Loan conversions and currency mismatches:

Undoing Swiss franc mortgage loans in Eastern Europe

Andreas M. Fischer[1]

Pınar Yeşin[2]

15 June 2017

Abstract

This paper examines the effect of Swiss franc loan conversion programs on currency risk for banks in Central and Eastern Europe (CEE). Swiss franc mortgage loans proliferated in CEE countries prior to the financial crisis and aggravated economic uncertainty as the Swiss franc strongly appreciated during the post-crisis period. Loan conversion programs benefited households with Swiss franc mortgages by reducing their foreign currency exposure. This paper asks how these programs affected systemic exchange rate risks on banks' balance sheets. The empirical findings suggest that Swiss franc loan conversion programs led to only a small reduction in Swiss franc mismatches but increased the exposure to other foreign currency mismatches. This asymmetric effect of loan conversion programs is due to the restructuring of Swiss franc loans to other foreign currency (euro) loans and the high level of euro mismatches in the CEE banking system. The paper concludes that the net effect of loan conversion programs on currency risk of banks is estimated to be negative in the short run.

Keywords: loan conversion programs, emerging markets, currency mismatch
JEL Classification Number: F15, F21, F32, F36, G15

1. Introduction

When the Swiss National Bank (SNB) discontinued its policy of the minimum exchange rate of 1.2 Swiss francs against the euro on January 15, 2015, hundreds of thousands of holders of Swiss franc mortgages across Central and Eastern Europe (CEE) suddenly found themselves facing loan repayments up to 20% or higher overnight. The sharp appreciation of the Swiss franc added further pain for many unhedged household borrowers whose loan repayments had continuously increased since the financial crisis due to the appreciation of the Swiss franc. Thus the sudden appreciation of the Swiss franc on January 15, 2015 increased the credit risk of bank balance sheets. To undo the burden of local currency shocks and the potential increase in non-performing loans, many CEE countries looked to the Hungarian experience that converted Swiss franc mortgage loans to local currency loans two months prior to the SNB's lifting of the exchange rate floor. Croatia, Cyprus, Montenegro, and Romania followed with similar programs, where households had the choice to convert their Swiss franc mortgage loans to another currency (such as domestic currency or the euro) or to maintain the mortgage loans in Swiss francs.

In this paper, we examine the effect of loan conversion programs on sys-

temic exchange rate risks to bank balance sheets in CEE.[1] Swiss franc mortgage loans proliferated in CEE countries prior to the financial crisis and aggravated economic uncertainty after the Swiss franc strongly appreciated. Loan conversion programs benefited households with Swiss franc mortgages benefited by reducing their foreign currency exposure. However, it is unclear whether the same programs were as effective in reducing systemic exchange rate risks to bank balance sheets. Many CEE banks suffer from dual currency mismatches in euros and in Swiss francs. Because some loan conversion programs converted Swiss franc loans into euro loans rather than into domestic currency loans, the reduction of aggregate systemic risks linked to foreign currency exposure for CEE banks is uncertain.

Undoing Swiss franc denominated mortgage loans in CEE have numerous ramifications for macroeconomic and macro-prudential policy. However, one repeatedly mentioned benefit of loan conversions is to reduce the exposure of CEE banks to systemic exchange rate risks to their balance sheets through local currency depreciations.[2] Ranciere et al. (2010b) and Reinhart et al.

[1]The cost of the conversion was an important element of the public discussion. However, we abstract from this issue in this paper. We also abstract from the effect of loan conversion programs on households' finances or welfare.

[2]The ECB (2015a) has stated on several occasions that foreign currency loans represent a major risk to financial stability in several Member States, where the share of foreign currency loans is relatively high. See also ECB (2015b), where they note that the conversion program is expected to provide relief for distressed foreign currency borrowers.

(2014) state that currency mismatch has been one of the key vulnerabilities leading to crises in emerging economies (i.e., Mexico 1994, East Asian 1997, and CEE in 2008). Large currency mismatches between foreign denominated assets and foreign denominated liabilities suggest that exchange rate risk could contribute to systemic risk in the CEE banking sector.[3] This is particularly the case if borrowers of foreign denominated loans are unable to hedge their exchange rate risk, then a large share of borrowers of foreign currency loans will default after a large devaluation. This increase in the number of non-performing bank loans could dramatically affect the banking system's capital base and have systemic implications for the economy.

There are further ramifications of loan conversion programs, especially those by government decree, from the perspective of international investors. Loan conversion programs tend to impose a large share of the conversion costs on the CEE banking system that are dominated by foreign banks. This in turn could have ramifications for future credit growth if foreign banks decide to leave. A further issue concerns passing laws that intervene in commercial contracts. Such actions might undermine a country's attractiveness for foreign investment and could have a negative effect on a country's international

[3]See, for example, Andrieş and Nistor (2017) regarding bank exposure to currency risk.

credit rating. In this paper, we abstract from these considerations and focus on the impact of loan conversions on the bank balance sheets.

The empirical analysis uses (unbalanced) panel regressions to identify the effect of loan conversion programs on currency mismatch indexes in Swiss francs and in other foreign currencies (which are to a large extent denominated in euros in CEE countries). The currency mismatch measure, which follows Ranciere et al. (2010a) and Yeşin (2013), is the ratio of foreign currency denominated net unhedged liabilities to total bank assets. The main feature of this index is that it adjusts the banks' net foreign currency liabilities by subtracting from the asset side foreign currency loans to households and firms without foreign currency income. The measure takes into account bank exposure of credit risk through sharp depreciations in local currency.[4]

The main empirical findings suggest that Swiss franc loan conversions only marginally reduced the aggregate systemic exchange rate risks to bank balance sheets. First, large reductions in Swiss franc loans did not always result in an improvement in currency mismatches. CEE banks were fairly well

[4]The analysis focuses on balance sheet exposures and mismatches due to the lack of off-balance-sheet data. We abstract from the possibility that banks may be hedging (some of their) currency mismatches on their balance sheets via off-balance-sheet transactions. On the other hand, hedging has become significantly more expensive since the financial crisis following the failure of the covered interest parity condition (see Avdjiev et al., 2017). Therefore, it is plausible to assume that not all on-balance-sheet mismatches have been hedged.

positioned against large currency movements in Swiss francs. Second, loan conversions restructured household mortgages from Swiss francs to euros. Such conversions meant that the level of euro mismatches increased for CEE banks.

The new empirical findings on the effects of loan conversions for currency mismatches contribute to three strands of the post-financial crisis literature for emerging markets. The first area concerns the recent literature on foreign currency loans in Eastern Europe, see Brown and de Hass (2012), Brown et al. (2011), Fidrmuc et al (2013), and Temesvary (2016).[5] This literature has primarily focused on identifying motives and risks behind the buildup of foreign currency loans both on the part of households and banks. Our analysis adds a new dimension to the credit growth narrative in Eastern Europe in that it concentrates on the rapid undoing of foreign currency loans and their effects on bank balance sheet risks linked to foreign currency exposure.

Our empirical results on loan conversion programs also contribute to the literature on international shocks and their transmission effects on emerging market countries. This literature has primarily focused on the international

[5]A part of this literature on foreign denominated loans has focused solely on developments in Swiss franc denominated loans. See for example Andries et al. (2017), Auer et al. (2012), Beer et al. (2010), and Yeşin (2013).

transmission of monetary policy shocks from the largest economies. Banerjee et al. (2016), Bernanke (2015), Canova (2005), Di Giovanni and Shambaugh (2008), Georgiadis (2016), and Miniane and Rogers (2007) consider the transmission of U.S. shocks. These studies emphasize the nature of the exchange rate regime, the level of trade integration, or financial integration are important factors in explaining the transmission of the monetary policy shock. On the other hand, Qureshi et al. (2011) examine the effectiveness of policy responses in terms of macroprudential policies and capital controls in mitigating financial stability risks associated with spillovers. We add to this international spillover literature by examining policy responses of loan conversions to international monetary policy shocks from a small open economy (i.e., SNB's decision to lift the minimum exchange rate policy) with a high level of financial integration (i.e., Swiss franc mortgage loans).

