Critical Housing Analysis
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Understanding the Economic Situation of People Who Took a Foreign Currency Mortgage in Hungary and Poland[1]

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[1] The paper presents the personal opinions of the authors and does not necessarily reflect the official position of Narodowy Bank Polski.

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Abstract: *In this article we show that significant differences between the foreign currency mortgage agreements in Hungary and Poland led to significant differences in monthly mortgage payments after the Global Financial Crisis (GFC) erupted. Hungarian banks were able to add a variable markup to the LIBOR3M that was connected to bank risk on top of the usual fixed markup. We compare the monthly mortgage payments and LTV levels of people who took out a CHF mortgage with those who obtained a local currency mortgage during the mortgage boom years of 2006–2008. We find that in the initial years of the mortgage CHF mortgages were cheaper than local currency mortgages, which allowed more people to buy housing. However, the GFC led to a deterioration of the exchange rate, and monthly payments and LTV levels (consequently?) increased. We analyse the mortgage costs and LTV levels of the 2006-2008 foreign currency (FX) mortgage vintages in Hungary and Poland between 2006 and 2020 and compare them to local currency mortgages. We also simulate the effects of changing housing prices and wages on mortgages in the cities of Budapest and Warsaw.*

Keywords: foreign currency mortgages; mortgage vintages; intervention.

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Introduction

Loans denominated in foreign currency began appearing around the globe as early as the late 1980s, when closed national economies started to liberalise capital flows. When two countries are at different stages of economic development, their money and capital markets are different and the differences in inflation and economic risk lead to two different interest rates. The more developed countries have abundant capital and low interest rates, while those still developing usually have an insufficient capital stock and high interest rates. The richer countries lend to the poorer ones, mostly in foreign currency. Under variable exchange rates the outstanding mortgage may grow in the host country currency, which makes it very difficult to pay it back. Banks have found an instrument with which to mitigate this risk, i.e. interest rate swaps,[2] but their clients are left fully exposed to the exchange rate risk. The mortgagors gain from the lower interest rates when they take the mortgage, but if the exchange rate deteriorates in the future, they will have higher monthly mortgage payments and, consequently, financial losses.

The first large-scale experiments with financing national investments with low-interest mortgages from the global capital market were in the fast-growing Asian Tigers, and they ended in a general banking crisis and long-term stagnation. Other examples are in Australia, which financed residential investments in yen, while in Austria banks issued Swiss franc mortgages to their citizens. Despite the mixed experience with these experiments, many Central and Eastern European countries – the Baltic States, Poland, and Hungary, and later even Bulgaria and Romania – used this financial vehicle to make housing mortgages more affordable in the early 2000s. While most of these countries' currencies are pegged to the euro, Hungary and Poland have a flexible exchange rate, so unexpected exchange rate shocks can lead to significant problems for borrowers. While the share of foreign currency mortgages in Austria peaked at around 32% in 2006 (see Beer et al. 2010), Hungary and Poland peaked in 2008, with a share of 49% and 69%, respectively. The majority of foreign currency mortgages in Hungary and Poland were taken in Swiss francs (CHF). However, while Poland had very clear rules defining the interest rate as the LIBOR3M plus a fixed markup, Hungarian banks were able to transfer the increased bank risk to the client, increasing the mortgage rate significantly after the outbreak of the GFC. We therefore focus on these two countries and the economic situation of the borrowers.

Our work was prompted by the studies by Waschiczek (2002) and Beer et al. (2010), who analysed foreign currency mortgages for house purchases in Austria. Waschiczek (2002) presents an overview of the situation of foreign currency mortgages in Austria and the theoretical reasons why people decide to use this risky instrument. He concludes (p. 98):

[2] In most cases the process works as follows (see also Brzoza-Brzezina et al. 2010): Poorer countries have little capital and are perceived as risky, so their interest rates are higher than those in richer countries, which have much capital and are perceived as secure. Investors in a richer country want to invest in a poorer one, and the interest difference is the source of income. But there is the risk that stems from the floating exchange rate, which could annihilate all the gains. So the investors use foreign currency interest rate swaps. A large bank in the rich country swaps a given amount of money in CHF to another bank in the poorer country in local currency at a fixed exchange rate for a short time. The bank in the poorer country thereby has access to money at lower interest rates, while the one in the richer country has a higher interest rate and spreads, without the usual exchange rate risk. The exact gain on both sides depends on the risk level in the poorer country and the negotiations. However, the client of the bank in the poorer country takes a mortgage that is fully exposed to exchange rate shocks.

