



HRVATSKA NARODNA BANKA

Analytical annex to Recommendation to mitigate interest rate and interest rate-induced credit risk in long-term consumer loans

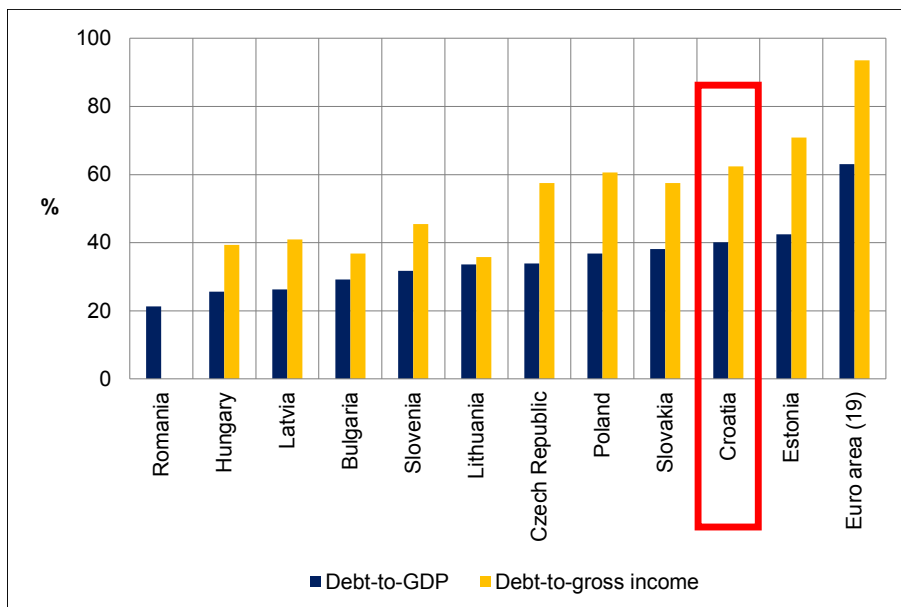
Summary

In addition to considerable exposure to currency risk (around 90% of foreign currency household loans are unhedged against currency risk), household exposure to interest rate risk also presents a significant risk that could be manifested in an increase of annuities for households having loans with a variable interest rate, which account for 67% of total household loans and for 81% of housing loans. In efforts to mitigate interest rate risk for consumers and interest rate-induced credit risk for banks, the CNB adopted a recommendation for credit institutions to mitigate that risk. It is recommended that credit institutions offer clients the possibility of changing loan financing conditions so that consumers having loans with variable interest rates could protect themselves against interest rate risk.

An overview of the situation and structure of interest rates on household loans in Croatia

Economic growth in most Central and Eastern European (CEE) countries over the past decade was accompanied by loan growth and a strong increase of the banking sector. In particular, household sector debt grew from below 10% of GDP in most CEE countries to around 30-40% in the ten year period. Among these countries, and apart from Estonia, Croatia recorded the largest household debt-to-GDP ratio according to the most recent available comparable data from 2015 (Figure 1). The situation is similar in terms of the debt-to-gross income ratio of the household sector.

Figure 1 Household debt in Croatia and comparable EU Member States (2015)



Sources: Eurostat and CNB.

To gain a better understanding of risks, it is necessary to observe the sector structure itself in addition to aggregate indicators, taking account of the differences among households that affect their vulnerability, such as income levels, average age, an analysis of the number of members and the number of the employed. According to the analysis of household debt data obtained from the Household Budget Survey (HBS)¹, indebted households with the lowest income are somewhat more burdened by loans, but, apart from the first income decile,²

¹ The Household Budget Survey (HBS) is a survey carried out on a sample of private households. The Survey collects data on the amount and structure of consumption expenditures as well as data on socio-economic and demographic characteristics of households. After 2010, due to changes in the questionnaire (the question about loan repayment amounts is not included), it is impossible to construct an indicator of vulnerability distribution among households.

² Deciles divide the distribution of results to ten equal parts, where each part comprises 10% of the sample members.

differences are not large. The burden increase after the outbreak of the crisis is also most perceptible in the lowest income decile, i.e. 10% of the lowest-income households (Figure 2). In accordance with the most recent analysis on household debt obtained from the Household Budget Survey, it is obvious that the share of potentially vulnerable households decreases as their disposable income grows (Figure 3). On average, around 73% of indebted households from the first three decile groups with the lowest income were potentially vulnerable in 2010, where vulnerable households are defined as those that do not make sufficient income to meet the minimum living needs. Shocks such as unemployment of some household members, increase in the exchange rate or interest on loans paid by households, may transfer to the vulnerable category some households that are currently not vulnerable.

