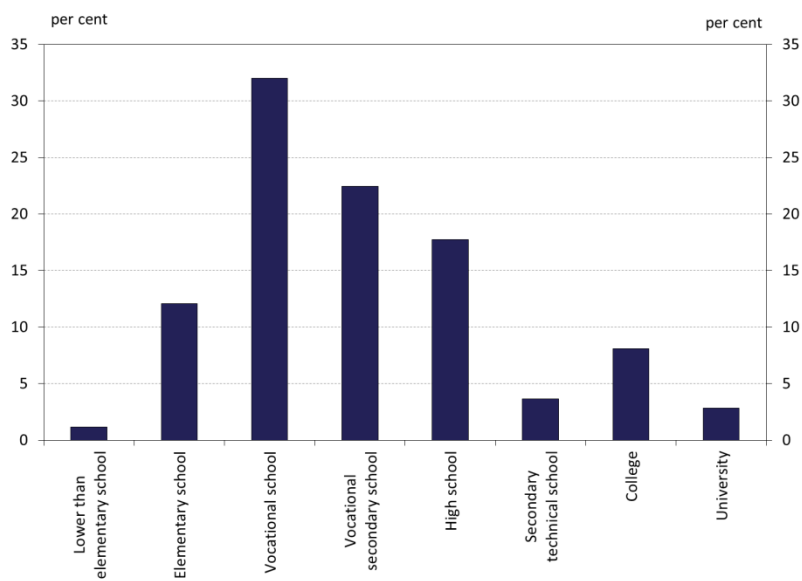
Source: MNB representative questionnaire-based survey

5. DEBTORS' WEALTH POSITION

We analysed debtors' wealth position primarily by **looking at the collateral** backing mortgage loans. From various perspectives, collateral is a key element of mortgage transactions. From the creditor's perspective, the collateral *is the main security on the loan* – in the event of the debtor's nonperformance, liquidation of the collateral guarantees recovery of the loan (or at least the minimisation of losses); accordingly, the *marketability* of a property is crucial for the creditor. From the debtor's perspective, the collateral primarily *secures housing*, and so keeping ownership is both a strategic and tactical objective. As a result, in the event of nonperformance, selling the property is the worst scenario for the debtors – particularly if the value of the loan exceeds collateral value: the creditor does not automatically forgive the portion of credit exceeding collateral value, therefore the debtor is not 'freed' from its total debt even after losing its most valuable asset. Therefore in the case of overindebtedness – in other words, when the debtor has negative equity – we must also expect the factors of psychological impacts: the deterioration in discipline of repayments and a reduced incentive to preserve the property's condition, the latter further 'increase' the debtor's negative equity.

The **marketability** of residential property is largely shaped by **geographic location.** The findings of the countrywide representative survey revealed that nearly 70 per cent of the collateral backing nonperforming mortgages are located in municipalities and other (smaller) cities – which are not optimal from housing market perspective – and only a small third part of stock is located in cities with county authority or the capital Budapest (*Chart 11*). By contrast, some 51 per cent of the stock of dwellings in Hungary is located in Budapest or cities with county authority, and therefore the collateral backing nonperforming loans is relatively more common in smaller localities relative to the total dwelling stock. Forty-four per cent of the properties (and the debtors) are located in the eastern regions of Hungary (Northern Hungary, Northern Great Plain and Southern Great Plain regions), and 29 per cent are located in the Western regions (Central Transdanubia, Western Transdanubia and Southern Transdanubia). The 'underrepresented character' of the central region (Budapest and Pest County) among the collaterals backing nonperforming loans is clearly reflected in the fact that 27 per cent are located in this region, while it accounts for 43 per cent of the national stock of dwellings.

Chart 11: Nonperforming debtors in a distribution by region and type of locality
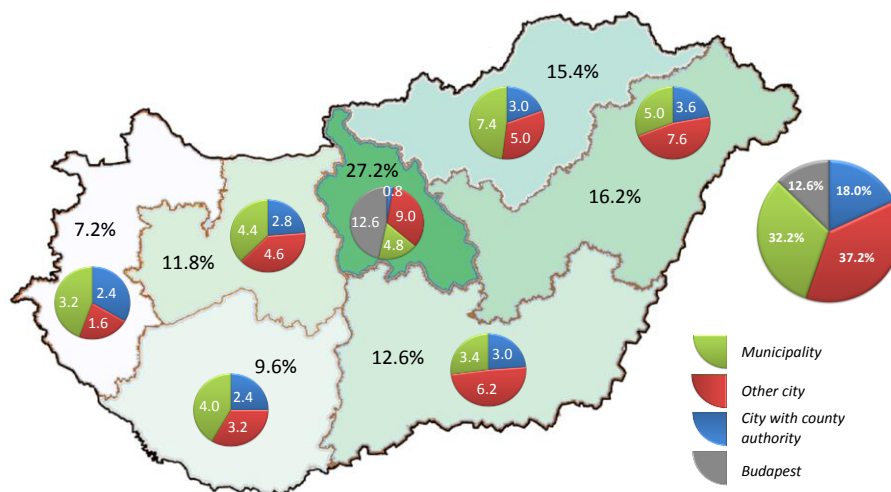
Source: CCIS

The **current value of the collateral** backing nonperforming loan listed in the mortgage loan database shows significant **heterogeneity:** some two thirds of properties have a current value of less than HUF 10 million, 16 per cent have a current value between HUF 10 and 15 million, 8 per cent have a value between HUF 15 and 20 million, and 10 per cent have a current value of over HUF 20 million. The average collateral value in Budapest and cities with county authority is higher relative to other localities (other city, municipality) (*Chart 12*).

Chart 12: Distribution of the collateral backing nonperforming mortgage loans in a distribution by current value and type of locality
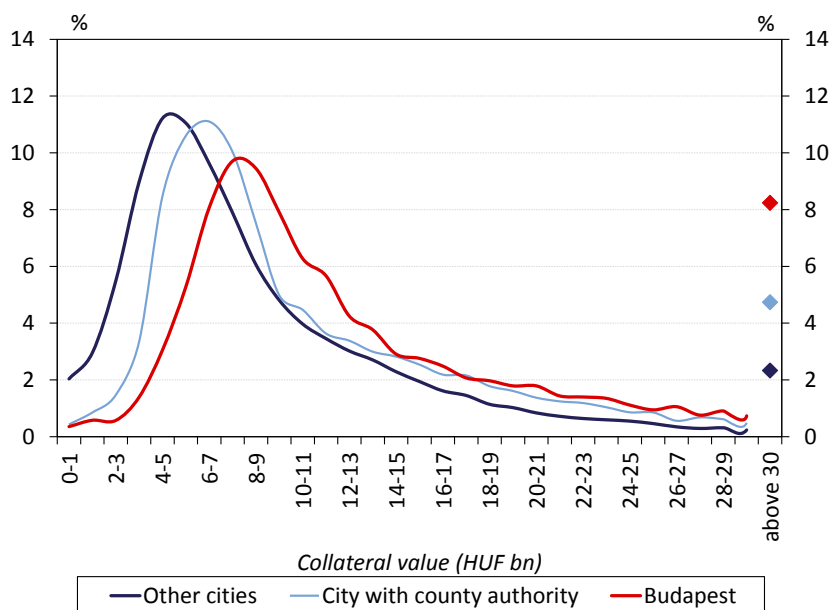
Source: MNB mortgage loan database

We looked at the ratio of collateral value to debt by investigating the **loan-to-value** (LTV) ratio, calculated as the ratio of the outstanding principal debt to the current value of the property(ies) pledged as collateral. The average **LTV** ratio at the time of contract conclusion for problematic mortgages listed in the mortgage loan database is **66.4 per cent,** as opposed to the **current ratio** of somewhat more than **110 per cent** (as of 30 April 2015). The portfolio's average LTV ratio has thus **increased by almost two thirds,** giving rise to characteristic **overindebtedness from a wealth perspective** among the debtors. The initial and current loan-to-value ratio of nonperforming contracts is significantly higher compared to performing restructured contracts: the difference is most pronounced in the case of CHF-denominated loans, where nonperforming loans feature a loan-to-value ratio of 121 per cent on average, while performing restructured loans feature a ratio of 91 per cent (*Chart 13*).

We found loan-to-value ratios of over 100 per cent among 28 per cent – some 64,000 transactions – of the problematic mortgages reviewed: nearly 50,000 contracts (35 per cent of contracts) among nonperforming loans are characterised by such loan-to-value ratios. In terms of the volume of loans, 48 per cent of the total portfolio features a loan-to-value ratio of over **100 per cent,** while this proportion stands at **55 per cent** within the **nonperforming portfolio** (*Chart 14*). As mentioned earlier, a loan-to-value ratio of over 100 per cent represents negative equity for the debtor, as the debtor retains some outstanding debt even after the set-off of collateral against the loan amount.

While the above value were obtained using the LTV ratios calculated on the basis of the principal debt, if we look at the LTV ratio compared to total debt (inclusive of overdue interest), over half of nonperforming contracts are characterised by a ratio of over 100 per cent. The average LTV ratio among nonperforming contracts calculated using this method was roughly 140 per cent in late April 2015.

Chart 13: Average initial and current LTV ratio of problematic mortgage loans
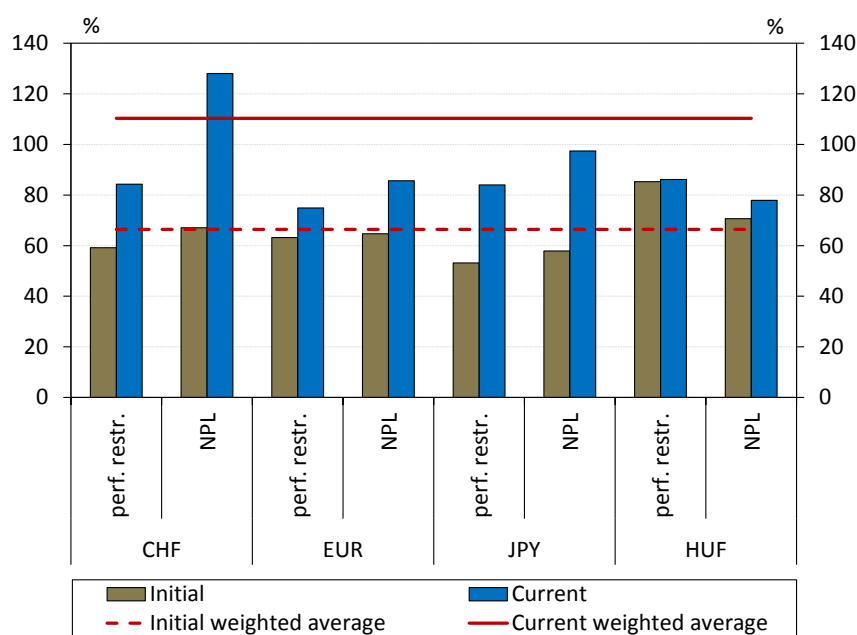
Source: MNB mortgage loan database

Chart 14: Distribution of the LTV ratios of problematic mortgage loans
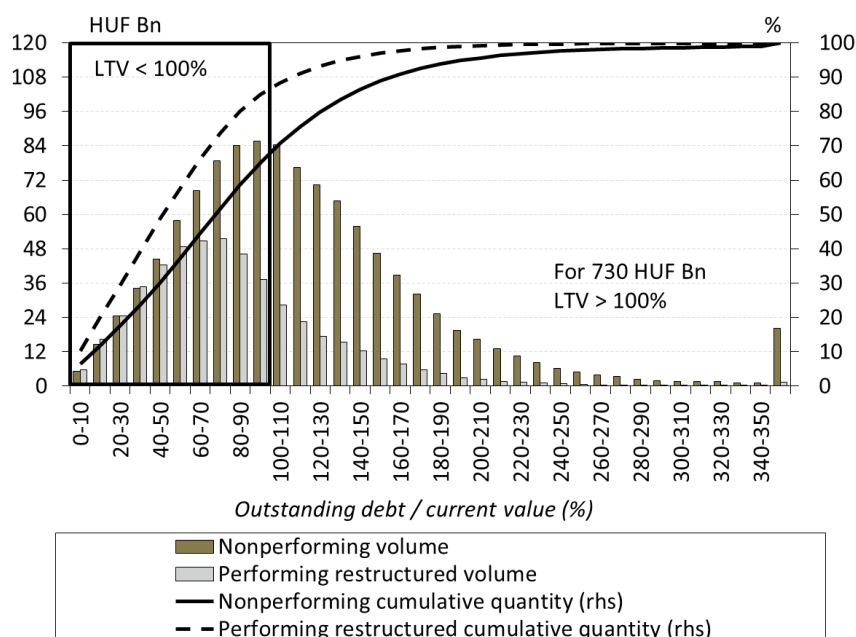
Source: MNB mortgage loan database

The significant **rise** in the **LTV** ratios of nonperforming mortgage loans was driven by **three components**: the impact of the depreciating exchange rate, which swells debt amounts, declining collateral value and the impact of unfulfilled principal repayments. Between June 2007[17] and 7 November 2014, the day designated for forint conversion

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[17] A large portion, 66 per cent of the nonperforming and performing restructured mortgage loans listed in the mortgage loan database were disbursed between 2007 and 2008.

exchange rates, the forint exchange rate to Swiss franc depreciated by 70 per cent.[18] On this basis, the LTV ratio of a Swiss franc denominated loan featuring average parameters, with a HUF 6.4 million initial loan amount and a 65.1 per cent initial LTV ratio rose to 110 per cent merely due to higher principal debt resulting from the depreciation in the exchange rate. The general depreciation of housing prices further eroded the collateral value, by 14 per cent on average, inflating the LTV ratio of the aforementioned representative Swiss franc denominated loan from 110 per cent to 128 per cent, *ceteris paribus*. The average current LTV ratio of the Swiss franc loans included in the sample is 117 per cent, so principal repayments have on average somewhat lowered the ratio. The loan-to-value ratios of loans denominated in other currencies – euro and Japanese yen – rose to a smaller degree thanks to the smaller exchange rate depreciation. In the case of forint loans, the nearly identical average initial and current value allows us to conclude that the amount of repayment instalments compensated the average decline in collateral values. Thus, the former **Swiss franc denominated mortgage loans feature the highest loan-to-value ratios**, with the drastic rise in the ratios **driven** for the most part by the **weakening forint exchange rate.**

Cyclical movements on the housing market can substantially influence households' wealth position, as residential properties constitute a large portion of the sector's wealth. As a result, the situation of problematic mortgage loan debtors and creditors is largely shaped by changes in the current value of the properties pledged as collateral. In the following section, we examine how the current state of the Hungarian housing market affects the situation of the affected problematic mortgage debtors.

The collateral listed in the mortgage loan database exhibits a strong heterogeneity in terms of the change in the current value since loan origination: the rate of depreciation shows an increasing trend when progressing towards smaller localities and economically lagging regions. The **current value of properties pledged as collateral** on problematic mortgage loans **deteriorated by 13.7 per cent on average** compared to the time of loan origination (*Table 4*), exhibiting a somewhat stronger decline compared to the average decrease in housing prices after the crisis. According to the calculations of the Hungarian Central Statistical Office (HCSO), used housing prices fell by 5.1 per cent on average between late 2008 and the end of 2015 Q1, while prices for new dwellings fell by 4 per cent, meaning that the value of collateral backing nonperforming loans deteriorated in excess of the national average. There are pronounced discrepancies among regions in terms of the value of collateral. Northern Hungary and Southern Transdanubia saw the sharpest decline, linked on the one hand to economic development and on the other hand to the nationally lagging labour market and demographic developments in these regions. While the average collateral value in the case of the former regions fell by 16.8 per cent and 18.9 per cent respectively on average, the Western Transdanubia and Central Hungary regions only saw values fall by 9.9 per cent and 12 per cent respectively. The change in the value of collateral is not only heterogeneous based on geographic location, but also based on locality size. While collateral value fell on average by 11.8 per cent in Budapest, the decline in cities with county authority was 12.5 per cent and 14.7 per cent in other localities. By and large collateral values fell **to the largest extent** in smaller localities of **Northern Hungary** and **Southern Transdanubia**, with average depreciation of 17.2 and 20.7 per cent respectively in these regions.

It should also be emphasised that the value of collateral backing **forint loans** listed in the database deteriorated **far less** compared to the collateral backing foreign currency loans. This stems from the fact that forint loans were typically disbursed earlier than foreign currency denominated loans, and therefore feature a loan history spanning a longer period that includes both increases and decreases to the housing price relative to the initial collateral value.

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[18] Without forint conversion, CHF-denominated mortgage debtors would have experienced a depreciation of the forint exchange rate by almost 91 per cent between June 2007 and April 2015.

Table 4: Average change in the current value of collaterals by region, locality type and original currency denomination

%	Budapest					Cities with county authority					Other cities and municipalities					TOTAL
	CHF	EUR	JPY	HUF	Total	CHF	EUR	JPY	HUF	Total	CHF	EUR	JPY	HUF	Total	
Southern Great Plain						-12.4	-8.4	-10.3	-4.6	**-10.6**	-15.8	-19.6	-7.0	-3.5	**-13.3**	**-12.5**
Southern Transdanubia						-13.9	-17.4	-16.1	-10.2	**-13.5**	-23.7	-13.6	-13.4	-10.4	**-20.7**	**-18.9**
Northern Great Plain						-13.9	-13.7	-17.8	-7.7	**-12.9**	-17.9	-16.9	-15.8	-8.2	**-16.1**	**-15.0**
Northern Hungary						-16.7	-13.5	-24.9	-10.7	**-15.6**	-18.3	-23.2	-21.6	-9.4	**-17.2**	**-16.8**
Central Transdanubia						-14.5	-12.2	-16.1	-8.9	**-13.4**	-18.4	-16.9	-15.5	-9.1	**-16.6**	**-16.1**
Central Hungary	-12.0	-10.9	-19.6	-10.6	**-11.8**	-13.9	-14.0	-10.3	-8.5	**-13.0**	-13.7	-12.9	-18.4	-5.9	**-12.2**	**-12.0**
Western Transdanubia						-11.2	-10.8	-13.2	-4.5	**-9.9**	-12.2	-17.9	-4.2	2.3	**-9.9**	**-9.9**
TOTAL	**-12.0**	**-10.9**	**-19.6**	**-10.6**	**-11.8**	**-13.7**	**-12.6**	**-14.6**	**-7.4**	**-12.5**	**-16.6**	**-16.2**	**-14.8**	**-6.4**	**-14.7**	**-13.7**

Note: The averages are weighted based on the initial current value.

Source: MNB mortgage loan database

As mentioned earlier, the marketability of collateral – and residential property in general – is largely determined by geographic location. Demand for properties in disadvantageous geographic locations is generally lower, as shown by two factors. For one, the number of housing market transactions in economically lagging regions is significantly lower, and they have also been affected by a more pronounced slump compared to the pre-crisis period. While the number of housing market transactions in 2014 was slightly less than 20 per cent lower compared to 2008 in the more developed Central Hungary and Western Transdanubia regions, the decline exceeded 30 per cent in Hungary's other regions (*Chart 15*). In addition, collaterals saw a more pronounced decline in their current value in the more lagging regions. The collaterals backing nonperforming loans are relatively overrepresented in the most underprivileged regions from the housing market perspective, which saw the largest decline in both the number of transactions and property value, which explains the diverging marketability of collaterals according to their geographic location.

Chart 15: Geographic distribution of collaterals backing nonperforming mortgage loans and a number of housing market transactions
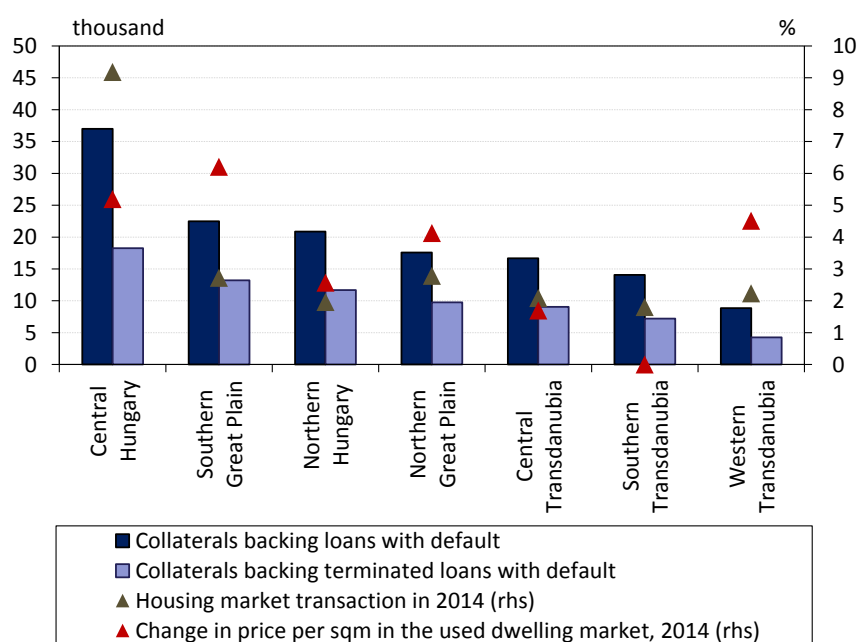
Source: HCSO, MNB mortgage loan database

In light of the foregoing, we will attempt to present to the relative marketability of collateral located in various regions using two indicators. First off, we investigate how the number of collaterals backing nonperforming loans relates to the number of housing market transactions in 2014 separately for cities with county authority and other cities/municipalities. Secondly, we performed a regional comparison of changes in the current value of collateral between the time of loan origination and April 2015.

While in Central Hungary the overall number of housing market transactions in 2014 exceeded the number of collaterals backing nonperforming mortgage loans, in Northern Hungary the number of collaterals is double the number of transactions concluded in the last year. The same applies to properties in the Central and Southern Transdanubia regions. An investigation of the collateral backing nonperforming loans and the number of housing market transactions by type of locality adds further nuance the picture. Similarly to the more advantaged situation of central Hungary and the Western Transdanubia regions in a regional comparison, **larger cities** (Budapest and cities with county authority) are in **an advantaged position** compared to smaller localities: the number of property market transactions in large cities, with the exception of Northern Hungary, exceeds the number of collateral 'needing to be cleaned' (*Chart 16*). The fact that the number of collaterals backing nonperforming loans in the category of other localities (other cities and municipalities) far outstripped the number of annual transactions indicates a structural problem – Northern Hungary and the Southern Transdanubia regions qualify as extreme cases. Collaterals located in the Northern Hungary and the Southern Transdanubia regions would therefore presumably **take longer to be absorbed by the property market.** Taking into account both the number of collaterals to transactions and the changes in their current value, the general opinion – broadly echoed in bank interviews – that collaterals are most **marketable in Budapest and its vicinity**, and the least marketable in Northern Hungary and the Southern Transdanubia region. Based on these factors, **realisation of collateral may only be a solution** to the nonperforming mortgage loan issue **in certain regions and for only a limited number of debtors.**

Chart 16: Marketability of collateral – nonperforming loan transactions
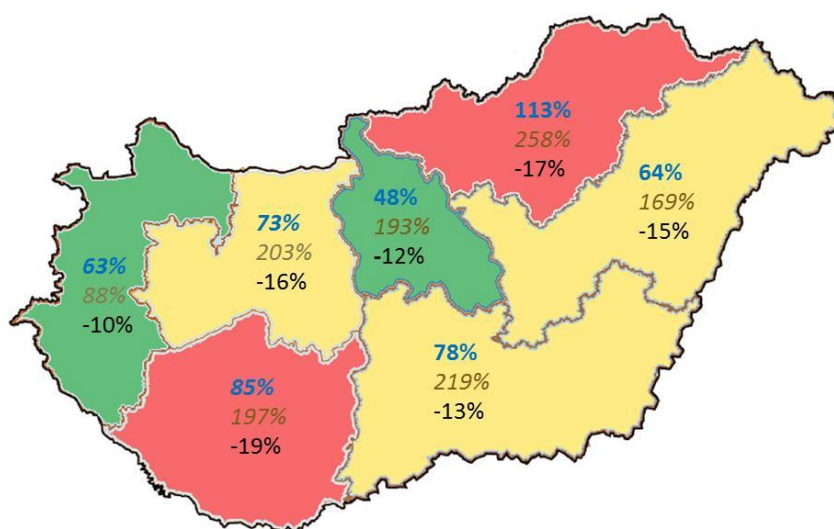
Indicators:

- **Number of collaterals backing nonperforming loans / number of transactions (Budapest and cities with county authority)**
- *Number of collaterals backing nonperforming loans / number of transactions (other localities)*
- Change in the current value of collaterals compared to the time of loan origination

Source: HCSO, MNB mortgage loan database

A potential strategy for debtors to get a fresh start is to move from the current property to one with lower maintenance (and financing) costs. Along with the debtors' willingness for mobility, the viability of this strategy depends on the balanced functioning of the property market. By looking at the ratio of the number of transaction

numbers to the number of collaterals, in our view, with the exception of the Central Hungary and Western Transdanubia regions, the possibility of **moving into a smaller home is only a plausible scenario to a limited degree**, with this scenario only being viable primarily in larger localities. Moreover, sales data corroborate the 'siphoning effect' of more developed regions and larger localities, which is likely to continue significantly impeding a rise in current value in the general improvement in the housing market in smaller localities. Based on the experiences of the representative questionnaire-based survey, debtors characteristically rejected relinquishing ownership of their property (moving out) and the option of moving into a smaller home, which is presumably in line with the average mobility trends.

In terms of debtors' wealth position, so far we have only looked at the value of collateral backing loan transactions. Although the bulk of households' wealth does in fact consist of their residential property, other assets owned by the household (such as other properties, vehicles, savings, or other valuable assets) may improve its actual wealth position. Due to its nature, the mortgage loan database only provided information on collaterals, so we supplemented the investigation of households' actual wealth position with the representative questionnaire-based survey. In the course of the survey, we collected more in-depth and comprehensive information on the other assets owned by households – based on which we examined the **relationship** between households' **outstanding mortgage debt and wealth background** (*Chart 17*). The findings of the survey showed that for 40.5 percent of households, the outstanding debt amounts to half of household wealth. **Overindebtedness**, that is when the amount of debt exceeds the household's wealth, **applies to 20 per cent of households. Nearly 3 per cent** of debtors seem particularly problematic; in their case, we observed **indebtedness exceeding 200 per cent** of asset value – even the personal bankruptcy procedure introduced in September of this year is unlikely to provide a solution for these debtors due to the eligibility criteria.[19]

Chart 17: Outstanding debt to total household wealth
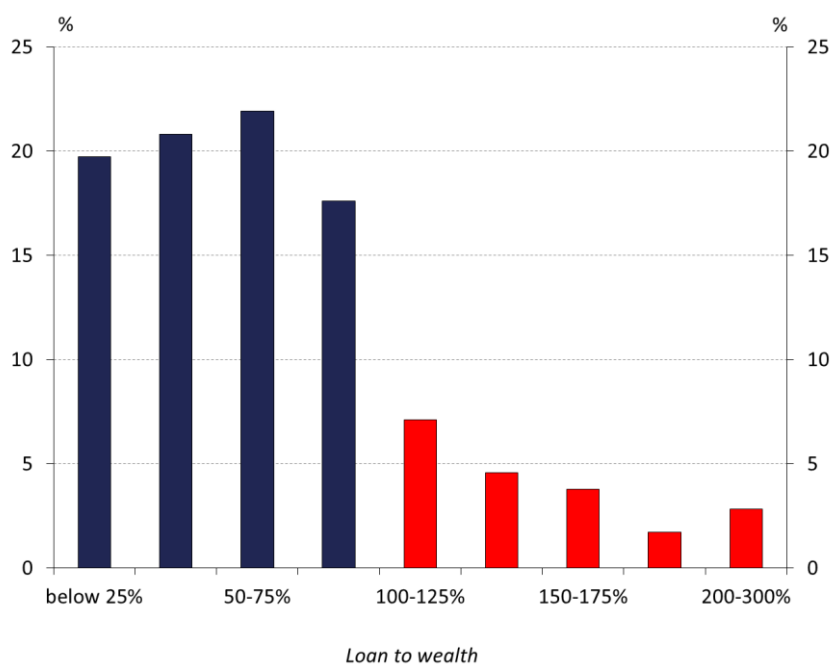
Source: MNB representative questionnaire-based survey

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[19] The questionnaire-based survey covered households' *current* wealth position. Under Article 7(b) of Act CV of 2015 on the Personal Bankruptcy Procedure, wealth 'includes all of the debtor's and the co-debtors' expected income eligible for inclusion in workout', in respect of which we do not have any data available.