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'Foreign currency loans may offer low interest rates in nominal terms, but the risks involved are substantial. Foreign currency borrowers are exposed to significant exchange rate and interest rate risk, and maturity mismatches may arise.' Beer et al. (2010) state that foreign currency mortgagors act in a manner that is similar to 'carry traders', i.e. people who borrow at low interest rates in one country and lend the money to another country at higher interest rates, but are exposed to a significant risk – if the exchange rate deteriorates, their profits will turn to losses. To find an explanation for this behaviour, Beer et al. (2010) analysed a sample of Austrian mortgagors and found that risk-seeking, more affluent, and married people were more inclined to choose the risky FX mortgages.

However, neither of these two studies, nor any other one we are aware of (besides Łaszek et al. 2016), analyses how people who took out a foreign currency mortgage performed economically in the long run compared to their peers who obtained a mortgage in local currency. We are aware that it is very hard to collect data about individual borrowers in order to make such an analysis. Therefore, we focus on mortgage vintages, that is, on mortgages that were taken in different years. One example of such an approach is the study by Haughwout et al. (2008), who looked at individual mortgage contracts to analyse how different vintages of subprime mortgages performed during the global financial crisis. Because we do not have access to such data, we analyse annual averages. We focus on the 2006-2008 mortgage vintages, most of which were issued in foreign currency, the majority of them in Swiss francs (CHF). We consider the average house price, the average wage, the exchange rate, and the interest rate level, and we simulate how a change in all these factors impacted the economic gains and losses of borrowers over the years between 2006 and 2020. Using publicly available data, we also estimate the gains and losses of house buyers who bought their home with a foreign currency mortgage in comparison to those who bought it with a local currency mortgage. A similar approach was applied by Łaszek et al. (2016) to Poland. In this paper we also apply it to Hungary in order to make international comparisons. We should mention that Buszko (2016) made a similar gains and losses analysis for Poland, but he only focused on the 2006 mortgage vintage and, moreover, looked solely at the impact of interest rate and exchange rate changes. We apply a holistic approach, as we also look at the effects of changing wages and house prices. We also explain the significant difference in the mortgage contracts, which had a huge impact on the effective interest rate after the GFC. We explain why Poland passed much more easily through the GFC, while Hungary experienced significant problems. Those problems motivated the Hungarian government to re-denominate CHF mortgages in February 2015 at the exchange rate of 7 November 2014, while in Poland there have so far been no significant interventions.

Our approach still has some limitations. We do not have data on single mortgages but instead assume that an average flat is financed with a mortgage. We use the annual average of all economic variables and in this way leave aside the fact that the actual values are higher or lower than the average. We assume that mortgages are paid back over a period of 25 years, though in reality some people can afford to pay them back more quickly. These details can have an impact on the factual economic results but should not have any impact on the main conclusions that we draw.

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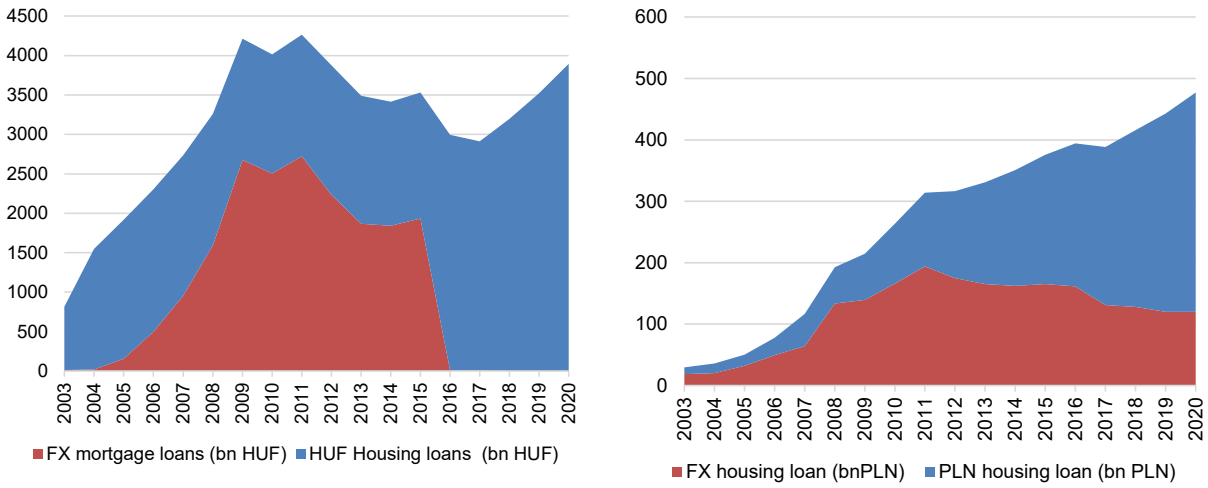
The background to the housing market and foreign currency mortgages in Hungary and Poland