Figure 2 Average total debt servicing burden of individual income deciles

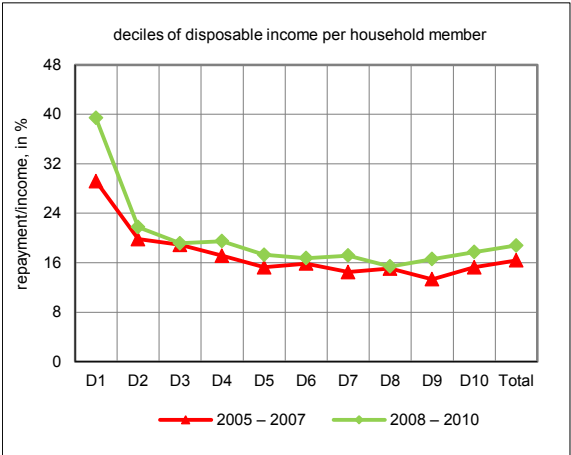
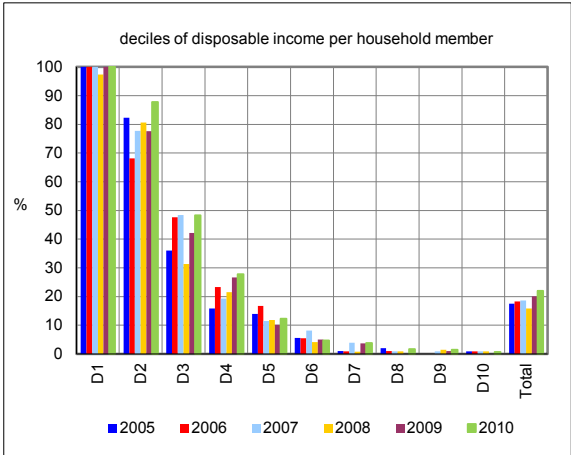


Figure 3 Vulnerable households based on the concept of financial margin



Source: calculations based on the Household Budget Survey, CNB.

The relatively high level of household sector debt relative to the comparable countries, as well as structural characteristics of debt distribution among households, highlight the risks associated with financial resilience of the household sector, i.e. possible implications of various financial and macroeconomic shocks, such as an interest rate increase, for the sector's debt-servicing capacity.

Interest rate risk and structure of interest rates on household loans in Croatia

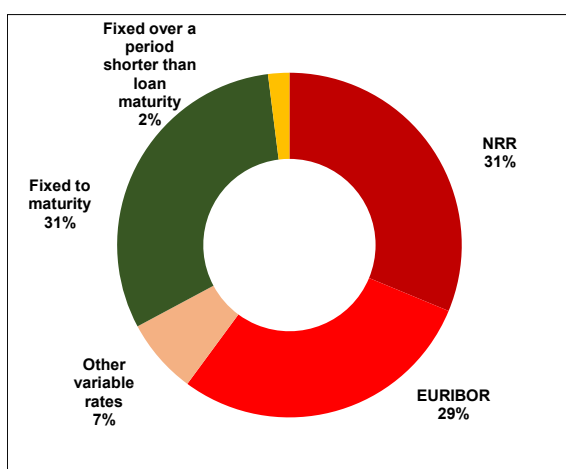
In addition to considerable exposure to currency risk (around 90% of household loans are unhedged against currency risk), household exposure to interest rate risk also presents a significant source of risk due to the dominance of financing at variable interest rates. The share of loans with a variable interest rate in total household loans stands at 67%, according to the results of the interest rate survey conducted in early 2016, while variable interest rate

loans predominate even more in long-term loans, exceeding 81% of all housing loans (Figure 4).

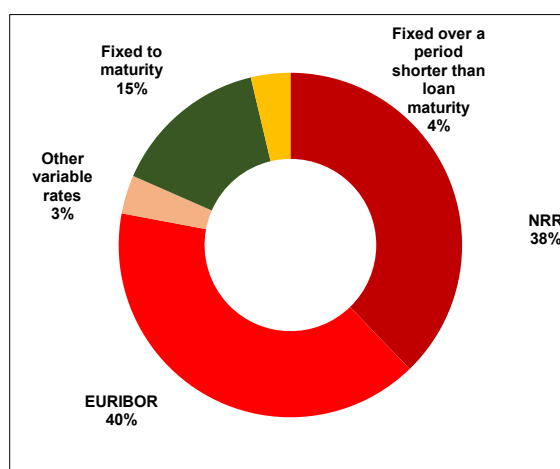
Within the structure of variable interest rates for the household sector, EURIBOR and the NRR are almost equally distributed as reference applicable parameters³ (43% vs 46%, respectively, of all household loans with variable interest rates). The same pattern is observed in housing loans, where as a reference variable parameter, EURIBOR accounts for 49% and the NRR accounts for 46% of all loans with a variable interest rate (for more details see *Rosan, M. Exposure of the private non-financial sector to interest rate risk: analysis of results of the Survey on interest rate variability, CNB Surveys (2017)*).

Figure 4 Structure according to interest rate type (as at the end of March 2016)

a) Household sector – total



b) Housing loans



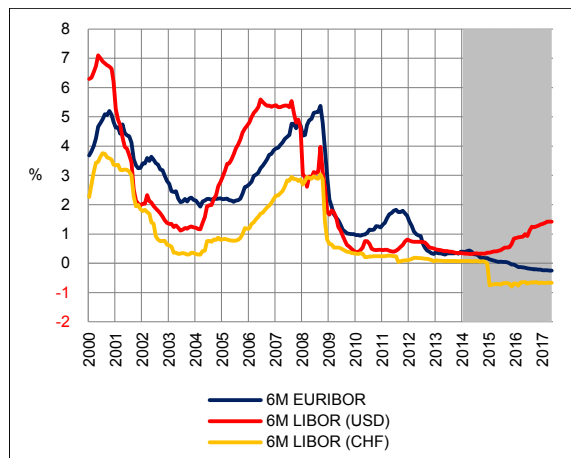
Source: CNB, Survey on interest rate variability.

