

Mortgage Loans and Impacts of the Global Pandemic COVID-19 in the Globalized Society

Libuše Svobodová^{1,*}, and Martina Hedvičáková¹

¹University of Hradec Kralove, Department of Economics, 50002 Hradec Kralove, Czech Republic

Abstract.

Research background: The paper is focused on the financial product, esp. on mortgage loans that are often used products in the field of long-term financing in the Czech Republic. These products provide commercial banks and other financial institutions on the Czech globalized financial market.

Purpose of the article: The aim of the paper is to analyze the situation on the globalized financial market focused on the mortgage loans and loans from building societies in view of the global Covid-19 pandemic.

Methods: Firstly a theoretical background with a review of the literature is provided, then research methodology is described, the key part brings results of development of mortgage loans, development of interest rates and the analysis of the current situation on the mortgage loan market with estimation of future development. The last part is focused on the comparison of selected mortgage loans provided by five financial institution. The article is based on primary and secondary sources. A detailed research together with the analysis and critical assessment of accessible materials will enable to identify the main objectives in the field of study.

Findings & Value added: Interest rates on mortgage loans have on the Czech market downward trend in the last years. The best conditions scored in 2019 loan from building society Modrá pyramida. The overall situation in 2020 cause lower interest rates in the mortgage loans. Lower annual percentage rate of charge and smaller monthly mortgage loan repayment and the total overpayment also correspond.

Keywords: *interest loan; central bank; monetary policy; mortgage; prognosis*

JEL Classification: *G21; M21*

*Corresponding author: libuse.svobodova@uhk.cz

1 Introduction

After the financial crisis ended there was also a revival in the mortgage market. Since, 2013 there has been a growth in the number of contracts concluded and at the same time the amount of mortgage loans increase [1]. The mortgage market is also experiencing constant new changes and measures aimed at increasing financial market stability.

Consumer credit is becoming more and more in demand over time. There are a number of banking and non-banking providers on the financial market that are flooding the banking market with their offers. Our analysis will focus on mortgage loans, which belong to consumer loans in the Czech Republic. Regulation of consumer credits includes the rules of negotiations of subjects on financial market with consumers. The Consumer Credit Act was extended with a range of entities subject to the Czech National Bank supervision with effect from 1 December 2016. It applies to all providers of consumer credit and consumer credit agents. The regulation concerns persons referred in Section 44 (1) of the Act on the Czech National Bank in the performance of activities performed by such persons on the basis of a authorization, license or registration of the Czech National Bank (CNB) or a similar permission to operate in the Czech Republic by a foreign authority in the field of consumer protection [2].

Due to market developments and previously published articles that have been devoted by the author of the paper earlier [3-6], we know that mortgage loans were almost still growing. The calculator of bank service calculations and mortgage loans was dealt by Hedvičáková and Soukal [7]. Soukal and Draessler [8] are researching price information asymmetry impact on optimal choice in the RCBS Market.

Kim [9] analyzes how mortgage loan modification policies, after a sudden drop in house prices, affect household choices in the mortgage and unsecured loan markets. The quantitative exercise shows that the government-driven mortgage modification program, initiated in 2009, reduces the mortgage default rate by 0.27% points. However, this increases the unsecured loan charge-off rate by 0.66% points.

In the observed German banks, capital growth and profit growth are positively correlated. Growth of assets most contributed to capital growth, capital growth was not accompanied by credit growth. Loans have contributed to profit growth, which can be considered as positive, because loans are the most yielding asset. [10]

2 Methods

Two large banks providing mortgage loans that have the biggest share on the Czech market, two smaller banks and one representative of building societies were selected into comparison.

Goal of the paper is to analyse the situation on the globalized mortgage market in the Czech Republic, their development and situation to individuals in 2019 and a forecast of mortgage interest rates in 2020 and in the next years.