6. DEBTORS' INCOME POSITION

One key element of the analysis of the nonperforming household mortgage portfolio was to explore debtors' income position. The purpose of our analysis of income position is to provide a general characterisation of debtors' solvency and to make a distinction between the segment with low willingness to pay and the segment facing actual payment difficulties (low solvency). According to our approach, the cleaning up of the segment exhibiting low willingness to pay calls for the application of different tools and interventions, and therefore an approximate estimation of the size of the segment is essential. We performed this estimation using the mortgage loan database, which contains income data, coupled with an investigation of debtors' behavioural characteristics (attitudes).

6.1. Analysis of solvency and willingness to pay using quantitative methods

Two decisive criteria of the performance or nonperformance of mortgage loans are adequate solvency and willingness to pay. While the former is primarily shaped by household incomes, the latter is shaped by subjective behavioural factors and ethical norms (attitudes), as well as the severity of the legal consequences of falling into arrears and the enforceability of these consequences. We estimated households' solvency based on data supplied by the National Tax and Customs Administration, using the **aggregate income of debtors and co-debtors subject to personal income tax.**[20] Of the 229,000 problematic loan transactions listed in the mortgage loan database we were able to allocate personal income tax returns for 2014 to 154,000 contracts, and we were unable to do so for approximately 75,000 loan contracts (*Table 5*). Therefore for analytical purposes, we will hereinafter assume that the latter group does not have declared or taxable income.

Table 5: Distribution of contracts listed in the mortgage loan database by declared income and delinquency status

	Delinquency status		
	Performing restructured	Nonperforming	TOTAL
Do not have declared or taxable income	25%	38%	33%
Have declared income	75%	62%	67%
TOTAL	**100%**	**100%**	**100%**

Source: MNB mortgage loan database

According to the NAV data, the regional distribution of net household incomes was in line with our expectations: in contrast to the higher incomes observed in Central Hungary and the Western regions, the population of Northern and Eastern regions earn 15-25 per cent lower incomes (*Chart 18*).

In relation to solvency, we primarily use the payment-to-income (PTI) ratio as our basis, which reflects the portion of monthly net income (including the co-debtor's income) that the debtor must be dedicate to repaying the loan. To calculate the PTI ratio, we collected data from the CCIS on the regular repayment burden falling due for total loan debt per debtor, calculating the ratio as the quotient of the instalment amount falling due on 30 April 2015 and one-twelfth of the total net income subject to personal income tax for 2014. Using the requirements of the debt cap

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[20] It is important to note that we were unable to observe incomes not listed in personal income tax returns (such as social transfers, grey or undeclared income, etc.), and therefore the analysis of income position must be interpreted as a conservative estimation of the actual situation The fact that not all salary-earner household members are included in loan contracts as co-debtors also biases the available data in a similar manner.

MNB decree that came into force in January 2015 as a point of reference, we consider PTI ratios of under 50 per cent as a manageable repayment burden.[21]

Chart 18: Regional distribution of the net income of households with a problematic mortgage loan
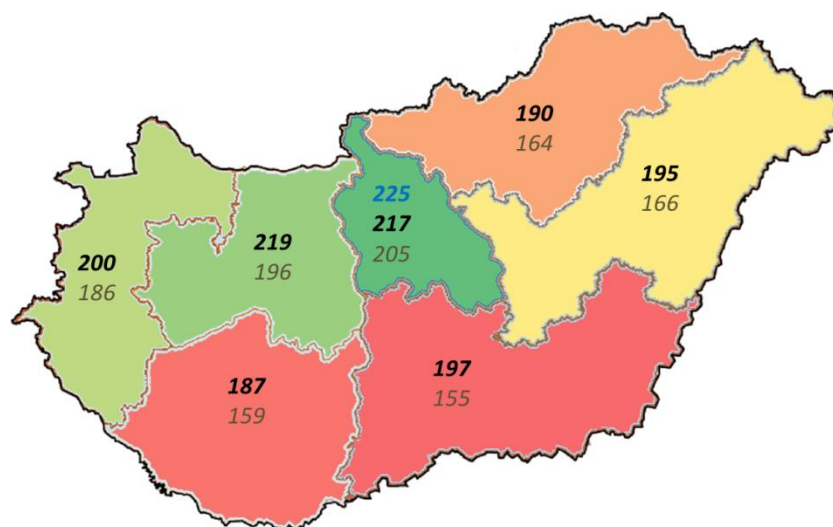
Indicators:
- *Average net income (Budapest, HUF thousand)*
- **Average net income (cities with county authority, HUF thousand)**
- *Average net income (other localities, HUF thousand)*

Source: MNB mortgage loan database

In terms of the distribution of incomes, the two most characteristic groups are those with no income and those with relatively low declared income ranging between HUF 100,000 and 200,000 per month. In line with expectations, the income distribution of performing debtors or debtors with less than 90 days of arrears is predominantly grouped towards those with relatively higher incomes. The median PTI ratio gradually decreases as the income category increases, suggesting that the issue is concentrated on the balance sheets of lower income households (*Chart 19*), which corroborates the findings of earlier analyses.

Mortgage loan debtors according to PTI ratio show a rather heterogeneous picture. We identified a **PTI ratio of below 50 per cent for 37 per cent of problematic valid contracts** (a total of 51,000 contracts), and a **PTI ratio of over 50 percent for 33 per cent of contracts.** The solvency of debtors in the former category is adequate according to the MNB's regulation of the payment-to-income ratio. For 7 per cent of debtors, we were unable – in the absence of any instalments due – to calculate the PTI ratio,[22] and for 23 percent, we were unable to identify income subject to personal income tax. Of course, during calculation of the PTI ratio, we cannot depart from the level of income: the disposable income actually available for debt servicing is lower than net income, as the latter must also cover the debtor's costs of living, and therefore the same PTI ratio applied to a lower income level represents a larger burden in absolute terms.

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[21] It should be added however that the rule pertaining to a 50 per cent payment-to-income ratio applies to new, not yet delinquent loans. For nonperforming loans, debtors usually have other outstanding debts over the principal not yet due that determines instalments, if which was converted to principal would materially increase the debtor's theoretical repayment burden. In view of this fact, it may be warranted to use a lower PTI level as a point of reference as well.

[22] These are typically overdue but valid contracts.

Chart 19: Distribution of problematic mortgage loans by income level and the length of the oldest arrears

Monthly income (HUF thousand)

■ Income distribution (performing restructured)
■ Income distribution (nonperforming)
◆ Median PTI in the actual income category (rhs)
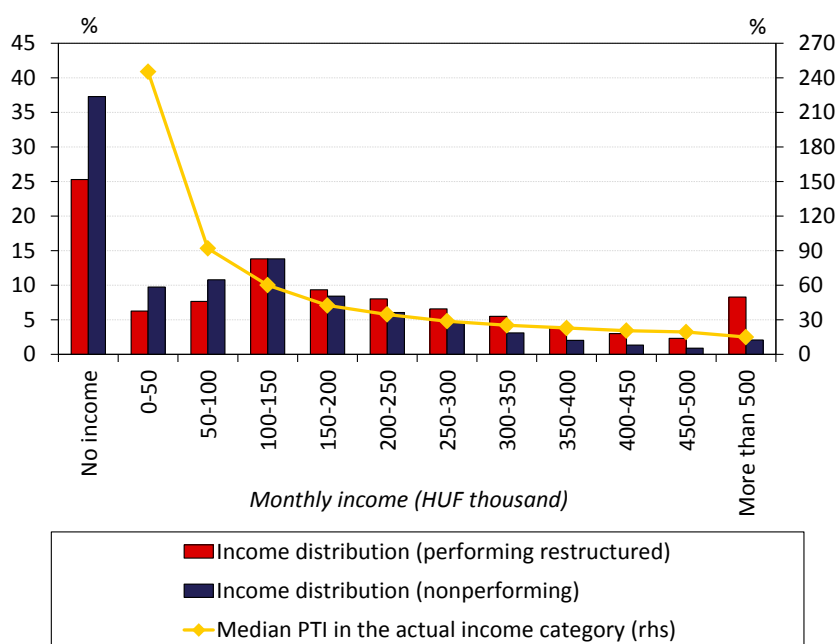
Source: MNB mortgage loan database

A low PTI ratio is more common for **performing restructured contracts**: 49 per cent of these contracts feature a PTI ratio of under 50 per cent, while 28 per cent feature a PTI ratio of over 50 per cent. For nonperforming contracts, 25 per cent feature a PTI ratio of under 50 per cent, while 37 per cent feature a PTI ratio of over 50 per cent (*Chart 20*).

Chart 20: Distribution of valid problematic mortgage loans by PTI ratio

PTI (%)

■ Nonperforming loans ■ Performing restructured loans
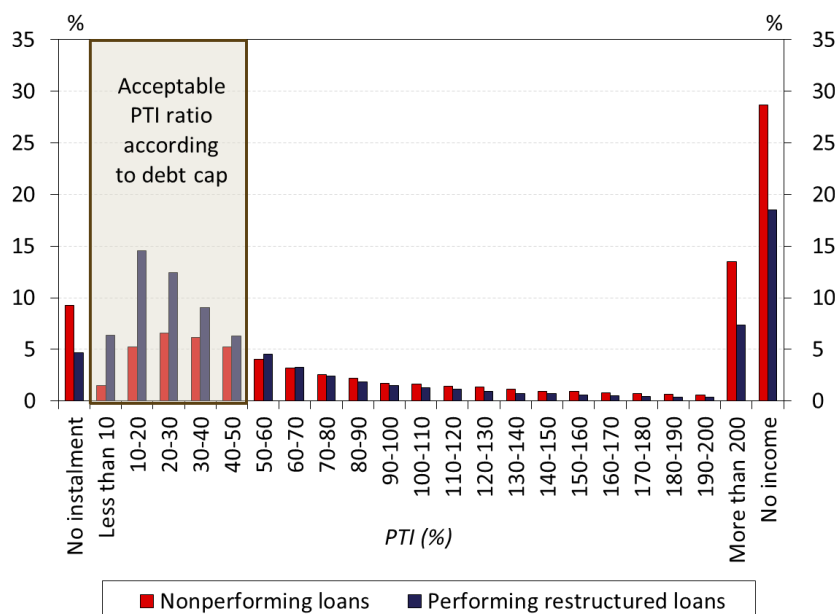
Note: Those with no instalments include loans that are already overdue but have not yet been terminated.
Source: MNB mortgage loan database

For valid problematic contracts, 69 per cent of debtors with a PTI ratio of under 50 per cent had no arrears in excess of 90 days, reflecting the fact that most of these debtors are likely to be adequately solvent (*Table 6*). The status of debtors that are in arrears despite a seemingly low PTI ratio may be explained by several factors. For one, the debtor may have recently found a new source of revenue (e.g. after a longer period of unemployment), and therefore it may

have not yet been able to settle its arrears. Alternatively, despite adequate repayment capacity, the debtor may have low or no willingness to pay. In addition, 49 per cent of debtors with a PTI ratio of over 50 per cent are nonperforming, which may reflect the presence of significant payment difficulties.

Among those with no personal income tax returns, the ratio of nonperforming contracts does not differ significantly from the ratio exhibited by the segment with a PTI ratio of over 50 per cent. These figures may suggest that not all debtors with no declared income face payment difficulties. In the case of 10 per cent of problematic valid mortgage loans (15,000 contracts), the debtor and co-debtor's monthly joint income exceeds HUF 400,000, and 2,000 of these contracts feature delinquency of over one year. On this basis, debtors with problematic mortgage loans do not always face payment difficulties; some may have low willingness to pay. The concurrent prevalence of adequate income and delinquency does not, however, accurately reflect the absence of debtors' willingness to pay, as a debtor who resumes repayment may also have substantial arrears accumulated earlier.

Table 6: Distribution of valid problematic mortgage loans by delinquency category and PTI ratio

	No instalment	PTI < 25%	25% < PTI < 50%	50% < PTI < 75%	75% < PTI < 100%	PTI > 100%	No declared income	TOTAL
0-90 days	0.0%	14.2%	11.2%	4.9%	2.5%	9.6%	14.2%	56.7%
90-360 days	0.1%	2.2%	3.0%	1.6%	1.0%	3.8%	4.3%	15.9%
360+ days	1.0%	2.6%	3.6%	2.2%	1.3%	6.5%	10.3%	27.4%
TOTAL	**1.1%**	**19.0%**	**17.8%**	**8.7%**	**4.7%**	**19.9%**	**28.8%**	**100.0%**

Note: Only includes valid loan contracts, that is, 148,079 contracts.
Source: MNB mortgage loan database

In the interests of more precisely assessing willingness to pay, we also introduced a particular methodology based on the mortgage loan database which we applied separately to two groups. The first group includes the mortgage contracts where there is still a valid contract and therefore an interpretable amount of instalment. For this data set (55,236 contracts), the debtor's payments can be expressed based on the current amounts due (prescribed instalments), using the performance ratio indicator.[23] The advantage of this indicator is that it ignores the volume of already outstanding overdue debt and specifically focuses on the extent to which the debtor performed from its 'current' amounts due (due between January 2014 and January 2015). For the group of terminated and valid but overdue loans, the indicator cannot be generated due to the absence of a prescribed instalment, so for this group the change in overdue debt (increase or decrease) and the rate thereof can provide a point of reference for measuring willingness to pay.

The vast majority of nonperforming debtors with instalments due **earn relatively low income compared to their debt service burden, and thus most likely face payment difficulties.** For total nonperforming loan contracts, the instalment size can be interpreted and exceeds 30 per cent of income in the case of 35 per cent of loans. This set featuring relatively high instalments can be separated into further two subsets: the majority of debtors – 25 per cent of total nonperforming debtors – perform their obligations deficiently, while a smaller portion – 10 per cent of total nonperforming debtors – pay at least 80 per cent of new amounts due. While **relative overindebtedness** compared to income level presumably applies to the former group, in the case of the latter, repayment may possibly **be made from incomes** not stated in personal income tax returns. The other large segment of debtors with instalments due (6

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[23] Based on the data provided by banks, we are able to estimate the ratio of the payments already made by the customer to the current amounts due. We estimate payments made by the customer using the difference between the 12 monthly amounts due and the change in overdue debt, which indicates, relative to the 12 monthly amounts due, the customer's performance ratio. In view of the fact that overdue debt may increase due to default interest, the indicator may take on a negative value.

per cent of total nonperforming debtors) **have relatively low instalments – under 30 per cent – compared to their declared income.** In their case as well, the majority of debtors – nearly 4 per cent of the total set – performs deficiently.[24] **These are the debtors that are potential sources of moral hazard,** i.e. would be able to meet to their debt servicing based on their declared income but fail to do so despite seemingly adequate repayment capacity. *Chart 21* illustrates the segmentation of debtors with instalments due by performance ratio and PTI ratio, while *Table 7* contains the detailed distribution.

Chart 21: Segmentation of nonperforming debtors with instalments by payment-to-income ratio and performance ratio (as a proportion of all nonperforming loans)
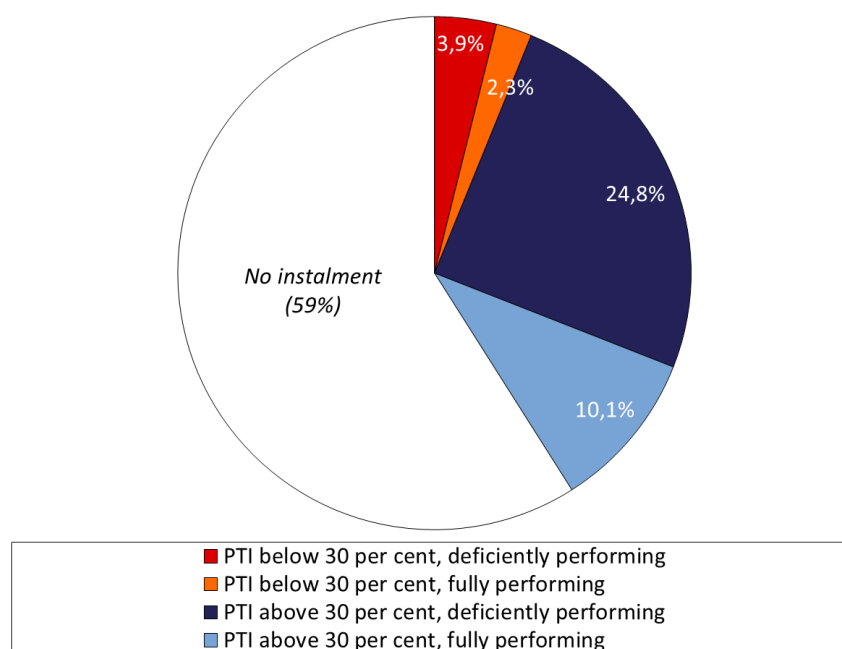
Note: A debtor is considered fully performing if it paid at least 80 per cent of its instalments due between January 2014 and January 2015.

Source: MNB mortgage loan database

For contracts where there was no instalment due in January 2014 (mainly terminated contracts), neither the above specified performance ratio nor the PTI ratio can be applied. In these cases, the relative amount of income can be measured using the debt-to-income ratio, which indicates how many years the debtor would have to pay until full repayment of the debt if it allocated all of its declared income to repayment. In the calculation of the indicator we compiled debtors' total loan debt using the Central Credit Information System (similarly to the calculation of the PTI ratio). We can define statements on the rate of decrease in debt in relation with this indicator: **if a debtor has low debt relative to its income** (which we defined as four times annual income[25]) **but is not repaying its debt, the drivers of nonperformance are most likely linked to willingness.** By contrast, those with relatively low income most likely face capacity issues.

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[24] In view of the fact the debt cap regulation allows a PTI ratio of up to 50 per cent, choosing the 30 per cent level can be regarded as a conservative choice. In the case of a 50 per cent level, 7.5 per cent of the total population has a PTI ratio of under 50 per cent, of which they fulfil less than 80 per cent.

[25] If the outstanding debt were converted to a 15-year annuity loan with a 6 per cent interest rate, the PTI ratio would be around 30 per cent if the amount of the debt were roughly four times the annual income. The segments thus created are comparable with the groups created for valid contracts.

Table 7: Detailed distribution of loan contracts by performance ratio and PTI ratio

		PTI							
		1-10%	10-20%	20-30%	30-40%	40-50%	More than 50%	No declared income	TOTAL
How much was paid?	Nothing	0.1%	0.4%	0.5%	0.4%	0.4%	2.9%	2.4%	7.1%
	0-20%	0.1%	0.3%	0.4%	0.4%	0.3%	3.0%	2.6%	7.1%
	20-40%	0.0%	0.2%	0.3%	0.3%	0.2%	1.5%	1.2%	3.7%
	40-60%	0.1%	0.3%	0.4%	0.4%	0.3%	1.9%	1.4%	4.7%
	60-80%	0.1%	0.4%	0.5%	0.5%	0.4%	2.5%	1.7%	6.1%
	80-100%	0.2%	0.6%	0.7%	0.5%	0.5%	3.2%	2.2%	7.8%
	100% or more	0.2%	0.4%	0.3%	0.3%	0.2%	1.7%	1.5%	4.5%
	TOTAL	0.7%	2.4%	3.0%	2.8%	2.4%	16.6%	13.1%	**41.0%**

Note: Only loans with an interpretable instalment in January 2014 are shown in the table (55,236 contracts). Terminated loans, overdue but valid loans and loans with instalments of HUF 0 are not listed in the table.
Source: MNB mortgage loan database

Terminated or valid loan contracts with no valid instalment account for 59 per cent of total nonperforming loans, and the majority of debt within this proportion (51 per cent of the total population) did not decrease between January 2014 and January 2015 (*Chart 22*). The ratio of debt where the debtor had no income at all was 21.5 per cent, and in the case of 19.5 percent income was relatively low compared to the amount of debt. The ratio of debtors whose debt does not exceed four years of income is significant compared to the total number, at **10.2 percent**, but their debt is not decreasing. Among terminated loans, this group represents **debtors with potential moral hazard.**

Chart 22: Segmentation of nonperforming debtors with no instalments by relatives debt size and performance ratio (as a proportion of all nonperforming loans)
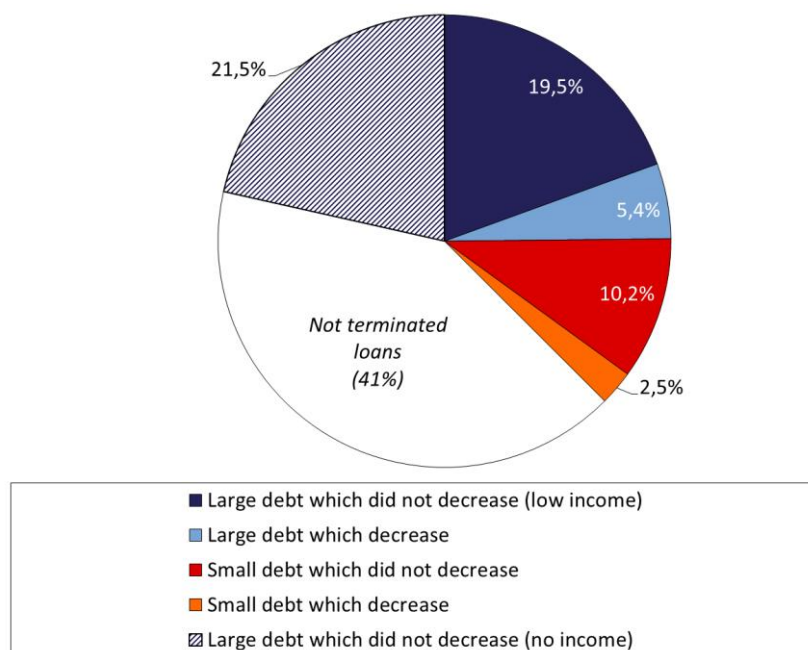
Note: A debtor is deemed to have a larger debt if at least four years of its total income would be required to repay the debt.
Source: MNB mortgage loan database

Table 8: Distribution of terminated and overdue loan contract to buy debt/income and the change in debt, as a proportion of all nonperforming loans

		Total loan debt / annual income categories							
		0-2 years	2-4 years	4-6 years	6-8 years	8-10 years	Over 10 years	No income	**TOTAL**
How much was paid?	*Did not decrease at all*	4.2%	6.0%	4.3%	2.8%	1.9%	10.5%	21.5%	51.1%
	0-20 %	1.0%	0.9%	0.6%	0.3%	0.2%	1.0%	2.5%	6.4%
	20-40 %	0.2%	0.1%	0.0%	0.0%	0.0%	0.1%	0.3%	0.8%
	40-60 %	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%
	60-80 %	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
	80-100 %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
	TOTAL	5.6%	7.1%	5.0%	3.1%	2.1%	11.6%	24.5%	**59.0%**

Note: Only loans with no prescribed instalment in January 2014 but had outstanding debt are shown in the table. These are typically terminated debts, or valid, but overdue loan contracts (79,391 contracts).

Source: MNB mortgage loan database

Debtors that are nonperforming despite a relatively manageable payment-to-income ratio and low debt value **do not meet to their payment obligations either because of their low willingness to pay or their low income level.** If the debtors' repayment obligation is low relative to their net income, but the latter is absorbed by the **regular costs of living**, then the actual income disposable for repayment may be rather low. The databases available to us do not contain comprehensive information on the number of persons per household, so **we can only estimate the cost of living** based on the number of dependents stated in the tax return. As we have no information on the number of persons with income in an actual household, we **determined cost of living in brackets**, performing the calculation for households with 'one adult' and households with 'two adults'. Based on our findings, the households' income falls below the minimum subsistence income level defined by the Hungarian Central Statistical Office for 16-31 percent of households with instalments due and potentially low willingness to pay, and for 29-51 percent of terminated loans with relatively low debt relative to income.

Overall, we estimate that the debtor group with low willingness to pay but adequate payment capacity, representing moral hazard may account for **approximately 10-20 percent of the total number of nonperforming loans.** Based on the strictest assumptions (assuming a PTI ratio of under 30 per cent, total debt not exceeding four years of income, with the cost of living in the case of a family consisting two adults), the ratio barely exceeds 7 per cent; meanwhile, using the least conservative estimation (assuming a PTI ratio of under 50 per cent, total debt not exceeding six years of income, and a family consisting of one adult), the proportion is nearly 25 per cent. As the chosen assumptions are extreme in a certain sense, the actual situation is presumably somewhere between the two values. **This means that a significant, but difficult-to-define subset of debtors can resume a path of performance with appropriate incentives.**

To nuance the size of instalments, we conducted a representative questionnaire-based survey among nonperforming debtors to shed light on their current repayment obligations and current household income. We examined the payment-to-income ratio calculated based on these two pieces of data both alone and relative to the instalment deemed 'manageable' by respondents (*Chart 23*).

The findings of the survey confirmed our expectation (and also echoed the opinions given at bank interviews) that **debtors fundamentally think differently about the size of 'sustainable'** instalments compared to creditors. For 39 per cent of respondents, 25 to 50 per cent of current household income would need to be allocated monthly to debt servicing, and three quarters would need to allocate up to 50 per cent of household income to debt servicing.[26] In

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[26] The deviation from the proportions presented in the mortgage loan database analysis stems from the fact that the representative questionnaire-based survey only targeted nonperforming debtors (with over 90 days of arrears), but not targeted restructured but performing debtors.

response to our question about the monthly instalment deemed manageable, respondents stated instalments **of up to 25 per cent** of income. It is noteworthy that **almost** nobody would undertake **a PTI ratio of over 50 per cent** (1 per cent of respondents), despite the fact that currently one quarter of the respondent debtors would have to make repayments of this degree. Among restructured debtors or debtors within the exchange rate cap system, more would undertake a PTI ratio of less than 25 per cent compared to debtors not participating in these relief schemes: 82 per cent of restructured loan debtors and 79 per cent of exchange rate cap participants would undertake instalments under such terms.