In view of the interest rate structure, the household sector would be exposed to an increase in the loan servicing burden in case of a significant increase in reference variable parameters. At the same time, banks are exposed to interest rate-induced credit risk due to the risk of inability to collect their claims (on time and/or in full). This interest rate risk arises from the currently extremely low reference interest rates in the euro area (Figure 5) and the time of adoption of the amendments to the Consumer Credit Act (OG 143/2013). More precisely, at the time of the Act's enforcement, the reference parameters (EURIBOR in particular) set as the basis for the calculation of variable interest rates in credit operations, were close to their record lows (Figure 5), so that the final variable interest rate mostly consisted of the fixed part.

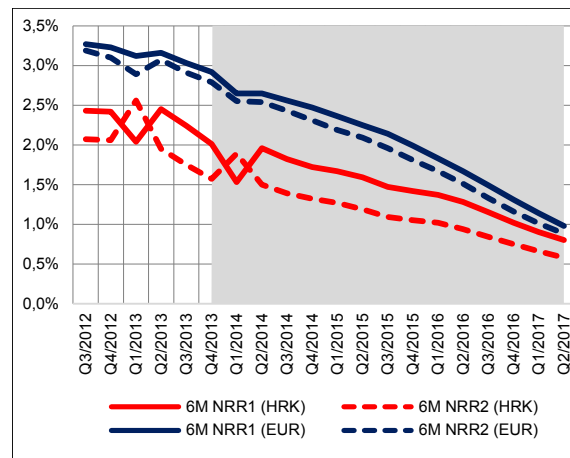
³ Under the Act on Amendments to the Consumer Credit Act (OG 143/2013), the following rates may be used in setting the interest rate: EURIBOR, LIBOR, the national reference rate (NRR), yield on the T-bills of the Ministry of Finance and the average interest rate on household deposits in the respective currency.

Figure 5 Reference parameters for setting variable interest rates at record lows for several years

a) Reference rates in the international markets



b) National reference rate – representative (NRR)



Note: The shaded area refers to the period after the amendments to the Consumer Credit Act of late 2013 (OG 143/2013) prescribed in detail the setting and changes to variable interest rates on household loans.

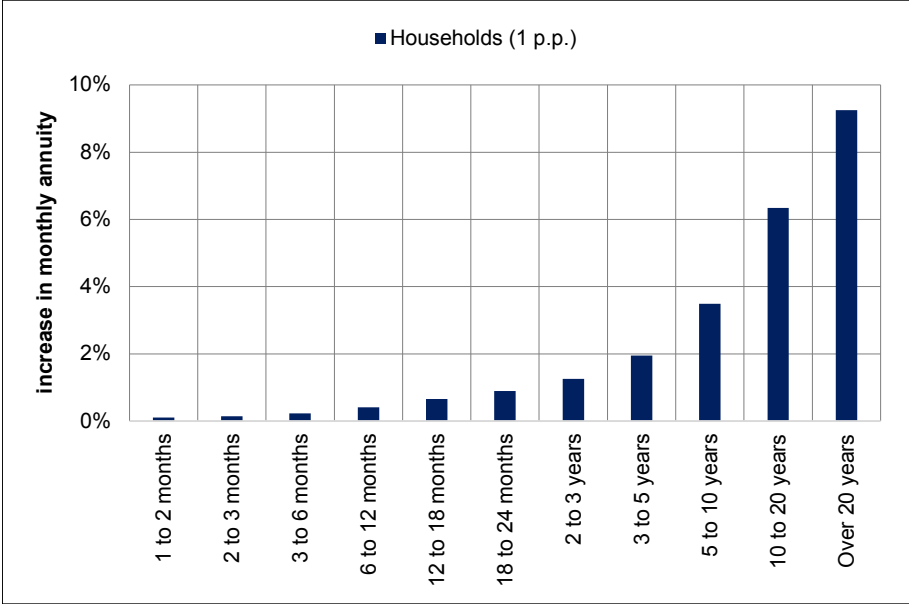
Sources: CBA and Bloomberg.

Interest rate risk may be activated primarily due to the expected continued tightening of the Fed's monetary policy, which could be followed by the European Central Bank in the medium term. The intensity of interest rate risk materialisation strongly depends on the variable parameter to which a variable interest rate is linked as there are considerable differences in the dynamics of the two most frequently used reference rates: the NRR and EURIBOR. EURIBOR is calculated and published on a daily basis and its spillover to interest rate growth depends only on the contractual period in which interest rates are adjusted. The NRR is calculated on a quarterly basis based on historical data on the cost of bank liabilities, so that it reacts to increases in market interest rates with a time lag and with less intensity than EURIBOR. On the other hand, under the scenario where the country's risk premium increases, the variable interest rate linked to EURIBOR is expected not to react, while the variable interest rate linked to the NRR would probably grow after the adjustment as the NRR implicitly reflects the country's risk premium. Conversely, if the risk premium falls, the NRR would probably decrease after the adjustment (for more details see CNB's information material [Risks to the consumer in a credit relationship](#)).

A consumer should take into account that any type of interest rates exposes debtors to potential favourable and unfavourable outcomes depending on future movements in reference interest rates. In case of fixed interest rates, the loan servicing burden remains the same regardless of changes in reference rates, so their potential decrease does not affect consumers in terms of lower repayment amounts. On the other hand, variable interest rates involve a certain degree of uncertainty in terms of future loan repayment amounts, which may be higher or lower than the current ones depending on the direction in which reference variable parameters move. Clients with loans having longer remaining maturities are more exposed to potentially larger changes in the repayment amount due to the fact that interest expense

constitutes a greater share of the repayment amount for loans with longer remaining maturities (Figure 6). Data for end-March 2017 show that the group of loans with a remaining maturity of over ten years accounts for almost 40% of all housing loans, while the share of loans with a remaining maturity of over five years exceeds 65% of housing loans (Figure 7).