As for applied methodology, primary and secondary sources were used. Data illustrating the issue on the loan scene were gained from the Czech National Bank and the European Central Bank. Data from the Czech National Bank were always used in period as they are presented by the Czech National Bank. There were used the oldest and the newest data that are available. Results are presented in graphs that were done by the authors of the article. They are accompanied by the comments. Secondary sources include websites, technical literature, information gathered from professional journals, discussions and participation at professional seminars and conferences. Then it was necessary to select, categorize and

update available relevant information from the collected published material so that basic knowledge about the selected topic could be provided.

3 Results and Discussion

3.1 Current situation and COVID-19

During the current Covid-19 pandemic, which began in Europe in the first quarter of 2020, it announced the following central bank credit moratorium. It was announced in the Czech Republic for three or six months. Clients in particular chose the six-month option, which will end at the end of October 2020. Further development of interest rates will mainly affect clients' ability to repay their liabilities and development, unemployment, which in the Czech Republic is one of the lowest in the EU. The last published value of the general unemployment rate since July 2020 was 2.7% from the Czech Statistical Office. [23] This unemployment rate is lower than the natural unemployment rate. However, it will also depend on other governments that are to support the economy, such as exchange rate work, positive demand shocks, etc.

Table 1 shows actual interest rates in September 2020. It shows that interest rates at the surveyed banks are stagnating and, according to the forecast, should stagnate in the coming months as well, as the credit moratorium expires. In case of 3 or 5 years of fixation that are mostly preferred by consumers are in 2020 lower interest rates in the comparison with spring 2019. Only Equa bank has in 1 year fixation higher interest rate in 2020 than in 2019. The overall situation not only in the Czech Republic cause lower interest rates. With this is corresponding lower APR and smaller monthly mortgage loan repayment and the total overpayment. Financial institutions that will be compared in the next analytical part are included in the tab. 1.

Table 1. Actual interest rates (September 2020). [13]

Bank	1year fixation	3 years fixation	5 years fixation	LTV
Hypoteční banka	2,19	2,19	2,19	From 70 to 80 %
Česká spořitelna	3,04	2,44	2,34	Up to 80 %
Fio banka	1,48	1,58	1,68	Up to 80 %
Equa Bank	3,99	2,09	2,09	Up to 80 %

Modrá pyramida has from 1st of June interest rate for LTV till 80% for all time periods 2.29% and up to 80% LTV 2.69%. [14] Those interest rates are for loans secured by real estate.

The following Table 2 compares the number and volume of mortgage loans for the month of August for the years 2013 to 2020. At the same time, the average interest rate in a given month is also examined. The month of August was chosen because it is the last published month. Table 2 shows that in August 2019 there was a significant drop in both the number of mortgage loans and the total volume. August 2019 thus reached the values of August 2014 due to the collapse of the mortgage market. In August 2020 despite the ongoing pandemic, the mortgage market revived and the number of mortgage loans increased. The average interest rate is also falling. The increase in the number and volume of mortgage loans is associated with a decrease in interest rates (also a decrease in the 2W

repo rate) and measures taken by the Czech National Bank, but also measures taken by the Czech government (for example, abolition of real estate acquisition tax, etc.).

Table 2. Year-on-year comparison of August in the mortgage market. [20, 21]

Month and year	Number	Volume (billion CZK)	Interest rate
VIII.20	6,868	19,173	2.11%
VIII.19	6,153	14,294	2.61%
VIII.18	8,475	18,788	2.53%
VIII.17	8,509	18,036	2.01%
VIII.16	9,290	18,139	1.84 %
VIII.15	8,493	15,637	2.11 %
VIII.14	6,515	11,187	2.65 %
VIII.13	7,661	12,424	3 %

3.2 Prognosis of the average interest rate

Within the prediction of interest rates, data obtained from the Hypoindex website were used. A 95% confidence interval was used to calculate future values. The monitored data start from January 2003. In the first period from 1 January 2003 to 1 August 2013, the benchmark interest rates ranged from 5.74 to 3.5%. In the years to come, interest rates on mortgage loans were declining and did not exceed the 3.5% mark. The lowest interest rates were in November and December 2016, reaching 1.77%. As of the following month, average interest rates began to grow slowly.