The analysis of loan conversions also contributes to the de-dollarization literature. In a low inflation environment, it is commonly viewed that dollarization impedes the transmission of monetary policy. Luca and Petrova (2007) and Acosta-Ormaechea and Coble (2011) argue that deepening domestic financial markets or setting macro-prudential measures support the de-dollarization process. Additional reform measures, such as restrictions on

foreign currency lending, have been introduced in various countries to accelerate the de-dollarization process. At the same time, Catão and Terrones (2016), De Nicolò et al. (2005), and Rennhack and Nozaki (2006) hold the view that de-dollarization requires restoring the functioning of, and trust in, the national currency as unit for saving and intermediation. However, dollarization has often proven to be highly persistent even when macro-economic stability has been achieved.[6] We add to these case studies, by considering the effect of a specific instrument (i.e., loan conversions) designed to rapidly undo mortgage loans denominated in Swiss francs in countries that also suffer from a high level of euroization.

The paper is organized as follows. Section 2 discusses the loan conversion programs within the context of foreign currency lending in CEE. Section 3 presents the mismatch index of Ranciere et al. (2010b). Section 4 discusses the empirical framework. Section 5 presents the empirical results that compares the relative behavior of currency mismatch indexes in Swiss francs and other currencies. Section 6 concludes.

2. Recent experiences with Swiss conversions loan conversions

[6]See the discussion in Ize and Levy-Yeyati (2003), Reinhart et al. (2014), and Galindo and Leiderman (2005).

This section highlights the main features of loan conversion programs intended to reduce Swiss franc exposure for household mortgage borrowers and bank lenders in Hungary, Croatia, and Romania. The next subsection highlights the main motives for introducing loan conversion programs. This is followed by a second subsection that addresses country specific features of loan conversion programs.

2.1 Core issues behind loan conversion programs

Swiss franc loan conversions were considered a policy option after a series of financial and macro-prudential measures had been introduced to stem the demand for foreign-currency denominated loans in various Eastern European countries. These measures included restrictions on the ability of households and small firms to receive new loans denominated in foreign currency, tighter lending requirements on the part of banks, and higher capital requirements for banks for existing loans.[7] The SNB's lifting of the minimum exchange rate policy revealed, despite previous measures, households and banks remained exposed to currency risk. Figure 1 shows that the Swiss franc appreciation in January 2015 affected CEE countries strongly, yet exchange rates between the local currency and the Swiss franc depreciated more over

[7]Fischer and Yeşin (2016) provide a descriptive overview of these macro-prudential developments.

time in countries that undertook loan conversions (i.e., Hungary, Croatia, and Romania) than in the remaining CEE countries that did not introduce loan conversion programs (i.e., Austria, Bulgaria, Czech Republic, Estonia, Serbia, and Slovenia). Further, the timing of the conversions was also facilitated by low domestic and international interest rates. The reduced spread between domestic and Swiss interest rates, shown in Figure 2, eliminated the attractiveness of foreign currency loans.

The rapid buildup of Swiss franc mortgage loans in CEE in the pre-financial crisis period was followed by a steady decline in loan volumes in the post-crisis period. Figures 3 and 4 show loan volumes in Swiss francs in countries with loan conversion programs and those without loan conversion programs. A notable difference between the two figures is that the Swiss franc loan volumes are larger in countries with loan conversion programs.[8] A further difference is the sharp decline in loan volumes in the loan conversion countries at the end of the sample. The 77.2% reduction in the Swiss franc loan volume in Hungary between 2014:Q4 and 2015:Q1 matches well with the

[8]Poland, which has the largest outstanding volume of Swiss franc denominated mortgage loans, has committed itself to a private sector conversion program in August 2016. Details of the program and its time line are still to be determined. The Polish case along with the smaller conversions in Cyprus and Montenegro are not considered in this study due to the lack of data.

timing in the conversion program. The timing of the declines in the Croatian (i.e., 1.5% after 2015:Q3 and 16.2% after 2015:Q4) and in the Romanian (i.e., 21.4% after 2015:Q2, followed by 16.9% after 2015:Q3) loan volumes with their respective loan conversion programs is also large but less acute as in the Hungarian case.

Two types of loan conversions for Swiss francs have been introduced in Eastern Europe. Government sponsored loan conversions (i.e., Hungary and Croatia) and private-sector conversions (i.e., Romania). The two programs differ considerably in the cost sharing between lenders and lendees and in the timing of the program's execution. First, government sponsored conversion programs were backed by legal mandates that dictated the terms for all participants nationwide, whereas the private-sector conversion programs did not operate under any legal decree. The conditions of government-sponsored loan conversions were transparent and publicly communicated. Borrowers had the choice to exercise the conversion option (i.e., convert the loan to a new currency or to remain with the existing Swiss franc denominated loan), but banks had to no choice.

The private-sector loan conversion on the other hand was voluntary and allowed banks to dictate the terms and conditions for individual borrowers.

The bank specific conditions were not made public. This difference in legal decree and information also has implications for the level of cost sharing between banks and borrowers. The costs are believed to be higher for banks under government sponsored conversion programs than under private-sector programs. Fears that banks would have to bear high costs and financial stability concerns meant that central banks tended to favor private-sector conversion programs over government-sector conversion programs.[9]

Timing is a second difference between the two conversion programs. The government-sponsored conversion programs require all banks to participate at the same time. The private-sector conversion programs instead impose no predefined timetable. This difference in timing means that the faster adjustment process under the government sponsored conversion program requires greater coordination. It also imposes greater macroeconomic uncertainty in that the central bank needs to furnish necessary foreign reserves before the conversion. Under a private-sector loan conversion program these adjustment costs are spread over time.

[9]Central banks also argued that foreign banks would leave if the level of cost burden was too high for them. They also warned that passing laws that intervene in commercial contracts might impact a countrys attractiveness for foreign investment and have a negative effect on the countrys risk indicators and credit rating. International credit ratings however did not decline in countries when the loan conversion programs were introduced.

2.2 Country specific features of loan conversion programs

The Hungarian loan conversion from Swiss franc mortgage loans to forint mortgage loans was prepared in November 2014 and was implemented in February 2015. The conversion affected about 1.3 million households, see ECB (2015c). The exchange rate for the conversion was fixed on November 7, 2014. In light of the SNB actions on January 15, 2015, the timing of the Hungarian conversion was regarded to be fortunate for mortgage holders. The volume of Swiss franc denominated loans in Hungary declined sharply from CHF 14.8 billion in 2014:Q4 to CHF 3.8 billion in 2015:Q1 after the conversion.

The Hungarian conversion led to a few changes in the structure of the banking sector's balance sheet. First, the so-called dollarization, or in this case Swiss francization, i.e., the prevalence of Swiss franc assets in the banking sectors balance sheet, decreased significantly in Hungary. The share of Swiss franc assets to total assets declined from 13% in 2014:Q4 to 3.9% in 2015:Q1. Similarly, the share of Swiss franc liabilities to total assets declined from 6% in 2014:Q4 down to 3% in 2015:Q1. A second feature is that the reliance on wholesale funding to refinance Swiss franc loans decreased significantly after the loan conversion.

The Croatian law on the conversion program does not exactly follow the Hungarian conversion program. The Croatian program facilitates the conversion of loans denominated in Swiss francs into loans denominated in euros or in Croatian Kuna that contain a currency clause linking payments to euros, see ECB (2015a). The law, which came into effect on September 30, 2015, places borrowers of Swiss franc loans in the same position that they would have been in had their loans, from inception, been denominated in euros (or denominated in Kuna with currency clauses linking payments to euros). This means the original principal amount of the Swiss franc loans is converted to euros (or loans denominated in Kuna which contain a currency clause linking payments to euros) at the exchange rate applicable at the date the Swiss franc loans were made to the borrowers. This exchange rate is equal to the exchange rate that the lender applied at that date to loans denominated in or linked to euros of the same type and duration. Within 45 days from the date the draft law enters into force, lenders are required to deliver by registered mail to borrowers the calculation of the loans so converted, together with a proposal for a new/modified loan agreement. Borrowers have the option to accept the conversion within 30 days of receipt of such notification. About 40% of mortgages in Croatia are denominated in Swiss francs, affecting about

55,000 households.