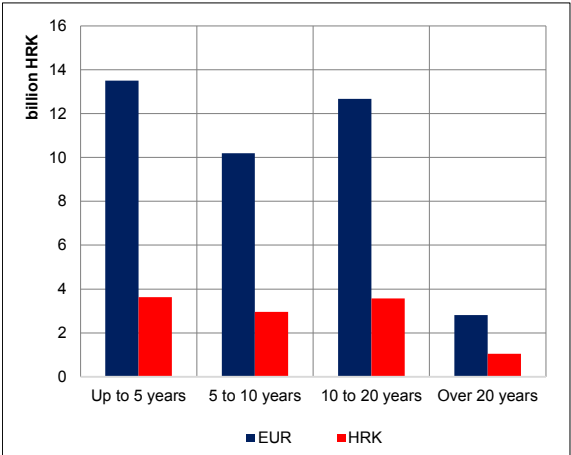
Figure 6 Relative change in annuities caused by a one-percentage point increase in interest rates



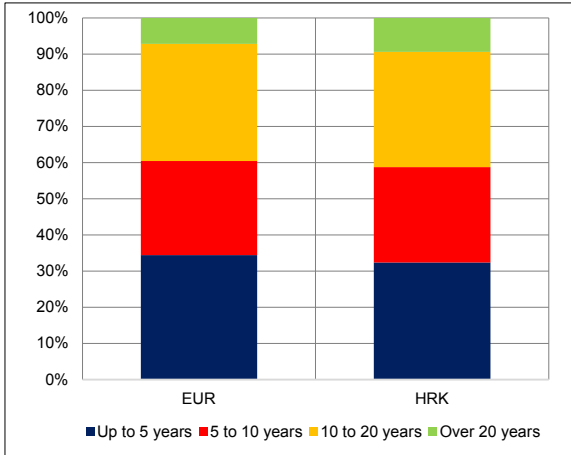
Note: Changes were calculated for total loans to the household sector under the principle that each group by remaining maturity was taken as a single loan, with the average interest rate on balances and the remaining maturity as the mean of the loan category. The mean of the category of over 20 years was taken to be 25 years.
 Source: CNB calculations.

Figure 7 Housing loans by remaining maturity (31 March 2017)

a) Nominal amounts by currency (31 March 2017)



b) Relative share by currency (31 March 2017)

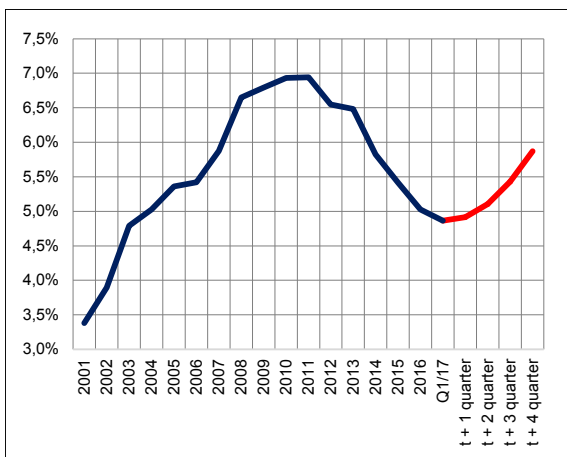


Source: CNB.

Simulation of the impact of potential EURIBOR growth and variable interest rates

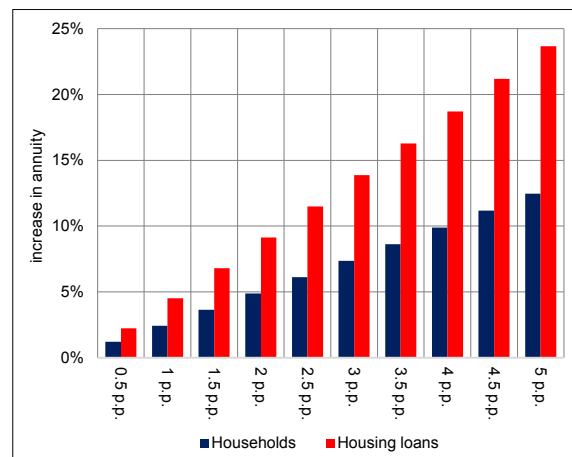
Under a macroeconomic scenario of the continued tightening of the Fed's monetary policy with a gradual increase in reference interest rates, EURIBOR is expected to grow gradually. Simulated here is an increase in EURIBOR of 0.5 p.p. a quarter, which would result in a 2 p.p. increase in EURIBOR over the projected time horizon of one year. With a time lag and somewhat less intensity, this increase would spill over to an increase in banks' borrowing costs, and then to an increase in the interest burden for clients whose variable interest rate loans are linked to the NRR. Based on the model estimate of transmission of EURIBOR growth to NRR growth (see Annex: Transmission channel of EURIBOR growth to the NRR), interest expenses for the household sector triggered by the EURIBOR increase of 2 p.p. measured by the ratio of interest payments to disposable income (assuming there are no changes in disposable income), are expected to grow by around 1 p.p. in the observed two-year period, while the adjustment, i.e. increase in the interest burden, would continue (Figure 8).