Hungary and Poland, like other EU post-socialist countries, observed significant economic growth before and after EU accession, but faced a tense housing situation. During socialist times there was rapid and extensive industrialisation and many people moved from villages to large cities. However, not enough houses could be constructed, and the existing ones were consequently overcrowded and of poor quality. Even when the economy changed to a market economy in the 1990s, the major suppliers of dwellings were ineffective and slow as state housing finance collapsed. Despite a growing demand for housing, given the high level of inflation mortgages in local currency were very expensive (the interest rate even reached double digits). People were consequently unable to afford them. The local financial system was underdeveloped, mainly because the savings rate was low. When foreign banks entered the market, they offered seemingly cheaper mortgages in foreign currency. Given that Hungary and Poland had a floating exchange rate, the borrower was fully exposed to any shocks on the international financial market. These mortgages, denominated mostly in CHF, allowed many households to buy a flat, which, amidst short-term rigid supply, was one of the factors that led to rising house prices. Developers started to increase their production capacities and produced more and more housing units.[3] The growth of the mortgage sector and the housing sector improved the rather poor housing situation and also had positive spillover effects on the economy. More information about housing policy trends in Hungary and Poland can be found in Hegedüs and Somogyi (2016), Csizmady and Hegedüs (2016), Widlak and Łaszek (2016) and Łaszek et al. (2016), while Hegedüs et al. (2011) analyse the reactions of Hungarian and Czech housing policy to the GFC.

Figure 1: Stock of mortgages in local currency and foreign currency in Hungary (left) and Poland (right) between 2003 and 2020



Source: Central Bank of Hungary (MNB), Narodowy Bank Polski (NBP).

[3] In Hungary, the growth in mortgages was supported by an expensive subsidy programme between 2000 and 2004. The FX mortgage boom started after the government cut the subsidy in 2004.

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In our simulation analysis of mortgage borrowers we focus on Budapest and Warsaw, which are the biggest markets. Housing markets are local and depend on the local labour market, but mortgages are affected by interest rates that apply to the whole country. Therefore, we use city-level variables and the interest rate at the country level.

We focus on the years 2006-2008, during which most foreign currency mortgages were issued. To simplify the comparison between the countries, we show how expensive housing was in relation to wages and how much housing in m2 people could by for 1000 CHF in Budapest and Warsaw. We see that flats in Budapest were cheaper than in Warsaw, but also that wages were lower. Table 3 shows the average initial mortgage rates for local currency mortgages in Budapest and Warsaw. In both countries the mortgage interest rate in CHF was significantly lower than in the local currency. What is striking is the fact that the CHF mortgage in Budapest was significantly more expensive, which results from the higher markup that local banks added to the LIBOR3M.

Table 2: How much housing in m2 a person can buy for 1000 CHF, months of work needed to earn it, and the price to income ratio in Budapest and Warsaw

Year	*Budapest*			*Warsaw*		
	housing sq.m.	*months of work*	*P/I*	*housing sq.m.*	*months of work*	*P/I*
2006	0.66	0.98	1.48	0.37	0.70	1.88
2007	0.58	0.83	1.44	0.27	0.61	2.27
2008	0.60	0.80	1.33	0.25	0.53	2.08

Source of data: Statistics Hungary, NBP, and Statistics Poland.

Table 3: Initial mortgage interest rates in local currency and CHF in Budapest and Warsaw

Year	*Budapest*		*Warsaw*	
	Interest rate in HUF	*Interest rate in CHF*	*Interest rate in PLN*	*Interest rate in CHF*
2006	12.3%	4.8%	5.7%	3.3%
2007	12.6%	6.3%	6.1%	4.2%
2008	13.1%	7.5%	8.1%	4.7%

Source of data: MNB, NBP.