Chart 23: Actual and manageable PTI ratios according to respondents
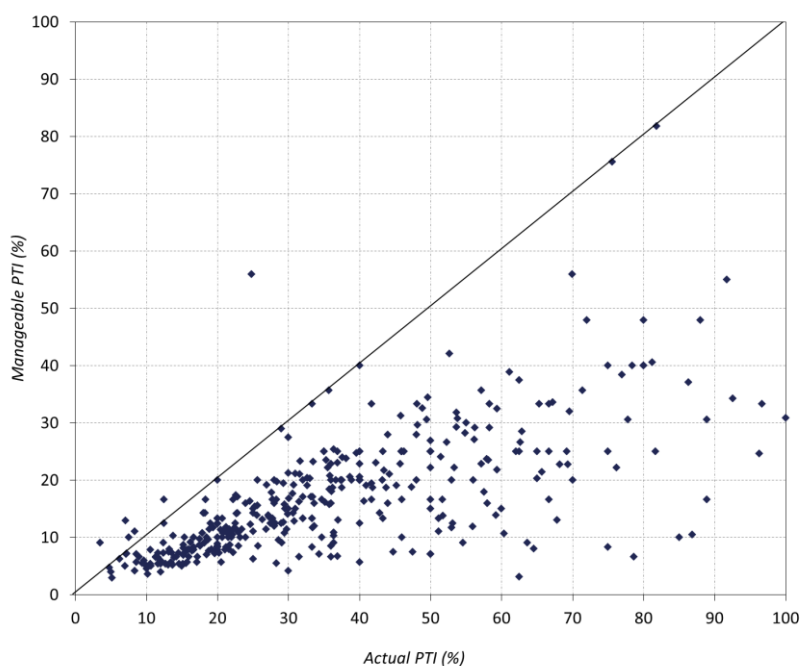
Source: MNB representative questionnaire-based survey

6.2. Debtors' behavioural characteristics

In addition to the analysis of objective data, we also performed the assessment of solvency and willingness to pay with an attitude assessment conducted as part of a questionnaire-based survey. The fundamental goal in this case was also to give an approximate estimation for the segment of the nonperforming portfolio where we could assume that the major cause of default was low willingness to pay. We asked nearly 500 debtors in the survey about (i) retail lending in general and their own loan transaction; (ii) their perception of their banks; and (iii) the government's consumer protection and debtor protection function. In the interviews we formulated a total of 16 statements: respondents were asked to evaluate their degree of agreement or disagreement with each statement on a 5-point scale.[27] In our opinion, the result of the attitude survey provides broad feedback about debtors' perception of the mortgage crisis on the one hand, and allows us to perform a principal component analysis in order to identify the groups characterised by low willingness to pay on the other.

Based on the answers to the questionnaire, **the vast majority** of debtors fundamentally considers **fair** debtor **behaviour** as equitable and acceptable, the main criterion of which is the repayment of the loan within the shortest time possible (81 per cent) furthermore – if this is possible based on the debtors' financial position – the repayment of the loan before the end of the maturity (prepayment – 79 per cent) (*Chart 24*). Two-thirds of the respondents considered that the payment of the instalments in time is important (68 per cent) and roughly half of them indicated

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[27] In the analysis, we merged the two lowest and two highest values of the scale for the sake of greater perspicuity.

that they would even continue repayment if their salaries were increased substantially (54 per cent). Nonperforming debtors are typically aware of the fact that in the case of long-term default **they may lose their real properties** serving as collateral (80 per cent), and a small majority considers this possibility as a real threat (57 per cent) – but along with this, they consider a lifelong debt service unacceptable (75 per cent).

Chart 24: Attitude in connection with loans
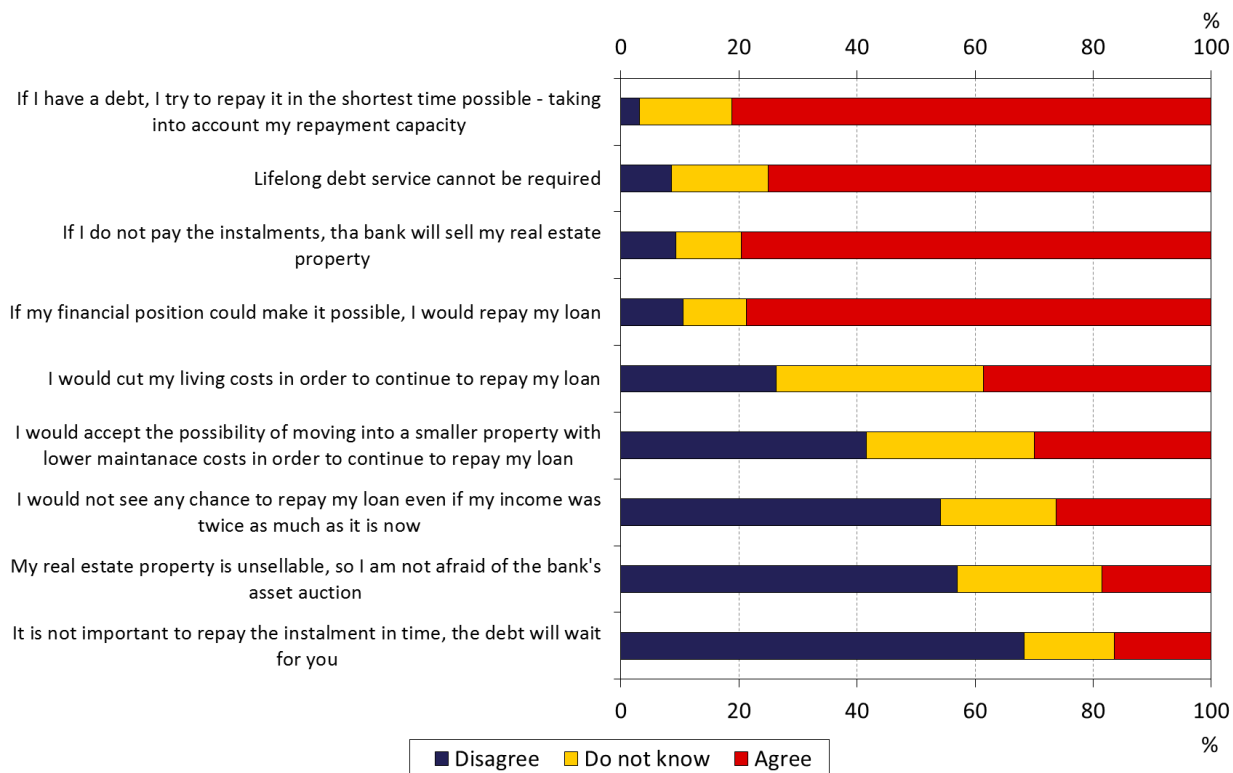
Source: MNB representative questionnaire-based survey

Chart 25: Attitude in connection with banks
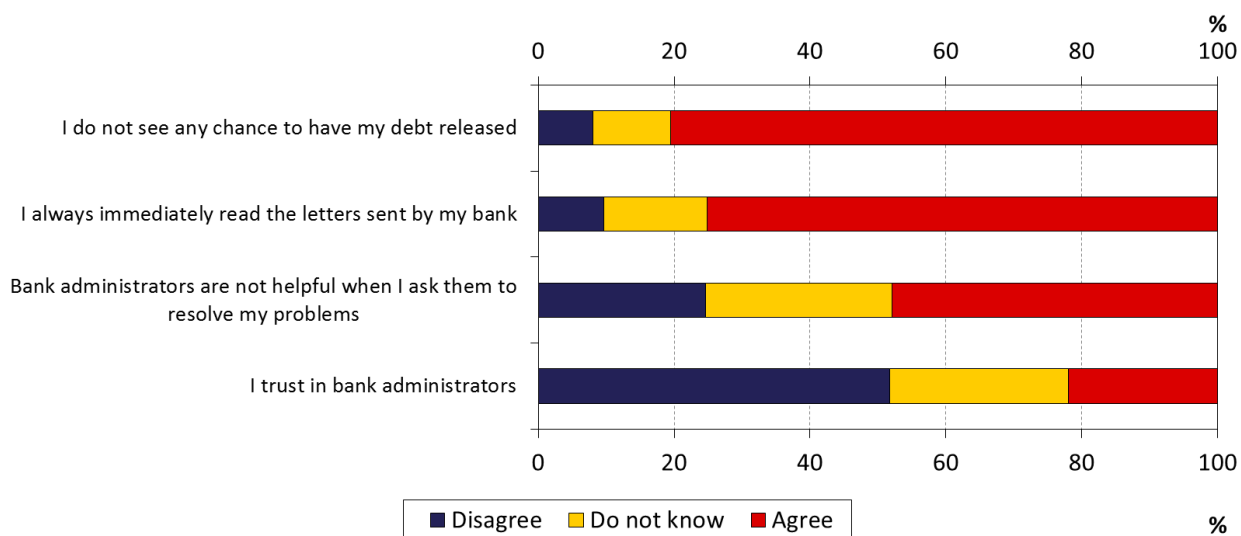
Source: MNB representative questionnaire-based survey

Respondents seemed divided concerning the feasibility of the solutions within their current income possibilities: only 39 per cent of them considers cutting their costs of living manageable (26 per cent of them are against it, while 35

per cent were uncertain) and a similar proportion of respondents accepted the possibility of moving into a smaller property with lower maintenance costs (30 per cent accepted, 42 per cent were against, while 28 per cent were uncertain).

Based on the findings of the survey, debtors do not see any realistic chances to have their debt released (81 per cent), but this does typically not demotivate them to the extent that they would refuse to read the banks' notifications and information (75 per cent). Roughly half of the respondents do not trust the bank administrators (52 per cent) and do not think that they would be helpful in resolving their problems (48 per cent). However, the phenomenon of '**passive resistance**' – outlined from the experiences of the bank interviews – is clearly indicated by the fact that one quarter of the debtors were unable to give a clear positive or negative answer concerning both the statement related to trust and helpfulness (*Chart 25*).

For the statements related to the government's financing packages, we mostly received negative feedback: the majority of the debtors do not consider that these packages provide a lasting solution for those struggling with payment difficulties (79 per cent) and feel that there would still be room and possibility to announce **more financing packages** (71 per cent). In connection with the execution of the financing packages, our expectation that the targeted population considers the measures elaborated for them as incomprehensible seemed to be confirmed (68 per cent, *Chart 26*). During the survey, we 'tested' several possible proposed solutions: we found it interesting that a significant group of debtors (14.5 per cent) rejected every proposed solution.

Chart 26: Attitude in connection with the government
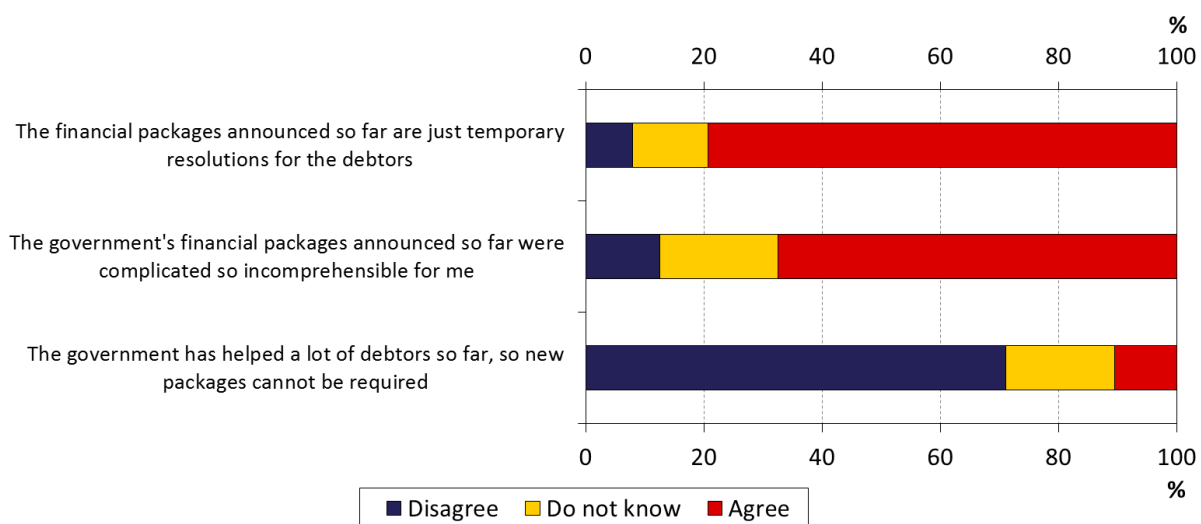
Source: MNB representative questionnaire-based survey

In the course of the attitude survey, we compiled principal components which we were able to combine to set up homogeneous debtor groups. In an ideal case, the characteristics of the homogeneous groups defined based on the behavioural characteristics of the debtors indicate the tools necessary for 'shifting' the debtors and make it possible to elaborate possible solutions aligned to the income and wealth characteristics of these groups. We grouped the 16 statements (variables) featured in the questionnaire into 3 principal components – the principal components give an explanation for a total of 42 per cent of the variance of the 16 variables. The connection between the variables and the principal components and their relevance is shown in the table in *Chapter 10.3*.

One of the characteristics developed using the principal components is the so-called '*feeling hopeless*' characteristic: these debtors consider themselves as fair and decent and still have the willingness to repay the debt. They are characterised by feeling hopeless about their income situation, and describing the state and the banking sector as institutions not caring about the personal concerns of people and which cannot (or do not want to) give real help. The '*distrustful*' attribution is characterised by mistrust of banks, the lack of real communication and cooperation

and – due to the unfair nature of the loan – the conscious refusal of repayment. The '*independence*' characteristic is typical if self-reliant debtors who build on their own strength who typically had a positive attitude towards the solutions proposed in the questionnaire. These debtors are also characterised by the fact that they do not expect support from the government. Using these three principal components, we were able classify the nonperforming debtors into **5 homogeneous groups** using the K-means cluster analysis the characteristics of which are summarised in *Table 9*.

Based on the behavioural characteristics, 44.7 per cent of the debtors can be considered distrustful towards the banks, which provides a broader estimation of the scope of debtors with low willingness to cooperate (pay). It should be noted however that the debtors included in the first and the fifth group – compared to the fourth group – consider their position much less hopeless which may be explained by their more favourable income position. All of this may indicate that these debtors would be able to meet their repayment obligations – thus denoting **a narrower scope of debtors with lower willingness to pay (29.5 per cent)**.

Table 9: Debtors' behavioural features

SEGMENT	FEELING HOPELESS	DISTRUSTFUL	INDEPENDENCE	%	SEGMENT'S CHARACTERISTICS
1	– –	+	0	11.3%	Group of debtors who are **hopeful** about their position and distrustful towards banks
2	–	– –	–	23.3%	Group of debtors who are not hopeless about their position, **totally cooperative** with banks and less independent
3	+ +	–	0	31.9%	Group of debtors who are **totally hopeless** about their position and show limited cooperation with banks
4	+	+ +	– –	15.2%	Group of debtors who are sometimes hopeless about their position, **most distrustful** toward banks and **least independent**
5	–	+	+ +	18.2%	Group of debtors who are not hopeless about their position distrustful towards banks and **really independent**

Note: – – Not characteristic at all; – Characteristic to a minor degree; 0 Average; + Characteristic; ++Very characteristic.
Source: MNB representative questionnaire-based survey

For the various debtor groups, we also analysed the **key indicators** characterising the loan transaction and solvency which is shown in *Table 10*.

Table 10: Key indicators of debtor groups

KEY INDICATORS	SEGMENT 1	SEGMENT 2	SEGMENT 3	SEGMENT 4	SEGMENT 5
Loan indicators					
LTV - starting (per cent)	49.9	53.8	53.5	62.5	58.6
LTV - actual (per cent)	61.8	61.9	75.7	81.4	71.9
"Loan-to-wealth" - starting (per cent)	51.6	60.3	72.3	75.1	67.5
PTI - actual (per cent)	43.6	32.9	37.9	55.6	58.7
Outstanding debt / Initial loan (per cent)	106.9	108.0	124.4	114.0	102.9
Date of contract	2007	2008	2007	2008	2006
Remaining maturity (years)	11	9	10	12	10
Age of debtor at maturity (years)	52.2	54.8	54.3	55.2	55.1
Solvency indicators					
Monthly household income (thousand HUF)	186.3	183.4	186.5	161.5	169.9
Per capita income (thousand HUF)	85.1	86.8	83.3	73.1	86.9
Manageable monthly instalment (thousand HUF)	36.0	27.6	26.1	29.1	33.6
Manageable PTI (per cent)	19.31	15.07	13.97	18.04	19.81

Source: MNB representative questionnaire-based survey

In general, the **quantitative indicators** of the various **groups do not show significant deviation compared to one another and the total multitude average –** the differences 'expected' based on the behavioural characteristics can be felt only slightly. The **fourth group is the most significant one** where the distrustful attitude can be justified by a higher level of indebtedness (the current LTV value is 81.4 per cent) by the longest remaining maturity and besides all these, by the lowest per capita income (HUF 73,100 – the group did not contain any respondents living in the Central Hungary or West Transdanubia region!). This group had the highest starting LTV value as well, which additionally increased by nearly one-third during the elapsed maturity – while the increase of the debt expressed in HUF had an impact on the payment-to-income ratio as well (55.6 per cent). The 'distrustful' group indicated a higher manageable monthly instalment (18.04 per cent), maybe because they still evaluate their own situation to be better than that of the third group. The situation of the 'totally hopeless' third group sheds light on an interesting phenomenon since, for example, based on the current PTI value or the income indicators, this group is considered to be of an average position, but the LTV indicator increased the most proportionally in this group and the outstanding loans compared to the initial loan volume is by far the highest in this group (124.4 per cent). Presumably this group has experienced some major payment difficulties, but partly in view of their cooperative attitude, they may be open to a rational restructuring solution. The second group shows the strongest willingness to cooperate with the banks, which is most likely mainly attributable to the group's relatively good financial position: it is not characterised by over-indebtedness (the value of debt-to-wealth is 60.3 per cent, which is the second lowest value), with the lowest current payment-to-income ratio (32.9 per cent) and the shortest remaining maturity (9 years). Furthermore, it should be noted that for the most part this group includes debtors living in the Western Transdanubia region, a region with a more favourable labour market position and more stable real estate market. The first group can be considered to be in the best position: while it is true that at nearly halfway through the maturity, the amount of outstanding debt is still higher than the initial volume of the loan, both the current value of the LTV (61.8 per cent) and the debt-to-wealth ratio (51.6 per cent) is the lowest. In terms of their own position, this group is the most hopeful but despite this, it shows less willingness for cooperation with the bank. The fifth group with the highest payment-to-income ratio (58.7 per cent) turned out to be the most independent group, which is also reflected by the per capita income (HUF 86,900) and the amount (HUF 33,600) and the proportion (19.8 per cent) of the manageable monthly instalment.

7. CHARACTERISTICS OF TOOLS USED FOR PORTFOLIO CLEANING

Having discussed the reasons for default and the main characteristics of nonperforming debtors through statistical methods in Chapter *3*, this chapter presents the practice and experiences of nonperforming mortgage loan portfolio cleaning. After presenting the applied banking tools and experiences and, based on the mortgage loan database, the analysis of the success of restructuring, we present the possible role of the two current government measures, i.e., the NAMA programme and the private bankruptcy procedure. In this chapter, we attempt to segment the retail mortgage loan portfolio based on risk profile and management methods, in order to establish the conceptual framework for the solutions to be proposed.

7.1. Characterisation of the portfolio cleaning activities of banks

In the course of 2015 H1, the banking sector as a whole cleaned up a gross amount of roughly HUF 41 billion in nonperforming retail loans from its balance sheets, representing 8 per cent of the nonperforming retail loan portfolio, but portfolio cleaning continues to be concentrated on unsecured loans. In the case of mortgage loans, the annual cleaning ratio is only 7 per cent, meaning that banks have forgiven or sold only 7 per cent of their nonperforming mortgage loan portfolios on an annual basis, and this ratio has also been continuously decreasing over the past one to one and a half years. Based on the experiences of the interviews conducted with the banks, the banks do have the professional background and capacities needed for portfolio cleaning, furthermore – in addition to using the government measures – they also apply broad and customised solutions. These solutions are typically modularised and every organisation builds up its own set of tools from roughly the same modules, developing a varied range of combinations: (i) **the rescheduling of loan conditions,** which includes a reduction of the payments and the lengthening of loan maturity, as well as deferring payment (for principal or for interest payment); (ii) **conditional debt forgiveness**; and finally – provided that none of the previous solutions are helpful for the debtor – (iii) **foreclosure**. The bank determines the tools actually applied – provided that the debtor is *willing to cooperate* – typically in the course of a personal consultation, together with the debtor depending on how much the debtor is intent on maintaining the ownership of the collateral and depending on their solvency. Therefore, the workout tools identified during the interviews vary in a wide spectrum ranging from voluntary sales of collateral all the way to debt forgiveness (*Chart 27*).

Chart 27: Management of nonperforming loans if there is willingness to cooperate
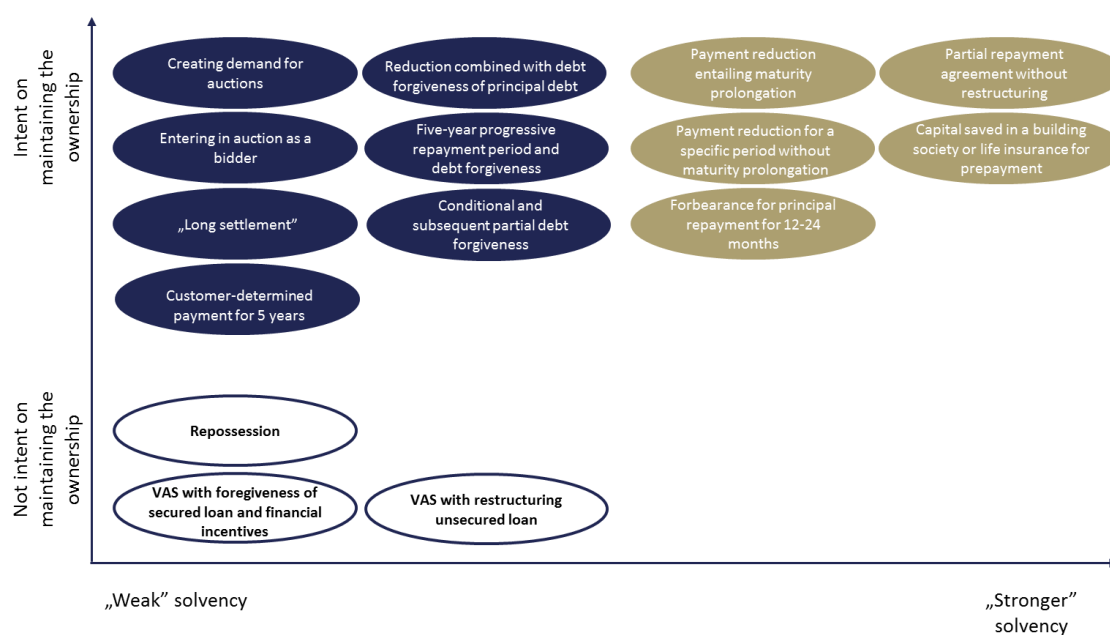
Note: VAS – voluntary asset sale.
Source: Authors' compilation based on bank interviews

The surveyed institutions apply several payment-reducing solutions to manage their nonperforming portfolio with poor solvency. In addition to **using reduction combined with debt forgiveness of principal debt**, there are some schemes in which the **customer may determine the size of the** payment (for a specified period). By applying this latter tool, the bank primarily intends to restore regular payment discipline since after the end of the special period they will restructure the loan facility in line with the debtor's income position at that point in time. During the interviews, the application of the **five-year progressive repayment period** was identified as an interesting portfolio cleaning tool as part of which the customer pays gradually increasing monthly instalments based on a 5-year repayment schedule fixed in advance in return for which the bank gradually decreases the outstanding principal debt so that by the end of the period debt forgiveness of roughly 30 per cent can be achieved. Banks can typically offer payment reduction entailing **term extension** for debtors with 'stronger' solvency or a forbearance **for interest payment and/or principal repayment**. A **partial repayment agreement without restructuring** is also a standard practice – its advantage is that it can be applied without contract amendment – while debtors with a combined loan can use the capital saved in a building society or life insurance for **prepayment**. Retaining ownership of the real estate is not only in the interest of the debtors but also in the interest of the bank, and therefore workout areas primarily have to restore the solvency of the nonperforming contracts as an objective. But if the customer is in a hopeless income situation and their solvency cannot be restored over the long term, the bank gives the possibility for **voluntary asset sale** (provided that the real estate collateral is appropriately marketable) possibly also ensuring some financial incentives for the debtor. The organisations taking part in the interview rarely use **repossessions** or entering in **auction as a bidder**: the objective in both cases is primarily the 'stimulation' of local real estate market demand and calling the debtors' attention to the possible negative consequences of lasting delinquency – which may become necessary from time to time from the aspect of handling the moral hazard. **Creating demand for auctions** also serves to strengthen real estate market demand as part of which the real estate being advertised on the court's auctioning website is also advertised by the bank on some other websites. In regions suffering from long-term economic depression, the '**long settlement**' tool may bring a solution, which enables the debtor, as a kind of final repayment, to retain the ownership of the property following the fulfilment of the monthly repayment instalments higher than previously during a longer payment period and the forgiveness of the outstanding debt.

During the interviews, a recurrent topic was the management of debtors which completely *reject cooperation* and do not show any willingness to pay at all. The banks concerned clearly consider the **execution procedure** as the only solution for this segment: several of them indicated that they only initiated this procedure for customers who did not show any willingness to cooperate whatsoever.

Furthermore, banks also look at the practice of receivable sales as well as the government measures as a portfolio cleaning tool: the previous exchange rate cap and 'NPL25' measures and the currently running **NAMA programme**. The assessment of the latter was clearly positive among the banks involved in the interview, and thus they actively support the contributions: they regularly contact the debtors offering them the option of the NAMA programme and help them procure the necessary certifications and fill out the forms and if necessary, they even contact the debtors in person. Based on the feedback given by the respondent banks, in connection with the recent legislative changes, settlement primarily had a technical impact and **roughly only 10 per cent of the nonperforming portfolio became performing** thanks to the impact of the measure. Several banks noted that, despite the fact that debtors have been informed of the fact that after settlement they can 'start with a clean slate' (without any delinquency) for the remaining duration of the maturity, a higher proportion of them did not start paying.

The primary objective of workout areas is the *lasting rectification* of nonperforming loans by restoring regular repayment discipline and retaining the customer for the long-term. According to the respondents, however, this objective can only be achieved for a small portion of the portfolio. As the main reasons for the unsuccessful rectification of loans, respondents indicated the customers' income position, issues with government communication and the problems and anomalies of the legal background. In connection with the income position, having recognised the unfavourable changes (worsening financial position of debtors, the drastic increase of

repayment instalments and of the principal debt)[28] several banks indicated that **restructuring in itself** – without debt forgiveness – **was not sustainable.** Roughly 20-30 per cent of restructured transactions proved to be viable, so we can state that this tool can only be a solution for 'tested' customers struggling with short or medium-term payment problems (e.g., after the application of a 4-6 months 'pilot period').[29] One of the respondents indicated that the vast majority of the portfolio currently being restructured were loan transactions which were already previously restructured, further underlining the low efficiency of this tool. On several occasions, respondents mentioned conditional and subsequent restructuring combined with debt forgiveness as a possible solution for sustainable restructuring: conditional because the debtor must fully meet their agreed repayment obligations for any debt to be forgiven and subsequent because the debt forgiveness can only take place after the fulfilment of the conditions and the agreed period.