Figure 8 Interest burden to disposable income



Note: The calculation is informative in nature and assumes the structure of household loans as established in the Survey on interest rate variability (Figure 2): EURIBOR 29%, NRR 31%, other variable interest rates 7% and 33% fixed interest rates. EURIBOR is assumed to grow gradually by a total of 2%, while, in line with the estimated long-term relation between the implicit NRR3 and EURIBOR, the NRR would grow by 1.26% in the observed period. Source: CNB (CNB calculations).

Figure 9 Percentage increase in the remaining annuity due to interest rate growth



Note: The calculation was made on the aggregate of loans taking into account the outstanding total amount of all loans as a single loan. Source: CNB (CNB calculations).

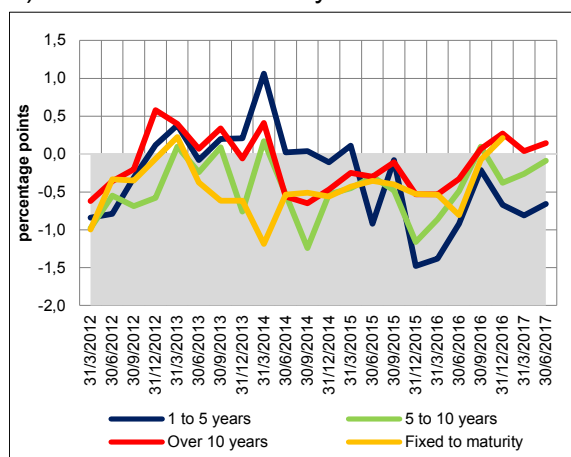
According to CNB calculations, in the event of a 2 p.p. increase in the average interest rate, the average annuity would grow by around 4% at the household sector level, while the increase would be 9% for housing loans (which, as a rule, have longer maturities). It is noteworthy that annuities may grow by more than 4% and 9% respectively for some loans.

Cost of interest rate fixation for consumers

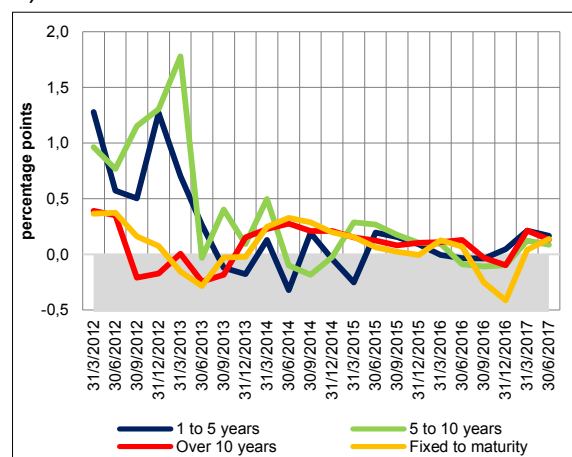
The current situation in the domestic market for housing loans suggests that the price of interest rate hedge for consumers is low. Interest rates in the loan market are currently similar for loans that provide a complete hedge against interest rate risk (loans with a fixed interest rate until maturity), and for loans that provide a partial hedge against interest rate risk as their interest rates are fixed over a period shorter than loan maturity. It may be noticed that interest rates on newly-granted loans with a currency clause and a fixed interest rate, and those with an initial period of interest rate fixation are currently lower, on average, than interest rates on loans with variable interest rates. Kuna loans do not exhibit this difference (Figures 10a and 10b). Caution is warranted because, although these loans currently provide some hedge against credit risk, it is only partial since, after the initial fixation period, interest rates on such loans become variable and are linked to movements in the predetermined reference parameter, exposing consumers to interest rate risk in the future. Interest rate risk on such loans is "moved" to the future, i.e. it will become visible only when variable interest rates start to apply, and it is higher for longer periods of variable interest rate application.

Figure 10 Spread between fixed interest rates and interest rates with an initial fixation period relative to variable interest rates (including those with an initial period of interest rate fixation up to three month) – newly-granted loans

a) Loans with a currency clause



b) Kuna loans



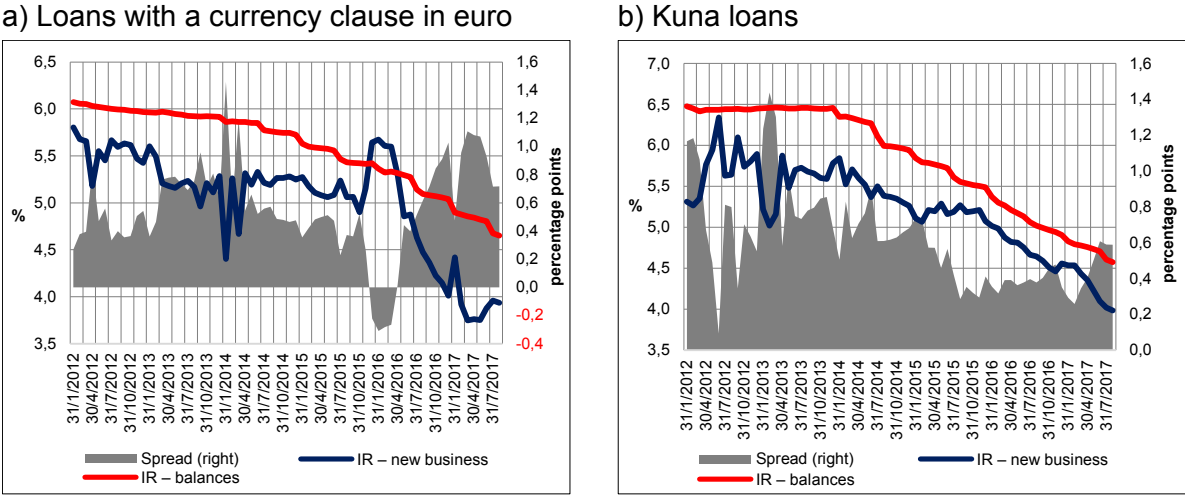
Note: Data on interest rates refer to an implicit interest rate on newly-granted loans and they are obtained as the average for the system. The calculation includes data for all banks that granted new housing loans in the reporting month. The grey colour highlights the situation when variable interest rates are lower than fixed interest rates and interest rates with an initial fixation period.