The last analyzed value is September 2020, when the short-term decline in average interest rates continues as a result of a decrease in interest in mortgage loans. The average interest rate in September was 2.11%. The lower confidence limit for January 2021 was 1,67% and the confidence limit was calculated at 2,38%, which is consistent with the current slow development. In January 2024, the lower confidence limit is calculated at 0,03% and the upper confidence level at 2,41% (see Fig. 1). However, this forecast is most likely not fulfilling in view of further macroeconomic developments, when the current decline in interest rates is mainly due to falling interest in mortgage loans. However, it will depend on the development of the 2W repo rate, which was increased to 2% in May 2019 and GDP growth, which slows down the growth rate. In February 2020, the Czech National Bank increased the 2W repo rate to 2.25%. With the onset of the Covid 19 pandemic, it reduced the rate three times in a row. March 17, 2020 at 1.75% and March 27 at 1%. In May, it lowered the interest rate to 0.25%. By lowering interest rates, it tried to stimulate the economy, make loans cheaper and weaken the koruna. This trend can also be seen in the following Figure 5, when average mortgage interest rates have been falling since April 2020.

The average interest rate on mortgage loans has been falling for the fifth month in a row. However, the decline is slowing down. While the average rate fell by another nine basis points in May and June, in August it fell by only four basis points to 2.11 percent [21].

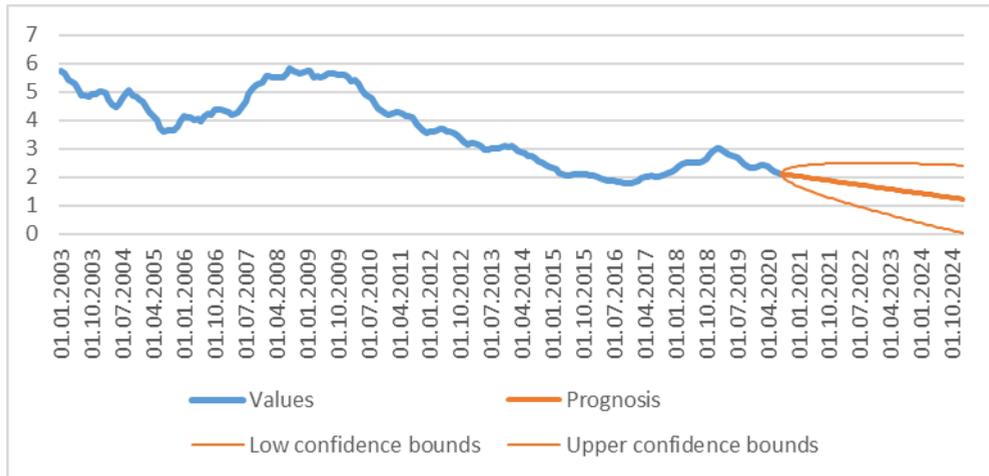


Fig. 1. Prognosis of the average interest rate in percent, own processing based on Hypoindex. [11]

It is a question to discussion whether the current short-term decline in average interest rates will lead to a growth in the amount of mortgage loans because Hedvicakova and Pozdilikova [12] used Spearman's correlation coefficient for the correlation analysis. There was a negative correlation of -0.6617647059 between the variables - the average interest rate and the average amount of the mortgage. Therefore, the variables are linearly dependent on each other and it has been shown that the average interest rate significantly affects the amount of the mortgage loan.

3.3 Model situation

A model example for comparing mortgage loans is based as follows. A young childless couple at the age of 25 owns a plot of 2,500 square meters. The estimated price of the new house is around CZK 4,000,000. A young childless couple have savings CZK 1,000,000, ie. 25% of the value of the property. They would like to redeem a mortgage in 20 years with 5 years fixation.

They have both have permanent employment for an unlimited period. The net monthly income is CZK 30,000 for a woman and 35,000 CZK for a man, together they earn 65,000 CZK a month. For both, they have no other financial obligations. Man have a bank account in Komerční banka and a woman in Poštovní spořitelna that belongs to the ČSOB group.

