

# A Local or a Foreign Currency Loan? Evidence on the Role of Loan Characteristics, Preferences of Households and the Effect of Foreign Banks

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*Using data from the OeNB Euro Survey in CESEE, which covers both EU Member States and (potential) candidate countries, we analyze how the currency of existing loans to households relates to (1) loan characteristics (loan maturity and purpose), (2) households' preferences regarding the loan currency and (3) bank ownership (domestic or foreign). Our findings support the existing literature's view that both demand- and supply-side factors have an influence on foreign currency lending. In the period under investigation, foreign currency loans were sought after by households in particular for long-term borrowing. Likewise, banks were more likely to grant large and long-term loans in foreign currency. On a descriptive level, we find that in Croatia and Hungary, foreign-owned banks had a higher share of foreign currency loans than local currency loans – in the remaining seven countries, however, the share of foreign currency loans is similar to or lower than that of local currency loans. In regression models we account for the possibility that foreign-owned and domestically-owned banks may differ in that they have issued loans with different characteristics and in that they have customers with different credit ratings and different preferences. Holding these factors constant reveals that, on average, foreign-owned banks did not issue more foreign currency loans – neither consumption loans nor mortgages – than domestically-owned banks.*

*JEL Classification: D14, G21, F34*

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Household debt in Central, Eastern and Southeastern Europe (CESEE) increased sharply before the crisis, but debt amounts and participation have remained low compared to levels seen in euro area countries. A particular feature of debt in CESEE is that in many countries, a significant percentage of loans are denominated in foreign currencies (chart 1).

The risks to financial stability that arise from foreign currency (FX) loans – e.g. because of a currency mismatch on banks' balance sheets, aggregate refinancing problems of banks, the threat of sudden stops – were well understood even before the crisis (Fernandéz-Arias, 2006; Levy Yeyati, 2006); they became highly visible during the crisis, as the currencies of several countries substantially lost in value against the Swiss franc, which has been an important currency in FX lending. Given the high share of foreign-owned banks in several CESEE countries,<sup>2</sup> the rise of the Swiss franc against local currencies became a concern not only for domestic policymakers. Some countries had taken measures to reduce foreign currency lending already prior to the crisis. For example, the Polish Financial Supervision Authority's "Recommendation S" in 2006 encouraged banks to enhance borrowers' risk awareness. In the aftermath of the crisis, the European Systemic Risk Board

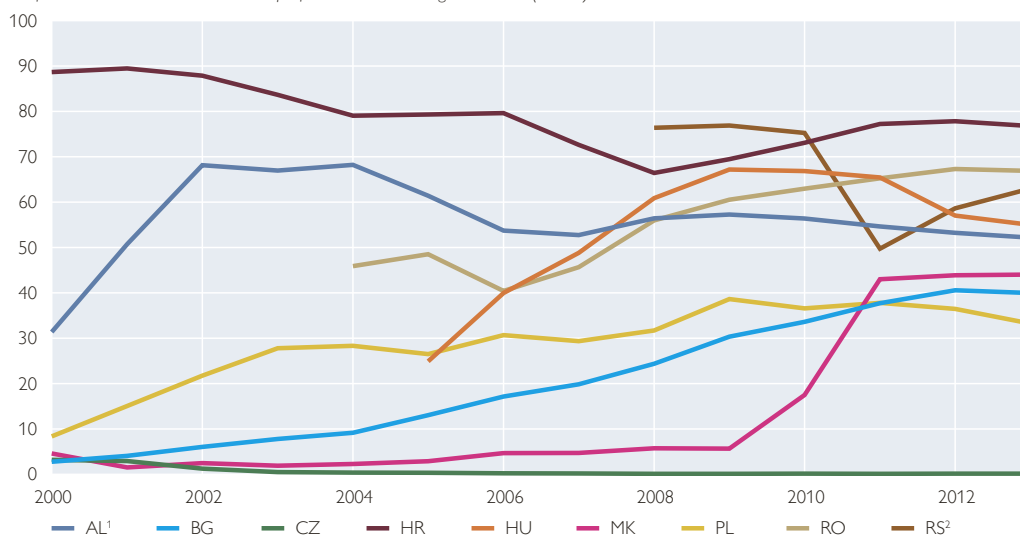
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<sup>2</sup> For the countries covered by this analysis, it ranges between 70% and 95%. (Source: EBRD Banking Survey [http://www.ebrd.com/downloads/research/economics/macrodatabank/Share\\_of\\_foreign\\_banks.xlsx](http://www.ebrd.com/downloads/research/economics/macrodatabank/Share_of_foreign_banks.xlsx) last accessed on November 21, 2014.)