When introducing measures in relation to settling and converting foreign currency loans, the ECB (2015ab) has expressed the opinion that consideration should always be given to fair burden sharing among all stakeholders, thus also avoiding moral hazard in the future. The Croatian law is retroactive and shifts the costs from households to banks. This, in turn, may also have a negative impact on the profitability, capitalization, and the future lending capacity of the affected credit institutions. The ECB's (2015a) assessment suggests that the conversion costs for banks could reach around HRK 8bn or EUR 1.1 bn, imposing losses for the banking sector equaling to around three years of expected profits. The Hungarian conversion program differs from the Croatian program in that a one-time non-market exchange rate is applied. As such it may be argued that the Hungarian program is more neutral in that households and banks share the costs.

Romania's largest banks offered loan conversion proposals to their clients in a non uniform manner in 2015. For example, Banca Transilvania offered 11'000 households to convert their Swiss franc loans into euro or lei in May 2015. Volksbank Romania followed in July 2015 and offered 17'000 households to convert their loans in euro or lei. Next, Bancopost offered interest

rates of 1.5% for three years in lei in September 2015. Last, Bank Romania offered 10'500 households to convert their loans in euro or lei in December 2015. It is unclear how many households restructured their loans and in what currency. The fact that the Romanian parliament has recently introduced a new law to convert Swiss franc denominated loans in October 2016 suggests that the conversion of private sector initiative was incomplete.

3. Foreign currency mismatch indexes

The approach to calculate a measure of systemic exchange rate risk for the banking sector in CEE economies follows Ranciere et al. (2010). This systemic risk measure calculates the net unhedged foreign currency liabilities as a percentage of total assets. In other words, the index of the "exchange-rate-induced credit risk" evaluates the currency mismatch on the balance sheets of CEE banking sectors in the case of the failure of households (and nonfinancial corporations) to service their foreign currency loans resulting from a sharp depreciation of the local currency.[10]

In the existing literature, currency mismatch in a banking sector is usually measured as the net foreign currency liabilities (i.e., the difference between

[10]The literature focuses on balance sheet exposures because off-balance-sheet information is generally not available for banking systems as a whole.

foreign currency liabilities and foreign currency assets) as a share of the total assets of the banking sector. However, banks usually match their foreign currency assets and foreign currency liabilities so that their difference would be almost (or sometimes by regulation identical to) zero. Furthermore, this simple measure treats all foreign currency assets equally without considering the risks associated with foreign currency loans given to unhedged borrowers.

Ranciere et al. (2010) calculate the net foreign currency liabilities as a share of total assets, but exclude the "risky" foreign currency assets from the foreign currency assets. The foreign currency mismatch (FCM) index in the banking sector is thus equal to net foreign-currency-denominated liabilities plus unhedged foreign currency assets (i.e., loans) divided by total assets:

$$FCM = \frac{(FCY^{\text{liabilities}} - FCY^{\text{assets}} + FCY^{\text{loans to resident households}})}{\text{total bank assets}},$$

where FCY denotes foreign currency. The mismatch indexes should be treated as an upper bound for the systemic risk because they assume that domestic households are unable to service their foreign currency debt in crisis times.[11]

[11] Our definition of the foreign currency mismatch index treats other unhedged loans to non financial firms as being non risky. This assumption does not alter the degree of Swiss franc mismatch, because Swiss franc loans are primarily mortgage loans. This is not the

Data used to construct the foreign currency mismatch index are from the CHF Lending Monitor, which is an ongoing SNB project in collaboration with nineteen European central banks to understand the scope of Swiss franc lending in Europe.[12] The CHF Lending Monitor data are quarterly and start as early as 2006 for some countries. From 2009 onwards the country coverage is complete. The data consist of aggregate banking sector statistics on both the asset and the liability side. More importantly, a currency breakdown between domestic currency, Swiss franc, and other foreign currency is available for all variables in the database. Statistics on loans, other assets, total assets; deposits, own securities issued, other liabilities, and total liabilities are included in the database. Furthermore, a sectoral breakdown of loan and deposit data is available for the following categories: resident banks, resident households, resident nonfinancial corporations, resident government, nonresident banks, and nonresident non-banks. The data template filled out by central banks is shown in the appendix.

With this detailed breakdown, the FCM index is calculated separately for the Swiss franc and "other foreign currencies", which is believed to be mostly euros in CEE countries. The FCM index captures solely how the banking

case for "other currency" mismatches.

[12]The data are confidential and have not been published until now.

sector's assets and liabilities would be affected by future exchange rate developments when unhedged borrowers can no longer service their foreign currency debt. This means the index measures the aggregate risk exposure of the banking sector to a common market shock, e.g., the simultaneous default of unhedged borrowers after a sharp exchange rate movement.

The FCM index is silent on several issues. For example, the index offers a macroeconomic perspective and cannot distinguish among banks with different characteristics such as different currency structures and borrower profiles on their balance sheets or off-balance sheet positions. Furthermore, contagion by way of the interbank market or information spillovers among banks cannot be captured by this index. The index merely focuses on risks that pertain to the banking sector and cannot say anything about the household's wealth or nonfinancial corporations' profitability. And last, the index cannot capture potential conversion costs (i.e., future profitability, off balance sheet risks, non performing loans, or maturity mismatches) that may be passed on to banks, for example, through non-market exchange rates. With these constraints, the index is used to assess the evolution of the aggregate risk exposure of the banking system in the CEE region to conversion loan programs.

Figure 5 shows the aggregate Swiss franc and the "other currency" mismatch indexes (weighted by currency loan volume) for three CEE countries with a Swiss franc loan conversion program (i.e., solid lines for Croatia, Hungary, and Romania) versus the six CEE countries without a loan conversion program (i.e., dotted lines for Austria, Bulgaria, Czech Republic, Estonia, Serbia, Slovenia). The figure shows that the level of aggregate Swiss franc mismatch for CEE countries with loan conversion programs is low (i.e., below 3% of total loans) throughout the quarterly sample from 2010 to 2016. The index's decline at the beginning of 2015 is primarily driven by the Hungarian conversion program and coincides with the SNB's lifting of minimum exchange rate policy. The aggregate index for the Swiss franc mismatches for the CEE countries without a loan conversion program is close to zero and rises slightly after the SNB's lifting of the minimum exchange rate policy.

The profile of the "other currency" mismatch indexes, shown in Figure 6, differs from the Swiss franc mismatch indexes in several respects. First, the "other currency" mismatch index is always higher than the corresponding Swiss franc mismatch index. Second, the dynamics of the "other currency" mismatch indexes do not move in parallel with the Swiss franc indexes. The "other currency" mismatch index declined in the first two years and was

relatively flat thereafter. The rapid undoing of Swiss franc loans through loan conversion programs does not appear to influence the aggregate "other currency" mismatch index.

Table 1 offers country-level statistics for the two FCM indexes. In each case, except for Slovenia, the mean of the Swiss franc mismatch index is lower than the mean of the "other currency" mismatch index. This suggests that currency risk (mostly likely) in euros was a problem for banks prior to the loan conversions. Further, high Swiss franc mismatches coincide with high "other currency" mismatches in Croatia and Romania. This suggests that the banking system for these two countries may suffer from dual mismatches.