Branches of all the above-mentioned financial institutions were visited on 14th of February 2019 to analyze the model situation.

3.4 Graphical comparison of model situation

Fig. 2 shows and compares interest rates of selected banks. The difference between commercial banks is 0.2% between the negotiation of the loan with the insurance of the ability to repay and without. Negotiating this insurance does not only affect the interest rate of the building society Modrá pyramida. Fio bank offered the lowest interest 2.99% with the concluded insurance and without the agreed insurance Modrá pyramida 3%. Česká spořitelna has the highest interest rates in both cases.

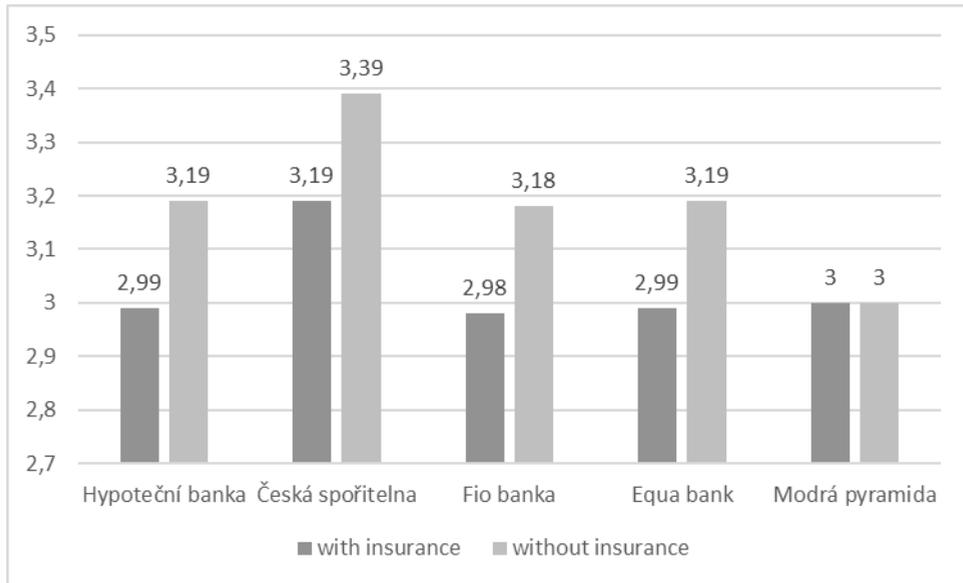


Fig. 2. Comparing interest rates. [own processing based on individual bank tariffs]

Fig. 3 compares the annual percentage rate of charge, both when arranging for repayment insurance and without arranging insurance at selected banks.

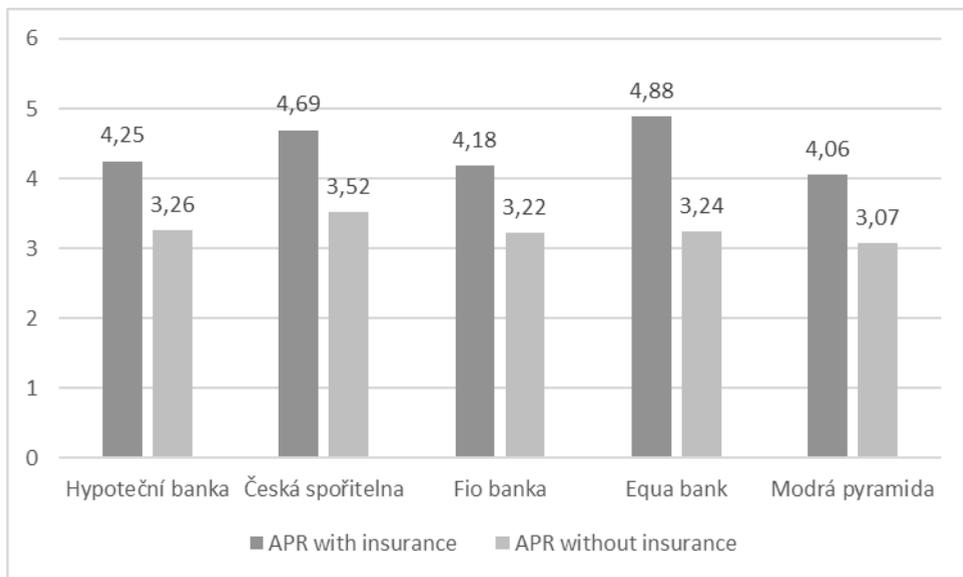


Fig. 3 Comparing APR. [own processing based on individual bank tariffs]