To explain how the main economic variables changed and affected the financial situation of mortgage borrowers, we focus on the 2008 vintage of mortgages, the year in which a very large number of CHF mortgages was taken. We present indices, for which the base year is 2008 (2008 = 100). Values below/above 100 in another year mean that in that year the value was lower/higher than in the base year. As Figure 2 shows, wages, exchange rates, and nominal house prices in Budapest and Warsaw underwent very similar changes between 2009 and 2013.

After the Global Financial Crisis erupted in mid-2007, local currencies depreciated by around 50% against the CHF in 2009. The value of CHF mortgages started to grow when expressed in the local currency and often exceeded the market value of the homes that were financed with

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them. The biggest problem was that monthly mortgage payments grew significantly, and many people had problems paying back their mortgage.

The Swiss Central Bank lowered the LIBOR3M in order to stabilise its currency against the EUR and the USD, which provided mortgagors in the two analysed countries with some relief. When the LIBOR3M declined, the effective interest rate in Poland decreased significantly, which nearly offset the currency depreciation. By contrast, banks in Hungary were able to increase the margin, and passed their increased cost of funds[4] to their clients (see Király and Banai 2013 and Berlinger 2019). This practice is now forbidden – since April 2012 banks can charge on new contracts only an interest rate that is fixed or tied to a reference rate (see Berlinger 2019). This risk was very low when people in Hungary were signing their mortgage, and they probably gave little consideration to the possibility of it rising in the future. But it grew quickly after the GFC erupted and the effective CHF interest rate in Hungary exceeded pre-crisis levels. As well as currency depreciation, the monthly payments increased so much that many households were unable to service their debt obligations. This led to massive demonstrations, and finally[5] in February 2015 the government decided to convert mortgages to HUF at the exchange rate of 7 November 2014. The conversion was done to eliminate the exchange risk for borrowers. The Hungarian government was fortunate with the timing of this move, as the exchange rate of the Hungarian forint continued to deteriorate. This was mainly because on 15 January 2015 the Swiss Central Bank stopped maintaining the minimum exchange rate against the euro, which had been as 1.20 CHF per EUR since 6 September 2011.[6]

The outstanding mortgage debt was not reduced in Hungary, but at least the risk of further exchange rate shocks was removed. The interest rate in HUF was fixed for 3 years and was lower than the exchange rate in CHF. VAT allowances and new subsidies were also introduced, and, consequently, house prices started to grow after 7 years of real price declines. This intervention was criticised by the banks, but they nonetheless started to issue new mortgages. The main economic variables are shown in Figure 2.

[4] Király and Banai (2013: 216) state: 'The absence of transparent pricing allowed banks to incorporate their increased cost of funds into their lending rates.'
[5] After several 'rescue programmes', which included: an early repayment scheme; a foreclosure moratorium was introduced that extended the time people can use to pay back the mortgage without default; defaulted, that is not payed back loans were bought by a state owned company; an exchange rate cap (limit on the exchange rate) was put, such that people who repay foreign currency mortgages could buy the foreign currency cheaper than on the market (Csizmady and Hegedüs 2016)
[6] After the GFC, Switzerland was considered a safe haven and a lot of money started to flow into the Swiss economy. The CHF appreciated strongly, and the Swiss economy became less competitive. The Swiss central bank started to buy foreign currencies on a massive scale, which made the CHF cheaper, whereby Swiss products became more competitive on the international market.