In addition to mentioning emotional attachment to the real estate, respondents regularly encounter the customers' **conscious resistance** and **opportunistic behaviour**, which they mainly attribute to the government's communication in past years attacking the banking sector and the unpredictable government measures and communication concerning the resolution of the mortgage problem. All of this prompts some nonperforming customers to refuse to cooperate with the bank and generates increasing **expectations** (wait and see attitude) in connection with a future **rescue package** even more favourable than the previous ones.[30] The changes experienced lately in the regulatory environment made the work of the workout areas significantly more difficult mainly due to the weakening willingness to cooperate experienced on behalf of the debtors (**increase in moral hazard)**. This not only negatively influences the banks' results, but also hinders the development of the secondary receivables and real estate market and forces the receivables management market to apply major discount rates and this market currently only takes over retail mortgage receivables to a very limited extent. Unpredictability invites nonperforming debtors to adapt the attitude of wait and see and reject cooperation; although one of the banks mentioned the following: 'The fact that these receivables have been ageing for 5-6 years is not good for society nor for stability.'

As regards the **efficiency of workout activity,** every institution surveyed gave negative feedback. The anomalies and problems of the legal background also substantially weaken the 'efficiency' of workout activity, mainly due to the foreclosure procedure being complicated, slow and costly and that debtors are 'overprotected'. Consensus was reached during the interviews in that **the major obstacle to the workout activity being effective is the elimination** from the system **of the feeling of being threatened** – as one of the interviewees aptly described it: '*The actual* start of evictions may be the most efficient tool to avoid evictions en masse'. All of this indicates that even a well-structured, 'customised' workout tool cannot result in any tangible portfolio cleaning impact as long as there is no clear and quickly enforceable foreclosure procedure available to sanction non-performance and lack of cooperation.

According to the banks, the central bank and the government could best promote the efficiency of portfolio cleaning primarily by engaging in clear communication with debtors and creating a predictable, supportive legal and regulatory environment. Clear and consistent communication[31] would be needed, making debtors understand that there will not be anymore rescue package and that failure to cooperate with the banks will result in strict sanctions. In their view, after having eliminated the moral hazard, there would be room and possibility for both the banks and the customers to find a sustainable solution (restructuring).

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[28] According to the feedback of one of the banks, the 200 per cent of LTV value represents the 'psychological limit' when customers simply 'give up'.

[29] According to the feedback of one of the banks 'It is not possible to restructure the portfolio en masse and in a sustainable manner because customers are unable to pay'.

[30] According to feedback from one of the banks, answers such as 'We are waiting for another rescue package' or 'I will talk to my lawyer' are typical answers.

[31] The idea came up to create an online information platform, which, after having provided some loan and solvency related data, would show the debtor's current position and the expected consequences of cooperation and non-payment in a clear and understandable form using graphic components.

7.2. Characterisation of restructured contracts

Using the mortgage loan database, we can gain detailed insight into the characteristics of the loans restructured by the banks, the frequency of the restructuring schemes applied and the factors determining their success. 50 per cent of the mortgage loans, i.e. roughly 114,000 contracts in the mortgage loan database, have been restructured during their credit history and of these, 67,000 have been restructured as part of the exchange rate cap. In our analysis, we differentiate 6 different bank restructuring types according to the following:

- principal reduction,
- forgiveness of arrears (which in the most cases means a principal reduction),
- specific reduction of repayment instalment,
- presumed reduction of repayment instalment or moratorium on payments,[32]
- prolongation of the maturity, and
- reduction of the interest rate.

In analysing the main loan characteristics, we can state that delinquent (nonperforming), but still active loans that underwent restructuring at least once during their maturity are typically characterised by a higher debt amount and higher instalment than the ones not restructured (*Table 11*). Comparing debtors based on their performance rate, in the case of loans that had been restructured, we can see a slightly higher value which is primarily induced by the difference seen among debtors delinquent in excess of 2 years. At the same time, performing restructured loans are characterised by lower debt, lower repayment instalment and lower interest rate.

Table 11: Median value of the main loan characteristics in the case of active problematic loans, by restructuring

		Longest delinquency	Number of contracts	Outstanding debt *(HUF million)*	Repayment instalment *(HUF)*	Residual loan term *(year)*	Interest rate *(%)*	Performance ratio *(%)*
Non-performing	**Not restructured**	91-180 days	4,520	3.60	41,053	11	5.43	86.9
		181-360 days	6,743	3.80	41,450	12	5.75	67.9
		361-720 days	8,287	4.27	43,692	12	5.80	20.4
		721+ days	14,949	7.08	50,218	12	6.20	7.2
		TOTAL	**34,499**	**5.19**	**45,310**	**12**	**5.90**	**47.1**
	Restructured	91-180 days	5,707	6.21	53,706	12	5.39	90.4
		181-360 days	6,340	6.51	55,867	12	5.25	71.0
		361-720 days	7,564	7.26	58,503	13	5.58	20.4
		721+ days	10,286	7.85	53,774	13	6.15	14.1
		TOTAL	**29,897**	**7.02**	**55,377**	**13**	**5.70**	**56.1**
Performing	**Restructured**	0-30 days	60,966	4.98	43,303	12	5.57	100.0
		31-90 days	8,537	5.79	49,742	12	5.55	99.9
		TOTAL	**69,503**	**5.08**	**44,112**	**12**	**5.56**	**100.0**

Comment: The table does not include the contracts with less than HUF 1 million of total debt.
Source: MNB mortgage loan database

The financial institutions featured in the database started to restructure their problematic mortgage loan portfolio on a larger scale from 2009. Until the appearance of the exchange rate cap in April of 2012 they rescheduled approximately 1,000 contracts on average per month representing somewhat less than 1 per cent of their mortgage loan portfolio delinquent in excess of 90 days, but at the annual level, this represents nearly 10 per cent of the concerned contracts (*Chart 28*). Until the appearance of the exchange rate cap, roughly 40 per cent of restructurings were successful, i.e. in their case the debtors do not have any delinquency in excess of 90 days at present, the creditor did not cancel the contract and the debtor has met the conditions of restructuring. It is however important to emphasise that the banks shared information with us only about the last restructuring event, and thus we did not examine what percentage of the restructured transactions were 'recidivist', that is that they could not be qualified as sustainable restructuring. But the experiences drawn from the bank interviews indicate that typically the loan

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[32] We created the type for those restructured transactions for which the bank did not indicate any restructuring strategy. We therefore assumed that if restructuring took place, it had to be reflected in the change of repayment conditions, but the least specific appearance of this is the repayment instalment moratorium.

transactions already previously restructured are currently being restructured – substantially deteriorating the value of the success rate that can be calculated from the mortgage loan database. To interpret the success of the restructuring, we must also take into account that banks have also often restructured the better quality loan contracts not yet delinquent in excess of 90 days, if the debtor showed payment difficulties, thus preventing the contract becoming lastingly bad. With the introduction of the exchange rate cap, the monthly number and volume of other bank restructurings also decreased somewhat, while the ratio of successful schemes increased. Nearly **43 per cent** of **restructured contracts** listed in the database were affected by the **exchange rate cap**, and the contract amendments incorporating the exchange rate proved successful in **81 per cent** of cases. The high success rate of the exchange rate cap is also explained, in addition, by the fact that all foreign currency denominated mortgage debtors were eligible for the scheme, while other bank restructurings were only offered to debtors in the workout phase, generally already facing payment difficulties.

Chart 28: Distribution of restructurings by initial date
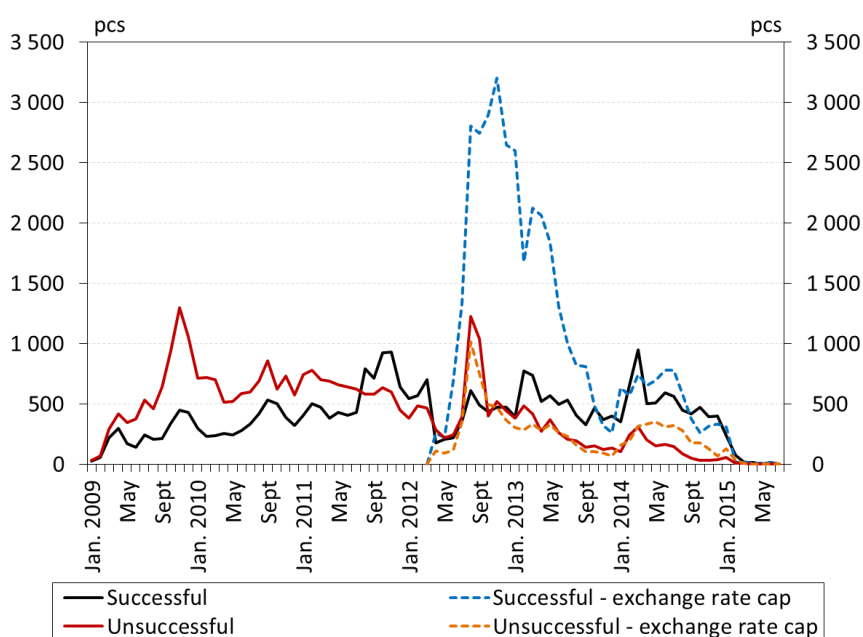
Note: Certain contracts may have undergone multiple restructurings in the course of their loan history; the chart only reflects the last restructuring of contracts.
Source: MNB mortgage loan database

Generally speaking, the **reduction of repayment instalments** and the **extension of maturities** were the **most common** tools applied for contract restructuring. These are oftentimes used in conjunction, as the reduction of repayment instalments was most frequently achieved by extending maturities.

Banks reported repayment instalment reductions in over 44,000 cases, coupled with an extension of the maturity in over 12,000 cases. This combination seemed successful in 53.6 per cent of cases, meaning that the debtor did not fall into arrears of 90 days after restructuring, did not terminate the contract and that the debtor fulfilled the terms of the restructuring. With such a success rate, this combination appears to be one of the most effective and common schemes.

It is important to note that we cannot conclude from these descriptive statistics whether the differences in these characteristics are the cause or effect of restructuring. Banks may have decided to restructure larger loans, but reduced repayment instalments also lead to the accumulation of principal and thus higher debt. The same holds true for the performance ratio: it may well be that more disciplined debtors are the ones granted relief, or perhaps better solvency emerged as a result of restructuring. We therefore applied a classification procedure in order to

comprehensively investigate the determinants of the success of restructuring and the bank decisions behind the contract selected for restructuring, presented in the following chapter.

Table 12: Frequency (number) and successfulness (per cent) of combinations of specific types of bank restructuring

	Principal reduction	Payment reduction	Maturity prolongation	Waiver of arrears	Interest rate reduction
Principal reduction	34.4% (1 592 pcs)				
Payment reduction	10.3% (910 pcs)	**51.4%** **(44 500 pcs)**			
Maturity prolongation	54.5% (11 pcs)	**53.6%** **(12 129 pcs)**	**53.3%** **(14 481 pcs)**		
Waiver of arrears	34.4% (1 592 pcs)	10.6% (917 pcs)	53.3% (15 pcs)	36.9% (1 658 pcs)	
Interest rate reduction	(0 pcs)	20.9% (349 pcs)	19% (305 pcs)	(0 pcs)	19.5% (401 pcs)

Note: The success rate shows the percentage of cases where the debtor did not fall into arrears of 90 days after restructuring, did not terminate the contract and fulfilled the terms of the restructuring. The most common and most successful combination is indicated in dark blue.
Source: MNB mortgage loan database

7.3. Analysis of the motives and successfulness of restructuring using a classification method

Using data from the mortgage loan database, we also analysed the features and successfulness of banks' restructuring practices applying a classification procedure. The analysis focused on identifying the **motives** behind restructuring decisions ('How can we characterise the contracts in respect of which banks opted for restructuring the contract in cooperation with the customer?') and their **factors of success** ('What are the features of restructured contracts regarded as successful?'[33]), using statistical tools.

The procedure applied, referred to in the literature as the *decision tree method*, attempts to distinguish more homogenous subgroups of the population in terms of the dependent variable, factoring in the various attributes of the contract. Applied to the issue under review, when identifying the factors of success, the method defines subsets of mainly successfully or for the most part unsuccessfully restructured loans by separating the set in two based on contraction feature variables, for instance on the initial maturity agreed upon when entering into the contract. An explanatory variable and a cutoff point were identified for each split that ensured the best separation of the population into subsets of successfully and unsuccessfully restructured contracts. The procedure splits the original set into increasingly homogenous subsets until the created groups meet the procedure's stopping criteria. Finally, the outcome of the method is a classification tree the nodes and branches of which form a structure where a subset is allocated to the features describing a given contract. The classification procedure applied is the widely used *decision tree method,* presented in depth in *Chapter 10.1 of the Annex.*

The analysis only covered loan contracts for which we were able to allocate income data based on the National Tax and Customs Administration's data supply. In the course of our exploratory analysis, we identified pronounced differences in the features and behaviour of forint and foreign currency loan contracts, which may stem from several factors: for one, state-subsidised schemes may form a non-negligible part of forint loans, moreover forint loans also fundamentally feature more predictable instalment and more stable loan-to-value ratios relative to foreign currency

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[33]Defining successfulness: the debtor has satisfied the required terms and conditions of restructuring, the contract was not terminated and the contract was not past due over 90 days immediately before settlement.

loans, which carry exchange rate risk and more frequent interest repricing. The different characteristics of forint and foreign currency denominated loans are also reflected in the fact that in the course of our exploratory analysis, when using the database with no breakdown by currency, the currency of the loan often proved to be one of the primary splitting variables. In view of this fact, our analysis examines **forint** and (previously) **foreign currency** denominated contracts **separately**. The mortgage loan database includes many features that vary over time, or were only observable at the time of data supply, but not prior to restructuring (for instance the volume of overdue principal), and therefore we only used features for which we could assume that they were not impacted by restructuring. Continuing our earlier example, if a loan is successfully restructured, the customer resumes repayment, which will therefore certainly reduce the volume of overdue principal compared to a scenario where the bank would have failed to restore the customer's payment capacity. The list of variables used in our analysis are specified in the Annex presenting the methodology in depth.

7.3.1. Foreign currency portfolio

A total of 134,576 foreign currency loan contracts from the mortgage loan database were found to be adequate for the classification procedure, out of which we took **samples of 40,000 elements** for performing the analysis. Verifying the robustness of random sampling using various methods,[34] we came to the conclusion that this sample size provides a representative reflection of the attributes of the total population.

In the course of sampling, we first attempted to separate restructured contracts from non-restructured delinquent contracts based on their descriptive features. The objective of this was to identify the features of foreign currency loans that provided greater motivation for banks, and the cases where customers exhibited sufficient willingness to restructure delinquent contracts. The methodology used allows us to measure the importance of the contract features and to gauge their relative strength compared to each other. We performed this in every case, on the one hand to shed light on the most important variables in explaining restructuring (and the successfulness thereof), and on the other hand to filter the variables from the further analysis which have so little explanatory power that they cannot be distinguished from random, non-systematic fluctuations in the variable. In the case of the foreign currency loan portfolio, the variable of the *instalment* due on 30 April 2015 proved to be a highly significant determinant of banks' restructuring decisions; this variable implicitly best identified the terminated (and thus not or unsuccessfully restructured) contracts listed in the database. In spite of this, we did not use this variable in several cases of our analysis. The reason being that instalment size does not in itself influence the customer's solvency and the bank's motivation for restructuring, as the 'tightness' of solvency is best characterised by the relative size of the debt-service burden to income, and furthermore because the instalment essentially depends on other factors such as outstanding principal, length of maturity and the transactional interest rate. However, these variables are also used separately in the analysis, thus when the instalment variable was not clearly used by the method to identify terminated contracts, we did not take it into account.[35] The fact that *original maturity* and the *current loan interest rate* variables also proved to be particularly important in the bank restructuring decisions corroborates the former argument.

In terms of the **motives of restructuring** within the foreign currency loan portfolio,[36] we first divided the stock into two subsets according to **original maturity**, separating approximately 20 per cent of the sample as featuring short maturities (*Chart 29*). For the following trees, we indicated scenarios deemed as viable (based on a high proportion of restructured contracts when looking at motivation, and based on a high proportion of successful contracts when

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[34] We took multiple random samples from both the population of the mortgage loan database and the population for which there are income data in the National Tax and Customs Administration database, the outcomes of which coincided on all relevant points for such a sample size. In addition, as a further robustness test we performed the resulting trees not only in respect of the sample, but also of the entire population, and obtained a result very similar to the one presented here.

[35] Among terminated transactions, the total debt is either due in one lump sum, or there is no instalment due, depending on bank records.

[36] The decision trees presented in the paper classify approximately 70 per cent of observations correctly. In view of the fact that both when choosing the method and defining the depth of decision trees, our main concern was interpretability as opposed to accuracy, so we must assess the above indicator with this in mind.

looking at successfulness – values of over 70 per cent) in blue, and less viable scenarios (featuring a ratio of under 30 per cent) in red. A much larger proportion of contracts with original maturities of approximately ten years were restructured relative to those with shorter maturities. This can be interpreted as original maturity behaving as a proxy of loan size.[37] With this interpretation, it becomes clear that a larger loan represents greater exposure, a higher loan-to-value ratio, and thus a source of greater potential loss for the bank, making the bank more motivated in restructuring the contract.

Chart 29: Motivations of restructuring in the case of FX loans
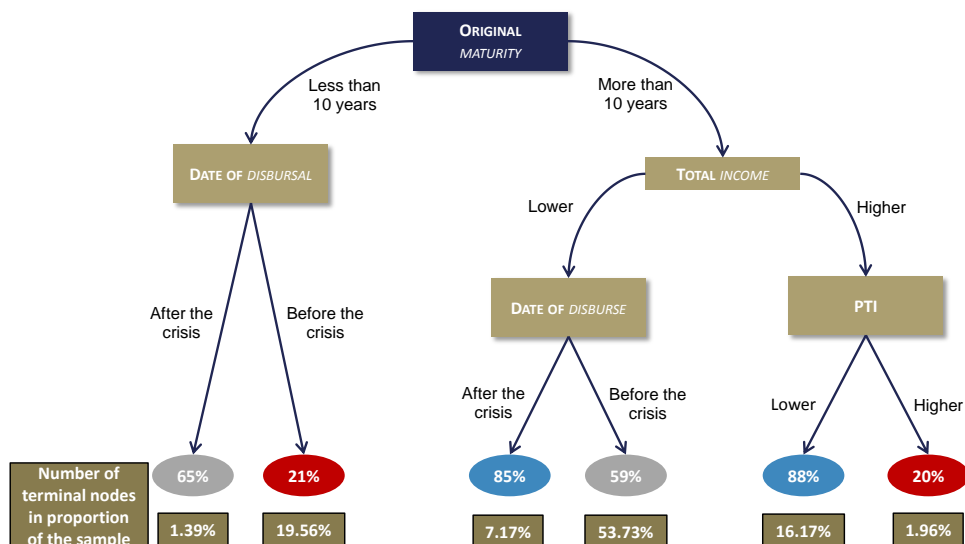
Note: In the bottom line of the chart, in an oval frame, the ratio of restructured loans within the contracts of the given category is shown. On the bottom of the chart, in a square frame, the number of contracts with characteristics corresponding to the given terminal node can be seen in the proportion of the sample.
Source: MNB mortgage loan database

For loans with original tenors of less than ten years, restructuring was frequent in the case of loans **disbursed after the crisis** only, but this is a small and negligible group that represents less than one and a half per cent. The reason why the crisis acted as a separator (cutting point: 21 October 2009) must be the fact that after the crisis, banks' risk-assessment became much stricter, and therefore in the case of loans provided after the crisis, banks see a higher probability of recovering the payment ability even in the case of overdue loans. Another possibility is that FX loans granted before the crisis for relatively shorter terms have been in arrears for a long time, and there is a very low likelihood of the recovery of solvency (for example, due to unemployment or a drastic increase in repayment burdens). This is supported by the fact that, according to the CCIS database, 70 per cent of the contracts belonging to this category, which represent 80 per cent of the portfolio, were due for more than 90 days already in 2012. In the portfolio of loans with original terms longer than ten years, the method separates different groups by **total income**. A much higher proportion of contracts falls into the category which can be characterised with the primary debtor's and the co-debtors' lower total income. As the higher total income of the household increases the probability of recovering the solvency of the debtors, banks see a better chance for a successful restructuring in these cases: customers have a better chance to adjust to the situation, as it may be easier for them to cut other expenses in the interests of more successful repayment of the loan. In the segment of high income, the method uses the **payment-to-income** ratio (PTI) to extract terminated contracts: the cutoff point is extremely high, which indicates that in the case of contracts in the high PTI category, the whole repayment burden has become due. Indeed, 99 per cent of contracts with these characteristics within the total population are already terminated. In the case of borrowers with lower income, the **age of the loan** is a more important factor: probably for the above reasons, the ratio of

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[37] While lower loan amounts may also be granted with longer maturities, this is uncommon.

restructuring among loans extended since the crisis (cutting point: 12 January 2009) is much higher. However, the largest group that accounts for more than half of the sample consists of contracts with long original maturities and low household incomes, granted before the crisis, and in the case of such contracts, we do not see an extremely high restructuring ratio. Nevertheless, it can be seen that the banks did not refrain from the restructuring of this segment, as they saw a possibility for restoring the payment ability in the case of almost 60 per cent of these debtors.

Based on all of this, we can say that the **decisions** related to the restructuring of FX loans are usually made by the banks on the basis of the **length of the maturity,** the **date of disbursing** the loan and the size of **total income.**

Focusing on the restructured contracts in the previous sample, we try to find the contract and contract modification features which determine the success of restructuring. To this end, the list of contract characteristics used in the previous analysis will also be extended with category variables containing restructuring methods (e.g. reducing instalments, reducing principal, forgiving arrears, etc.). Among the variables applied (except for the due instalment, the omission of which has already been explained), the two most important ones, which have the biggest weight in the explanation of the success of restructuring, are the *change* in the *market value of the collateral* since the signing of the contract and the *current loan interest rate.*

In the examination of the **success of restructuring measures**, the method first groups the portfolio according to the **current loan interest rate** (*Chart 30*), but the category limited by a loan interest rate higher than 8.6 per cent (accounting for 7.4 per cent of the sample) practically extracts terminated contracts (only 12.9 per cent of this category is not terminated). This is further strengthened by the fact that when the interest rate variable is omitted from the model, the variable of the due instalment takes its place. In the remaining contract portfolio, the relative **change** in the **market value** of the collateral is the variable that determines the most homogeneous groups from the aspect of the success of restructuring: where depreciation was less, restructuring was more successful. This is reasonable, if we consider the fact that keeping a property of steady value may be a good motivation for better repayment willingness for debtors (as a psychological factor, the customers' willingness is greatly influenced by the LTV ratio). In the case of contracts with collateral that suffered less depreciation, the variable identifying the **reduction in instalment** formulated on the basis of residual logic[38] can efficiently contribute to the success of restructuring. On the lower nodes of this branch, we can observe on the one hand that the higher **total income** of the household makes restructuring more successful (although the contract segment defined in this way, with higher income households, accounts for hardly more than 2 per cent of the sample), as the higher total income of the primary debtor and co-debtors increase the likelihood of solvency. On the other hand, we can see that the fact that the **mortgage** of the bank was registered in the first position makes restructuring more successful. The reason behind this is that when the bank's mortgage is not in first rank, the customer must owe certain amounts to other financial institutions, public utility companies or perhaps to the state, and that obviously makes the repayment of the loan more difficult. When the market value of the collateral falls to a larger extent (almost 60 per cent of the total sample falls into this category), restructuring is more successful when the **primary debtor** is not the **obligor**. The reason is that when the obligor is not the primary debtor, then several parties are interested in repaying the loan according to the schedule (e.g. family members). The fact that the primary debtor's repayment motivation is weaker without a mortgage obligation contradicts the above statement to some extent, but the results indicate that the first influence is stronger. On the branches of this node, we can observe the above detailed impacts again: the higher total income of the debtors and a smaller drop in the market value of the collateral facilitate the success of restructuring. The majority of the contracts in the sample, almost half of them, can be characterised with a larger fall in the market value of the collateral and with the mortgage obligation of the primary debtor. The restructuring success rate of slightly more than 50 per cent even in this category implies the general success of restructuring, along

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[38] This variable was created by us for restructured contracts for which the bank did not specify any restructuring strategy. Hence, we assumed that if there was restructuring, it had to be reflected in the changes in repayment conditions, and the instalment moratorium is the least specific realisation of that.

with more strictly limited groups with a higher rate of successful restructuring (in which selection bias can obviously also play an important role).

Based on the above, we can say that the **success** of the restructuring of FX loans is primarily determined by the **change in the collateral's market value**, the debtor's role as **obligor**, the size of the **total income** and the **rank** of the registered mortgage.

Chart 30: Success of restructuring of FX loans
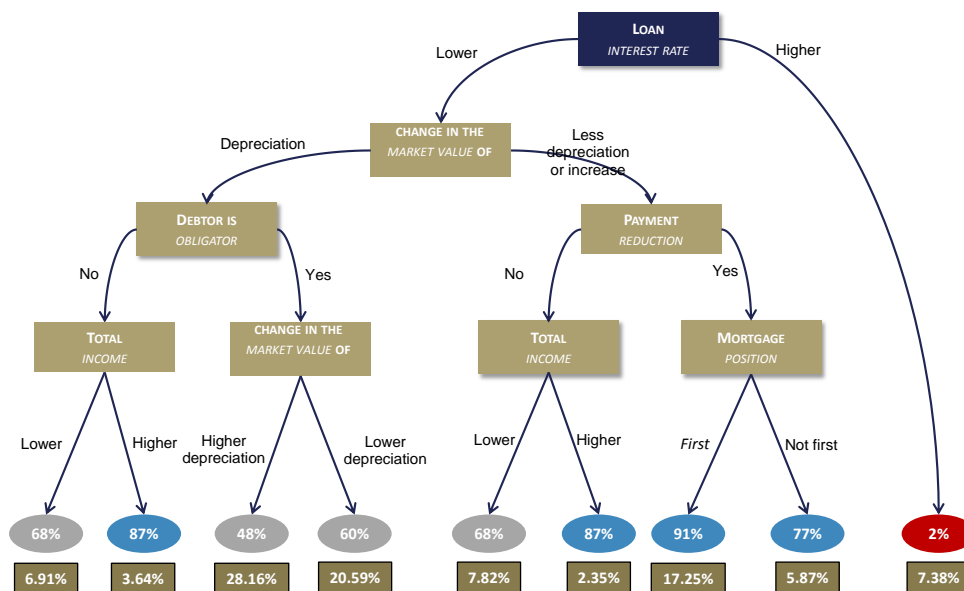
Note: In the bottom line of the chart, in an oval frame, the ratio of *successfully* restructured loans within the restructured contracts of the given category can be seen. On the bottom of the chart, in a square frame, the item number of contracts with characteristics corresponding to the given end point can be seen in the proportion of the sample.

Source: MNB mortgage loan database

7.3.2. Forint loan portfolio

Altogether **37,089 HUF loan contracts** in the mortgage loan database proved to be suitable for the classification procedure; therefore, in view of the robust results, we did not take samples but examined the **whole subset of the population.** Similarly to the analysis of the FX portfolio, first we assigned the contracts – on the basis of their characteristics – to categories in which restructured contracts are present in the most homogeneous manner (i.e. in a given category, most of the loans are restructured or not restructured).

In the explanation of the **restructuring motivations** related to the portfolio of HUF loans, the *due instalment* variable also plays an important role, but in line with our earlier criticisms, we do not use it in the further analysis in this case either. Other significant explanatory variables are the *loan amount at the time of signing the contract*, as well as the *current loan interest rate* and the *age of the loan*.