Modrá pyramida offers the lowest APR in both cases, 4.06% with insurance and 3.07% without insurance. A large difference between rates is noticeable for Equa bank due to the highest monthly premium amount.

Fig. 4 presents the monthly mortgage loan repayments in both variants. The lowest monthly installment with and without insurance is offered by Modrá pyramida. The Hypoteční banka, Fio banka and Equa banka have similar payments when comparing installments without insurance. Česká spořitelna has the highest monthly loan repayment of

CZK 17,309. The payment at Modrá pyramida is CZK 18,138 when arranging for the repayment insurance. The highest installment of CZK 19,423 is paid by Equa bank.

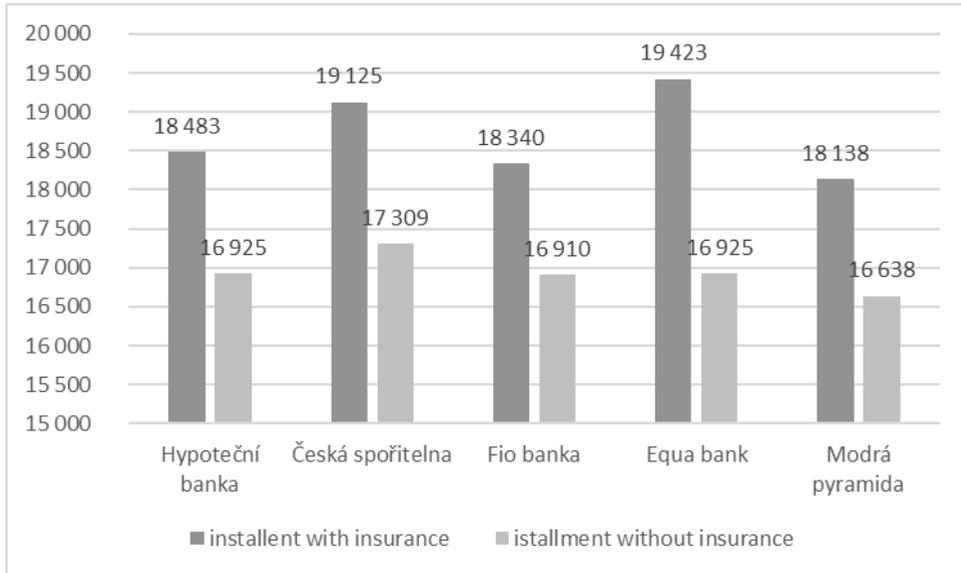


Fig. 4. Comparison of monthly mortgage loan repayment. [own processing based on individual bank tariffs]