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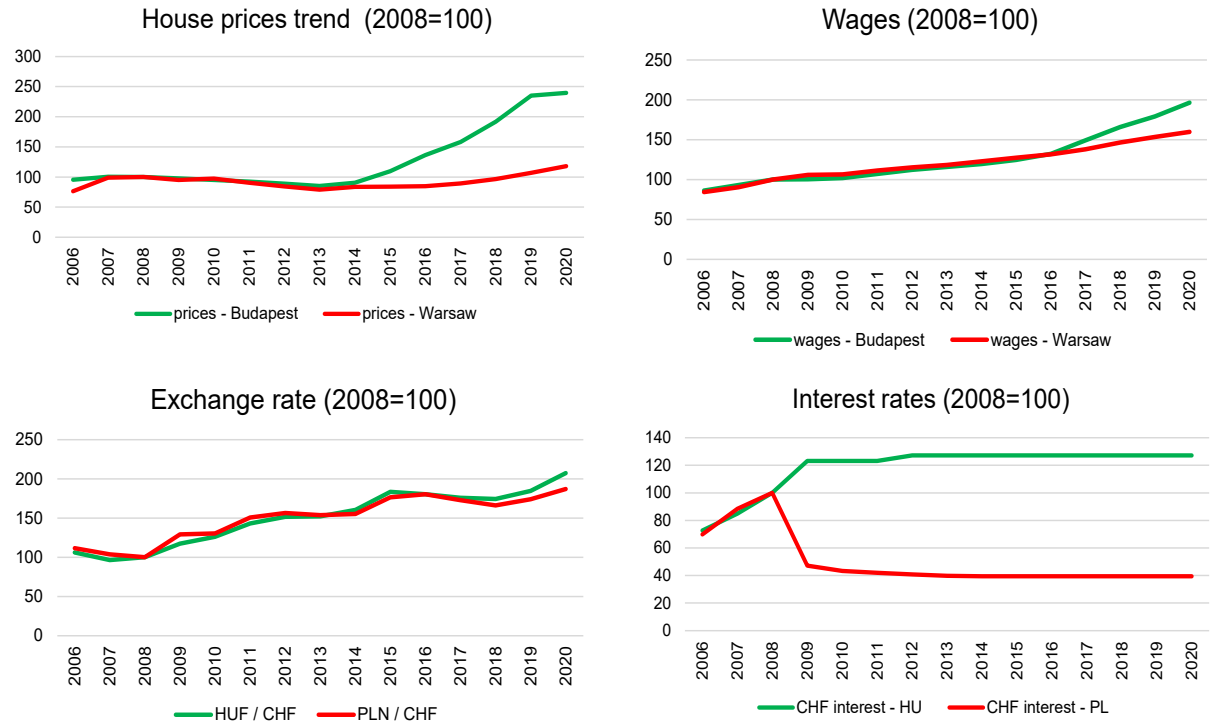
Figure 2: Nominal house prices and wages in Budapest and Warsaw, CHF exchange rates against the local currency, and the interest rate on outstanding CHF mortgages (2008=100)



Source: Authors' elaboration based on MNB, NBP, Statistics Poland, and Statistics Hungary data.

Analysis of the economic gains and losses of mortgage borrowers

We show how the different factors affected monthly mortgage payments and the outstanding mortgage. We assume that people take adjustable-rate mortgages for 25 years and the initial loan to value (LTV) is set at 80%. The monthly mortgage payment consists of the principal payment and the interest payment. We start with the effective interest rates of CHF mortgages and assume that the exchange rate is fixed over time. The evolution of the effective monthly cost of the mortgage (which accounts for both the interest payment and the repayment of the principal) is shown in the left upper panel in Figure 3. Because the Swiss central bank cut the interest rate in 2009, the effective monthly cost of a mortgage dropped slightly in Poland, but in Hungary it remained stable, or sometimes increased. This was the effect of the increased risk premium that banks charged their clients. The bank risk in Poland was low: only around 3% of all mortgages were considered impaired. In Hungary, by contrast, the share of non-performing mortgages was around 3% for HUF mortgages and 7% for CHF mortgages at the beginning of 2010, reaching 8% and 24%, respectively, by the end of 2013. The right-hand panel includes the effect of the deterioration in the exchange rate. The exchange rate shock was reduced in Poland because of the lower interest rates, but not in Hungary.