Chart 1

### FX Lending in CESEE before and after the Crisis

% of total loans to households and nonprofit institutions serving households (NPISH)



Source: NCBs.

<sup>1</sup> Claims on households and NPISH.

<sup>2</sup> Claims on households and NPISH. No reporting before July 2008 because of the exclusion of claims indexed to foreign currencies. The value for 2008 is the average from July to December 2008.

Note: We do not present data for Bosnia and Herzegovina as reported foreign currency loan data do not include loans indexed to foreign currency.

issued recommendations on lending in foreign currencies (ESRB, 2011), whose implementation it assessed in November 2013.

A large and growing literature seeks to identify the drivers and consequences of FX borrowing to provide the background for policy measures. Macro data-based studies analyzing the role of the inflation rate, the real exchange rate and the respective volatility of both (Ize and Levy-Yeyati, 2003; Basso et al., 2011; Neanidis and Savva, 2009; Neanidis, 2010) as well as the interest differential (Crespo Cuaresma et al., 2011; Rosenberg and Tirpák, 2009; Luca and Petrova, 2008) yielded mixed results. Macro data-based studies argue that the high market share of foreign-owned banks plays an important role (Basso et al., 2011) and that banks seek currency-matched portfolios; hence, it is argued that credit euroization is closely linked to deposit euroization (Luca and Petrova, 2008). However it is difficult to separate demand from supply effects on the basis of macro data. It is this separation, however, which is particularly important for designing and implementing targeted policy measures. Supply-side effects can be addressed by regulation; but policy responses have to be different if FX borrowing is demand driven (Jeanne, 2005; Nagy et al., 2011).

Thus, empirical research began to use micro data to explore these issues further. Employing bank survey data covering 193 banks in 20 emerging European countries from 2005, Brown and De Haas (2012) conclude that foreign banks' easier access to foreign wholesale funding is not a driver of FX lending. Studying firms also on the basis of survey data, Brown et al. (2011) show that firms' FX revenues are more important than interest rate differentials; they conclude that FX loans are taken out by customers who are hedged or are equipped

to bear the exchange rate risk. Brown et al. (2014) demonstrate that FX lending may partially be driven by banks. Analyzing a dataset of firm loans between 2003 and 2007 from one Bulgarian bank, which includes information on both requested and granted loan currencies, they find that this bank sought to match the currency structure of their assets with that of their liabilities.

The present paper contributes to the existing literature by focusing on FX borrowing by households rather than by firms. Previous research suggests that results obtained for firms are not necessarily directly transferable to households. For example, Basso et al. (2011) show that a country's openness has an impact on firm loan dollarization but not on household loan dollarization. Furthermore, households' financial decisions constitute a special case because households have been found to be particularly prone to choosing "sub-optimal loans," i.e. making borrowing mistakes (see e.g. Disney and Gathergood, 2013). And Campbell (2006) argues that many households seek advice from financial experts, which may further indicate that the role of demand and supply effects may be different in lending to households and in lending to companies.

We use survey information to investigate whether (1) loan characteristics (e.g. loan maturity and purpose) and (2) socioeconomic characteristics of households as well as the requested versus the granted loan currency determine the currency of borrowing and lending. This allows us to draw conclusions on the importance of demand and supply effects.

Additionally, we provide (3) evidence on whether foreign-owned banks issued more foreign currency loans than domestically-owned banks in the period under review. It has been argued that foreign banks' easier access to foreign wholesale funding could be a determinant of FX lending (Basso et al., 2011; Brown and de Haas, 2012; Beck and Brown, 2014). Also, foreign-owned banks may have tried to gain market share by pursuing more aggressive lending policies (in foreign currency) than domestically-owned banks. We are able to analyze this question because Euro Survey data provide harmonized information from nine countries.