Examining the **restructuring motivations** of the HUF loan portfolio, the method first groups the portfolio according to the **loan amount at the time of signing the contract** (*Chart 31*). Looking at the mortgage loan database, it can be seen that very small HUF loans (not more than HUF 500,000) primarily consist of loans disbursed a long time ago and already terminated, as well as technical accounts connected to the exchange rate cap scheme initiated from 2012, which make up approximately 15 per cent of the total HUF loan portfolio. With the exception of loans belonging to this relatively narrow category, the rest of the contracts can be separated by the **age of the loan**, basically to loans extended before the increase in FX lending, mostly with state interest subsidies, and to HUF loan contracts signed after the FX loan boom. It is clear that among HUF loans extended a long time ago, which make up approximately 30 per cent of the population, the ratio of restructuring is much lower – the reason may be that in the good-quality

subsidised HUF loan portfolio, the low number of nonperforming contracts had such serious solvency problems (e.g. permanent unemployment, loss of income because of a particular situation in life) that can be managed with the examined restructuring techniques to a limited extent only.

Chart 31: Motivations of restructuring in the case of HUF loans
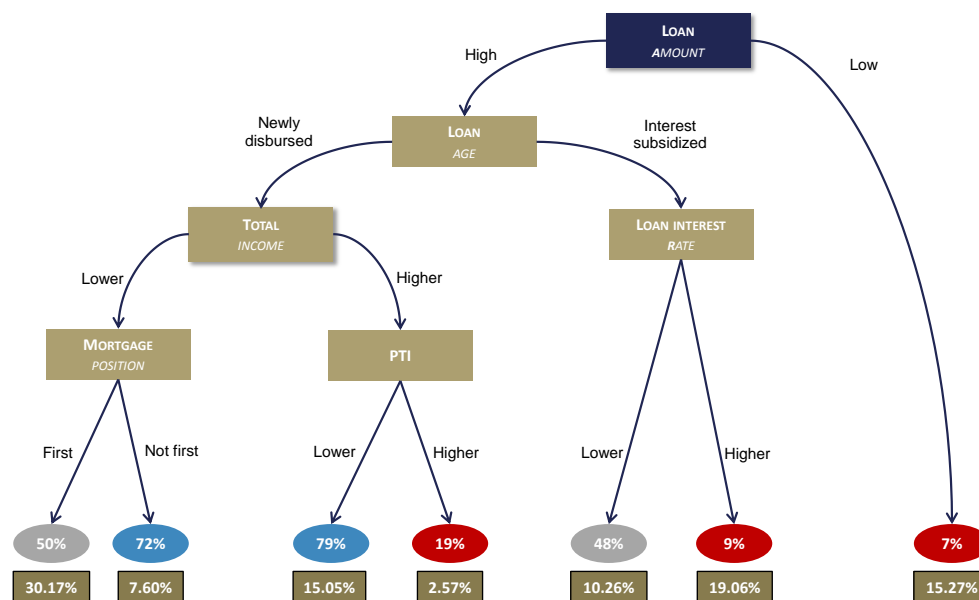
Note: In the bottom line of the chart, in an oval frame, the ratio of restructured loans within the contracts of the given category can be seen. On the bottom of the chart, in a square frame, the number of contracts with characteristics corresponding to the given terminal node can be found in the proportion of the population.

Source: MNB mortgage loan database

In the case of HUF loans extended after the crisis, the total **income** of the primary debtor and the co-debtors together proves to be the best variable for splitting the group. The examination of the number of contracts at the terminal nodes shows that higher total incomes also offer a positive contribution to the restructuring decision of the bank in this case, i.e. when the bank makes a decision, it also considers the potential repayment abilities of the debtors behind the contracts. In the case of the contracts of customers with lower total income, which, unfortunately, also represent a higher percentage (almost 38 per cent of the total population) in the case of HUF loans, similarly to FX loans, the method sets up two additional categories depending on whether or not the bank's **mortgage** is registered in the first position. If it is not, in the case of a possible sale of the collateral, the bank will certainly not get the total amount released by the sale of the collateral, and therefore it will have additional losses if the loan becomes nonperforming, i.e. the bank has more interest in restructuring these contracts and restoring the solvency of the customers than in the case of first-rank mortgages.

In the case of customers in the higher total income category, the **payment-to-income** (PTI) variable divides the relevant contract portfolio to two segments. If the PTI has a higher value in the case of customers with higher total income, that means an extremely high instalment. The majority of these contracts are terminated loans, in the case of which the whole repayment burden has become due, so the instalment and the derived PTI are both extremely high. By contrast, in the category of the lower payment to income, a large number of contracts have been restructured. The method divides HUF loans extended earlier, most probably with state interest subsidies, into two groups by using the **current loan interest rate** variable. More than 80 per cent of the contracts in the category of

high loan interest rate are already terminated,[39] but in the category of lower loan interest rates, where restructuring can probably be more successful, the rate of restructuring is also relatively low, 48 per cent.

All in all, it can be observed that compared to the analysis of the FX loan portfolio, a much smaller proportion of the population can be considered suitable for restructuring in the case of forint loans, and therefore the general restructuring motivation/possibility of HUF loans is probably lower. The possibilities and motivations of restructuring HUF loans may be determined by the size of the **loan amount**, the **age of the loan**, the **rank** of the mortgage (i.e. how many other debts the customer has) and the **payment-to-income** indicator's value.

In order to explore the success factors of restructuring, we focused on restructured contracts from the previous set of the population and also included the variables of the restructuring methods as potential explanatory variables for HUF loans, in addition to the characteristics of the contract. From the variables used by us, the *current loan interest* variable and the *due instalment* proved to be the most important ones, which, considering the fact that its role in this case is only to separate the segment of terminated loans, we left in the analysis.

Looking at the **success of restructuring**, the method first separates the terminated loans that can be identified by the **due instalment** variable, from other contracts: the transactions that belong here and make up only 7 per cent of the loan portfolio are almost all (97 per cent) terminated (*Chart 32*). In the next step, contracts without extremely high instalments can be separated on the basis of the fact whether the **term was extended** during any restructuring of the loan. Where this did not happen (in the case of approximately 70 per cent of the population), 89 per cent of the restructuring measures proved to be successful, and where it did happen, the ratio of successful restructuring is 77 per cent. Looking at the contracts where the term was extended, we can find that a significant number of these contracts are loans extended after the crisis, with longer original terms. In the case of these relatively newly extended loans which already face repayment problems, the policy of term extension was a less efficient contribution to successful restructuring than the application of other strategies in the other transaction category. Contract categories can also be efficiently created within contracts restructured with term extension. For instance, in the case of loans extended **not earlier than three to four years ago**, the success rate is considerably lower. We believe this can be attributed to the fact that these young contracts did not pass the repayment test of the first few years (it is typical for retail loan contracts that the probability of default is much higher in the first phase of the term than in later phases). Thus in the case of contracts that 'survived' this critical period, there is a much higher likelihood of successful restructuring. Even within this sub-category, the success of restructuring is more certain if the **rank** of the mortgage is not higher than one. In the case of transactions where the term was not extended, the variable[40] created by us based on residual logic, identifying **instalment reduction** significantly improved the success of restructuring, but the ratio of successfully restructured loans is also high in the case of loans where restructuring was carried out in another way. These two latter sub-categories cover approximately 70 per cent of restructured HUF loans, with an average success rate of 89 per cent.

Based on the above points, we can say that the **success** of restructuring HUF loans is primarily determined by the size of the **due instalment**, the **age of the loan**, the **rank** of the mortgage and the **reduction in the instalment**. We can also see that the restructuring of HUF loans so far has proved to be successful in a much higher ratio than in the case of FX loans.

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[39] The reason for this is that in the case of terminated contracts where the loan interest rate in the database was zero, for the sake of intuitive grouping (i.e. to make sure that contracts of high loan interest rate, therefore probably more difficult to restructure, and the already terminated contracts with technically zero interest rate could be on the same 'side' according to the interest variable), the zero values were set to unrealistically high value, to 99 per cent at the interest rates.

[40] This variable was created by us for restructured contracts, for which the bank did not specify any restructuring strategy. Hence, we assumed that if there was restructuring, it had to be reflected in the changes in repayment conditions, and the instalment moratorium is the least specific realisation of that.

Chart 32: Success of restructuring in the case of HUF loans
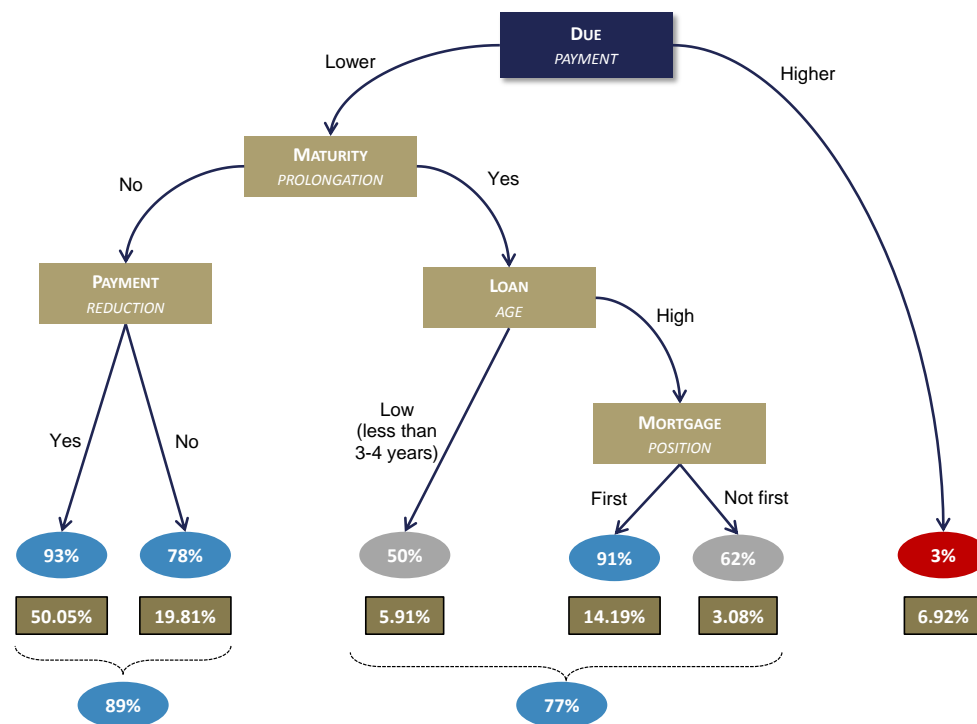
Note: In the bottom line of the chart, in an oval frame, the ratio of successfully restructured loans within the restructured contracts of the given category can be seen. On the bottom of the chart, in a square frame, the number of contracts with characteristics corresponding to the given terminal node can be found in the proportion of the population.
Source: MNB mortgage loan database

7.4. Segmentation of nonperforming portfolio by risk profile

In terms of the cleaning of the nonperforming mortgage portfolio, the most important objective may be the permanent restoration of debtors' solvency, and the key instrument for that is sustainable bank restructuring. Therefore, apart from the examination of the motivations and success factors of restructuring measures, the following questions must also be addressed:

- What are the characteristics of the nonperforming loan portfolio from the aspect of the risks of restructuring: what kind of **risk profiles** can be created by using the success factors of restructuring?
- What **layers** can be created from the combinations of risk profiles and the debtors' behaviour features (attitudes)?

Using the success factors explored in Chapter 7.3, groups of low and high risk profiles can be determined in both the HUF and the (earlier) FX loan portfolio: these groups are characterised by the fact that the ratios measuring the motivation or the success of restructuring are relatively higher or lower. In the course of the classification, we identified the features which are related to reduced payment ability, and can be attributed to reasons detailed in *Chapter 3* (e.g. permanent unemployment, loss of income, excessive indebtedness, lower lending standards, etc.). These are more or less similar in the case of HUF and FX loans, the only difference is in the extent. The 'end points' defined with classification procedures for the establishment of risk profiles (the end points of the decision tree branches considered successful or not successful) were classified to classes of low or high risk, and then, based on the characteristics of loan transactions at the end points (based on the related cutting values and their structure), we identified the groups with loan transactions of similar characteristics – and homogeneous from this aspect – from the mortgage loan database. Following that, we assigned the relevant motivation and success rates defined with a classification procedure to the homogeneous groups. Assuming that the individual trees provide a representative

estimation of the motivation or success probabilities, we defined the partial sample features of the aggregate risk classes (high and low) (*Table 13*).

In the nonperforming portfolio, transactions of **higher risk** have a **higher ratio**: although the portfolio is more or less well-balanced in the case of HUF loans, in the FX loan portfolio of much larger size, the ratio of transactions of high risk is **85 per cent**, which offers less favourable restructuring potential for creditors.

Table 13: Risk profiles in light of classification results

	FX loans		Forint loans	
	Debtors at low risk	**Debtors at higher risk**	**Debtors at low risk**	**Debtors at higher risk**
Main characteristics	Disbursed after the crisis, more than 10 year term, high household income, low PTI	Permanent unemployment or illness, low income, high PTI, loans disbursed before the crisis	Lower PTI, relatively higher income, loans disbursed after crisis	Permanent unemployment or illness, low income, high PTI, loans disbursed before the crisis, multiple indebtedness
Ratio to NPL portfolio*	Number of contracts: 15% Volume: 15%	Number of contracts: 85% Volume: 85%	Number of contracts: 42% Volume: 55%	Number of contratcs: 58% Volume: 45%
Probability of restructuring	64-84%	21-44%	55-67%	17-34%
Success rate of restructuring	67-74%	29-39%	78-80%	4-5%
Possible success factors of restructuring	Collateral with steady value, balanced household income, low total debt	Relatively higher income, more involveable co-debtors (family members), lower depreciation of collateral (favourable geographical location)	Relatively older contracts (older than 3-4 years), low total debt, maturity prolongation or other payment reduction	Newer contracts maturity prolongation

Source: MNB mortgage loan database

Summarising the restructuring classification, we can make the following statements. In the case of **FX loans**, in the segment of **low risk**, the motivation rate of restructured contracts is around 64-84 per cent, while restructuring may be successful for such a loan transaction with a probability of **67-74 per cent**. In the case of **HUF loans**, the possibility of restructuring is 55-67 per cent, while their **success rate** is higher than that of the FX loans, **78-80 per cent**. However, in the segment of **high risk**, the picture is less favourable: the motivation/possibility of restructuring is only 21-44 per cent in the case of FX loans, and 17-34 per cent in the case of HUF loans, while their **success rate** is **30-40** and **4-5 per cent**, respectively.

We performed our analysis on the basis of the mortgage database data, for the current nonperforming loan portfolio and the past restructuring experiences. Assuming that both the database and the experiences of past restructuring measures, and the features of restructured loan transactions can be considered representative for the current – not yet transformed – nonperforming loan portfolio, a rough estimate can be given for the restructuring potential. Interpreting the motivation rates received as a result of the classification procedure as upper limits, and interpreting the success rates as lower limits, we can say that 45-50 per cent of the nonperforming mortgage loan portfolio (contracts) *may be* suitable for sustainable restructuring by the banks.

7.5. Role of the National Asset Management Agency in portfolio cleaning

The National Asset Management Agency (NAMA) set up by the government has been actively involved in the cleaning of the retail mortgage loan portfolio since March 2012. According to the mission of the agency established in 2011 and owned by the Hungarian National Asset Management Inc., it offers help to families with special social needs, that are unable to meet their obligations from their loan contracts, so that they can get out of the debt trap for good. Under this scheme, based on the given parameters of the loan contract, debtors who meet the social considerations, offer their properties for sale to the Hungarian State with the preliminary principle consent of the mortgage beneficiary of the first rank. After checking the eligibility conditions, the Asset Management Agency works

out a plan to divide the sales price, and makes a purchase offer to the mortgage beneficiaries qualifying as financial institutions – with veto right in the transaction – by applying the legally defined discounts and satisfaction ratios. If the creditors with a veto right accept the offer and the property meets the criteria of the technical delivery and acceptance carried out by the Asset Management Agency, the transaction may be performed: after the payment of the purchase price, the debtor receives a statement on the waiving of the debt from the financial institution creditors, and thus released from the debt amount over the collateral value. However, the remaining claims of nonfinancial institution creditors remain in force, so the debtor is not released from the burden of public utility debts, telephone bills or common costs in condominiums, for instance. The NAMA programme offers a home renting product with favourable fees and an indefinite period for the debtors, with the maintenance of a six-year repurchase right, which offers a realistic chance to get the lost property back.

During the operation of the NAMA programme so far, the banks and the customers together offered more than 25,000 real estates for sale, from which **16,047 properties** were actually purchased **by the end of April 2015**, and altogether 17,390 until the end of July, in an approximate value of HUF 64 billion. The programme allows for the purchase of 1,500 properties per month, but the number of actual transactions is much less than that: in the 3.5 years since its start, 434 properties were sold in a month on average. On average, 8 months passed between the offering and the purchase, and 90 per cent of the transactions were closed within one year (*Chart 33*).

Chart 33: Dynamics of offering and purchasing properties purchased in the NAMA programme
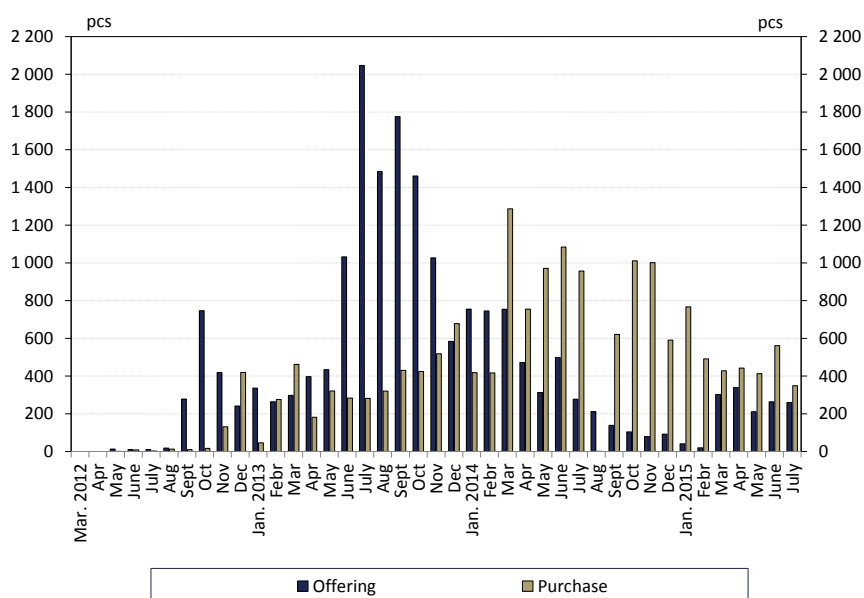
Source: NAMA

Of the purchased portfolio, 35 per cent is concentrated in three counties (Budapest and Pest county together represent 14 per cent, Borsod-Abaúj-Zemplén represents 11 per cent and Szabolcs-Szatmár-Bereg represents 10 per cent), while the counties in the region of Western Hungary have a share below 2 per cent. 40 per cent of the properties are located in smaller towns, and 37 per cent are in villages – only 23 per cent can be found in the capital or in cities with county authority. The average purchase price of collaterals – in line with the discounts defined in legal regulations and the market value of the properties – is different in each region: the highest average purchase price was paid by the Asset Management Agency in the Central Hungarian region, while the lowest was paid in the Southern Transdanubian region. Following the pattern of purchase prices, the extent of the average monthly rent is between 8,000 and 13,000 HUF (*Chart 34*).

Chart 34: Average property purchase price and rent in the NAMA programme
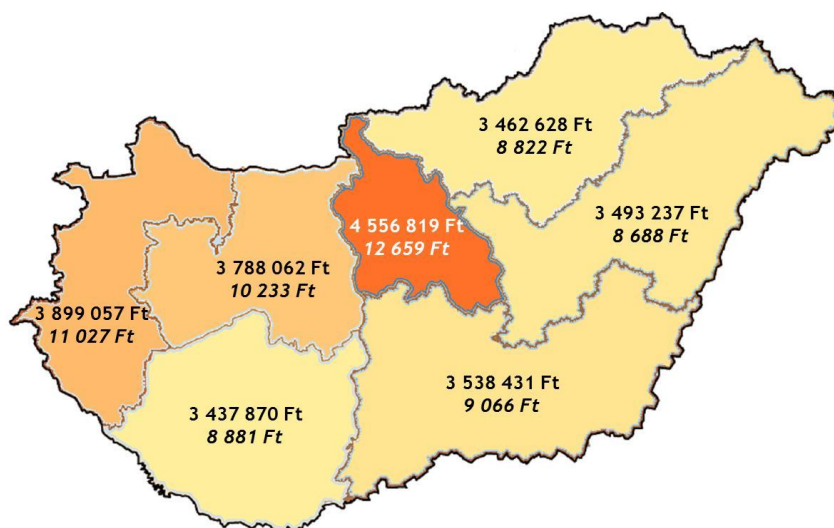
Source: NAMA

Creditors with veto right waived 21-86 per cent of debts on average for debtors, which is by far the most favourable – from the debtors' perspective – among the present portfolio cleaning instruments (*Table **14***). In the majority of the transactions, only one mortgage beneficiary creditor was registered on the title deed of the property, and there were altogether 2,600 transactions where several creditors had to be listed in the purchase price division plan.

Table 14: Loans replaced in the NAMA programme

Category of purchase price (1)	Number of collateral (db) (2)	Disbursed loan AVERAGE (3)	Purchase price AVERAGE (4)	Debt claims of creditors with veto AVERAGE (5)	Other creditors' claims AVERAGE (6)	Debt relief ratio AVERAGE ((5)-(4))/(5)
Below 1 million HUF	241	3,033,179	792,741	5,451,969	36,525	85.5%
Between 1 and 2 million HUF	2,950	3,445,143	1,589,240	6,018,480	43,257	73.6%
Between 2 and 3 million HUF	4,123	4,211,630	2,535,759	7,277,146	47,654	65.2%
Between 3 and 4 million HUF	3,859	4,718,543	3,547,433	8,167,395	55,305	56.6%
Between 4 and 5 million HUF	2,738	5,169,421	4,480,782	9,114,240	70,961	50.8%
Between 5 and 6 million HUF	1,487	5,461,841	5,465,147	9,611,394	56,905	43.1%
Between 6 and 7 million HUF	1,062	5,919,225	6,489,979	10,454,776	73,011	37.9%
Between 7 and 8 million HUF	475	6,417,778	7,403,436	11,493,659	87,398	35.6%
Between 8 and 9 million HUF	187	6,382,989	8,454,507	11,411,734	109,421	25.9%
Between 9 and 10 million HUF	149	6,452,421	9,461,554	11,970,004	109,591	21.0%
Between 10 and 11 million HUF	119	7,502,075	10,495,645	14,027,861	335,902	25.2%

Source: NAMA

As far as the quality of the purchased property portfolio is concerned, it is worth mentioning that in the case of 10,000 transactions, in the course of the technical delivery-acceptance procedure before the transaction, the tenants-to-be agreed to fix the technical faults – otherwise the transaction would not have been completed.[41] 351 tenants had to be warned about their non-payment of the common costs, and in 135 transactions, the NAMA (NET Zrt.) paid to the condominium, paying debts of HUF 170,000 on average. The number of tenants who did not meet their rent payment obligations has been continuously increasing since the start of the programme: while in 2012, the number of nonperforming tenants was marginal, 32 per cent of the fees due (invoiced) in March did not arrive at the account of the Asset Management Agency until 30 April. Thus looking at the first quarter of this year – based on volumes – the ratio of non-performance reached 21.6 per cent: examining the whole portfolio and the whole period from the launch of the programme, the balance of matured and paid rents shows a deficit of almost 8 per cent (*Chart **35***).

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[41] However, in the case of 330 deals from the 10,000, the HNAM carried out the necessary intervention instead of the debtor.

Chart 35: Nonperformance ratios in the NAMA programme
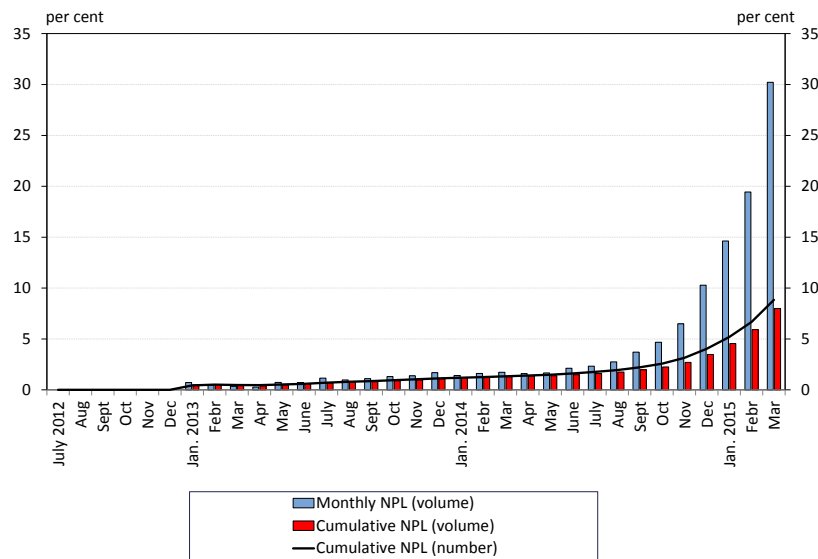
Note: The 'current month' is the indicator calculated from the difference between the rents due and actually paid in the given month. The 'Cumulative' is the indicator calculated from the difference of cumulated due rents from the start of the NAMA programme and the actually paid rents.
Source: NAMA

Based on the data of the end of 2015, the ratio of problem-free contracts is 37 per cent, and the ratio of debtors in arrears of maximum 30 days is also this high (32 per cent). Almost 21 per cent of the contracts had an arrears of more than 90 days (*Chart 36*).

Chart 36: Breakdown of contracts in arrears by time of delay
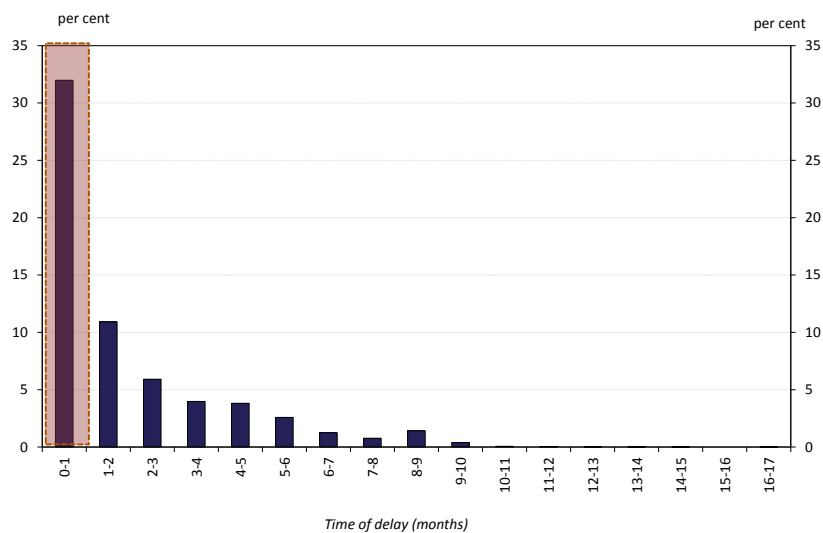
Source: NAMA

Because of the non-payment of rent, 1,240 tenants received 'final notices', and in 868 cases, the contract has already been terminated.[42] Following termination, the former tenant is given a chance to pay its outstanding debts to NAMA with a debt settlement and cooperation agreement. For the period of the agreement, a lease contract of definite term ensures further living in the property, and this can be transformed into an agreement of indefinite term when

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[42] There may be several reasons for termination – one of them is the non-payment of rent.

the debt settlement procedure is successfully closed. Debt settlement – as a mandatory element of the agreement – is supported by helping organisations under a mentor programme (Hungarian Charity Service of the Order of Malta, Hungarian Reformed Church Aid). By the middle of the summer, 484 agreements of definite term were concluded – 415 because of the non-payment of the rent – and the Asset Management Agency expects approximately 1,500 contracts of this kind that before the end of the year.