Source: CNB.

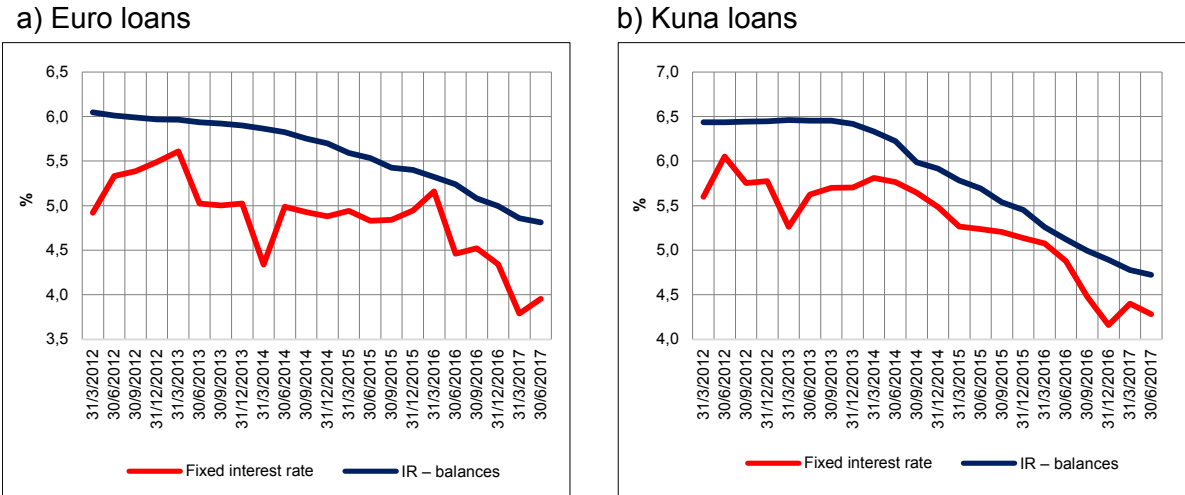
The room for changes in contractual terms without increasing the servicing burden for some clients has been created also by the sharp decrease in interest rates on newly-granted loans (Figures 11a and 11b). Therefore, clients that obtained loans in the previous years may fix the interest rate without increasing the repayment burden. In particular, the average interest rate on outstanding euro housing loans (balances of housing loans) was 1.1 percentage

point higher than the interest rate on newly-granted housing loans at the end of the first quarter, while that difference was 0.3 percentage points for kuna loans. Interest rates on new loans with a fixed interest rate were also lower than the average interest rates on outstanding loans (Figures 11c and 11d). In the first quarter of 2017, this difference stood at 1% for euro loans and at 0.4% for kuna loans, which indicates that current market conditions are relatively favourable for fixing interest rates on outstanding loans.

Figure 11 Spread between the average interest rate on balances and newly-granted housing loans provides room for refinancing euro loans



The spread is the same between newly-granted loans with a fixed interest rate and loans with a variable interest rate



Source: CNB.

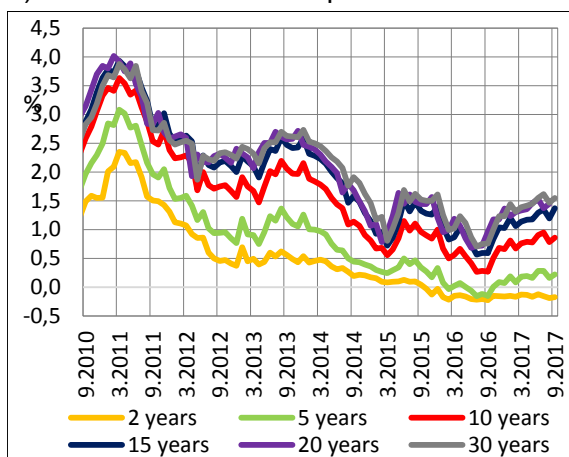
Cost of interest rate fixation for banks

Protection against interest rate risk banks assume when fixing interest rates imposes certain costs for banks. However, thanks to the decrease in the market price of interest rate