## 1 Loans: Data Source and Descriptive Evidence

### 1.1 OeNB Euro Survey

The data source we use is the OeNB Euro Survey, a survey on the use of the euro by households in nine CESEE countries (5 EU Member States – Bulgaria, Croatia, Hungary, Poland and Romania – and 4 (potential) EU candidate countries – Albania, Bosnia and Herzegovina, FYR Macedonia and Serbia).<sup>3</sup> In each country, the target population comprises residents aged 15 years or older. Interviews are carried out face-to-face at respondents' homes. For each country, the final sample of about 1,000 respondents is selected via a multi-stage stratified random sampling procedure. It is representative of the country's population with regard to age, gender and region. In the following analysis we look only at respondents aged 19 years or over. The OeNB Euro Survey collects information about the role of the euro in households' portfolios, covering respondents' assessment and expectations of current and future economic conditions, their personal experience of banking and currency crises, and their saving and borrowing behavior. In addition, the survey

<sup>3</sup> The survey is also conducted in the Czech Republic, but as foreign currency loans do not play a major role there, the questions we use for this analysis are not part of the Czech survey.

collects socioeconomic information on respondents. While the questions are posed at the individual level, the questionnaire accounts for the fact that loans will typically be taken out by households by asking whether the respondent has the loan either alone or together with his/her partner.

We analyze the two survey waves of fall 2012 and fall 2013, which included questions on loan applications and rejections, requested and granted loan currencies, loan characteristics as well as information about the bank to which the household owes the loan. In general, the survey collects information on the incidence of loans, but it does not cover loan amounts. Detailed variable definitions are available in table A1 in the annex. Further details on the survey are summarized by Brown and Stix (2015), and selected results can be found at <http://www.oenb.at/en/Monetary-Policy/Surveys/OeNB-Euro-Survey.html>.

It is evident that survey data contain much fewer details about loan characteristics than loan-level data. This implies that our analysis has to be less detailed than previous studies on this topic and, moreover, relies on a relatively small number of observations. However, loan-level data are often confined to a specific bank (e.g. Brown et al., 2014); the Euro Survey, by contrast, provides information on loan decisions at a number of banks in different countries – which we see as the distinctive advantage of our data.

## 1.2 Data Validity – Loan Participation and Loan Currency

Survey respondents are often hesitant to reveal details about their personal financial situation. In order to check the plausibility of our data, we present evidence on loan participation and loan currency, which to some extent can be benchmarked against macro data and also other survey data.

Table 1 shows that there is substantial heterogeneity among countries regarding loan participation, loan purpose and loan currency: On average 21% of all respondents have a loan; but percentages range from below 10% in Albania to above 30% in Croatia. Compared to the euro area, where 44% of the population are debt holders, the levels are significantly lower in CESEE (ECB, 2013). This matches the picture provided by macro data showing higher debt-to-income ratios in the euro area compared to CESEE. The highest number of mortgage holders, around 15%, can be found in Hungary and Croatia. Those two countries also report the highest shares of loans – both consumption loans and mortgages – denominated in foreign currency.

While in most countries, the majority of FX loans are denominated in euro, significant shares of Swiss franc loans can be found in Croatia and Hungary (results on individual foreign currencies not shown), which again is in line with aggregate data.<sup>4</sup>

To assess the plausibility of our survey results we compare them with survey data from the Life in Transition Survey (EBRD, 2010), which, however, only contains information on mortgages. Furthermore, the data from the Life in

<sup>4</sup> In previous studies based on Euro Survey data, the share of FX loans is significantly higher. This is due to the fact that previous studies employed results from a question about all loans the respondents hold, also counting loans which are partially denominated in foreign currency as FX loans. In this analysis, we employ information from a question on the largest (most important) loan, and only loans which are fully denominated in foreign currency are counted as FX loans. We select this approach for consistency reasons as subsequent survey questions, e.g. on the requested currency, also refer to the most important loan.