The National Asset Management Agency is presently a **key player in the enforcement of bank collaterals.** The vast majority of collaterals sold are purchased by the Hungarian State under the NAMA programme: the financial institutions sold approximately 18,500 collaterals between 2013 and the end of Q2 2015. About **78 per cent of the properties sold** in this period, i.e. 14,500 properties were purchased by the National Asset Management Agency. Based on this, in the last two and a half years, the financial intermediators enforced their mortgages only in less than 4,000 cases by selling the collateral, which makes up 2 per cent of the nonperforming portfolio on the basis of the number of contracts. The NAMA programme was originally designed for the purchase of altogether 5,000, then 25,000 properties, but because of its popularity, the government has recently decided to extend it, so **it has been possible to buy additional 10,000 properties**. In the course of our analysis, on the basis of the change in legal regulations that came into force in the autumn we examined the ratio of nonperforming debtors who were eligible for the extended programme. Based on our rough estimate, it will be possible to fully utilise the programme if the terms of eligibility are modified.

7.6. Possibilities of personal bankruptcy proceedings in portfolio cleaning

The act on the debt settlement of private persons – or personal bankruptcy proceeding as it is commonly called – came into force in September of this year.[43] Pursuant to the preamble of this act, the procedure allows excessively indebted borrowers – with the provision of the family bankruptcy protection – to repay a certain part of their outstanding debts, and – if they cooperate – to break free from the debt trap for ever. The procedure may consist of an out-of-court agreement and a judicial phase, depending on whether the debtor and the creditors are able to agree on the details of debt repayment, and whether the debtor meets the terms of the agreement (court resolution). In the first step, the personal bankruptcy procedure prescribes an agreement between the debtor and the creditors: if that is not reached, the second step is an agreement reached in court, and in the lack of that, the last step is a forced agreement (with court resolution). In the course of this procedure, if the debtor does not meet its commitments (the debt settlement plan), or acts in bad faith, the personal bankruptcy procedure is closed, and an execution proceeding is initiated. The objective of legislators with the personal bankruptcy is to restore the payment ability of people with minimum income and assets and with moderately excessive debts, but it does not aim to protect excessively indebted people (debtors with debts more than twice of their asset value). The debt settlement agreement reached in this procedure (or court resolution) allows, after a controlled repayment period of maximum seven years, to waive the remaining debts, in the case of meeting the minimum creditor returns defined in the legal regulation.

The popularity and expected efficiency of the personal bankruptcy cannot be assessed yet: based on our surveys with focus groups and questionnaires, debtors generally reject this procedure, and in the course of the bank interviews, we heard opinions that the complexity of the procedure will probably deter potentially interested persons, or some of the customers may look at the procedure as a new instrument to play for time, because of its complexity and slow progress. In the interviews, a consensus was reached in the point that the documentation required for entry is a heavy administrative burden, but the possibility of reaching an agreement before the court procedure may facilitate progress even in cases where so far a third person was an obstacle to voluntary sale or an out-of-court agreement.

In order to explore the demand side of the personal bankruptcy procedure, using the data of the representative questionnaire survey and the mortgage database data, we produced a rough estimate on the number of debtors that

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[43] Act CV of 2015 on debt settlement procedure for private individuals.

can be involved in the procedure (*Table 15*). In our estimation, we had to use several limitations, adjusted to the possibilities of the survey: we relied on the division – based on contract numbers – of the mortgage database regarding the exact number of days in arrears, and the probable presence of the 'noise' related to the incomes indicated by the respondents is true for this estimate. We had to consider another limitation about incomes involved in debt settlement, and therefore the forecast of the expected incomes of the next five years exceeded both the frames of the questionnaire survey and the financial planning abilities of respondents.

Table 15: Scope of debtors eligible for personal bankruptcy – estimate

Reference	Condition	Filter condition	In proportion to NPL portfolio (%)
Act CV. of 2015 7.§ (1/a)	Total outstanding debt between 2 and 60 million HUF	Total outstanding debt meets the requirements	74.7%
Act CV. of 2015 7.§ (1/b)	Loan-to-wealth ratio between 100 and 200 per cent. Total income of next 5 years involved in wealth.	Loan-to-wealth ratio meets the requirements. Total income of next 5 years could not be taken into account.	18.2%
Act CV. of 2015 7.§ (1/e)	Number of subordinated liabilities does not exceed 5.	Number of liabilities toward suppliers does not exceed 4	14.7%
Act CV. of 2015 7.§ (1/d)	At least one 90 days past due liability, with at least 500 thousand HUF volume	Using ratio from the financial institution data supply: 70.9 per cent of non-performing contracts have at least 500 thousand HUF liability	**11.0%**

Note: The percentage value shows the ratio of the segment corresponding to the given filtering condition and the previous terms to the whole population.
Source: MNB estimate

Based on the data, in our view, **the debt settlement procedure may be a realistic option for 11 per cent of nonperforming debtors** (11.6 per cent of loan contracts), **i.e. for approximately 15,000 debtors**.

7.6.1. Legal and administrative obstacles to portfolio cleaning

The efficient portfolio cleaning of banks is presently hindered by a number of legal and administrative obstacles and in particular, for the cleaning of mortgage loans, three main areas can be identified: anomalies in the regulatory environment affecting the **enforcement of collaterals and eviction** (repossession), the **personal income tax payment obligation** related to the waiving of debts, and **other administrative factors**.

The fast, successful performance of the **judicial execution proceeding** is hindered by the *overload on bailiffs*, the *lack of actual motivation instruments* and the *unrealistic order of procedures*.

The practice of **voluntary sale**, which should reduce the overload on the bailiffs, is less popular because of the unregulated nature of the procedure. The sensitive point of voluntary sale is the division of the purchase price, because for lack of regulations, mortgage beneficiaries of less favourable rank usually do not accept (or cannot accept) the partial return of their receivables (or their waiving), even in spite of the fact that they would not have a more favourable position in a possible execution procedure. In addition, voluntary sale is not always an attractive option for the debtors, as it does not solve the housing problems in the period after the sale of the property, even for a temporary period.[44] The order of procedures of **out-of-court auctions** (which could also help reduce the burdens of bailiffs) does not contain the algorithm of dividing the sales price, and thus causes the problem already described under the voluntary sale. It should be allowed for the Hungarian State to approve partial or full waiving of the debts in certain contracts, because that could give a further impetus to the collateral's voluntary sale or sale outside a court auction.

The completion of successful, fast proceedings is significantly hindered by the **regional monopoly position of bailiffs:[45]** the selection of bailiffs is not based on professional skills, workload, the bailiff's individual knowledge or perhaps the feedback from creditors, therefore the creditor (who applies for execution) may not select another

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[44] For this purpose, some banks encourage the debtors to apply voluntary sale by leaving a certain portion of the purchase price with them. This amount may temporarily help the housing problems of the debtor for as long as half a year.

[45] The procedure may be carried out by the bailiff who is competent at the place of residence of the debtor or at the location of the property under enforcement.

bailiff even if he is not satisfied with the efficiency or results of the proceeding. The **remuneration system** of bailiffs and the **fee structure** of the procedure are not good enough incentives in our views, for several reasons:

- The bailiff receives a fee, cost refund (out-of-pocket expenses and flat expenses) and collection commission, while the Hungarian Court Bailiffs Chamber receives a general flat charge. The fee is defined on the basis of the value of the case: if several execution proceedings are in progress against a debtor, the bailiff is entitled to charge fees separately in each case. As a consequence, the execution proceeding is extremely expensive – the total costs of the proceeding may reach more than 15 per cent of the amount collected at the auction, and thus significantly reduce the returns for the creditor, and this is also a heavy burden on the debtors (*Table 16*). In addition, the size of the transaction value is not in line with the work to be done,[46] which may increase the burdens of debtors by another 25-40 per cent, with the payment of the fees as obligors.

- The fee must be paid even if the debtor performs voluntarily, or if the creditor and the debtor reach an agreement, or if the amount collected in the execution does not cover the fee. In the latter case, the difference shall be paid by the creditor (who requested the execution) instead of the debtor. Except for the duty, the costs of the execution are to be borne by the debtor – and they shall be advanced by the creditor during the proceeding. What makes it worse is that at the time of paying the advance, the creditor does not have all the information that would be required to assess the expected success of the procedure. As a consequence of this, bailiffs receives the fee even if the proceeding is closed without effective results, and the institution of the advance payment does not motivate them to complete the proceeding in a fast, efficient way.

- The costs that emerge during the execution have priority in the order of satisfaction, which again is not an incentive for the bailiff to maximize the collected amount.

Table 16: Execution costs in the case of a property of average market value of HUF 10 million

NAME OF ITEMS	OBLIGOR	BENEFICIARY	COST
DUTY	Creditor	State	1% (HUF 100,000), 3% (HUF 300,000) if the execution is the responsibility of the bailiff of the court of the capital.
GENERAL FLAT COST	Debtor	Hungarian Court Bailiffs Chamber	Above a transaction value of HUF 500,000, it is 1% (HUF 100,000)
BAILIFF'S FEE	Debtor	Bailiff	HUF 160,000
BAILIFF'S COST REFUND	Debtor	Bailiff	Minimum HUF 80,000, which may be further increased by the costs of out-of-pocket expenses
COLLECTION COMMISSION	Debtor	Bailiff	Sale with a 50% discount, i.e. HUF 500,000 on a collected amount of HUF 5 million.
TOTAL:*	-	-	**HUF 1,140,000 (22.8 per cent of the collected amount in the example)**
- DUE TO THE BAILIFF FROM THAT:	-	-	*HUF 740,000 (14.8 per cent of the collected amount in the example)*

Source: MNB estimate

In the case of transactions belonging to the Court of Budapest.

The **length of the execution proceeding cannot be planned** by the banks, mainly because deadlines to be met by the bailiffs are hard to enforce, and the actions related to auctions require a lot of time. The law on judicial execution

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[46] As the bailiff may be entitled to different fees for the same amount of work.

does not regulate in detail the deadlines of the whole proceeding and some of its phases, and does not specify the times of procedures for meeting (responding to) the bailiff's requests. The creditor applying for execution has no efficient tool to **force the legal performance** of the bailiff; the institution of excuses does not work properly, as the legal regulation does not specify a specific deadline to manage that, does not define clearly the sanctions to be used in the case of the bailiff's failure (the imposed fine - because of its ratio to the fee - has no deterring effect anyway), and the practice of receiving and assessing excuses is not uniform. The excuses are assessed by the Hungarian Court Bailiffs Chamber (so 'colleagues act against colleagues'), and there is no effective feedback in the case of bailiffs reprimanded several times.

The **auctioning practice** significantly differs from the usual (expected) practice followed in market-based sales: in many cases, the auctioned properties cannot be *effectively* inspected in advance, and the data contents and appearance of the electronic auctioning interface does not always meet the average market expectations. The possibility of successful auctions is further reduced by the blocking of the estimated value of the real estate,[47] i.e. in the case of housing properties, the electronic auctioning system will not even accept bids that are 70 per cent lower than the estimated value. Following an unsuccessful execution proceeding – i.e. two unsuccessful auctions – in order to secure the original loan, the creditor must pay half of the value of the asset to be taken over (70 per cent for housing properties) in addition to the execution fees, which is another burden for the creditor.

Because of the regulation of the **eviction** (repossession) **procedure** and the weak rights of the buyer, after a successful auction – if the tenant does not leave the property voluntarily – the buyer must initiate a lengthy and costly eviction procedure with the bailiff: however, he must pay the purchase price within 15 days of bidding. Furthermore, there are no sanctions for deliberate damage caused by the debtor to the property, which may also deter potential buyers or may encourage them to apply a significant discount.

Chart 37: Distribution of collaterals sold on market basis by banks, according to the returns for the creditor
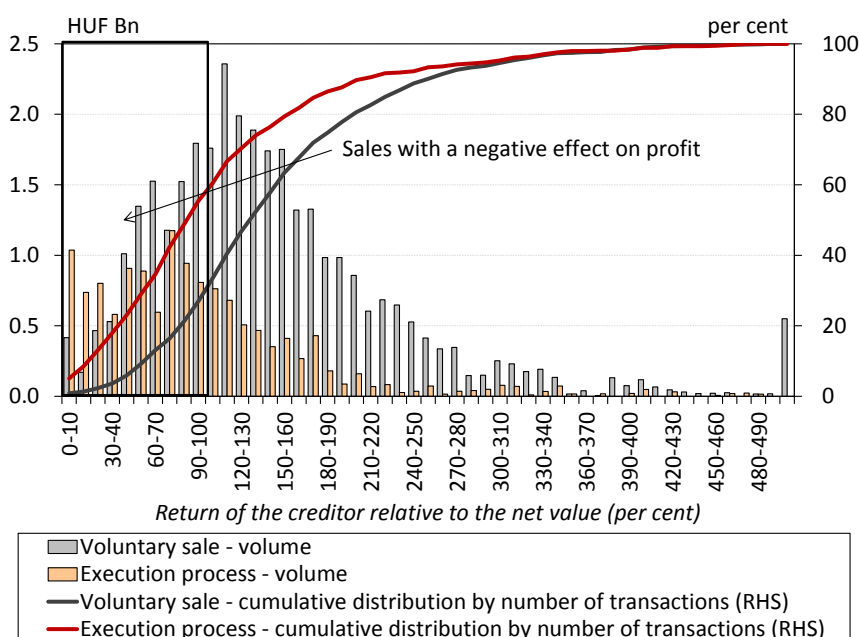
Source: MNB

The effect of administrative limitations related to the execution proceeding is also reflected in the statistics of collateral sales: between the beginning of 2013 and the end of Q2 2015, altogether 4,000 sales were concluded on market basis,[48] more than 1,100 contracts were managed by the enforcement system, and in 2,900 cases, the banks

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[47] The estimated value is fixed for 3 years in the execution proceeding, so it is not able to follow the changes in market prices in a flexible way.

[48] In this period, the NAMA purchased altogether 14,500 properties.

and the debtors sold the property jointly. As the mortgage is difficult to enforce, the banks probably initiate the sale of receivables that ensure the best return only. This is indicated by the fact that the average return of receivables against the net value in cases where the bank and the debtor sold the property jointly is close to 200 per cent, and compared to the gross receivables, it is close to 60 per cent on average. In the case of properties sold in the course of execution proceedings, the average returns for the banks are probably somewhat lower because of the high costs, i.e. 150 per cent compared to the net value, and 50 per cent compared to the gross value. All in all, in the joint sales, the banks achieved a result of HUF 8.7 billion from 1,606 sales ensuring positive returns and 617 sales ensuring negative return, while the **properties sold during the execution proceeding generated a loss of HUF 1.1 billion**, as a joint effect of 416 contracts with positive returns and 509 contracts with negative returns. Thus, in the past one and a half years, with the joint sales of collateral real estates, the banks cleared a problematic mortgage loan portfolio of almost HUF 34 billion gross, while in execution proceedings, this value was only HUF 14 billion (*Chart 37*).

Because of the uncertainties in **personal income tax regulations**[49] regarding the waiving of debts – the exact meaning of the 'principle of equal treatment' in the law is not clear – the banks run the risk of penalties imposed by the tax authority if they waive debts, and this hinders the decisions on waiving.

In connection with other administrative factors hindering portfolio cleaning, we can mention the **ban on the re-activation of terminated loan contracts**, which makes refinancing unnecessarily expensive, because of the KHR classification of the debtor and the valid debt brake regulation. The **notarisation of loan contract modifications** – if the essential parts of the loan contracts remain unchanged – could also be omitted, and the **strict regulations regarding the classification as bad debt** does not make banks interested in removing obviously uncollectable loans from their balance sheets. The administrative burdens of offering the loan to the NAMA programme are significantly increased by the fact that the banks and/or the debtors have to provide information that could be **centrally inquired from authentic public databases**. As a matter of interest about bank interviews, it happened to a bank that because of the collection of information on the solvency of debtors, the National Authority for Data Protection and Freedom of Information imposed a fine on it. Therefore the data protection requirements of the Authority and the registration requirements of the MNB should be harmonised. Finally, although the sale of receivables is rather difficult under the present market conditions, it would be an incentive if a valid leasing contract could be sold together with the asset only, and the transfer of data would not be mandatory in the course of the transaction.

7.7. Segmentation of the nonperforming portfolio by methods of management

The descriptive analysis of the problematic (nonperforming and performing restructured) portfolio, the exploration of the motivations and success criteria of restructuring, and the analysis of the behaviour of debtors provided considerable information on problematic mortgage loans and nonperforming loans that are the focus of this project. However, for the compilation of the offers that facilitate portfolio cleaning, it is essential to segment the nonperforming portfolio by possible methods of management – i.e. to examine which part of the portfolio can be managed with presently available instruments and which part may require further regulatory intervention. In the previous chapters, we provided rough estimates about the sizes of segments that can be handled with the NAMA programme and personal bankruptcy procedures, and with the compilation of risk profiles, loan contracts that *can* be successfully managed with restructuring have become eligible for approximate separation. Based on this, we can say that it is possible to manage the majority of the nonperforming portfolio using the current instruments. The more dynamic start of sustainable restructuring by banks may create the possibility of restoring the payment ability for 70 to 80 thousand debtors, so that they could become performing again. The NAMA programme – considering the capacity limit of 35,000 – provides a possibility for another 17,000 debtors to escape the debt trap. In addition to the possibilities of portfolio cleaning, however, we must point out that almost half of the portfolio consists of terminated loans, in the case of which, presently – because of administrative barriers – restructuring is not a real

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[49] Pursuant to point 7.21 of annex 1 to Act CXVII. of 1995.

option, and one of the basic conditions of more dynamic loan transformations is the strengthening of the cooperation willingness of debtors and creditors.

8. SUMMARY

The micro-level mortgage loan database provided a unique possibility for us to develop a comprehensive view of the status of the problematic portfolio. Based on the analysis of the nonperforming mortgage loan portfolio and restructured loan contracts, the following concluding statements can be made, laying the foundations for the conceptual framework for pre-decision recommendations to facilitate portfolio cleaning.

The reduction of the nonperforming retail mortgage loan portfolio is hindered by the excessive indebtedness of debtors. *The failure of mortgage loans and the permanent nature of nonperforming behaviour was primarily caused by the excessive indebtedness which was mainly the result of a drastic increase in debt amounts. For a significant number of debtors, the increase in the debt amount expressed in HUF triggered a sharp increase in the ratio of the instalment to income, while the ratio of the loan amount to the collateral value also deteriorated to a significant extent.*

Nonperforming debtors show signs of excessive indebtedness in respect of both income and assets. For 38 per cent of nonperforming mortgage loan owners, we could not identify any income liable to personal income tax, and for the majority of the nonperforming portfolio, i.e. 43 per cent, the debt service is high compared to the income level. The settlement in Q1 2015 somewhat reduced the size of instalments, but their current size still represents an unpayable burden for a high number of debtors. In parallel with the rise in instalments, the ratio of debtors' debts to their assets has also deteriorated since the loan was disbursed: the loan-to-value ratio of problematic mortgage loans calculated on the basis of the market value rose by two thirds on average during the loan history, and this increase was higher in the case of nonperforming loans. The drastic increase in this indicator was primarily due to the weakening HUF rate: the loan coverage ratio of a CHF-based loan with average parameters changed by 70 per cent *ceteris paribus* due to exchange rate changes. As a result of the increase in the principal debt, a situation known as "negative principal" in the technical literature arose, i.e. the value of real estates behind the loan does no longer covers the whole loan amount. In respect of nonperforming contracts, 35 per cent (about 50,000 contracts) show negative principal. Apart from the change in the loan-to-value ratio, another important factor is that for 82 per cent of nonperforming loans, the total amount of the debt is presently higher than the initial loan amount. In the case of 20 per cent of the examined households, the existing debt exceeds the value of the household's total assets – these indicators have presumably played a role in the weakening of payment discipline, due to debtors' desperation. The recession on the real estate market in recent years further deteriorated the re-starting possibilities of debtors, as the market value of real estate collateral – with significant regional differences – dropped by 13.7 per cent on average compared to the time of loan disbursements, further reducing the loan-to-value indicator of debtors.

Significant 'restructuring reserves' are visible in the portfolio, but more effort is required by the banks. *A significant portion of the nonperforming portfolio (up to 70 to 80 thousand debtors) may be suitable for sustainable restructuring if banks' practice becomes more dynamic and powerful. Restructuring of contracts can be successful if it results in debt servicing being better adjusted to the households' income position.*

Based on the experiences of bank interviews, only 20 per cent of the restructuring by the banks was sustainable. Based on the success criteria and success rates defined on the basis of the classification analysis of earlier restructured contracts, a significant portion of the nonperforming portfolio, up to 45-50 per cent, i.e. 70- to 80 thousand debtors, might be suitable for permanent restructuring. However, the 'age tree' of debtors limits the tools that can be used in restructuring, as almost half of the debtors reach retirement age within 20 years, and a quarter of them will be over 70. In their case, the extension of the term can be only partly suitable in the creation of a sustainable debt repayment path.

Greater willingness to cooperate is required from debtors. *As nonpayment had no consequences, a significant segment of the nonperforming portfolio has shown low willingness to pay. Based on the creditors' experiences, a*

definite segment of debtors shows low willingness to cooperate, and this has also been demonstrated by the results of our questionnaire survey.

The vast majority of nonperforming debtors are aware that they may lose their property, but only a few of them think that this is a real threat. A certain minority of debtors rejected all possible solutions offered by in the survey, while the majority of them are waiting for further intervention by the government. The significance of the moral risk is also raised in connection with nonperforming debtors: based on our estimates, the ratio of debtors characterised with low payment willingness, but adequate payment ability and moral risk may represent 10-20 per cent of the total nonperforming population. Based on our representative questionnaire survey – considering the methodology and interpretation limits – this ratio may be somewhat higher, even around 30 per cent.

The possibilities of selling collateral are limited. In the case of some debtors, the voluntary sale of the collateral or its enforcement by the bank are effectively limited by the local features of the property market. A significant part of the collateral is located in regions and towns where the property market is weak, and market-based sale may be difficult, also rendering it more difficult to clean the portfolio.

The geographical location of the properties strongly limits the possibilities of selling collateral. Almost half of these properties can be found in the Eastern part of the country (Northern Hungary, Northern Great Plain and Southern Great Plain), and 70 per sent of the debtors live in smaller towns (villages or smaller towns). In addition, the current market value of two thirds of the collaterals does not reach HUF 10 million. The chances for future sale are indicated by the fact that, with the exception of the Central Hungarian and Western Transdanubian regions, the number of collaterals is higher than the number of transactions per year on the real estate market, and the number of collaterals in small villages is 1.5-2.5 times higher than the typical number of transactions per year. Based on the above, it can be seen that, on its own, the real estate market would only be able to absorb the collaterals over the long term, with differences between regions. With the exception of the Western Transdanubian and Central Hungarian regions, moving into a smaller flat may be a realistic scenario in a limited number of cases only, in fact, the 'draw' effect of more advanced regions and larger settlements will probably continue to be an obstacle to the improvement of the real estate position of small towns' properties and situation. Three quarters of collaterals sold were purchased by the National Asset Management Agency, which is a good indication of the weak demand on the real estate market. However, the end of the programme represents a risk for creditors, as sales possibilities will narrow considerably.

Administrative burdens render successful management of the problem more difficult, especially in the case of terminated loans. In addition to the weakness of the real estate market, administrative obstacles also hinder the cleaning of the portfolio. The costly and lengthy execution proceeding, the taxation rules that are not clear at certain points and the problematic transformation of terminated loans represent risks for the cleaning of the nonperforming mortgage portfolio.

Execution and eviction (repossession) proceedings are extremely time-consuming and are impossible to plan for both creditors and potential buyers of the property, and this may have a negative effect on the returns for the creditors, as well as on the success of sales (auctions). Execution proceeding are still extremely expensive, and actually generate a loss for the banks: the bailiff's remuneration, the cost refunds and collection commission together may reach more than 15 per cent of the amount received at the auction. The cleaning of the portfolio by waiving debts is made more difficult by the unclear rules of tax exemption regarding the waiving of debts, which, in the banks' views, may deter the institutions from using this instrument. Another administrative problem is that more than half of the nonperforming loans have a terminated status, which, in the present regulatory environment, makes the sustainable restructuring of loan transactions difficult. The refinancing of terminated loans is also made much more difficult by the KHR classification of the debtor. Presently, terminated loan contracts can be managed with the execution proceedings or, looking ahead, the personal bankruptcy procedure enacted in the autumn of 2015.

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10. ANNEXES

10.1. International benchmark

The financial market crisis that started in 2007 and the subsequent economic recession shook the financial position of households with mortgage loans in a number of countries throughout the world. In most cases, the reasons were largely the same: real estate collateral which was often overvalued in the period of credit expansion suddenly lost some of its value after the financial crisis, and this undermined the financial situation of households, while the deepening recession and growing unemployment impaired their income position. The situation was even worse when households were indebted in foreign currency, and the weakening exchange rate increased the value of the debt in domestic currency.

In a number of countries we examined, the increased ratio of nonperforming debtors **first of all** forced a **reform in the framework** that handled debtors in difficulties: For instance, in Ireland, Iceland and Spain, the procedure of personal bankruptcy – which was outdated in many respects – was overhauled, and informal or formal rules determining the expected behaviour of banks were introduced. The main objective of overhauling the framework was to manage debtors in temporary or permanent payment difficulties in a uniform way. Because of the social aspect of the mortgage loan crisis, a general **execution and/or eviction moratorium** was also introduced on a temporary basis. In addition to the responses to the deepening mortgage loan crisis and changes in the regulatory environment, a fairly wide, detailed set of tools was identified, and these tools can be categorised in terms of a few key characteristics (*Chart 38)*:

- **Centralised or decentralised instruments:** the measures are effectively different (even within a country) in terms of the extent of the centralisation that characterises them. The more centralised a measure is, the less role is played by individual solutions that are based on agreements between the bank and the debtor. The waiving of debts in Iceland may be an example for centralised measures: these were meant for individual groups of debtors, and within the groups, it was mandatory to use the same solution (independently of the fact whether the debtor was performing or nonperforming). As opposed to that, the Irish example that encouraged restructuring left a significant part of the solution to the banks, and defined only the frameworks of the decentralised and individual approaches. In the United States and in Spain, the problem is also managed within the relationship of the bank and the debtor, but in accordance with pre-defined criteria and principles in each programme. Centralised solution attempts are usually less targeted and therefore probably have a lower efficiency, but are much faster to implement than decentralised instruments.

- **Mandatory or voluntary instruments**: some of the measures stipulate solutions of a general scope that are mandatory to use for banks and/or debtors (e.g. interest moratorium), and others are based on the voluntary participation of banks (e.g. code of good practices) or on the initiatives of debtors (e.g. Irish debt settlement procedures). In the case of measures that can be initiated by debtors, it was typical that the complex nature of the measure (and therefore the fact that it was more difficult to understand) or a potential 'entry limit'[50] resulted in low willingness to participate.

- **Extent of benefits**: the measures are also different in a sense that the benefits they offer result in a temporary or permanent change in the debtor's position. A final reduction in the burden may be ensured by cutting the interest rate or waiving some or all of the debt, while measures that temporarily ease the payment and the extension of the term do not reduce the overall burden to be paid by debtors in many cases. However, the role of government measures also cannot be eliminated in the latter case, if the framework and mandatory procedures of rescheduling are centrally regulated.