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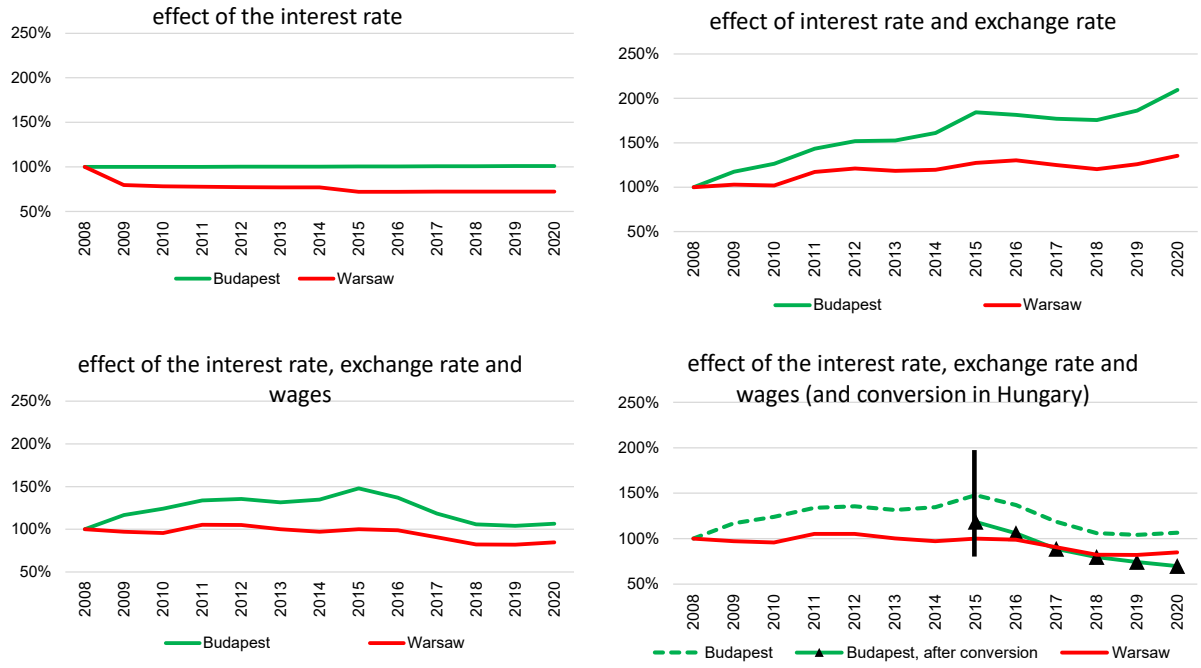
The lower left-hand panel considers the scenario of wage growth, where the perceived cost of the monthly payments is then lower. Finally, in the lower right-hand panel the forced conversion of mortgages in Hungary in February 2015 is considered. The dashed line shows the baseline scenario, while the solid line shows the scenario after the forced conversion. After the conversion, the borrowers paid lower monthly payments and the outstanding debt declined faster than it had done before. Since around 2018, the difference between the current monthly payments and the initial payments in Hungary have reached similar levels as in Poland, where there was no state intervention to ease the problem of FX mortgages.

Figure 3: The current monthly payment of a CHF mortgage in relation to the initial payment (2008=100) in Warsaw and Hungary following changes in different economic factors over time



Source: Authors' elaboration based on MNB, NBP, Statistics Poland, and Statistics Hungary data.

Finally, to show that the situation is more complex, we analyse the simulated economic performance of people who took out a mortgage in the years 2006-2008 in Budapest and Warsaw. First, we analyse, as above, the relation of the current payment on a CHF mortgage to the initial payment, deflated by wage growth. In Figure 4a we observe that after the GFC the monthly payment in Budapest increased in real terms, while it remained stable or even declined in Warsaw. This means that people in Hungary faced a worsening situation, while it remained constant and rather favourable in Poland.

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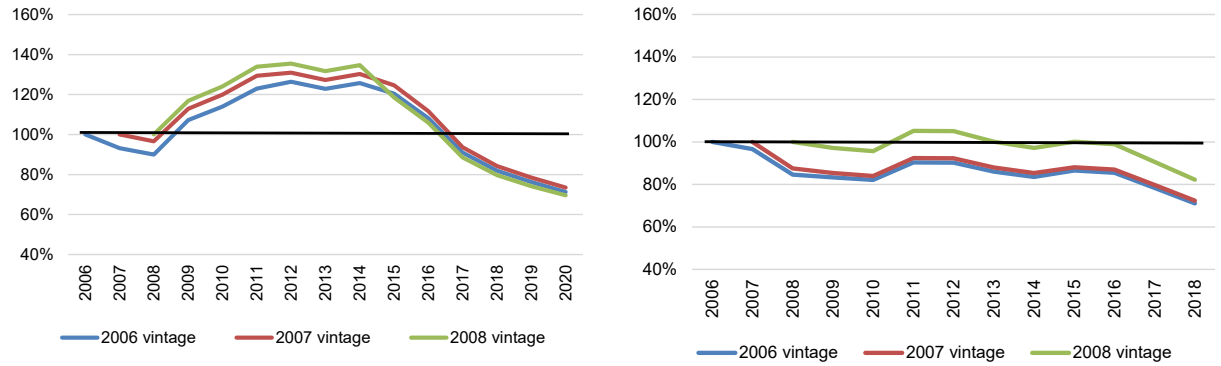
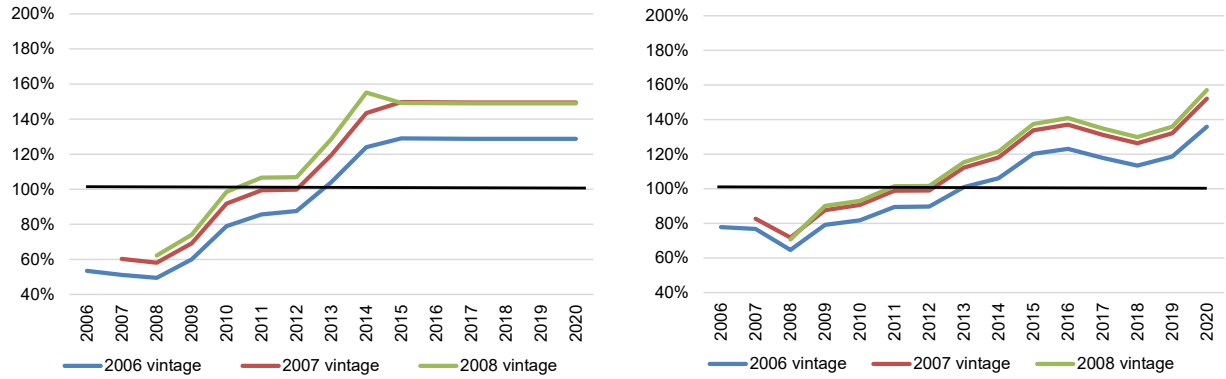
Figure 4a: Comparison of the current payment in relation to the first payment (=100), deflated by wage growth for different mortgage vintages in Hungary (left) and Poland (right)