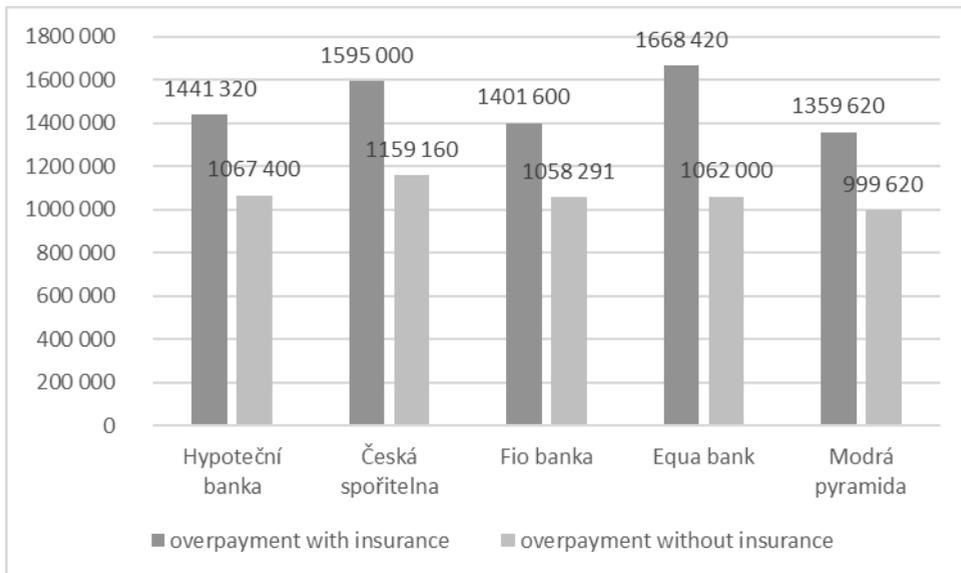


Fig. 5. Comparing the amount of the final overpayment for a mortgage loan. [own processing based on individual bank tariffs]

Modrá pyramida offers the lowest overpayment of 1 359 620 CZK with the option of repayment insurance. Fio banka is the second most advantageous loan with an overpayment of CZK 1,401,600. The client will overpay CZK 1,441,320 at Hypoteční banka and CZK 1,595,000 at Česká spořitelna. The offer is the least advantageous and the loan will be

overpaid by CZK 1,668,420 in Equa bank. When comparing the option without the repayment ability insurance, CZK 999,620 is paid at least again at Modrá pyramida. The total loan will be increased by CZK 1,058,291 at Fio banka and CZK 1,062,000 at Equa bank. Hypoteční banka's overpayment is CZK 1,067,400. The offer from Česká spořitelna was the least advantageous, when the loan will be overpaid by CZK 1,159,160.

4 Conclusion and Discussion

The results of the analysis show that the mortgage loan from the building society Modrá pyramida is the most advantageous for model applicants. The 3% interest rate is the second highest, while APR 4.06% is the lowest at the five-year fixation period. With a monthly payment of CZK 18,138 and basic fees of CZK 6,500, the client will overpay the mortgage loan by CZK 1,359,620. The Fio Bank was on the second place was, which offers the lowest interest rate 2.98%. The difference between the overpayment between Modrá pyramida and Fio Bank will be CZK 41,980. The third place was taken by the bank with the largest market share in the mortgage market. Hypoteční banka with an interest rate of 2.99% and an APR of 4.25% with a difference of 0.19% compared to Modrá pyramida. Česká spořitelna took the fourth place with the second largest market share on the mortgage market. Česká spořitelna offers the highest interest rate of 3.19% and APR of 4.69%. The overpayment is CZK 1,595,000. Equa bank placed on the last position. It offers one of the lowest interest rates of 2.99%, but the highest APR of 4.88%.

The Bank Board of the Czech National Bank [15] decided in May 2019 to maintain the current limits on mortgage lending indicators. The maximum LTV (loan-to-value) ratio thus remains at 90% and banks may provide a maximum of 15% of loans with LTVs of 80%–90%. The DTI and DSTI limits introduced in October 2018 also remain in force. Banks should continue to not provide loans where the total debt exceeds nine times applicants' net annual income (the DTI – debt-to-income – ratio) At the same time, households with mortgages should spend no more than 45% of their net monthly income on debt service (the DSTI – debt-service-to-income – ratio).

The CNB increased its two-week repo rate to 2% in May 2019 and the second rate increase was to 2.25% in February 2020. Subsequently, with the onset of restrictive measures in connection with Covid 19, the 2W repo rate was reduced three times in a row to the current 0.25% from 11 May 2020. Further interest rate developments will depend on many factors. The development of 2W repo rates will also be affected by inflation. According to CNB forecasts [18], the euro area economy slipped into deflation for the first time in four years in the summer. During the current economic crisis, there has been a significantly lower decline in import prices in the manufacturing industry. This indicates that at least some of the current shocks are negative in nature and that deflationary tendencies may not be as pronounced as in the case of the global financial crisis. If anti-globalization tendencies were added to the current crisis, which would represent an additional cost factor, it is not excluded that the crisis could be staggering in the long run.