4. Econometric specification

The effect of loan conversion programs on foreign currency mismatch indexes is estimated with the following specification:

$$\Delta FCM_{jit} = \beta LCP_{it} + \beta^* OC_j LCP_{it} + \delta OC_j + \gamma X_{it} + \gamma^* OC_j X_{it} + \varepsilon_{jit}, \quad (1)$$

where ΔFCM_{jit} is the change in the foreign currency mismatch index for currency, j (i.e., Swiss franc or "other currency"), country, i, and time, t.[13] Two

[13]The nine CEE countries are Austria, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Serbia, Slovenia, and Romania. The alternative specification in levels with fixed effects generates similar results. The first-difference specification is preferred because of the well known phenomena of high persistence during de-dollarization phases.

effects of Swiss franc loan conversion programs, $LCP_{it} = \{LCP_{it}^{f}, LCP_{it}^{s}\}$, are considered for country, i, and time, t. The dummy variable, LCP_{it}^{f}, captures the immediate effect of the loan conversion program and is defined: +1 for the quarter when the loan conversion program was first active in country, i, and otherwise zero. The assumption is that conversion is completed within one quarter. The second dummy variable, LCP_{it}^{s} captures the medium-term (persistent) effect of the conversion program and is defined: +1 for periods when the loan conversion program was first active in country, i, to the end of the sample and otherwise zero. The assumption is that the conversion process is slow and persistent (i.e., lasting at least several quarters). We consider three conversion programs with the following start dates: Hungary +1 for 2014:Q4, Croatia +1 for 2015:Q3, and Romania +1 for 2015:Q2. Because the variable LCP_{it} is stacked at the country level, β represents the joint effect of Swiss franc conversion programs on Swiss franc and "other currency" mismatch indexes. The "other currency" dummy variable, OC_j, is + 1 when j = other currency and 0 when j = Swiss franc. It is interacted with the loan conversion dummy, LCP_{it}, to filter out the effect for "other currency" mismatch. Next, X_{it} are control variables for country, i. The control variables are also interacted with OC_i to separate their effects for the individual

currency mismatches. The control variables are the change in (ln) currency cross rates (i.e., euro-local currency and the Swiss franc-local currency) and two measures of risk (i.e., VIX and CDS spreads).[14] The residual to FCM index j for country i at time t is denoted by ε_{jit}.

The empirical analysis seeks to uncover separate effects of Swiss franc loan conversion programs on the Swiss franc and the "other currency" mismatch indexes. A key assumption is that CEE banks suffer from dual currency mismatches. Two hypotheses are considered. First, loan conversion programs reduce currency mismatches for the Swiss franc index, i.e. $\beta < 0$. Second, loan conversion programs increase currency mismatches for the "other currency' index, i.e., $\beta + \beta^* > 0$. In this second hypothesis, there are two effects. First, loan conversion programs that convert Swiss franc mortgage loans into euro mortgage loans (i.e., Croatia and partially Romania) lead to a deterioration in the "other currency" mismatch index, i.e., $\beta + \beta^* > 0$. For the conversion program from Swiss francs to local currency (i.e., Hungary and partially Romania), the prior is $\beta^* = 0$. In other words, the combined effect of the two types of conversion programs should lead to a deterioration in the

[14]The Appendix offers a short description and sources of the control variables in equation (1).

"other currency" mismatch index. Unclear is which effect dominates: the reduction in the CHF mismatch index or the increase in the "other currency" mismatch index.

Equation (1) is estimated for an unbalanced panel. The earliest quarterly observation is 2006:Q4 and the last observation is 2016:Q3. The sample for the individual countries is dependent on available information for the currency mismatch indexes. The sample sizes are given in Table 1.

5. Estimation results

This section presents estimation results based on equation (1). The next sub-section presents the baseline results. Robustness checks are presented in a second sub-section. All standard errors are clustered by country.

The empirical results support three findings. First, conversion programs resulted in an immediate and a persistent (slow) reduction in the CHF mismatch index. Second, the conversion programs resulted in an immediate increase in the "other currency" mismatch index. This evidence suggests that the choice of the conversion currency is important if currency conversion programs are intended to reduce the aggregate currency mismatches for banks. Third, the immediate effect of the conversion programs tends to

increase the "other currency" mismatch index more than reduce the CHF mismatch index. This suggests that the aggregate systemic exchange rate risk (i.e., CHF and "other currency" mismatches) increases immediately at the time of the conversion. The level of aggregate risk, however, diminishes slowly overtime.

5.1 Baseline results

Table 2 presents baseline regressions that show the effect of conversion programs on two currency mismatch indexes. The first column documents the immediate effect of the loan conversion programs on currency mismatch indexes for a sample of nine CEE countries. The immediate effect of the loan conversion programs is a reduction of 1.4 percentage points in the CHF mismatch index. Column 1 in Table 2 also shows the immediate effect of the loan conversion programs on the "other currency" mismatch index. The coefficient is 2.9 and highly statistically significant. This positive effect suggests that loan conversion programs increased the "other currency" mismatch indexes by 1.5 percentage points. Because most countries are more exposed to euros, the larger deterioration in the "other currency" mismatch index versus the improvement in the Swiss franc mismatch suggests that the conversion increased the aggregate systemic risk in exchange rates for CEE banks.

Column 2 in Table 2 presents the same regression as in column 1, but now considers the persistent effect of the conversion programs. This effect is captured through the dummy variable +1 for the period from when the conversion program was first introduced to the end of the sample. The effect of the conversion programs generated a persistent reduction in the CHF currency mismatch of -0.3 percentage points each quarter. The effect of the conversion programs on the "other currency" mismatch indexes is 0.0 percentage points and statistically insignificant. These results suggest that the effect of the conversion process for the CHF mismatch index was not fully captured in the first quarter, whereas this was the case for the "other currency" mismatch index.

Columns 3 and 4 repeat the regressions of columns 1 and 2 for larger samples that include five European countries with a considerable share of Swiss franc loans (the United Kingdom, Germany, Greece, Italy, and Luxembourg). The regression results with the expanded sample are consistent with those with the strictly CEE sample shown in columns 1 and 2. The baseline results do not appear to be sample sensitive.[15]

[15]In the next section on robustness checks, the sample is restricted to the CEE countries due to space considerations. All regressions with the expanded sample do not deviate from the presented regressions.

5.2 Robustness checks

To determine the robustness of the empirical findings of the previous subsection, several control variables are added to the baseline regressions presented in Table 2. The control variables include exchange rates, measures of non performing loans, market volatility captured by the VIX, the degree of banking regulation (see Cerutti et al. 2017), and several financial variables. The addition of control variables does not alter the main findings and are found to have little or no explanatory power for changes in the currency mismatch indexes.

Table 3 presents regressions that include the exchange rates between the local currency and the Swiss franc and the euro.[16] The cross rates are the change of the (ln) exchange rates. The two exchange rates are considered separately and jointly, yielding three separate regressions. Columns 1 to 3 present regressions with the conversion dummy, LCP_t^f, that captures the immediate effect, whereas columns 4 to 6 present regressions with the conversion dummy, LCP_t^s, that captures the persistent effect. The evidence from these regressions suggests that the change in the (ln) exchange rates do

[16] As in Bonadio et al. (2016) and Efing et al. (2016), we also controlled for the sharp Swiss franc appreciation after the discontinuation of the exchange rate floor with a January 2015 dummy. This did not change the results.

not explain movements in the currency mismatch indexes. The coefficients of the conversion dummies are nearly identical to those in Table 2 and do not change the narrative effect of conversion loan programs.

Next, Table 4 presents regressions that control for VIX volatility (VIX_t), the level of macro-prudential (MPI_{it}), and the level of non performing loans in country i (NPL_{it}). Again columns 1 to 3 present regressions with the conversion dummy, LCP_t^f, that captures the immediate effect, whereas columns 4 to 6 present regressions with the conversion dummy, LCP_t^s, that captures the persistent effect. The regressions with the addition of the new controls show that the baseline coefficients for the conversion dummies remain stable.

Several financial variables are considered as a final set of controls. Table 5 presents regressions that control for interest rate spreads between domestic and Swiss lending rates, the five-year CDS spread, and the change in (ln) bank stock prices. As in the previous Tables, columns 1 to 3 present regressions with the conversion dummy, LCP_t^f, that captures the immediate effect, whereas columns 4 to 6 present regressions with the conversion dummy, LCP_t^s, that captures the persistent effect. Each of these regressions show that the baseline coefficients of the conversion dummies remains stable.

6. Conclusions

The paper is the first to consider the effect of foreign currency loan conversion programs on systemic exchange rate risks to bank balance sheets. The empirical findings for CEE countries show that loan conversion programs led only to a small immediate and persistent reduction in Swiss franc mismatches but increased the immediate exposure for "other currency" mismatches. This later result is explained by the fact that CEE banks were better hedged against Swiss franc exposure than against euro exposure. The empirical results suggest that Swiss franc loan conversions into euro (rather than domestic currency) are only able to marginally reduce aggregate systemic exchange rate risks to bank balance sheets. Euro mismatches remain a considerable risk to financial stability for many CEE countries.