Source: Authors' elaboration based on MNB, NBP, Statistics Poland, and Statistics Hungary data.

The important question is how people with a CHF mortgage performed in relation to their counterparts who took out a mortgage in the local currency (Figure 4b). We find that in the year the mortgage was taken out and shortly after, the CHF mortgage was less costly than the one in the local currency. This difference is even more pronounced for Budapest, which explains why people took out so many CHF mortgages. However, around 2010 the cost of a CHF mortgage started to exceed that of a local currency mortgage. In the case of Budapest, the forced conversion did not lower the cost (because it was done at current market exchange rates), but at least it did not increase it further.

Figure 4b: Comparison of the monthly mortgage payments of CHF mortgages and the monthly mortgage payments of analogous local currency mortgages for different mortgage vintages in Hungary (left) and Poland (right)



Notice: A value of 100% means that both payments are equal and values above 100% mean that the monthly mortgage payments on CHF mortgages are higher than the payments on HUF mortgages.
Source: Authors' elaboration based on MNB, NBP, Statistics Poland, and Statistics Hungary data.

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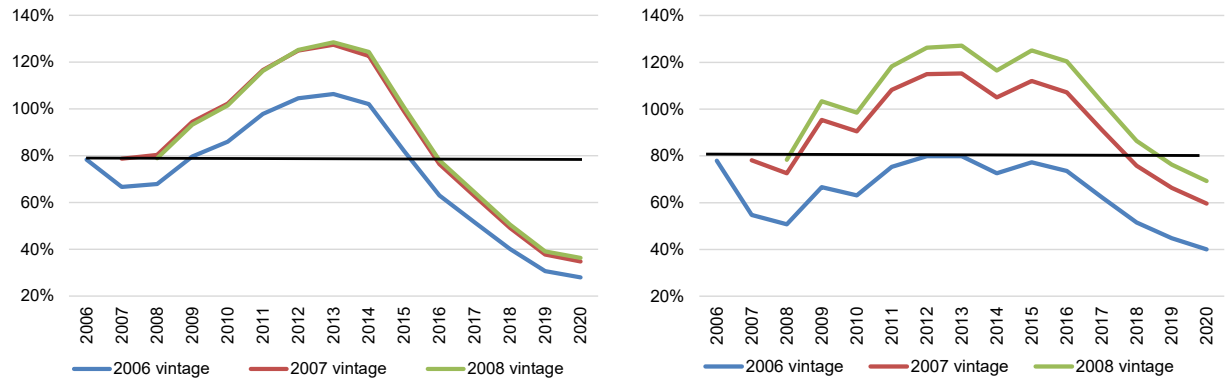
Another important measure is the loan-to-house-value ratio (LTV), shown in Figure 4c. We observe that in Budapest and Warsaw the value of the principal (the amount still owed on the mortgage) sometimes exceeded the value of the property by as much as 20%. This means that the mortgagor would incur a financial loss after selling the property to pay back the mortgage in full. In Budapest, house prices started to rise from around 2015 and LTV decreased significantly. This kind of improvement in the LTV could be observed in Warsaw, too, but it was among those who bought their home during the price boom in 2007 and 2008, and the improvement in LTV occurred as late as 2018.