The CNB could also wait for the uncertainties in the world economy to disappear, namely the issues surrounding the effects of Brexit and the currently enforced US President Trump trade policy and the introduction of tariffs into the US. Therefore, many analysts believe that further tightening of the CNB's monetary policy will take place during the first half of next year. Other factors include the exchange rate of the koruna against world currencies, the development of unemployment and nominal wages, GDP and others. Uluca and Wieladek [16] examine the interaction of capital requirements and monetary policy. This suggests that a monetary policy tightening may mitigate the loan contraction associated with higher capital requirements, as maturity transformation allows the affected bank to profit from a steeper yield curve and raise capital through retained earnings.

Beltratti et al. [17] find suggestive evidence that prepayment penalties affected mortgage pricing, as well as prepayments and delinquencies through borrowers' mortgage selection at origination, most notably for riskier borrowers.

Interest rates on mortgage loans have started to grow very slowly since September 2017. This growth lasted until May 2018, when interest rates began to stagnate and fell slightly by 0.02% to 2.49% from June 2018. The following month, they began to grow very slowly until January 2019, when the average interest rate reached its maximum of 3%.

According to the forecast, there should be a further decline in average interest rates on mortgage loans. However, everything will depend on the current development of Covid-19. The development of the main macroeconomic indicators is based on this. The September GDP growth outlook for this year brought a moderation of the decline for the three strongest world units, ie the USA, the euro area (including Germany) and China, while for next year they are expected to perform slightly worse (excluding China) than before [22].

We see a much bigger problem in the overvaluation of apartment prices. Although banks were mostly compliant with the current recommendations as regards LTV limits, the CNB observes their natural tendency in the current "good times" to value collateral on the basis of current market prices regardless of the fact that prices may be overvalued in an upward phase of the cycle. The CNB estimates this overvaluation of house prices at 15% at the end of 2018, i.e. around 5 percentage points higher than a year earlier [15]. The results indicate that appraised home values were inflated on average by around 30% with respect to the contract purchase prices in Spain. Diaz-Serrano [19] also observe that credit-constrained households were more likely to be involved in mortgages with inflated house values and that upwards bias in appraisals was more likely to occur in mortgage markets in which there was a higher degree of competition among lenders. This situation led lenders to lower credit standards dramatically.

The paper is supported by the project SPEV 2020 at the Faculty of Informatics and Management of the University of Hradec Kralove, Czech Republic. In addition, the authors thank Anna Borkovcova for her help with the project.

References

1. Hedvicakova, M., Pozdilikova, A. (2018). The development of mortgage loans with using regression analysis. *Journal of Engineering and Applied Sciences*, 13(9), 7003-7007.
2. Svobodová, L., Dittrichova, J. (2018). Business entities and loans in the Czech Republic. In: *European Financial Systems 2018. Proceedings of the 15th International Scientific Conference* (pp. 749-756). Brno: Masaryk University.
3. Hedvicakova, M. Svobodova, L. (2016). Development and the current situation of the mortgages for the Czech households. *European Financial Systems 2016: Proceedings of the 13th International Scientific Conference* (pp. 234-241). Brno: Masaryk University.
4. Hedvicakova, M., Svobodova, L. (2017). Mortgages for individuals, businesses and municipalities in the Czech Republic. *Proceedings of the 15th International Scientific Conference on Hradec Economic Days 2017* (pp. 279-286). Hradec Králové: Univerzita Hradec Králové.
5. Svobodova, L., Hedvicakova, M. (2015). Doing Business in the Countries of Visegrad Group. *Procedia Economics and Finance*, 34, 453-460.
6. Svobodova, L., Hedvicakova, M. (2017). Technological readiness of the Czech Republic and the use of technology. *Proceedings of the Information Systems – 14th*