Transition Survey are only available from one survey wave in 2010, causing a time mismatch with our data of 2012 and 2013 and implying also a smaller number of observations. Still, for 6 out of 9 countries, the results on mortgages yielded by the two surveys match rather well. With regard to the percentage of mortgages held in foreign currency, the results match well only for two countries; but given that the Euro Survey results have been fairly stable over altogether six survey waves, we are confident that the results are valid.

In addition, we can compare survey results with aggregate data. The percentages of loan amounts held in foreign currency are consistently higher than the percentages of the incidence of FX loans. This is plausible due to the high share of mortgages denominated in foreign currency. If we weigh the data of loan incidence in foreign currency based on an estimated ratio of the average amount of consumption versus mortgage loans, our results are within 10 percentage points for all countries except Albania, FYR Macedonia and Romania.<sup>5</sup> In summary, the

Table 1

### Loan Participation, Loan Purpose and Currency

	Euro Survey (2012–2013): Respondents with a...						Life in Transition Survey (2010): Respondents with a...			Data from monetary statistics (2012–2013): Loan amounts...	
	loan	FX loan	con-sumption loan	FX con-sumption loan	mort-gage	FX mort-gage	N*	mort-gage	FX mort-gage	N*	denomi-nated in a foreign currency
	% of all respon-dents	% of respon-dents with a loan	% of respon-dents with a loan	% of respon-dents with a consump-tion loan	% of respon-dents with a loan	% of respon-dents with a mort-gage	respon-dents with a loan	% of all respon-dents	% of respon-dents with a mort-gage	respon-dents with a mort-gage	% of total loans to households and NPISH
Bulgaria	24	13	18	16	6	43	464	4	30	37	40
Croatia	33	65	16	76	17	83	668	7	85	65	77
Hungary	26	47	12	58	14	66	537	16	55	168	56
Poland	21	9	16	11	5	35	390	4	37	63	35
Romania	16	22	11	27	5	53	342	5	73	47	67
Albania	9	9	5	14	3	22	214	2	39	24	53
Bosnia and Herzegovina	27	3	18	5	9	10	501	4	16	39	0
FYR Macedonia	22	9	13	15	7	23	431	2	11	16	44
Serbia	21	36	17	39	3	89	374	4	75	52	61
Euro Survey weighted country average	21	22	14	27	6	55	3,921				

Source: OeNB Euro Survey, EBRD, ECB, NCBs.

\* Number of observations.

Note: Individual country values are weighted by sampling weights which account for at least age, gender and region. The weighted country average is additionally weighted by each country's population size.

<sup>5</sup> We estimate the average value of consumption and mortgage loans based on the limited available aggregate data on loan purposes and our information on loan incidence. Of course, this is only a very rough approximation.

survey results provide a reasonably accurate and informative picture of households' loan positions.

### 1.3 Loan Characteristics

Information from the survey which is not available from macro data is loan maturity by loan currency. The average loan maturity of FX loans is seven years longer than that of local currency loans (table 2). This is in line with results regarding the loan purpose and currency presented in table 1, which shows that the share of mortgages denominated in foreign currency is 28 percentage points higher than that of consumption loans denominated in foreign currency. In addition, the percentage of respondents who say they have fixed interest loans is higher among local currency loan holders (results not shown).<sup>6</sup>

Table 2

#### Loan Maturity – Comparison between Local Currency and FX Loans

	Local currency loans				FX loans			
	Mean	Median	Max.	N*	Mean	Median	Max.	N*
<i>Loan maturity in years</i>								
Weighted country average	6.84	5	36		14.19	10	35	
Bulgaria	7.35	6	30	363	11.72	10	30	51
Croatia	7.33	6	30	213	12.29	10	35	422
Hungary	10.13	9	30	259	15.16	15	30	224
Poland	6.76	4	36	335	17.84	20	30	33
Romania	6.90	5	35	225	16.58	16	30	59
Albania	4.43	4	15	192	6.89	5	18	20
Bosnia and Herzegovina	4.96	5	30	404	8.75	6	25	15
FYR Macedonia	4.86	4	20	337	6.69	5	15	39
Serbia	4.02	3	30	200	8.90	5	30	122

Source: OeNB Euro Survey.