Figure 4c: Comparison of LTV levels at year end for CHF mortgages for different mortgage vintages in Hungary (left) and Poland (right) (the initial LTV is set at 80%)



Source: Authors' elaboration based on MNB, NBP, Statistics Poland, and Statistics Hungary data.

Finally, we compare the economic gains and losses of taking out a CHF mortgage against a local currency mortgage. We add up the differences in the monthly mortgage payments of the two alternative mortgages and express the result in terms of the monthly wages of 2020. People who took out a mortgage in 2006 in Budapest and Warsaw have so far paid lower instalments than they would have paid for a mortgage in the local currency. However, those who took out a mortgage in 2007 or 2008 bought their homes at high prices and high mortgage margins and made economic losses between 2014 and 2017 in both countries.

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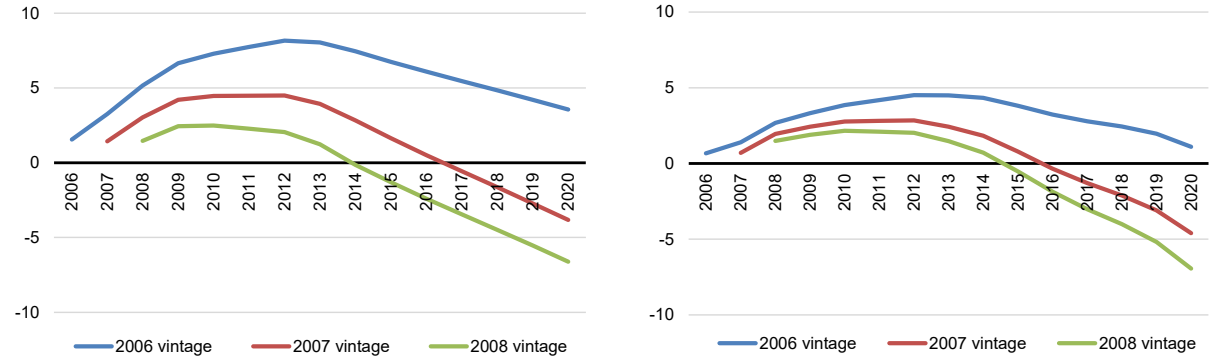
Figure 4d: Comparison of the economic gains of CHF mortgages over local currency mortgages (the sum of the differences in the monthly mortgage payments), expressed in 2020 monthly wages, for different mortgage vintages in Hungary (left) and Poland (right)



Source: Authors' elaboration based on MNB, NBP, Statistics Poland, and Statistics Hungary data.

Conclusion

We analysed the costs of foreign currency mortgages in comparison to analogous local currency mortgages for the 2006-2008 mortgage vintages over the period between 2006 and 2020. We found that for a long time the foreign currency mortgages were cheaper than local currency mortgages, which explains why they were very attractive at times. However, the outbreak of the global financial crisis led to a deterioration of the exchange rate, and both monthly mortgage payments and the amount of the outstanding mortgage increased significantly in comparison to local currency mortgages. We also observed that the gains and losses differ depending on the mortgage vintage, thus each mortgage vintage should be analysed separately. We found that foreign currency mortgages are a risky financial instrument and are not appropriate for people who are unable to hedge against the exchange rate risk.

We point out that in the case of Hungary a massive mistake was made, as banks were able to add their risk premium to the interest rate, which grew over time. This factor made the situation of mortgage borrowers in Hungary after the GFC much worse than in Poland, where banks were not able to affect the interest rate *ex post*. Consequently, the Hungarian government reacted by forcing the banks to convert CHF mortgages in February 2015 into local currency mortgages at the exchange rate of 7 November 2014. Our simulation shows that the losses of the people in Hungary would have been much greater had the government not carried out the forced conversion of CHF mortgages.

In the case of Poland, there was no intervention by the government. It was not until as late as summer 2021 that the European Court of Justice ruled that the foreign currency mortgage contracts in Poland were abusive. Now every mortgage borrower must independently go to a local court, which must decide case by case what to do.

Our research suggests three main conclusions. First, mortgages for private individuals who cannot hedge against FX shocks should only be issued in the currency in which those

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individuals make their earnings. Second, when different mortgage products or policy interventions are analysed, this should be done for different mortgage vintages separately. Finally, mortgage interest rates need to be fixed or tied to a reference rate, which prohibits banks from increasing them during turbulent times.

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