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[50] In Ireland, for instance, problematic debtors have to fill in a financial questionnaire of more than 10 pages to start the restructuring process.

- **Cost bearers**: in the case of most of the examined examples – compared to the volume of earlier domestic measures (e.g. discounted final repayment, settlement, etc.) – the banks usually bore the costs of the measures to a lesser extent. In many cases, the benefits provided on a temporary or partial basis during restructuring result in the loss of 'incomes ' in the case of which the possibility of realisation can be strongly questioned, and more favourable impairment settlement rules apply to debtors that are made performing by restructuring, which also reduces the bank's net expenses. The sale of collateral that offers a solution for the banks could be realised over a longer term, with significant discount, and therefore the net present value of the reduced cash flow that could be obtained by restructuring may in certain cases exceed the present value of amounts potentially received with the termination of the loan. Among the international examples, a wide scope of waiving of debts was realised in Iceland only, but it must be emphasised that after the bankruptcies of banks in foreign ownership, household loans were recorded in the balance sheets of banks at fair value, with significant discount, therefore the waiving of debts did not affect their book value up to a certain limit, and so it also did not cause a significant loss for the banks.

A common feature of the decentralised programmes aiming at the restructuring of transactions is that they define strict terms for communication between creditors and debtors, and they also usually offer protection against the enforcement of the collateral during the period of rescheduling the loans. The 'price ' of this, however, in most cases is that the debtor informs the bank about his income and financial position in detail, supported by documents.

Chart 38: Typical instruments for managing the mortgage loan crisis

CENTRALIZED

OBLIGATORY		VOLUNTARY
Collateral enforcement moratorium [IRL]		Interest subsidy [IRL]
Tightening governance, supervisory, reporting rules [E]		Personal bankruptcy procedure modification [IRL]
Interest moratorium [E]		Introduction of new debt settlement procedures [IRL]
Less stringent rules of enforcement of collaterals [E]		Restructuring [USA]
Eviction moratorium [E]		Performance instead of payment (datio in solutum) [USA]
Tightening the rules of creating provisions [E]		Restructuring [E]
Eviction moratorium [IS]		Partial debt release [E]
Principal repayment moratorium [IS]		Performance instead of payment (datio in solutum) [E]
Restructuring [IS]		Social rental apartment programme [E]
FX-conversion [IS]		Personal bankruptcy procedure modification [E]
Settlement [IS]		Restructuring [IS]
FX-conversion [HR]		Personal bankruptcy procedure modification [IS]
Settlement [SRB]		Partial debt release [IS]
'Bad bank' [MX]		Partial debt release [HR]
Restruction [MX]		FX-conversion [PL]
Interest subsidy [MX]		Partial debt release [PL]
Eviction moratorium [MX]		Performance instead of payment (datio in solutum) [CO]

Defining target numbers for sustainable restructuring [IRL]	Restructuring [IRL]
Restructuring [SRB]	Less stringent rules of enforcement of collaterals [IRL]
	Partial debt release [E]
	Payments to private pension funds spent on mortgage loan repayment[IS]

DECENTRALIZED

10.1.1. Ireland[51]

The economic crisis had a severe impact on the Irish mortgage loan market: as a result of reduced domestic consumption and the falling number of orders in the building industry, as well as soaring unemployment and a significant drop in the value of properties used as collateral, the ratio of nonperforming transactions reached 20 per cent by 2013. In order to solve this complex economic and social problem, a **series of measures built on three** – partly overlapping – **pillars** was introduced.

The objective of the first pillar is to support debtors: therefore a **code of conduct** was worked out, which identified principles to be observed by creditors and supervised by the central bank regarding the treatment of nonperforming debtors and sustainable restructuring. This code defined a **collateral enforcement moratorium** (in the first version, for six, and then for 12 months), and regulated the frameworks of the relationship with the debtor. For the latter, creditors had to work out an **order of procedures,**[52] which defines alternative repayment conditions, and ensures the protection of debtors from the application of 'improper' collection activities. In the revision of the code of conduct in 2013, the rules of maintaining the relationship with the debtor (the development of a relation policy and the documentation of contacts for creditors was prescribed), and the rules of cooperation and concluding agreements with the debtors (especially the terms of information supply to the debtor) were modified. In the first pillar, in order to reduce repayment burdens, the state offered help to debtors in the form of **interest subsidy**, and they could also rely on official counselling to settle their situation.

The objective of the second pillar was to overhaul the outdated regulatory environment which significantly hindered the settlement of debts, i.e. to implement a **comprehensive debt settlement reform**. As part of the reform, the **bankruptcy act was modified** (the period of settling the debt was reduced from the previous twelve years to three years, using a debt settlement plan of maximum 5 years), and **three types of new debt settlement procedures** – managing the individual features of problems originating from the different types of debts – were elaborated. As an incentive to use the new procedures, the **rules** that made the **enforcement of collaterals** rather difficult in the past were made **less stringent**. In the process of debt settlement, the first step – within the framework defined by the code of conduct – is always a bilateral agreement between the debtor and the creditor on the modification of the terms of the loan. In the lack of an agreement, the debtor is given a chance – apart from the options of personal bankruptcy and voluntary or forced sale – to participate in one of the new debt settlement procedures. The success of the participation in the new procedures and the strengthening of the debtor's willingness to cooperate are facilitated by the fact that debtors may utilise these options only once in their lifetime.

From the new debt settlement procedures, the so-called '*Debt Relief Notices*' procedure focuses on debtors who have a low amount (maximum EUR 20,000) of unsecured outstanding debt, and it is certified that they do not have an income or assets that would facilitate repayment of the debt within three years. The strict terms of entry regarding income and assets, and their existence in the debt settlement period is controlled by a central supervisory body, the '*Insolvency Service of Ireland*': if the income or financial position of the debtors improves, they have to start repayment. Following the successful completion of the debt settlement period or the repayment of at least 50 per cent of the debts, the debtors are released from their remaining debts.

The purpose of the so-called '*Debt Settlement Arrangements*' procedure is the repayment of unsecured debts in a controlled way, in a debt settlement period of 5-6 years. The debtors sign a debt settlement agreement with their creditors: the document is managed and the performance of the agreement is monitored by the central supervisory body mentioned in the previous procedure, while the approval of the agreements is in the competence of the courts. Following the successful completion of the debt settlement period, the debtors are also released from their remaining debts in this procedure. This procedure can be applied even in a case when the amount received from the collateral enforcement of a secured loan does not cover the creditors' receivables.

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[51] Based on Andritzky (2014), Keane (2011).
[52] Mortgage Arrears Resolution Processes.

The third new procedure is the so-called 'Personal Insolvency Arrangements' procedure, which is similar to the Hungarian personal bankruptcy procedure: debtors and creditors have to reach an agreement on a debt settlement plan with a time horizon of 6-7 years, and must submit this plan to the previously described central supervisory body, and – for approval – to the court. Implementation of the plan is also supervised by the central body in this procedure, as well as through the network of 'Personal Insolvency Practitioners', who offer consultancy to debtors. The objective of the procedure is to settle unsecured debts during the debt settlement period, and restructure secured debts for the years following the debt settlement period. Following the successful completion of the debt settlement period, the debtors are released from their remaining unsecured outstanding debts.

As the third pillar of the series of measures, the central bank of Ireland also participated actively in the resolution of the problem by defining **target numbers** for the large banks for the **sustainable restructuring** of mortgage loans. The central bank of Ireland publishes targets to be met quarterly with regard to (i) the percentage of the defaulting customers to whom the banks propose the sustainable restructuring of the debt (including the management under debt settlement procedures and personal bankruptcy and the voluntary agreement to sell the collateral); (ii) the percentage of nonperforming loans where a sustainable restructuring was materialised; and (iii) the percentage of restructured transactions that indeed remained performing. If a bank falls short of the agreed target figures, it faces stricter impairment requirements.

Partly as a result of the series of measures (as indicated in Chart **39**), the cleaning of the nonperforming mortgage loan portfolio started slowly: following the peak in Q3 2013 (19.92 per cent), the NPL ratio started to gradually fall in Q4, and this trend also continued without interruption last year.

Chart 39: Key indicators of the nonperforming household mortgage loan portfolio
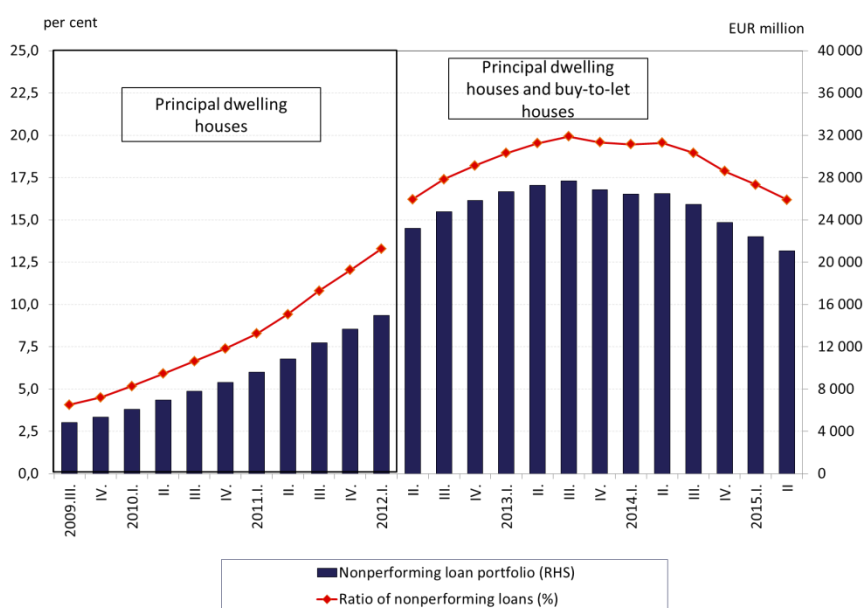
Source: Central Bank of Ireland

Achievement of the portfolio cleaning target figures set by the central bank are shown in *Table* **17**. It can be seen that the first objective – i.e. the development of proposed solutions for nonperforming debtors – was achieved by the banking system last year well over the expectations: the banks proposed a solution for 97 per cent of the problematic loans by the end of the year with approximately 50 per cent of the proposed solutions referring to the restructuring of loans, and the same ratio referring to the enforcement of collaterals, although the latter option is not necessarily favourable for debtors. The second objective – a bilateral agreement on the acceptance of proposed solutions – was also achieved over the expectations of the central bank: by the end of the year, 62 per cent of the nonperforming portfolio was covered by agreements between the debtors and the creditors. 60 per cent of the

solutions projected restructuring and 39 per cent projected the enforcement of the collateral – only 19 per cent of the enforcement of the collateral was voluntary (voluntary sale or an agreement on the transfer of the collateral).

Table 17: Achievement of portfolio cleaning targets in 2014

Solutions	2014							
	Q1		Q2		Q3		Q4	
	targeted	reported	*targeted*	reported	*targeted*	reported	*targeted*	reported
Proposed [Target 1]	*70%*	77%	*75%*	87%	*80%*	93%	*85%*	97%
Concluded [Target 2]	*25%*	33%	*35%*	46%	*40%*	56%	*45%*	62%
Terms being met [Target 3]	*75%*	90%	*75%*	88%	*75%*	89%	*75%*	91%

Source: Central Bank of Ireland

One important feature of the series of measures was gradual implementation prolonged over time: the first step was taken by the government in February 2009 by introducing the code of conduct, and the last step was the introduction of the personal bankruptcy procedure in November 2013. The establishment of the legal background took almost three years, lasting from 2010 right to the end of 2013. Another important message from the Irish solution is the strengthening of **debtors' willingness to cooperate** (moral risk) **with legal and regulatory elements**.

10.1.2. United States of America[53]

Before the crisis, mortgage loans were offered with extremely favourable credit conditions and often covered by overvalued real estate in the United States. As a result of the crisis on the real estate market and, following the outbreak of the crisis, the drop in household incomes and the value of properties used as collateral, more and more debtors found it difficult to meet their repayment obligations. In order to manage this problem, the government set up the '*Making Home Affordable*' (MHA) programme in 2009, which offered differentiated solutions for the individual debtor segments. Altogether the programme consisted of four measurement packages – relying on one another and interoperable to some extent: the individual packages contain more and more favourable conditions for debtors meeting the conditions of eligibility. The objective of the programme is to keep the property used as collateral[54] in the ownership of the debtor, with sustainable restructuring of the debt.

The first set of measures ('*Home Affordable Refinance Program*') offers help to performing debtors who have had no payment delays for at least 12 months and have a loan of at least 80 per cent LTV value, but have been unable to utilise the fall in reference rates because of the drop in the collateral value and thus have a higher repayment obligation. This set of measures offers help to debtors by 'adjusting' the **loan interest rate** to the market level and **reducing** the related banking charges. This package cannot be considered as a traditional portfolio cleaning instrument, as it focuses on performing debtors, but it plays and important prevention role by mitigating the risks of becoming nonperforming.

The second set of measures ('*Home Affordable Modification Program*'*)* already focuses on de facto nonperforming debtors by offering them an **instalment reduction** for a period of five years. The terms of participating in these measures include that the debtors were not finally convicted for mortgage fraud in the past ten years, their existing debt is maximum USD 730,000 (HUF 200 million, in the case of a larger dwelling, the value limit may be higher), and the bank registered the mortgage on the primary residence of the debtor. The first sub-measure of the package (*Tier 1*) prescribes the payment of maximum 33 per cent PTI for debtors with loans with collateral that serves only a residential purpose, while the second sub-measure (*Tier 2*) prescribes the payment of maximum 55 per cent PTI in

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[53] Based on IMF (2012) and Andritzky (2014).

[54] In this analysis, we focus on mortgage contracts on housing properties (first lien). We do not show the mortgage facilitating (second lien) programmes that refer to primarily 'investment properties' not used for residential purposes, or the MHA programmes which were specifically set up for certain special groups of the society of the US (veterans' VA programmes, agricultural producers' USDA programmes) that do not exist in Hungary or do not enjoy a preferential position.

the case of loans with collateral that serves the purpose of income generation. The reduction in instalments may be realised by the banks by (i) capitalising the accumulated interest and other charges; (ii) cutting the interest (maximum to a level of 2 per cent); (iii) extending the term (maximum to 40 years); or (iv) waiving the debt on a temporary basis (using an interest-free omnibus account), considering the features of the given loan, and with the gradual application of individual instruments (in the above sequence). The set of measures also contains an incentive for the debtors: if the restructuring proves to be sustainable and the debtors prove to be good debtors, they receive a credit of USD 1,000 per year under the first sub-measure, and USD 5,000 per year after the sixth year under the second sub-measure.

The third set of measures ('*Unemployment Program*') offers – exclusively temporary – help to **unemployed** debtors and debtors who receive unemployment benefit at the time of the application. An important condition of eligibility is that the debtors' existing debt may not exceed USD 730,000, and the debtors must start working again within 12 months. This package allows for the payment of a 31 per cent **PTI** compared to the present income of the debtors, and instalments not paid in this period will be transferred to an omnibus account.

Chart 40: MHA programme measure packages

HARP
- Only the **best debtors**, without payment delays;
- Who were **unable to utilise** the **fall** in reference rates**.**

HAMP
- Ensures **lower interest rates than market ones** for **5 years**, after that **1 percentage point annual increase** based on an aggregate complemented with the **omnibus account.**
- For good debtors an **allowance** of maximum USD 1,000 **per year**.

UP
- UP provides a **12-month temporary period** for debtors if loosing their job;
- In that case their **payment to income is maximum 31 per cent**.

HAFA
- **Debtor** can offer a **voluntary sale** or **enforcement** of the collateral for the bank;
- In case of offering a benefit of maximum USD 10,000;
- The **debtor could be released** from the payment of the debt over the sales price, if the lack of other collaterals is proven.

Eligibility criteria: mortgages guaranteed, or **insured** by Fannie Mae, Freddie Mac, FHA, VA, or USDA**.**

The fourth set of measures ('*Home Affordable Foreclosure Alternative Program*') offers help to debtors in the worst situation, who are unable to participate in the '*Home Affordable Modification Program*', and for whom the earlier offered restructuring measures did not prove to be sustainable.[55] The point in this package is that in the case of the **voluntary sale or transfer of the collateral** (performance instead of payment – *datio in solutum*), the debtors are released from payment of the outstanding debt over the sales price, and from the payment of other outstanding charges. If the sold (or transferred) lien is the primary residence of the debtor, the package allows for a housing benefit of maximum USD 10,000 (HUF 2.7 million). This package is more favourable than the personal bankruptcy practice used in the United States, as that does not allow for the total remittal of remaining debts, only some of them. It is important to note for the evaluation of the package that in several states, the creditors must provide a possibility to waive possibly remaining debts after the sale of the collateral. Therefore in these states, lending takes places with stricter terms, as the drop in the collateral value – if it also leads to a loan coverage ratio over 100 per cent – impairs the position of the creditor, not only that of the debtor.

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[55] Further conditions of eligibility: the debtor's financial 'value' (scoring) is very low, he was not finally convicted for mortgage fraud in the past ten years, he did not buy new property in the past one year, and his outstanding debt does not exceed USD 730,000.

In the case of the above four packages,[56] the creditors calculate the original present value and the net present value calculated from the expected cash flows of transactions restructured according to the rules of the packages, in a preliminary examination.[57] If the net present value of the transaction modified according to the given package is lower than the net present value of the original product, the creditor is not obliged to accept that. However, it is a good **incentive for participation in the programme** that both the creditors and the debtors receive financial allowance from the state: in the case of the second package, creditors receive the funds already upon the start of restructuring, while the debtor gets the funds on the completion of his agreements, and this will directly reduce his existing principal debt. In the fourth package, an incentive is due on the sale of the property to both the debtor and the creditor. The objective set in 2009 by the programme, i.e. offering help to 9 million mortgage loan debtors has not been achieved even with two extensions in the original lifetime of the programme.[58] In the case of the second package, the number of new entries has been continuously decreasing since the introduction of the package, the third package has not been used at all, and in the case of the fourth package, participation increased until 2014, then started to fall. All this means that the MHA programme has only partially achieved its objectives, i.e. the keeping of collaterals in the ownership of debtors.

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2. BOX: SOLUTIONS FROM THE GREAT DEPRESSION (1929-1933)[59]

From the aspect of the preceding events and consequences, the crisis that broke out in 2007 in the United States can be compared with the period around the crisis of 1929. Similarly to the years of 2000, the housing market in the 1920s showed an effective price increase, followed by a continuous easing of lending conditions. Following the outbreak of the crisis, the housing market shrank dramatically, unemployment soared, and incomes dropped, as a result of which the number of loans falling into arrears kept growing.

In 1933 a number of measures were introduced at both the state and national level so that the debtors would not lose their homes even in spite of their financial difficulties. On the one hand, 28 states introduced some form of an eviction moratorium in order to avoid immediate collateral enforcement, and on the other hand, the government set up the Home Owners' Loan Corporation (HOLC) which had to take over problematic loans from the portfolios of banks. Debts taken over by HOLC had to meet strict criteria: the loan coverage ratio of loans taken over could not exceed 80 per cent (in the case of loans of larger amount, the limit was as low as 70 per cent), the debtor had to have payment problems, but had to be able to meet the reduced debt service. In exchange for the loans taken over, the HOLC provided bonds issued by itself, and their repayment – first the interest only, then the principal – was guaranteed by the government. For the banks, the incentive to participate was the lower but relatively certain interest income (the interest rate of mortgage loans was around 6 per cent, and that of the bonds received was around 4 per cent) and the liquidity of the received bonds, while the situation of the customers was made easier by the restructuring represented by the HOLC.

The HOLC refinanced the loans taken over, basically modifying the repayment schedule of these loans. The loans issued in the 1920s were usually products of balloon type, extended with lower LTV, and their principal repayment was due in one amount after an interest repayment period of 5 years. The HOLC transformed these loans to monthly depreciating annuity loans of 10-15 years, with an initial interest rate of 5 per cent, which was fixed at 4.5 per cent from 1939. The HOLC accepted a little more than 1 million loan contracts with a value of USD 4.75 billion (8.4 per cent of GDP of 1933), so it had almost 20 per cent of the loan portfolio covered by mortgage, but 800,000 debtors were rejected. Most of the loans taken over were in arrears for two years, and of relatively small amounts (at today's value, these were loan amounts of approximately USD 50,000).

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[56] Except for HAFA.

[57] Banks use either a basic NPV model published by the MHA, or customise certain parameters of the basic model, and have it approved by the MHA.

[58] The number of mortgage loan owners (contracts) participating in MHA programmes (together with special target group and second-lien programmes) is a little higher than two million. http://articles.latimes.com/2009/mar/05/business/fi-housing5

[59] Based on Wheelock (2008), Fishback et al. (2011) and IMF (2012).

During the operation of the asset manager until 1951, the collateral was enforced for about 20 per cent of the loans taken over, and the remaining 80 per cent of the debtors repaid their debts. In 1951, the HOLC closed its operation with a profit, and it is to be pointed out that after its initial capitalisation, it never required additional capital increase.

10.1.3. Spain[60]

Mainly due to funds provided by structural and cohesion funds and the expansive lending policy of the banking system, Spain achieved dynamic economic growth in the early 2000s. In 2001-2002, the growth rate of the gross domestic product was the fifth highest among the EU-28 countries (at 5.3 and 3.0 per cents, respectively), and growth exceeded the community average even in the middle of the decade (*Chart 41*). One of the most important 'engines' of economic growth was the construction industry: demand for real estate soared (real estate prices tripled from 1997 to 2008), and this was an obvious driving force for the performance of the sector and for employment.

Chart 41: Macroeconomic indicators of the Spanish and the EU-28 economies
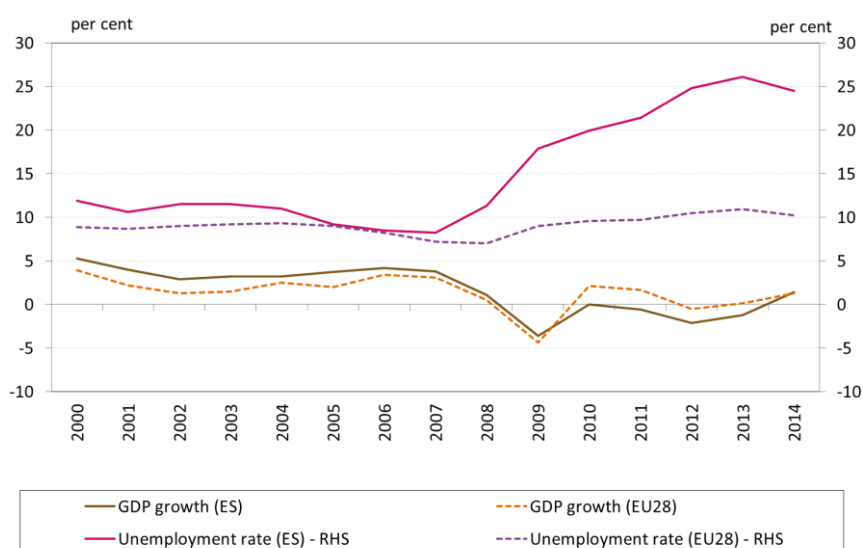
Source: Eurostat

As a result of the global financial crisis that peaked in 2008, financing possibilities were limited, demand on the real estate market and real estate prices fell dramatically, and in parallel with these developments, the income of households dropped and so did GDP. The banking system suffered significant losses, and maintaining solvency presented an increasing problem for excessively indebted households and companies, as was clearly reflected in the development of the nonperforming loan portfolio (*Chart 42*).

The government faced two challenges: on the one hand, the banking sector – primarily because of the exposure generated by bad corporate loans – was vulnerable, and on the other hand, the household mortgage crisis threatened a social crisis.

The government managed the threats of the **financial system** with bank-specific and sector-level measures, and a recapitalising programme. In the course of the bank-specific measures, a **comprehensive review** of the banking system was carried out (AQR review, stress tests), the **capital requirements** for each bank were defined, and the banks' **financial structures** and **business models** were **transformed**. The measures included setting up a **"bad bank"**[61] which took over bad corporate loans from credit institutions. In the sector-level measures, the government

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[60] Based on Andritzky's study (2014), using the data of the Banco de España and processing the legal regulations of the Boletin oficial del Estdo.

[61] SAREB: Sociedad de Gestión de Activos Procedentes de la Reestructuración Bancaria

tightened the **rules of creating provisions**, the **governance rules** and the **supervisory procedures** of banks, and modified the **reporting instructions**. The government asked for the assistance of the European Stability Mechanism in recapitalising the banking system. In 2012 and 2013, altogether EUR 41 billion was taken as a loan, for the management of this a restructuring fund[62] (set up by the government) was responsible.

Chart 42: Ratio of the nonperforming loan portfolio
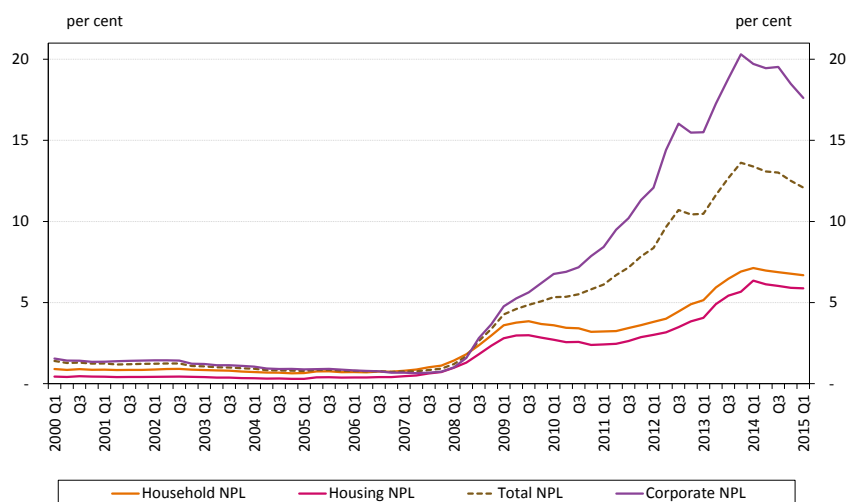
Source: Banco de España

The nonperforming loan portfolio and **households** unable to meet their payment obligations were first attended to by the cabinet in 2012. This has two reasons: the household NPL rate – from a domestic aspect – was low for quite a long time, and the strict bankruptcy act of 2003 and the efficiency of execution proceedings were good incentives to improve payment willingness.

Act 6/2012 on the protection of households without income was passed by the Spanish Parliament in the spring of 2012, and this offered a possibility for the people most in need to restore their payment ability, and to maintain that over the medium to long term. This act ordered an **interest moratorium** (the interest rate of the loan can be a maximum of 2.5 per cent), and defined requirement in the **'Code of Good Practices'** on sustainable restructuring. The banks who joined the stipulations of the code – on the initiative of debtors who met the conditions of eligibility – first had to work out a restructuring plan, which contained a **principal repayment moratorium** of a maximum of four years, **term extension** (to a maximum of 40 years) and **reduced interest rate** for the period of the principal payment moratorium (EURIBOR + 0.25 per cent). If the restructuring plan worked out this way does not prove to be sustainable, i.e. the value of the PTI indicator calculated on the basis of the total monthly income of the household is higher than 60 per cent, in the second round the banks *may* offer **partial debt release** to the debtors. The method of calculating the extent of waived debt[63] is strictly regulated by the code, and in particular cases banks are free to determine the calculation method. If the restructuring plan does not prove to be sustainable even after the partial debt release, in the third round, the banks will have to accept **performance instead of payment**.[64] The idea in this solution is that in exchange for the enforcement of the collateral (sale of property), the banks shall fully waive the remaining debt (moreover, the bank may agree with the debtor that some of the extra income from the sale is

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[62] FROB: Fondo de Restructuración Ordenado Bancaria

[63] The code contains three options. (i) waiving a maximum of 25 per cent of the principal debt; (ii) waiving of debt that equals the difference between the repaid principal and the initial principal debt adjusted with the performed repayment period ratio (where the performed repayment period ratio is the quotient of the performed repayment periods and the number of repayment periods to be performed during the whole term; (iii) the (1) present value of the real estate and half of the difference between the (2) value appraisal at the time of taking the loan and (3) the disbursed loan amount – in a formula: . {1-2*(2-3)}/2.