\* Number of observations.

Notes: Respondents answering "Don't know" and "No answer" are excluded. Individual country values are weighted by sampling weights which account for at least age, gender and region. The weighted country average is additionally weighted by each country's population size.

## 2 Loan Demand versus Supply – Descriptive Evidence

In order to get an impression of supply and demand effects in FX borrowing and lending, we now present descriptive evidence on loan demand in general and potential supply-side effects as well as evidence on loan currency demand compared to loan currency supply.

### 2.1 Changes in Loan Plans, Applications and Rejections before and in the Wake of the Financial Crisis

We interpret two questions in the survey as indicators of loan demand: (1) plans to take out a loan and (2) loan applications. The former are based on the question "Do you plan to take out a loan within the next year and if so in what currency?", which has been included in each wave of the Euro Survey since fall 2007. The evidence presented in table 3 is based on this time series. Data on loan applications are

<sup>6</sup> This may also partially be due to perception, i.e. FX borrowers hit by exchange rate depreciation may perceive this as a variable interest rate.

based on the question “Since the year 2000, have you or any other member of your household ever contacted a bank with a view to obtaining a loan?”, which was included in the fall 2012 and fall 2013 survey waves only; hence, it is a backward-looking question the answer to which depends on the accurate memory of the respondent.

As table 3 shows, loan demand declined in the aftermath of the financial crisis: After 2009, in all countries the percentages of households planning to take out a loan within the next 12 months decreased substantially. This is in line with the results for actual loan applications, which dropped in all countries except Albania. This decline is not surprising given the impact of the crisis on the economic situation of households (see, e.g., Corti and Scheiber, 2014). In addition, loan demand may also have been influenced by regulation, in particular with regard to foreign currency lending. For example, we observe that the percentage of planned FX loans in total planned loans in Hungary dropped from 44% in 2007 to 0 in fall 2011 after measures introduced in 2010 effectively prohibited the issuance of new FX loans to households.

Turning to indicators of supply-side effects, we present evidence on the percentages of loan cases in which borrowers did not receive the full amount they

Table 3

### Loan Plans, Applications and Rejections

	Planned loans		Loan applications		Restricted loans	Rejected loan applications		Once rejected application	N*
	% of respondents who planned to take out a loan within the next 12 months		% of respondents who applied for a loan at a bank		% of respondents who were not granted the amount they requested in full	% of respondents who applied for a loan but were rejected or discouraged		% of respondents whose loan application was rejected once but who now have a loan	
	Before 2009	2009 or later	Before 2009	2009 or later		Before 2009	2009 or later		
Bulgaria	14	6	23	11	7	11	6	58	103
Croatia	11	6	37	14	11	17	5	63	235
Hungary	6	4	27	11	8	10	7	50	114
Poland	15	11	23	17	6	8	4	43	70
Romania	16	5	17	7	9	10	3	56	50
Albania	12	9	7	10	10	9	6	35	43
Bosnia and Herzegovina	15	7	20	14	2	5	4	56	50
FYR Macedonia	13	11	16	13	6	8	7	60	89
Serbia	13	11	25	14	10	13	4	46	109
Euro Survey weighted country average	14	8	22	13	8	9	4	51	863

Source: OeNB Euro Survey.

\* Number of observations.

Note: Values for planned loans are the average of the results stemming from the semi-annual surveys conducted between fall 2007 and fall 2008 and between spring 2009 and spring 2014; for the exact phrasing of the question see table A1 “plan loan.” The remaining information is based on the Euro Survey results of fall 2012 and fall 2013 and the retrospective questions contained in these surveys; see table A1 for the exact phrasing: for loan applications, see “applied”; for restricted loans, see “amount granted in part;” for rejected loan applications and once rejected applications, see “loan refused.” We only report N for the last column, as this is the only variable for which it is rather low in some cases. Individual country values are weighted by sampling weights which account for at least age, gender and region. The weighted country average is additionally weighted by each country’s population size.

requested (table 3, column 3). On average, this applies to 7% of loans in all countries taken together (8% before 2009 and 6.5% after 2009). A further indicator of possible supply-side effects is the number of loan applications that were rejected or discouraged by banks (table 3, column 4). In all countries, the percentage of rejected loan applications in total loan applications declined in the period under review. These results do not reveal the reasons for this decline. It could be due to the overall decrease in applications, with banks granting a constant percentage of loan applications; it could also be due to a decline in applications that are deemed to be risky; finally, it could also indicate a change in banks' lending policy. Put differently, these results should not be overinterpreted as they do not control for the credit risk profile of applicants.