References

Acosta-Ormaechea, S. and Coble, D.O. (2011) "Monetary Transmission in Dollarized and Non-Dollarized Economies; The Cases of Chile, New Zealand, Peru and Uruguay", IMF Working Paper No.11/87, International Monetary Fund.

Andrieş, A., Fischer, A. M. and Yeşin, P. (2017) "The asymmetric impact of international swap lines on banks in emerging markets", *Journal of Banking and Finance*, 75(C), 215-234.

Andrieş, A. and Nistor, S. (2017) "Systemic risk and foreign currency positions of banks: Evidence from Emerging Europe", mimeo, Alexandru Ioan Cuza University of Iasi.

Auer, R. A., Kraenzlin, S. and Liebeg, D. (2012) "How do Austrian banks fund their Swiss franc exposure?", OENB Financial Stability Report 24 (December), 54-61.

Avdjiyev, S., Wenxin, D., Koch, C. and Shin, H.S. (2016) "The dollar, bank leverage and the deviation from covered interest parity", BIS Working Papers, No 592, Bank for International Settlements.

Banerjee, R., Devereaux, M.B. and Lombardo, G. (2016) "Self-oriented monetary policy, global financial markets and excess volatility of international capital flows", *Journal of International Money and Finance*, 68, 275-297.

Beer, C., Ongena, S. and Peter, M. (2010) "Borrowing in foreign currency: Austrian households as carry traders", *Journal of Banking and Finance*, 34(9), 2198-2211,

Bernanke, B.S. (2015) "Federal Reserve policy in an international context", Mundell-Fleming Lecture at the 16th Jacques Polak Annual Research Conference, November 2015, International Monetary Fund, Washington, D.C.

Bonadio, B., Fischer, A.M., and Saure, P. (2016) "The speed of exchange rate pass-through", Globalization and Monetary Policy Institute, Working Paper No. 282, Federal Reserve Bank of Dallas.

Brown, M., Ongena, S. and Yeşin, P. (2014) "Information asymmetry and foreign currency borrowing by small firms", *Comparative Economic Stud-*

ies, 56(1), 110-131.

Brown, M. and De Haas, R. (2012) "Foreign banks and foreign currency lending in emerging Europe", *Economic Policy*, 27(69), 57-98.

Brown, M., Ongena, S. and Yeşin, P. (2011) "Foreign currency borrowing by small firms in the transition economies", *Journal of Financial Intermediation*, 20(3), 285-302.

Canova, F. (2005) "The transmission of US shocks to Latin America, *Journal of Applied Econometrics*, 20(2), 229-251.

Catão, L. and Terrones, M. (2016) "Financial De-Dollarization; A Global Perspective and the Peruvian Experience", IMF Working Paper, No. 16/97, International Monetary Fund.

Cerutti, E. M., Claessens, S. and Laeven, L. (2017) "The use and effectiveness of macroprudential policies: New evidence", *Journal of Financial Stability*, 28, 203-224.

Cerutti, E. M., Correa, R., Fiorentino, E. and Segalla, E. (2016) "Changes in prudential policy instruments: A new cross-country database", IMF Working Papers, No. 16/110, International Monetary Fund.

De Nicolò G. and Lucchetta, M. (2009) "Financial intermediation, competition, and risk: a general equilibrium exposition", IMF Working Paper, No. 09/105, International Monetary Fund.

Di Giovanni, J. and Shambaugh, J. C. (2008) "The impact of foreign interest rates on the economy: The role of the exchange rate regime, *Journal of International Economics*, 74, 2, pp. 341-361.

European Central Bank (2015a) Opinion on the conversion of Swiss franc loans (CON/2015/32), Croatia, 18.9.2015.

Efing, M., Fahlenbach, R., and Herpfer, C., (2016) "How do investors and firms react to an unexpected currency appreciation shock?", Swiss Finance Research Paper No. 15-65.

European Central Bank (2015b) Opinion on a draft law on specific terms of restructuring of home loans denominated in foreign currency (CON/2015/26), Poland.

European Central Bank (2015c) Opinion on the conversion of foreign exchange loans (CON/2014/87), Hungary, 16.12.2014.

Fidrmuc, J., Hake, M. and Stix, H. (2013) "Households foreign currency borrowing in Central and Eastern Europe", *Journal of Banking and Finance*, 37, 1880-1897.

Fischer, A.M. and Yeşin, P. (2016) "Undoing CHF Mortgage Loans in Post-Crisis Eastern Europe", mimeo, Swiss National Bank.

Galindo, A. and Leiderman, L. (2005) "Living with Dollarization and the Route to Dedollarization". Inter-American Development Bank, Working Paper No 526.

Georgiadis, G. (2016) "Determinants of global spillovers from US monetary policy", *Journal of International Money and Finance*, 67(C), 41-61.

Ize, A. and Levy-Yeyati, E.L. (2003) "Financial dollarization", *Journal of International Economics*, 59(2), 323-347.

Luca, A. and Petrova, I. (2008) "What drives credit dollarization in transition economies?", *Journal of Banking and Finance*, 32, 858-69.

Miniane, J. and Rogers, J. (2007) "Capital controls and the international transmission of U. S. money shocks", *Journal of Money, Credit and Banking*, 39(5), 1003-1035.

Qureshi, M.S., Ostry, J.D., Ghosh, A.R. and Chamon, M. (2011) "Managing Capital Inflows: The Role of Capital Controls and Prudential Policies", NBER Working Paper, No. 17363, National Bureau of Economic Research.

Ranciere, R., Tornell, A. and Vamvakidis, A. (2010a) "Currency mismatch, systemic risk and growth in Emerging Europe", *Economic Policy*, 25(64), 597-658.

Ranciere, R., Tornell, A. and Vamvakidis, A. (2010b) "A new index of currency mismatch and systemic risk", IMF Working Paper, No. 10/263, International Monetary Fund.

Reinhart, C.M., Rogoff, K.S. and Savastano, M.A. (2014) "Addicted to Dollars", *Annuals of Economics and Finance*, 15(1), 1-51.

Rennhack, R. and Nozaki, M. (2006) "Financial Dollarization in Latin America", IMF Working Paper, No. 06/7, International Monetary Fund.

Temesvary, J. (2016) "The Drivers of foreign currency-based banking in Central and Eastern Europe", *Economics of Transition*, 24(2), 233-257.

Yeşin, P. (2013) "Foreign currency loans and systemic risk in Europe", Federal Reserve Bank of St. Louis Review, May/June 2013, 95(3), 219-35.

Appendix A: List of variables

LCP_{it}^{f} is a dummy variable for loan conversion programs
Hungary + 1 beginning 2015:Q1; otherwise zero.
Romania + 1 beginning 2015:Q2; otherwise zero.
Croatia + 1 beginning 2015:Q4; otherwise zero.
LCP_{it}^{p} is a dummy variable for loan conversion programs
Hungary + 1 beginning 2015:Q1 to end of sample; otherwise zero.
Romania + 1 beginning 2015:Q2 to end of sample; otherwise zero.
Croatia + 1 beginning 2015:Q4 to end of sample; otherwise zero.
OC_j is a dummy variable interacted with loan conversion dummies if the dependent variable is FCM_{jit} for j = other currency mismatch.

Control variables
$LCUCHF_{it}$: exchange rate local currency per 1 CHF.
$LCUEUR_{it}$: exchange rate local currency per 1 EUR.
MPI_{it}: Macroprudential index constucted from IMF survey Global Macroprudential Policy Instruments (GMPI) and used in Cerutti et al (2016). Since the data only covers 2000 – 2013, the index is held constant for the rest of the period.
NPL_{it}: Bank nonperforming loans to total gross loans. Source: IMF Global Financial Stability Report. Bank nonperforming loans to total gross loans are the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions). The loan amount recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue. International guidelines recommend that loans be classified as nonperforming when payments of principal and interest are 90 days or more past due or when future payments are not expected to be received in full.
VIX_t: Chicago Board Options Exchange volatility index (VIX).
$Bank_{it}$: Bank equity indices for country i provided by Datastream.
CDS_{it}: 5-year CDS spread for government bonds. The spread of a CDS is what the buyer pays the seller as an annualized percentage of the notional amount, until a credit event occurs or maturity is reached. Source: Thomson Reuters Datastream.
$SPREAD_{it}$: difference in the household borrowing rates between the corresponding country and Switzerland, where the rate for a certain country is the volume-weighted average interest charged on outstanding amounts of local currency denominated loans to households for purchasing or improving housing with a maturity of five years or more.