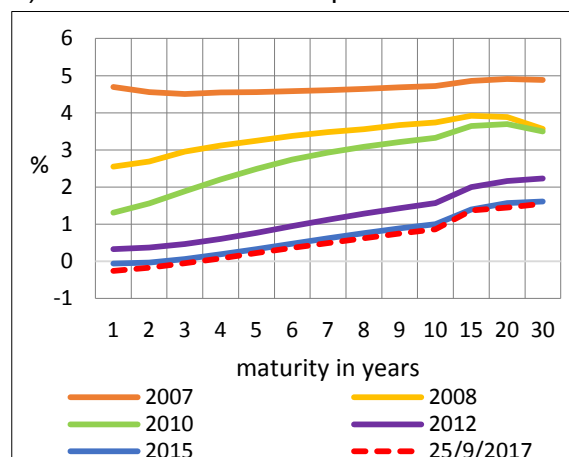
protection (*interest rate swap*), the cost of interest rate hedging is currently at relatively low levels (Figures 12a and 12b). The market price of a ten-year interest rate hedge in the international market (*euro interest rate swap*) was 0.86% a year at the end of September 2017, while it was 1.45% and 1.55% a year for maturities of 20 and 30 years, respectively (Figure 12). The relatively low price of interest rate swaps reflects current expectations of the market regarding the continued pursuit of the ECB's low interest rate policy. These expectations can be quickly changed; Figure 12a shows that the cost of interest rate hedges has grown slightly in the recent period. Reference interest rates are expected to start growing the moment the ECB begins to normalise its interest rate policy, which will eventually spill over to an increase in interest rates paid by loan users. On the other hand, there is not much possibility to obtain interest rate hedges for kuna instruments, especially in relations with individuals. More precisely, as only several large banks have quoted indicative quotations for kuna interest rate swaps, their liquidity in the market is questionable. In line with this, the Croatian National Bank has changed its monetary policy instruments so as to increase the possibility of interest rate hedging for kuna placements.

Figure 12 Market situation indicates a favourable moment to obtain interest rate hedges in the international market

a) Euro interest rate swap



b) Euro interest rate swap curve



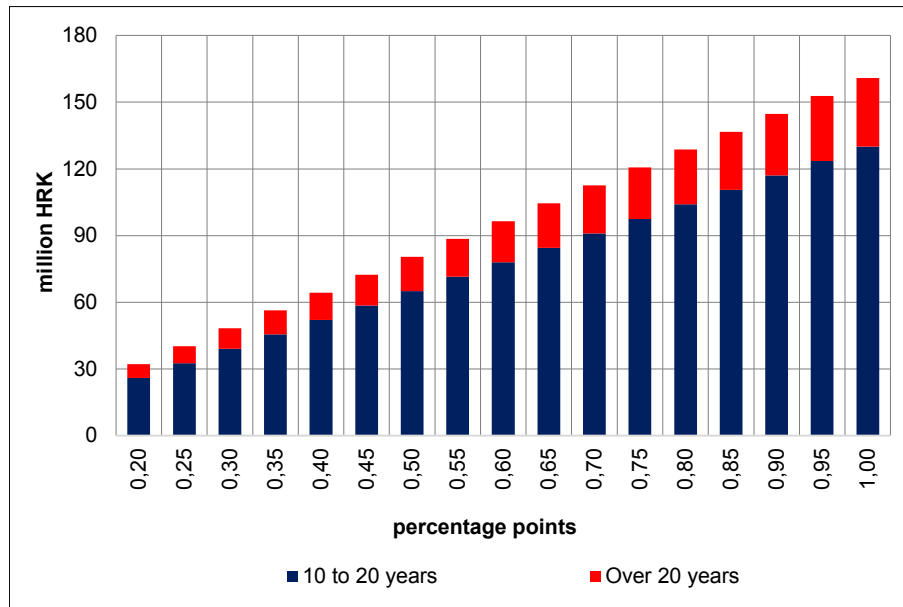
Note: *Interest rate swaps* are financial instruments that may be used to hedge against unfavourable interest rate movements in the future. They provide for an exchange of payments of variable amounts (in this case linked to EURIBOR) for payments of fixed amounts and *vice versa*. The *swap yield curve* shows what fixed rate is required for swaps of particular maturities.

Source: Bloomberg.

Should contractual provisions on variable interest rates be changed to provisions on fixed interest rates in line with current interest rates in the market, banks would lose some of their interest income as interest rates on new loans are on average lower than those prevailing in the past, i.e. before the beginning of the recent downward trend in interest rates. If a newly-agreed fixed interest rate was lower by 1 percentage point, the CNB estimates that the potential annual loss in interest income from household loans (for the portfolio of loans with a remaining maturity of over 10 years) in the static balance sheet would be around HRK 160m (Figure 13).

Figure 13 Potential loss in interest income in view of refinancing at lower fixed interest rates (for a portfolio with a remaining maturity of over 10 years)

depending on how much would a fixed interest rate be lower than the current variable rate



Note: The calculation is static in nature for total housing loans to the household sector at the end of the first quarter 2017, and it assumes that 80% of all housing loans were granted with a variable interest rate and then refinanced at a lower fixed interest rate, so that the banking sector loses only interest income on refinanced loans.

Source: CNB calculations.

Should consumers fix interest rates?

In line with the risks and benefits of variable or fixed interest rates, each consumer makes his own decision on changing the contractual provision that replaces a variable interest rate with a fixed interest rate (for more details on interest rate risk and other risks, see the CNB's information material [Risks to the consumer in a credit relationship](#)). Therefore, based on their own judgements and analysis of their financial situation, consumers themselves have to decide whether or not they want to fix the interest rate.

As regards interest rate fixation, loan refinancing is usually a more expensive option for consumers than amendments to the existing loan agreements because of the related costs that may be charged by the banks. However, apart from the costs, one should take into consideration possibly more favourable market terms that a consumer may obtain by going to another bank. The information list disclosed by the CNB on its website can certainly be of help in this regard.