The percentage of respondents whose loan application was once rejected but who now have a loan might indicate that also risky applicants were granted loans (table 3, column 5). Again, caution against overinterpreting these results is warranted as we do not know whether the credit risk profile of the applicant changed between the initial, rejected application and the successful loan application.

## 2.2 Loan Currency Demand versus Perceived Supply

A particular asset of our data is that they contain information on both requested and granted loan currencies, similar to those used in Brown et al. (2014). We measure the requested loan currency based on the question "When you first asked for this loan at your bank, did you have a preference regarding the denomination of your loan?" An average of 15% (N=674)<sup>7</sup> of respondents state they had a preference for a FX loan when they initially applied (chart 2), but there is substantial variation between countries, with the highest share of borrowers with a FX loan preference in Hungary and Croatia.

Borrowers were also asked about their banks' behavior in the application process ("Did the bank provide you with an offer to take out a loan in any other currency than the one you got the loan in?"). An average of 9% (N=363) of borrowers report that the bank did not offer a choice with regard to the loan currency. However, this percentage also includes borrowers who did not have a preference or who had a preference that matched the single offer the bank made. If we exclude these borrowers and only look at those loans for which the bank chose the loan currency, we find that 8% (N=107) with a FX loan report having had a preference for the local currency, whereas 1% of local currency loan holders (N=49) originally had a preference for FX loans (bottom left-hand panel).<sup>8</sup> It is important to stress, though, that here, the conclusion that it was solely the banks that chose the loan currency is not based on hard facts (as opposed to the loan level data used by Brown et al. (2014)), but on borrowers' *ex post* perception, which may have been influenced by the subsequent loan performance.

Finally, borrowers were asked about the possible reasons why the bank did not offer them a choice regarding the loan currency: 26% (N=85) said they explicitly asked for one currency only, which constitutes a demand-side effect. 27% of respondents (N=99) said it would not have been possible to receive the required

<sup>7</sup> In the following, *N* denotes the number of observations which fall into the respective category, e.g. in this case the number of respondents who preferred a FX loan.

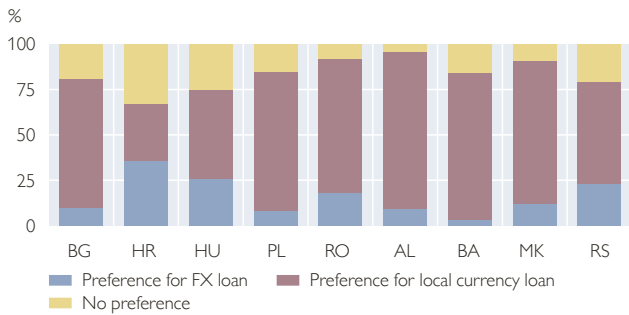
<sup>8</sup> These values are not weighted by country size due to the low number of observations.



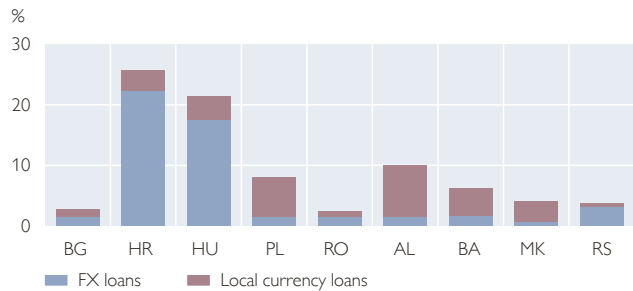
Chart 2

## Loan Currency – Demand and Perceived Supply

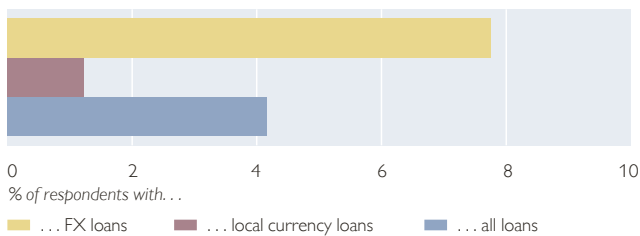
**Respondents' Currency Preference when Loan Was Taken Out**