Table A1: Underlying data to calculate mismatch indices
(Volumes in millions of local currency units, end of quarter)

A. Assets of resident banks[1]	Denomination			
	Local currency A	CHF[2] B	All other currencies[3] C	Total =A+B+C
1. Loans to residents[4]				
Banks				
Non-banks				
of which: to households				
of which: to nonfinancial corporations				
of which: to general government (public sector)				
2. Loans to non-residents[4]				
Banks				
Non-banks				
3. Other assets				
4. Total assets (=1.+2.+3.)				

B. Liabilities of resident banks[1]	Denomination			
	Local currency A	CHF[2] B	All other currencies[3] C	Total =A+B+C
1. Deposits from residents[5]				
Banks				
Non-banks				
of which: from households				
of which: from nonfinancial corporations				
of which: from general government (public sector)				
2. Deposits from non-residents[5]				
Banks				
Non-banks				
3. Own securities issued[6]				
4. Other liabilities[7]				
5. Total liabilities (=1.+2.+3.+4.)				

Notes:

[1] Banks = "other depository corporations" according to IMF Monetary and Financial Statistics Manual, p. 28, or "other monetary financial institutions" according to ECB definition.

[2] Denominated in, or indexed to, the Swiss franc (CHF).

[3] Denominated in, or indexed to, foreign currencies.

[4] Loans as in ECB Monthly Bulletin, Table 2.1. (Aggregated balance sheet of euro area MFIs).

[5] Deposits as in ECB Monthly Bulletin, Table 2.1. (Aggregated balance sheet of euro area MFIs).

[6] Money market paper, medium-term notes, and long-term bonds.

[7] Including capital and reserves.

Appendix B: List of countries in the sample

Conversion countries: Croatia, Hungary, Romania

Non-conversion countries: Austria, Bulgaria, Czech Republic, Estonia, Serbia, Slovenia

Control group: Germany, Greece, Italy, Luxembourg, the UK

Appendix C: Timeline of events

November 2014: The exchange rate for the conversion program in Hungary is set

15 January 2015: The exchange rate floor is discontinued by the SNB

28 February 2015: Swiss franc mortgages are converted into forint in Hungary

May 2015: Voluntary conversions of Swiss franc loans into either leu or euro start in Romania

September 2015: The Law on Consumer Credit and Law on Credit Institutions are signed in Croatia to convert Swiss franc loans into euro