[64] 'Datio in solutum' – 'dación en pago'.

returned to the debtor). If the debtor requests, he may stay in the sold property for maximum two years as a tenant: the beneficiary of the rent is the bank. The banks may apply this code on a voluntary basis, for maximum two years (which can be extended), and the meeting of the stipulations is supervised by a four-member **supervisory committee**, in which, apart from the central bank, the Spanish Mortgage Association, the State Secretariat for Economy and Enterprise Support and the National Securities Market Commission are also represented. In addition to checking compliance with the requirements, the committee also performs analysis and pre-decision tasks for the government, on the basis of the quarterly data supplies of banks to the central bank. In addition, Act 6/2012 clearly specifies and **simplifies some of the rules of the out-of-court execution proceedings**, and introduces the possibility of **online auctions.**

In the autumn of 2012, the Parliament passed another legislation to protect debtors (Act 27/2012 on the strengthening of the protection of debtors), which aims at the groups of society that are in the most difficult situation, and ordered the **immediate suspension of evictions** and the introduction of a **moratorium of two years**. According to the intention of legislators, the moratorium may be suitable for achieving that households in trouble get into an income situation that allows for the continuation of the loan repayment. In addition, this law authorises the government to set up a financial fund with the creditors' cooperation (and from their money), which can be used to finance a social rental apartment programme.

Act 1/2013 on the protection of debtors came into force in 2013 and modifies the previously passed acts in several points: it **extends** the **scope of debtors** targeted by legal regulations, and defines **more favourable** conditions. The act reduces the 'ceiling value' of the **interest moratorium** from the previous 2.5 per cent to **2 per cent**, and allows the banks to deviate from the contents of the Code of Good Practices to a direction that is **more favourable for the debtor**. Based on the new regulations, the restructuring plan (first round of measures) may stipulate a five-year principal repayment moratorium (instead of the previous four years), partial waiving of the debt (second round of measures) can be offered by the banks in the case of a 50 per cent PTI indicator (instead of the previous 60 per cent), and if the rent in performance instead of payment (third round of measures) is paid late, the debtor pays a lower default interest. The number of the members of the committee that supervises compliance with the code was significantly increased,[65] and instead of the previous quarterly data supply frequency, monthly data supply will have to be carried out by the banks to the central bank on the number, volume and features of transactions received, implemented and rejected in connection with the application of the code, the implementation of mortgage transactions, the banking practice of managing mortgage debts, and on the complaints on the implementation of the code. In addition to this information, the supervisory committee may request any other data and information from the affected credit institutions, if that is related to the implementation of the code. The law **extends** the **scope of debtors eligible** for the social rental apartment programme, and modifies the regulations on the repayment of debts remaining after forced sale: if the debtor is able to settle at lest 65 per cent of his remaining debt within 5 years (or 80 per cent within ten years), he is **released from the rest of his debt**.

Act 1/2015 on the second chance, the reduction in repayment burdens and other social administrative rules was issued in 2015, and its most important innovation was the principle that natural persons – having paid to the creditors with all their assets – could get rid of some of their debt for good. Therefore the regulation allows in the framework of a **bankruptcy proceeding** that **natural persons can settle their debts**, the precondition of which is the sale (liquidation) of the assets of debtor. If the debtor settles his debt from the money received this way against the privileged creditors, and at least 25 per cent of his debts to other creditors, he is automatically released from the remaining debts. If the debtor is not willing to sell his property, but repays his outstanding debts to privileged creditors, as well as his public debts according to a five-year repayment schedule, he will be released from his

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[65] In addition to the earlier organisations, representatives are provided by the General Judicial Council, the Ministry of Economic and Competition Affairs, the Ministry of Justice, the General Notary Council, the National Statistical Office, the Consumers' Council and the two civil organisations appointed by the Ministry of Health, Social Insurance and Equal Opportunities.

outstanding debts.[66] In addition, the act orders another extension in the target group of act 6/2012 (e.g. involvement of debtors over sixty years of age), and the extension of the eviction moratorium ordered in act 1/2003 by additional two years (until 2017).

The Spanish government responded to the problems caused by the mortgage loan crisis relatively late, as of 2012: by tightening the regulatory background, taking over bad loans and repositioning the bank business model, they **managed to restore the stability of the financial intermediation system**. Based on the stability report of 2013 by the European Stability Mechanism, they managed to restructure and stabilise the Spanish banking system, which is able to boost the economy again with its increasing deposit portfolio and satisfactory access to private financing sources. However, the **management of the social impacts of the mortgage loan crisis was less successful**, which is indicated by the fact that the measures originally worked out for debtors most in need are extended (or prolonged) every year to other target groups.

10.1.4. Iceland[67]

In Iceland, in the one and a half decades before the outbreak of the crisis, households became extremely indebted. The household loan portfolio increased dramatically between 1995 and 2007, and at the peak of the expansion in 2009, its ratio to domestic product was 120 per cent (*Chart 43*). Apart from consumer and car loans, the expansion also affected mortgage loans. By Q1 2008, almost 75 per cent of properties had mortgage loans registered on them. The state directly participated in supporting lending, by extending loans through the government-owned fund called *'Housing Finance Fund'*.

Within household loans, loans fixed (indexed) to the consumer price index and rate changes accounted for the greatest share. These loans became huge burdens for debtors after the 50 per cent devaluation of the Icelandic krona in 2008. In addition to the change in exchange rates, another serious problem was that between 2008 and 2010 the real value of properties fell almost by 40 per cent, while the economy turned into recession and the rate of unemployment increased to more than 8 per cent by 2009 from the previous 3 per cent (average) rate. The serious nature of the problem is indicated by the fact that in 2010, from 130,000 households, 85,000 had mortgage loans: 30 per cent of debtors had an instalment that was higher than their income, and the ratio of loans overdue for more than 90 days exceeded 30 per cent.

The devaluation of the domestic currency triggered serious social tensions, as a result of which, in October 2008, the government introduced an **eviction moratorium**, and temporarily **froze** the **instalments** of consumer price index and FX base. In November 2008, the centrally regulated **restructuring** of debts took place – it was mandatory for loans of consumer price index base, and optional in the case of FX-based loans. Within the framework of the programme, the volatility of the instalment was mitigated by the introduction of a new indicator that determined the changes in debt service, and contained the unemployment rate and average wage level indicators. The mitigation – the extent of which was 15-20 per cent on average in the case of loans related to consumer price index, and 30-40 per cent for FX-based loans – affected approximately half of the mortgage loans. The reduction in the instalments was coupled with **higher subsequent instalments** and the **extension of the terms**: debts were rescheduled according to the new reduced instalments, and the extension of the term was maximum 3 years. If the construction calculated with the new instalment did not allow for the full repayment of the principal debt, the remaining debt was waived by the creditors. It was also a great help for households that it was possible to **use asset**s accumulated in **private pension funds** for **loan repayment**. The resolution of the supreme court of Iceland in 2010 meant a significant easing for debtors, as it declared that **loans tied to exchange rate changes were against the law**. Following this decision, banks recalculated their loans, but in the domestic currency.

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[66] The law allows for the waiving of the debt even if the debtor was not able to repay his debt during the five-year period, but he did his best to settle his debt.

[67] Based on Ólafsson and Vignisdóttir (2012) and IMF (2012).

In October 2009, the Parliament modified the **bankruptcy act**, but the slow pace of restructuring forced the government to take additional **measures**, consisting of **three pillars**. The target group of the measures were households with multiple loans at the same time, which seemed to be able to repay a loan with at least 70 per cent LTV.

The **first pillar** – the so-called *Sector Agreement* – aimed at restructuring after the liquidation of movables (and spending the amounts received on debt repayment). The point in **restructuring** is that the debt remaining after liquidation is replaced with a secured and an unsecured loan – the instalment fully covers the secured part, but only partially covers the unsecured part. The non-repaid part of the unsecured loan is transferred to an omnibus account, and following three years of repayment, this can be waived. In addition to this incentive, the willingness to pay is ensured because in the case of non-performance, the movables of the debtor can also be involved in debt settlement. This measure can help households with an LTV of at least 100 per cent.

Chart 43: Loan portfolio of Icelandic households
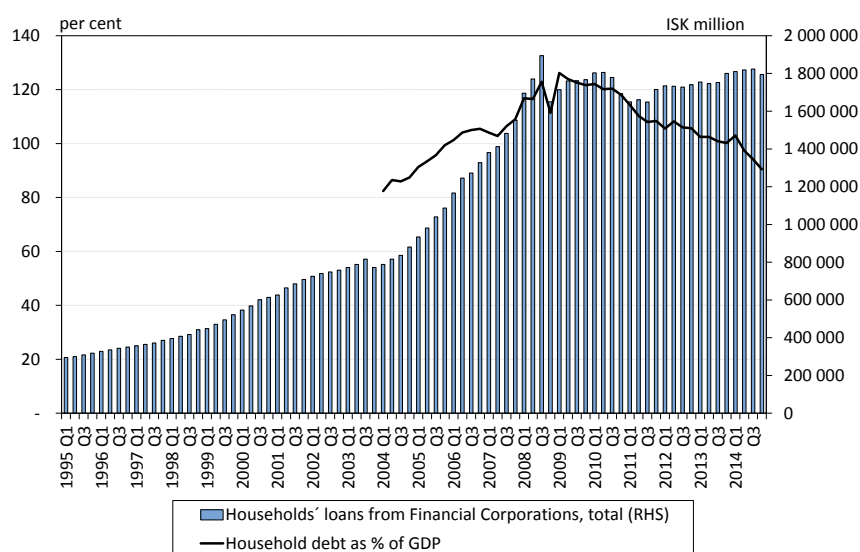
Source: Central Bank of Iceland

The **second pillar** provides help to debtors who have an unsecured debt after three years of repayment in the first pillar, and the bank was not willing to write it off. In this case, an **out-of-court debt settlement procedure** is carried out for the debtors with the involvement of an ombudsman, and if that is not successful, a **judicial debt settlement proceeding** is carried out.

In order to reduce the repayment burden, the **third pillar** projected **simplified debt write-off** – allowing at least an 18 per cent value for the PTI – for those debtors who had a loan secured with a mortgage on their residential property. The debt can be written off up to a maximum of 110 per cent of the eligible collateral value, with the limit set on the PTI indicator. Of the three pillars, this last pillar offered debt reduction in the widest scope: as many as 15 per cent of debtors utilised this option.

In 2013, the government announced additional measures: **payments to private pension funds became tax-free**, if they were spent on mortgage loan repayment by the debtor, up to the limit of ISK 500,000 (HUF 1 million) per year. The measure also included the **writing off of the principal debts of indexed loans**, by annulling the growth of indexation over 4.8 per cent between December 2007 and August 2010. This debt mitigation was netted with the previously granted benefits, and the amount of write-off could not exceed ISK 4 million (HUF 8 million).

As a result of these broad measures, a significant part of Icelandic households in difficulty received some help. In parallel with the macroenonomic stabilisation, the programmes introduced played an effective role in reducing the excessive debt portfolio of households and decreasing the NPL ratio. The losses of the banking system remained

limited during these measures, but it was possible only because of the low book value of receivables taken over with a significant discount from banks that went bankrupt during the crisis. Thus, ultimately the costs of the widespread waiving of debts were borne by the earlier, mostly foreign owners and creditors of the banking system.

10.1.5. Certain countries in Central Europe

In **Croatia**, mortgage loans denominated in Swiss francs appeared in the early 2000s, and in 2008 this portfolio was the second largest in the region compared to GDP. Although this portfolio started to gradually shrink at the end of 2011, at the end of last year, the ratio of CHF-based loans to all loans was still high, at around 16 per cent. The ratio of nonperforming household loans was 17 per cent at the end of 2014, and in the case of CHF loans, this value was one percentage point higher.

In order to mitigate the increased burdens, on 26 January 2015, the exchange rate used for the **conversion of the instalment** was frozen for one year for household loans. This measure is expected to cause the banking sector a loss of HRK 400 million (approximately HUF 16.4 billion), but according to the financial stability report, the loss caused by loans that fell into arrears because of the increased instalments would have been of a similar volume. Later, this measure was also extended by the government to cover family farms and small entrepreneurs.

In order to further mitigate debt burdens, on 2 February 2015, the government announced the measure on the **waiving of certain loans** of households with the lowest income. In this programme, banks, telecommunication companies, energy suppliers, local governments, state-owned companies and the state were also involved. Debtors are entitled to debt release if their bank account has been suspended for at least one year, their monthly income is less than HRK 2,500 (HUF 100,000), or in the case of households with several adults, HRK 1,250, and the total debt does not exceed HRK 35,000 (HUF 1.4 million). By mid-April 2015, approximately 5,800 debtors' debts were cancelled in this manner – and an additional 9,000 applications were waiting for assessment.

Similarly to other countries in the region, **Serbia** was also forced to take steps after the decision made by the Swiss central bank in January 2015. This occurred a month later, on 24 February for FX-based mortgage loans. The National Bank of Serbia worked out a two-level solution plan to mitigate the burdens.

The first step affected all FX-based mortgage contracts: within this, the banks had to consider the **instalment difference** originating from earlier unilateral interest increases as **advance repayments**.[68] The second step affected only CHF-based loans, in relation to which the banks were obliged to offer the following four options to debtors (who had three months to make a choice):

- CHF-based housing loans are converted to EUR-based loans, at an exchange rate that is 5 per cent more favourable than the market rate. The interest rate is identical to the rate of EUR-based loans, and the debtors may also extend the term by a maximum of 5 years.
- CHF-based housing loans will be converted to EUR-based loans, in a way that the annual rate of EUR loans will be reduced by 1 percentage point, but not less than 3 per cent. In addition, debtors may also extend the term by a maximum of 5 years.
- CHF-based housing loans will not be converted, but the annual interest rate will be reduced by one percentage point, but not less than 3 per cent. In addition, debtors may also extend the term by a maximum of 5 years.
- CHF-based housing loans will not be converted, but the monthly instalment will be reduced by 20 per cent for 36 months from the performance date defined in the appendix to the loan contract. The repayment of the amount lost because of the reduced instalment must be settled by the original maturity, for 12 months, in equal amounts. No interest is charged on receivables postponed in this way.

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[68] This was basically equivalent with the methodology used for the domestic settlement of unilateral interest increases.

In **Poland**, the law to mitigate the burdens of debtors has not been enacted yet, but the Polish governing party submitted a bill,[69] which says that customers living in flats of less than 75 square meters and houses of less than 100 square meters (the limitation does not affect families with three or more children) may **convert their debts to PLN loans** voluntarily until the middle of 2020 and do not have to fully bear the exchange rate loss. The banks must recalculate FX debts as if customers had taken them in PLN (conversion at daily rates), and 90 per cent of the difference[70] **had to be waived**. The conversion is planned to be completed gradually, starting with the most seriously indebted customers (over an LTV of 120 per cent) and proceeding to less indebted customers in the ratio of the collateral.

10.1.6. Certain countries in Latin America

Following the privatisation in the early 1990s, the **Mexican** banking system[71] significantly increased its activity, primarily using foreign funds. The wide scope of deregulation and the inexperienced bank managers and regulators triggered an irresponsible lending wave, which resulted in an increase in the NPL ratio, which jeopardised the stability of the whole financial system by the middle of the decade. The situation of the already vulnerable banking system was further aggravated by the devaluation of the peso at the end of 1994.

The position of the Mexican debtors was primarily influenced by the increasing interest rates at the middle of the decade. Mexican mortgage loan products generally adjusted to movements in interest rates in a dynamic way, which meant that an increase in interest rates increased the capital amount above a certain level, and not the instalment (this is practically the same when the debtor covers some of the instalment by taking a new loan). Therefore, in a large number of loans, the amount of the debt exceeded the size of the collateral value.

The government initiated a number of measures to manage the situation in a comprehensive way, considering the stability of the banking system and debtors' interests. One of the first elements of the measures was the establishment of the institution called **FOBAPROA**, which, in parallel with the direct capitalisation of banks, **took over the effective parts of the nonperforming instruments**. These instruments were usually purchased over the market value (which was paid with 10-year bonds issued by FOBAPROA), the instruments remained in the management of the bank, and the amounts received for the loans reduced the value of bonds received. The amount not received until the expiry of the bonds was a loss, and 20-30 per cent of that was borne by the bank and the rest by the government. All in all, we can say the FOBAPROA served the capitalisation of banks, rather than helping the debtors.

The situation of mortgage loan debtors was primarily influenced by the indexing of loan amounts to inflation. Steadily double-digit inflation eroded the real value of loans, and therefore the **contracts were exchanged to a measurement called UDI**, the rate of which against the peso was defined by the development of inflation. In this way, the real value of loans remained at the same level, and the impact of inflation was reflected in the principal amount and not in the interest rates. In order to offset the effects of high interest rates, the government introduced an **interest subsidy** for a period of one year, between September of 1995 and 1996, and in parallel with that, restructuring processes were unified, and an **eviction moratorium** was introduced. In 1996, a further measure was the **reduction** of **instalments** as stipulated and financed by the government, for 10 years, but it was possible to apply for it up to a certain loan amount only. The extent of the benefit was initially 30 per cent, and by the end of the programme, it gradually dropped to 5 per cent. The programme offered an additional 10 per cent benefit to instalments brought forward, which were paid by the debtors before May 1999. In 1998, another measure was that for those debtors who repaid their debts, the government waived the debts to a significant extent – up to 60 per cent – below a certain lower amount. At the same time, the loans of SMEs and some sectors (agriculture, fishing)

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[69] This proposal was approved by the lower chamber of the Polish Parliament.

[70] In the original proposal, the banking system would have borne only half, but a modification proposal modified it to 90 per cent, seriously increasing the burdens of the banking system.

[71] Based on Calomiris et al. (2004).

received similar benefits, but one condition was the recovery of lending by banks (in exchange for the lending of 3 pesos as a new loan, the government financed the waiving of 1 peso from the loan).

The Mexican solution incurred significant costs for the budget, while their success can be interpreted in many ways. Although the capitalisation of the banks and the operation of the state asset manager achieved their primary objectives (the banking system did not collapse, even in spite of the tense financial environment), it worked with a very low efficiency and distorted incentives. However, the effect of programmes – together with the improvement in the macroeconomic situation – was reflected in the effective decline in the NPL ratio, which fell from 27.6 per cent in 1997 to 8.5 per cent in 2000.

The repayment problems of **Columbian**[72] mortgage debtors were triggered by the external financing tensions experienced in 1997-1998. The outflow of foreign capital, a deep economic recession, rising unemployment, falling housing prices and increasing interest rates caused instalments to soar, and thus the number of problematic debtors increased significantly.

With the increase in the number of debtors in arrears, more and more of them were looking for a solution by initiating a legal procedure, which led to a serious workload for the legal authorities. In response to that, the constitutional court made decisions to significantly reduce debts and debt servicing in 1999: the most important of these is the so-called **'walk away'** option, which allowed for the complete write-off of the debt, when the collateral was relinquished. This practically released the debtors from paying the portion of the debt over the 100 per cent loan coverage ratio. At the same time, the constitutional court **declared that the capitalisation of interest arrears was against the constitution**, and thus reduced the likelihood of the emergence of debt spirals.

These measures significantly eased the situation of households in a tense financial situation, but primarily at the expense of the banking system. The 'walk away' option encouraged even those households to stop their debt service which would have been able to continue repayment, but because of the depreciation of the collateral, they were able to improve their financial situation by transferring the collateral. So all in all, the measure cannot be deemed successful: the lower trust that is the result of the eroding of the capital situation of the banking system and the subsequent modification of private contracts had an impact on the Columbian credit market for years; the mortgage market only started to recover about 6 years later, in 2005.

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[72] Based on IMF (2012).

10.2. Methodology of the classification procedure applied for the analysis of the targeted and successful nature of restructuring

Using the mortgage loan database, we applied a classification procedure to examine what features of transactions may have motivated restructuring, and what features defined their successful or unsuccessful nature. The applied classification methodology is known as the decision tree method. For the stability of the results, the traditional methodology of decision trees was extended with the so-called random forest method.

10.2.1. Description of methodology

The basic idea of the decision tree (also known as recursive partitioning algorithm) is that groups are formed on the basis of the combinations of certain features, and these groups are identified as groups belonging to the individual categories of the dependent variable, depending on which category is in majority in the given group. The result of the method is a classification tree, on which the nodes and branches create a structure that assigns the group to features describing a given transaction. This procedure keeps dividing the original population to more and more homogeneous groups, until the groups received satisfy the end point requirements (Oravecz, 2007).

Application of this procedure requires the definition of three principles (Oravecz, 2007):

- what rule should be used for splitting the sample into two parts (splitting rule);
- how to decide whether the given sub-group is already a terminal node (stopping rule);
- how to assign the terminal nodes to the categories of the dependent variable (one way is simply assigning them to the category which is in majority in the given sub-group).

The splitting rules select the best separation cutting points for each feature, and from those select the best separating feature and cutting value. There are various indicators to measure the goodness of a split (e.g. impurity measures, Kolmogorov-Smirnov statistic). The main advantage of this method is that it automatically considers the interactions among explanatory variables, while in the case of linear methods, these interactions need to be defined in advance (Oravecz, 2007). In addition, in a number of applications, the simple interpretation of the tree diagram produced with the recursive partitioning algorithm is also useful. As it is also claimed by Strobl et al. (2009), the main problem with decision trees is their instability to smaller changes in the database: the whole structure of the tree may be modified, if the first splitting variable or only the first cutting point changes as a result of a smaller change in data. Therefore, instead of depending on one single decision tree in our conclusions, we produced a number of decision trees, and drew the conclusions from averaging on these trees. Several methods are known for the multiplication of trees, one of the most efficient is the random forest method. This method allows us to add additional variability to the data. On the one hand, the set of explanatory variables is randomly narrowed down for a given run, providing a possibility for evaluation to other variables that may not be the strongest ones. On the other hand, a random sample is also taken from the original database, either a subsample, or a bootstrap sample, i.e. a sample with as many elements as the original population obtained by sampling with replacement (Strobl et al., 2009). Averaging on trees is to be understood for classification trees in the following way: the method categorises each observation on each element of the set of trees, then assigns the category voted for by most of the trees to the individual observations. In the random forest method, it is possible to measure the importance of individual variables. The indicator of permutation importance offers a frame for that. The intuition behind the method is that if the values of a given explanatory variable are permuted randomly, we will definitely break its relation with the dependent variable. Therefore, if the permuted variable is used for classification together with the other (not permuted) variables, the accuracy of classification will probably decrease significantly. Thus the falling prediction accuracy taken on the average of trees can be a good measure to judge the importance of individual variables (Strobl et al., 2009).

10.2.2. Logic followed in the analysis

In the course of the analysis, variable importance measures taken from the random forest method were used to assess the relative importance of the variables applied in the explanation of the given dependent variable.[73] This is useful not only for the identification of the key variables, but also because the setting of an importance threshold value may help to decide which of the variables used explain the dependent variable to a significant extent. The threshold value may be set as follows. If the variable importance measures contain a negative value (this is possible in theory), the threshold may be set as the opposite of the negative value with the highest absolute value (Strobl et al., 2009). If all the variable importance values are non-negative, we can add a pseudo variable to the explanatory variables, which by definition cannot have explanatory power (e.g. in our case the contract identifier), and the importance indicator value received for this variable will be considered as the threshold. In the next step, one single decision tree was produced by using the significant explanatory variables. The most important argument supporting the depiction of one tree is that this is the best way to depict the results of the method in a transparent way: the result of the random forest method is much more difficult to interpret. However, the stability of the decision trees presented as the result was checked in several ways: by taking various samples, and omitting the key variables of the tree. In order to answer the questions on restructuring, from the variables available in the mortgage loan database we filtered the ones for which we cannot assume that restructuring would influence their development. Therefore, the following variables were used to explain the motivation of restructuring in the random forest analysis:

- currency of loan,
- age of loan contract, i.e. the time elapsed since disbursement,
- original term specified in the contract,
- type of mortgage loan contract (housing loan or mortgage loan of unrestricted use),
- category variable of pledge commitment of customer (main debtor),
- current loan interest rate.
- instalment due on 30 April 2015,
- PTI calculated by using the National Tax and Customs Administration data and instalment due,
- loan amount in HUF at the time of signing the contract,
- LTV at the time of signing the contract,
- relative change in the market value of the collateral,
- type of settlement in which the real estate used as collateral is situated (capital, city with county rights, other settlements),
- number of properties used as collateral,
- rank of mortgage registered by the bank,
- total income of primary debtor and co-debtors in 2013,
- total income of primary debtor and co-debtors in 2014,
- number of people paying tax in 2013 among the debtors to the contract, and
- number of people paying tax in 2014 among the debtors to the contract.

To explain the success of restructuring, we expanded the above list of variables with the category variables that identify the various restructuring strategies:

- waiving principal,
- waiving arrears,
- term extension,
- interest rate reduction,
- instalment reduction indicated in data supply, and
- the instalment reduction we identified.

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[73] We used the 'party' package of programme R for the analysis, the random forest algorithm of which is based on the works of Hothorn et al. (2006b), Strobl et al. (2007) and Strobl et al. (2008), and its 'ctree' command to produce the decision tree on the work of Hothorn et al. (2006a).

10.3. Principal components of attitude survey

Principal components	Statements (variables)	Correlation	Explained variance	Cumulative variance
1. principal component *"FEELING HOPELESS"*	I do not see any chance to have my debt released.	positive	19.3	19.3
	If I do not pay the instalments, tha bank will sell my real estate property.	positive		
	The government's financial packages announced so far were complicated so incomprehensible for me.	positive		
	Lifelong debt service cannot be required.	positive		
	If I have a debt, I try to repay it in the shortest time possible - taking into account my repayment capacity.	positive		
	The financial packages annonced so far are just temporary resolutions for the debtors.	positive		
2. principal component *"DISTRUSTFUL"*	Bank administrators are not helpful when I ask them to resolve my problems.	positive	13.0	32.3
	I trust in bank administrators.	negative		
	If my financial position could make it possible, I would repay my loan.	negative		
	It is not important to repay the instalment in time, the debt will wait for you.	positive		
	My real estate property is unsellable, so I am not afraid of the bank's asset auction.	positive		
	I would not see any chance to repay my loan even if my income was twice as much as it is now.	positive		
	I always immediately read the letters sent by my bank.	negative		
3. principal component *"INDEPENDENCE"*	The government has helped a lot of debtors so far, so new packages cannot be required.	positive	9.6	**41.9**
	I would accept the possibility of moving into a smaller property with lower maintanace costs in order to continue to repay my loan.	positive		
	I would cut my living costs in order to continue to repay my loan.	positive		