- European, Mediterranean, and middle eastern conference, EMCIS 2017* (pp. 670-678). Coimbra, Portugal.
7. Hedvicakova, M., Soukal, I. (2012). Retail core banking services costs optimization. *Procedia Technology*, 1, 177-182.
 8. Soukal, I., Draessler, J. (2015). Price information asymmetry impact on optimal choice – rcb market case study. In Kocourek, A. ed. *Proceedings of the 12th International Conference Liberec Economic Forum* (pp. 144-153). Liberec: Technical University of Liberec.
 9. Kim, J. (2015). Household's optimal mortgage and unsecured loan default decision. *Journal of Macroeconomics*, 45, 222-244.
 10. Horvat, J., Horvatova, E. (2018). Capital Creation Factors in Selected Banking Sectors of Europe. In: *European Financial Systems 2018. Proceedings of the 15th International Scientific Conference* (pp. 174-179). Brno: Masaryk University.
 11. Hypoindex. (2019). *Fincentrum hypoindex – vývoj*. Retrieved from: URL <https://www.hypoindex.cz/hypoindex-vyvoj/>.
 12. Hedvicakova, M., Pozdilkova, A. (2017). Regression Analysis of Mortgage Loans on the Czech Banking Market. In Kocourek, A. ed. *Proceedings of the 13th International Conference Liberec Economic Forum 2017* (pp. 19-27). Liberec: Technical University of Liberec.
 13. *Current mortgage rates: The moratorium is coming to an end, rates are stagnating* (2020). Retrieved from : URL [https://www.hypoindex.cz/clanky/aktualni-sazby-hypotek-konec-moratoria-se-blizi-sazby-stagnuji/Czech National Bank. \(2019\)](https://www.hypoindex.cz/clanky/aktualni-sazby-hypotek-konec-moratoria-se-blizi-sazby-stagnuji/Czech%20National%20Bank.%20(2019).).
 14. Modrá pyramida. (2020). *Interest rates*. Retrieved from : URL <https://www.modrapyramida.cz/sazebniky/urokove-sazby>.
 15. *CNB keeps mortgage limits unchanged*. Retrieved from: URL <https://www.cnb.cz/en/cnb-news/press-releases/CNB-keeps-mortgage-limits-unchanged/>.
 16. Uluca, A., Wieladek, T. (2018). Capital requirements, monetary policy and risk shifting in the mortgage market. *Journal of Financial Intermediation*, 35(B), 3-16.
 17. Beltratti, A., Benetton, M., Gavazza, A. (2017). The role of prepayment penalties in mortgage loans. *Journal of Banking & Finance*, 82, 165-179.
 18. Czech National Bank. (2019a). *Inflation forecast of the financial market - May 2019*. Retrieved from: URL https://www.cnb.cz/export/sites/cnb/cs/financni-trhy/gallery/inflacni_ocekavani_ft/inflacni_ocekavani_ft_2019/C_inflocek_05_2019.pdf
 19. Diaz-Serrano, L. (2019). Inflation of home appraisal values and the access to mortgage loans of credit constrained borrowers. *International Review of Economics & Finance*, 63(SI), 412-422.
 20. Hypoindex (2019a). *Fincentrum hypoindex srpen 2019: Propad hypotečního trhu sílí*. Retrieved from: URL <https://www.hypoindex.cz/clanky/fincentrum-hypoindex-srpen-2019/>.
 21. Hypoindex (2020). *Fincentrum hypoindex srpen 2020: Rekordní rok na dosah*. Retrieved from: URL <https://www.hypoindex.cz/clanky/fincentrum-hypoindex-srpen-2020-rekordni-rok-na-dosah/>.
 22. Czech National Bank (2020). *Global economic outlook – September 2020*. Retrieved from: URL https://www.cnb.cz/export/sites/cnb/cs/menova-politika/gallery/gev/gev_2020/gev_2020_09.pdf.

23. Czech Statistical Office. (2020) *Latest economic data*. Retrieved from : URL <https://www.czso.cz/csu/czso/engaktualniinformace>