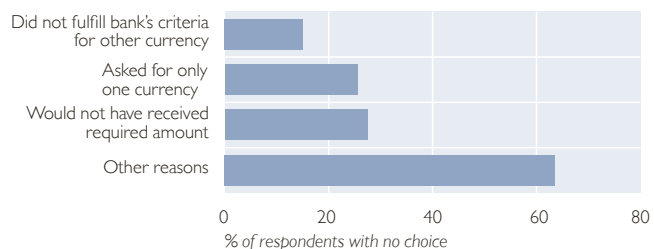
**Respondents Not Offered a Choice of Loan Currency by Banks**



**No Match of Respondents' Preference and Bank Offer**



**Reason If Bank Did Not Offer Choice Loan Currency**



Source: OeNB Euro Survey.

Note: Results are based on the following variables described in table A1: FX loan preference (top left panel), no choice (top right panel), no currency match (bottom left panel), reason (bottom right panel).

amount in another currency, and 15% (N=51) did not fulfill the bank's criteria for a loan in a different currency; these shares are indicative of supply-side effects. It must be noted, however, that these results are (1) based on a rather small number of observations (we do not differentiate between countries) and (2) based on respondents' *ex-post* perceptions only, which may have been influenced by how borrowers subsequently coped with loan repayments.

### 2.3 The Impact of Bank Ownership on the Loan Currency

Another determinant of the loan currency on the supply side may be bank ownership (domestic or foreign). To find out more about its role, we combine the information about the bank at which respondents hold their loan, which we glean from the survey, with information on bank ownership. We use BankScope data on bank ownership, which show the global ultimate owner at the highest consolidation level, thus ensuring comparability across banks. We check and supplement this information with the database by Claessen and van Horen (2013) as well as Internet-based research.

Table 3 shows the differences in the loan portfolios of domestically-owned banks and that of foreign-owned banks. We can see that there are no significant differences in the percentages of FX loans across all countries; the only exceptions are Croatia and Hungary, where the percentage of FX loans is significantly higher at foreign-owned banks. With regard to the type of loans, we do not find a significant difference in the percentages of mortgages held at foreign- or

Table 4

### FX Loans, Mortgages and Loan Maturity at Domestically- and Foreign-Owned Banks

	Foreign-owned banks		Domestically-owned banks		H0: a=b
	(a)	N*	(b)	N*	p-Value
<b>FX loans</b>					
	% of loans				
Weighted country average	25	2,222	21	937	
Bulgaria	14	378	9	35	0.27
Croatia	67	513	54	94	0.00
Hungary	57	196	39	254	0.00
Poland	11	186	8	121	0.45
Romania	25	155	14	27	0.24
Albania	12	123	4	17	0.35
Bosnia and Herzegovina	3	293	9	90	0.03
FYR Macedonia	9	207	12	138	0.94
Serbia	37	171	34	161	0.51
<b>Mortgages</b>					
	% of loans				
Weighted country average	30	2,198	33	909	
Bulgaria	25	377	30	34	0.55
Croatia	52	514	43	92	0.01
Hungary	52	198	63	247	0.11
Poland	22	183	20	117	0.70
Romania	30	157	35	27	0.35
Albania	43	113	61	16	0.39
Bosnia and Herzegovina	35	293	27	87	0.22
FYR Macedonia	42	197	30	127	0.43
Serbia	15	166	16	162	0.59
<b>Loan maturity</b>					
	Median in years				
Weighted country average	5	2,073	5	868	
Bulgaria	7	351	6	30	
Croatia	9	503	6	88	
Hungary	10	183	13	228	
Poland	4	184	5	117	
Romania	6	138	8	25	
Albania	5	121	4	17	
Bosnia and Herzegovina	5	250	5	78	
FYR Macedonia	5	189	4	132	
Serbia	5	154	4	153	

Source: OeNB Euro Survey.