March 2016: The majority of loan conversions are conducted in Croatia

Figure 1: Weighted exchange rates of CEE countries

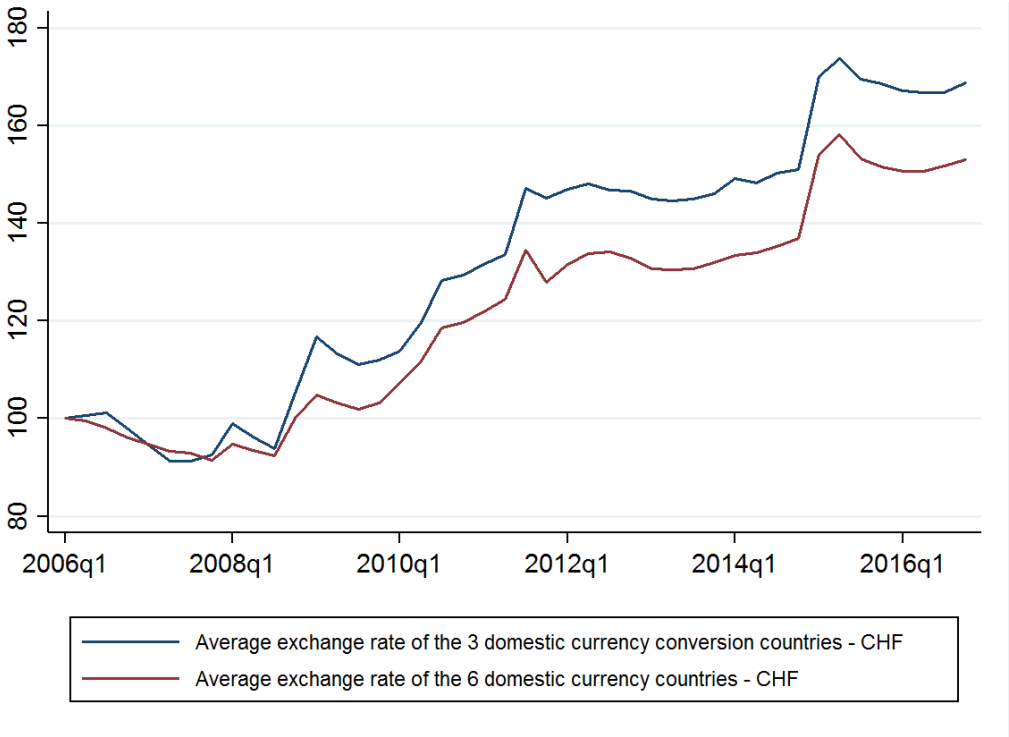


Figure 2: Total CHF loan volumes in countries with loan conversion programs

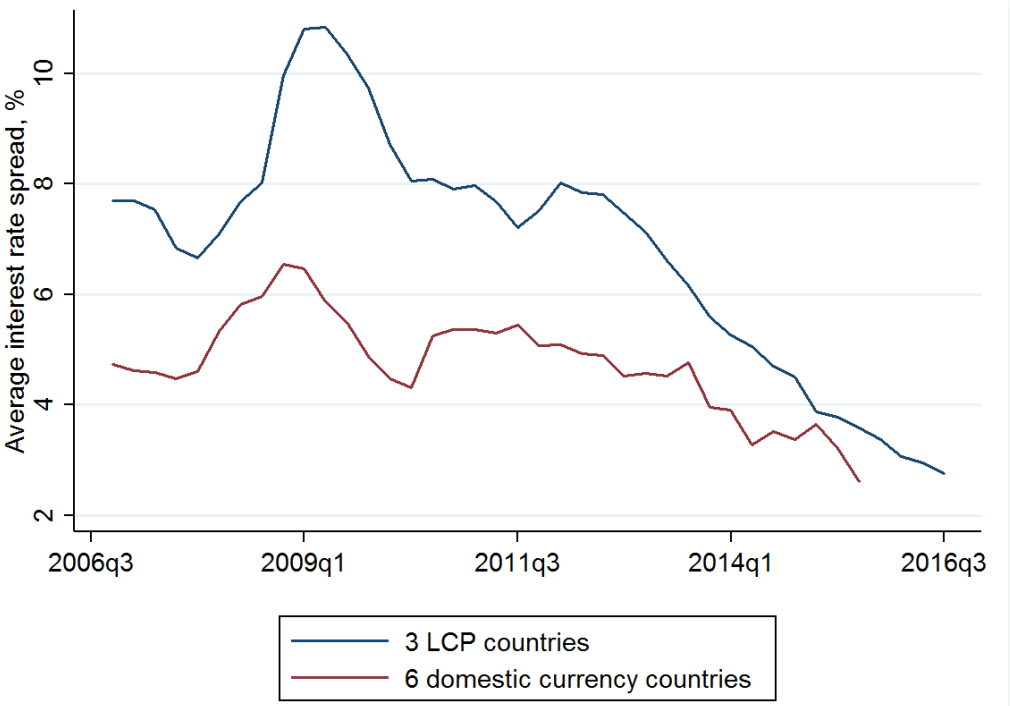


Figure 3: Total CHF loan volumes in countries with loan conversion programs

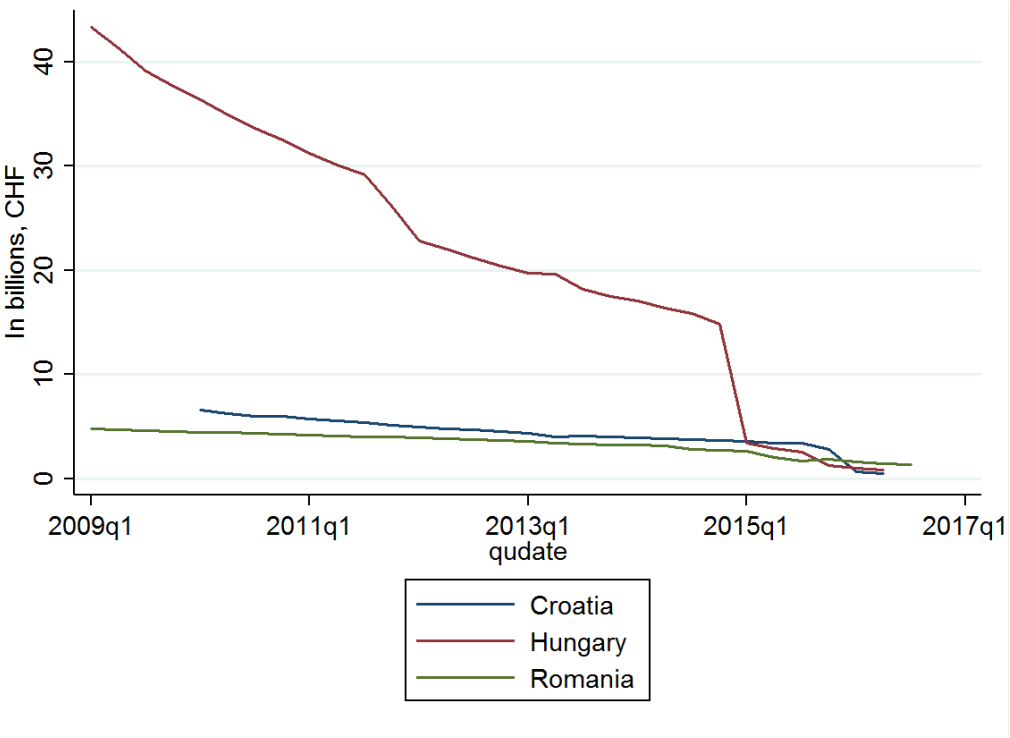


Figure 4: Total CHF loan volumes in other countries

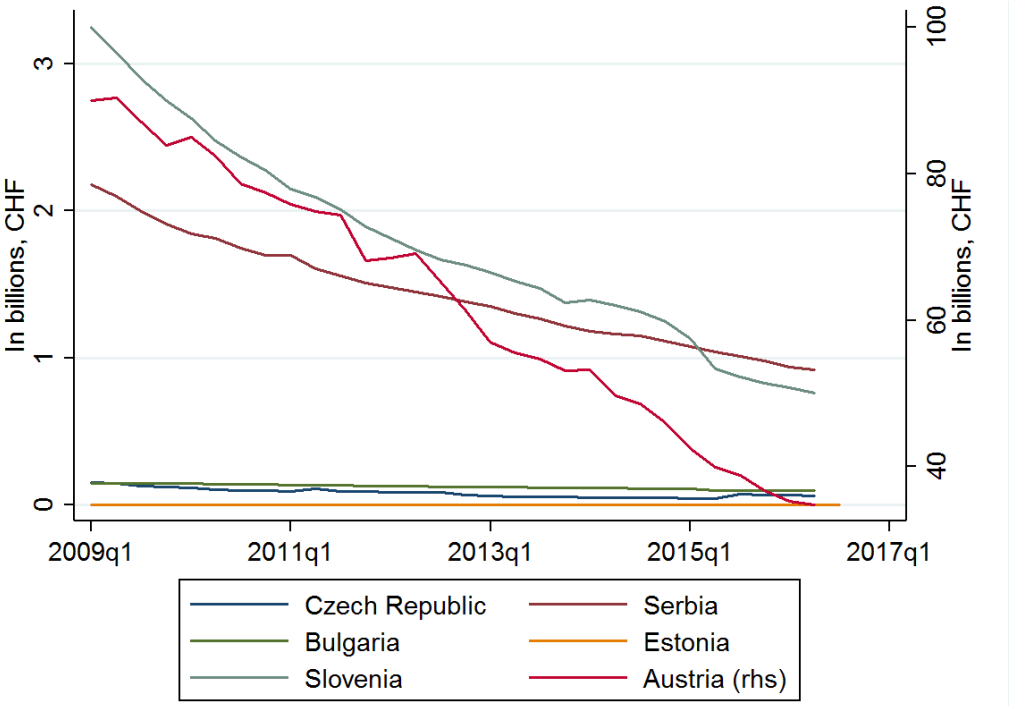
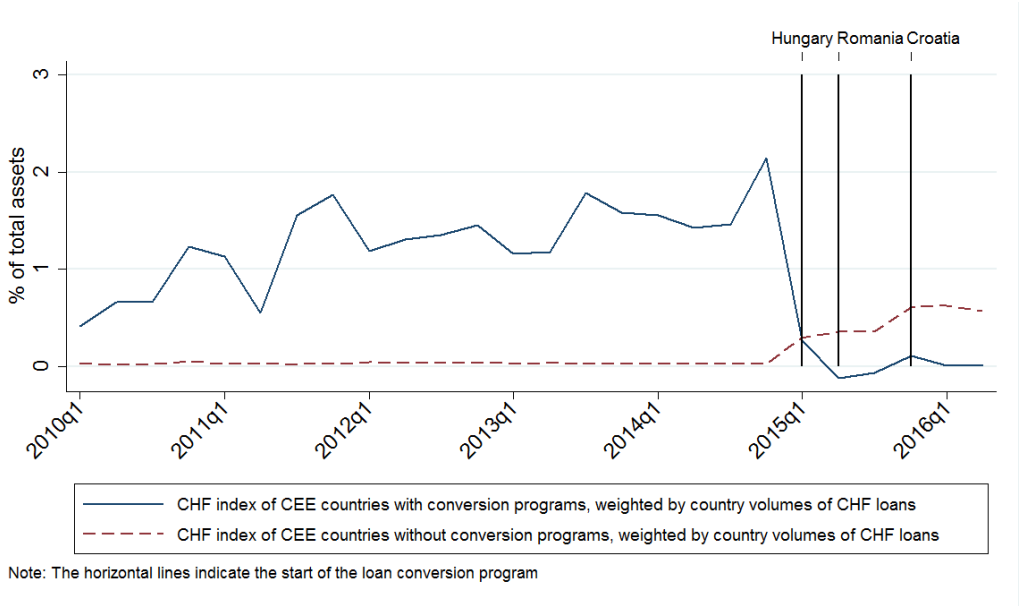
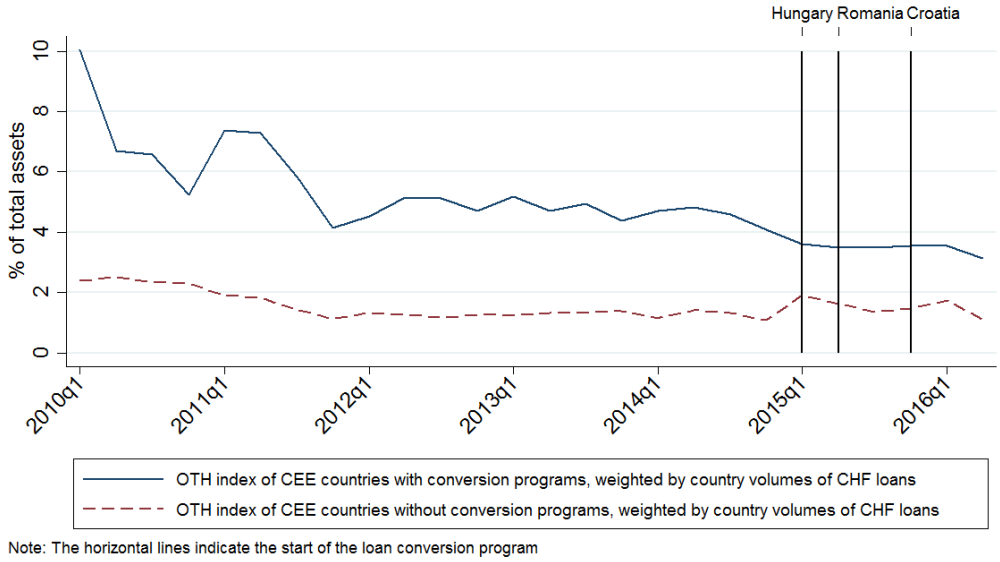