Exit fees are among the costs associated with the loan refinancing procedure. Some banks charge early loan repayment fees whose amount depends on the outstanding principal amount; the fee also depends on whether the loan is closed by an early repayment or refinanced by a loan from another bank, or a new loan from the bank with which the client already has a contractual relationship. Under the Consumer Credit Act, an early loan repayment fee is charged for loans concluded up to 31 December 2009. No early loan repayment fees are charged for loans obtained after 1 January 2010, except for loans with

fixed interest rates for which such fees may be contracted. In efforts to facilitate loan refinancing, in its *Recommendation to mitigate interest rate and interest rate-induced credit risk in long-term consumer loans*, the CNB recommended to banks not to charge early loan repayment fees.

According to the currently available information (before publication of the Recommendation), a third of all banks in the system do not charge exit fees for loans granted before 2010, while the majority of the banks do so. In addition to the practice of charging exit fees, banks also differ according to exit fee amounts, which range from 1% to 4% of the outstanding principal amount.

Apart from these costs, it should be noted that there are other costs associated with obtaining a new loan, such as costs of loan agreement authentication by a public notary, the costs of property valuation and other fees under the loan agreement.

The CNB recommended that, when changing agreement terms and conditions, banks do not impose charges for costs that at their discretion. As regards the costs of authentication, the fees paid to public notaries should be much smaller for authentication of annexes to loan agreements that change the method of interest rate calculation than fees for concluding new loan agreements.

ANNEX

Transmission channel of EURIBOR growth to the NRR

An increase in borrowing costs in the European banking market (in terms of EURIBOR) may be expected to spill over to an increase in borrowing costs in the domestic market due to the relatively strong financial integration of Croatia with the euro area. In particular, should interest rates in the European market increase, domestic banks may be expected to raise deposit interest rates in order to maintain stable sources of financing. In order to assess the spillover effect, the intensity of the transmission channel of EURIBOR to the NRR was determined by using historical data.

Based on the methodology used to **set the NRR**, published on the website of the Croatian Banking Association (CBA), an implicit NRR was reconstructed (to obtain the longest possible time series) from available data, aggregated for all main funding sources regardless of the currency (implicit NRR3). It should be noted that historical data do not provide for a division of funding sources by currency, so that the implicit NRR should be interpreted as the average cost of bank financing.

The tested model with a dependent variable of the implicit 6-month NRR3 comprises 6-month EURIBOR and 5-year dollar CDS as independent variables to measure domestic sovereign risk, whereas sovereign risk to some extent also implicitly affects the financing cost, i.e. interest rates.

Figure 1 Implicit 6M NRR3 and 6M EURIBOR

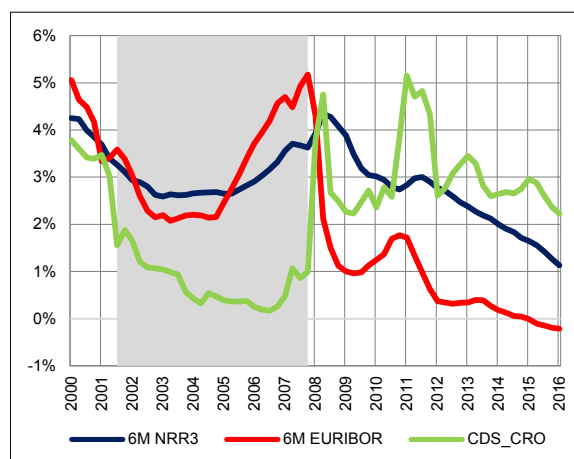
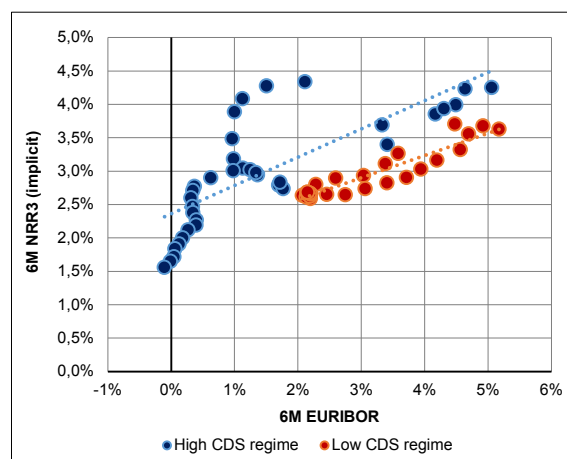


Figure 2 Relationship between the 6M NRR and 6M EURIBOR



Note: The grey colour highlights the period of the low CDS regime.

Sources: ECB and CNB (CNB calculations).

The model estimate on quarterly data implies that, on average, an increase in EURIBOR of 1 p.p. raises the implicit NRR3 by an average of 0.63 p.p. in the observed period, while an increase in CDS of 1 p.p. raises the implicit NRR3 by 0.23 p.p. on average. Of course, the model also assumes a short-term adjustment between these variables.

A limitation of the estimated model that should definitely be mentioned is that the implicit NRR3 applied, which in addition to kuna sources comprises sources in other currencies, implies that the intensity of transmission of the EURIBOR increase to an increase in the euro and kuna NRR could differ from that obtained by the model, with the speed of transmission being probably faster for euro NRR than for kuna NRR.