Figure 5: CHF mismatch index



Note: The horizontal lines indicate the start of the loan conversion program

Figure 6: Other foreign currency mismatch index



Note: The horizontal lines indicate the start of the loan conversion program

Table 1: Summary statistics

	CHF mismatch index			Other FX mismatch index				
	mean	median	variance	mean	median	variance	periods	starting
Austria	0.10	0.04	0.08	0.95	0.87	0.48	31	2009Q1
Bulgaria	0.01	0.01	0.00	-2.43	-3.28	21.71	40	2006Q4
Croatia	3.11	3.58	1.35	13.30	13.32	0.92	27	2010Q1
Czech Republic	-0.04	0.00	0.01	0.75	0.70	1.66	40	2006Q4
Estonia	0.02	0.01	0.00	5.61	4.09	15.70	31	2009Q1
Germany	- 0.11	-0.15	0.02	0.20	0.28	0.40	40	2006Q4
Greece	-0.83	-0.86	0.03	-0.54	-1.41	3.34	39	2007Q1
Hungary	0.03	0.24	2.35	8.98	6.80	22.50	40	2006Q4
Italy	0.00	0.01	0.00	-1.03	-0.24	17.28	29	2008Q4
Luxembourg	-0.10	-0.42	0.50	1.00	1.38	2.49	31	2009Q1
Romania	1.67	1.77	0.24	8.35	8.55	3.04	39	2007Q1
Serbia	1.18	1.16	0.17	4.91	4.77	3.33	31	2009Q1
Slovenia	1.86	2.06	0.49	-0.20	0.00	0.07	39	2007Q1
United Kingdom	-0.14	-0.14	0.01	-0.07	-0.12	0.57	31	2009Q1

Table 2: Baseline regressions

VARIABLES	(1) FCM	(2) FCM	(3) FCM	(4) FCM
LCP	-1.382***	-0.335***	-1.414***	-0.321***
	[0.512]	[0.093]	[0.505]	[0.090]
OC * LCP	2.880***	0.126	2.880***	0.041
	[0.747]	[0.185]	[0.730]	[0.185]
OC	(omitted)	-0.113*	(omitted)	-0.028
		[0.059]		[0.057]
Constant	-0.052**	0.020	-0.020	0.005
	[0.023]	[0.019]	[0.024]	[0.013]
Observations	618	618	948	948
Number of idcur	18	18	28	28

Clustering-robust standard errors in brackets, where clustering is on country level.
*** p < 0.01, ** p < 0.05, * p < 0.1

Note:
FCM: foreign currency mismatch index (dependent variable)
LCP: local conversion program
OC: other currency

Table 3: Panel regressions with exchange rates as control variables

VARIABLES	(1) FCM	(2) FCM	(3) FCM	(4) FCM	(5) FCM	(6) FCM
LCP	-1.397***	-1.383***	-1.404***	-0.342***	-0.337***	-0.342***
	[0.514]	[0.511]	[0.522]	[0.093]	[0.094]	[0.093]
OC * LCP	2.945***	2.881***	2.962***	0.129	0.125	0.129
	[0.769]	[0.747]	[0.810]	[0.177]	[0.188]	[0.176]
OC	(omitted)	(omitted)	(omitted)	-0.117*	-0.113*	-0.119*
				[0.063]	[0.061]	[0.064]
lnLCUCHF	0.203		0.373	-0.745		-0.901
	[0.434]		[0.548]	[0.846]		[1.186]
OC * lnLCUCHF	-1.419		-1.824	0.327		0.582
	[2.042]		[3.247]	[2.324]		[3.716]
lnLCUEUR		-0.078	-0.545		-0.524	0.482
		[0.477]	[0.733]		[0.543]	[1.076]
OC * lnLCUEUR		-0.848	1.292		-0.138	-0.788
		[1.614]	[4.443]		[1.795]	[4.718]
Constant	-0.046***	-0.051**	-0.046***	0.030	0.021	0.031
	[0.016]	[0.024]	[0.014]	[0.029]	[0.020]	[0.031]
Observations	618	618	618	618	618	618
Number of idcur	18	18	18	18	18	18

Clustering-robust standard errors in brackets, where clustering is on country level.
*** p < 0.01, ** p < 0.05, * p < 0.1

Note:
FCM: foreign currency mismatch index (dependent variable)
LCP: local conversion program
OC: other currency
LCUCHF: exchange rate local currency per 1 CHF
LCUEUR: exchange rate local currency per 1 EUR

Table 4: Panel regressions with other control variables

VARIABLES	(1) FCM	(2) FCM	(3) FCM	(4) FCM	(5) FCM	(6) FCM
LCP	-1.379***	-1.377***	-1.387***	-0.336***	-0.337***	-0.336***
	[0.512]	[0.505]	[0.514]	[0.093]	[0.090]	[0.094]
OC * LCP	2.880***	3.027***	2.900***	0.133	0.181	0.131
	[0.748]	[0.811]	[0.746]	[0.184]	[0.190]	[0.187]
OC	(omitted)	(omitted)	(omitted)	-0.120**	-0.120*	-0.110*
				[0.061]	[0.064]	[0.057]
MPI index	0.003			-0.028		
	[0.098]			[0.091]		
OC * MPI index	0.253**			0.303**		
	[0.128]			[0.124]		
Bank NPL		0.000			-0.003	
		[0.020]			[0.027]	
OC * Bank NPL		0.111			0.099	
		[0.084]			[0.084]	
VIX			-0.003			-0.002
			[0.003]			[0.003]
OC * VIX			0.013*			0.011*
			[0.007]			[0.007]
Constant	-0.055**	-0.056**	-0.051**	0.021	0.021	0.019
	[0.024]	[0.026]	[0.023]	[0.018]	[0.016]	[0.018]
Observations	618	612	618	618	612	618
Number of idcur	18	18	18	18	18	18

Clustering-robust standard errors in brackets, where clustering is on country level.
*** p < 0.01, ** p < 0.05, * p < 0.1

Note:
FCM: foreign currency mismatch index (dependent variable)
LCP: local conversion program
OC: other currency
MPI: macroprudential index
Bank: bank equity indices
NPL: bank nonperforming loans to total gross loans
VIX: Chicago Board Options Exchange volatility index

Table 5: Panel regressions with other control variables

VARIABLES	(1) FCM	(2) FCM	(3) FCM	(4) FCM	(5) FCM	(6) FCM
LCP	-1.386***	-1.360***	-1.397***	-0.344***	-0.327***	-0.337***
	[0.507]	[0.515]	[0.523]	[0.092]	[0.097]	[0.093]
OC * LCP	2.891***	2.880***	2.928***	0.141	0.148	0.135
	[0.746]	[0.749]	[0.774]	[0.184]	[0.181]	[0.183]
OC	(omitted)	(omitted)	(omitted)	-0.116*	-0.138**	-0.110*
				[0.061]	[0.069]	[0.058]
Bank index	0.001			0.002		
	[0.002]			[0.002]		
OC * Bank index	-0.003			-0.003		
	[0.004]			[0.005]		
5 year CDS spread		-0.000			0.000	
		[0.000]			[0.000]	
OC * 5 year CDS spread		-0.000			-0.000	
		[0.001]			[0.001]	
Lending rate			-0.027			-0.009
			[0.018]			[0.007]
OC * Lending rate			0.093			0.049
			[0.078]			[0.047]
Constant	-0.052**	-0.073***	-0.051**	0.021	0.011	0.020
	[0.024]	[0.025]	[0.023]	[0.019]	[0.019]	[0.018]
Observations	618	574	610	618	574	610
Number of idcur	18	18	18	18	18	18

Clustering-robust standard errors in brackets, where clustering is on country level.
*** p < 0.01, ** p < 0.05, * p < 0.1

Note:
FCM: foreign currency mismatch index (dependent variable)
LCP: local conversion program
OC: other currency
Bank: bank equity indices
CDS: 5-year CDS spread for government bonds
Lending rate: lending rate