\* Number of observations.

Note: Respondents answering "Don't know" or "No answer" are excluded.

domestically-owned banks, again with the exception of Croatia. As far as loan maturity is concerned, the picture is mixed.

Beck and Brown (2014) argue that foreign-owned banks cherry-picked financially transparent customers. They report that people taking out mortgages from foreign-owned banks are more likely formally employed and richer than those taking out mortgages from domestic banks. Table 5 corroborates their finding but adds a further dimension by providing a breakdown by loan currency and including both mortgages and consumption loans. It shows that borrowers at domestic banks with a local currency loan most frequently belong to multiple-person households who own their main residence and a car; furthermore, the respondent most frequently has completed primary- or secondary-level education and is in employ-

Table 5

**Socio-Economic Characteristics of Respondents Who Borrow from Domestically- and Foreign-Owned Banks**

	Domestically-owned banks		Foreign-owned banks	
	Local currency loan	FX loan	Local currency loan	FX loan
All loans				
%				
<b>Type of loan</b>				
Mortgage	31	33	29	37
Consumption	69	67	70	63
<b>Household size</b>				
1 person	17	9	12	8
2 persons	32	24	23	22
3 or more persons	51	66	66	70
Household includes at least one child	32	52	49	52
<b>Educational attainment of respondent</b>				
Primary	38	42	34	22
Secondary	43	38	42	49
Tertiary	19	19	24	30
<b>Monthly household income after taxes</b>				
1–33 income percentile	55	19	17	12
34–66 income percentile	6	30	29	22
67–100 income percentile	29	27	26	39
No information on income provided	15	24	28	27
<b>Labor market status of respondent</b>				
Employed	26	72	76	78
Self-employed	22	12	10	8
Retired	21	19	14	11
Unemployed	30	9	11	10
<b>Ownership of other assets</b>				
Main residence	86	91	92	92
Secondary residence	7	6	11	18
Other real estate	12	14	22	20
Car	55	74	77	80

Source: OeNB Euro Survey.

Note: Results are weighted by sampling weights and population size.

ment. The profile of FX borrowers at domestic banks differs only slightly from that of local currency borrowers at domestic banks. Among borrowers at foreign-owned banks, the differences between local currency and FX borrowers is slightly more pronounced. We see the starkest differences, though, between domestically- and foreign-owned banks: At the former, the share of high-income local currency borrowers is 9 percentage points lower than at the latter, and the share of high-income FX borrowers at the former is even 13 percentage points lower than at foreign-owned banks.

**3 Demand versus Supply – Estimations**

To ascertain (1) whether the preference for FX loans depends on loan characteristics and (2) how the loan currency relates to demand and supply factors, we use an estimation approach. In particular, we relate FX borrowing to detailed individual-level survey information on socioeconomic characteristics, loan characteristics and the ownership structure of banks.

The first question closely follows previous research on demand for FX loans (Fidrmuc et al., 2013; Beckmann and Stix, 2014). The difference between our

approach and the approaches used in previous studies is that we can utilize information on loan characteristics. Our measure of demand for the loan currency is derived from a retrospective question about the requested loan currency. This implies that we cannot study the effect of exchange rate and inflation expectations as this information is only available at the date of the interview and not at the date when the loan was granted. Brown et al. (2014) analyze detailed loan and loan application information from a Bulgarian bank. They also study the determinants of the requested loan currency. The difference between our approach and their approach is that we focus on households (and not firms) and that we use survey data (and not administrative data). While administrative data are clearly superior to retrospective survey information, the main advantage of our data is that we can observe loan decisions made by multiple banks in multiple countries.

The second question also lines up with previous literature in that we study the relative importance of supply and demand factors. Specifically, we present evidence on how loan characteristics and credit ratings of loan applicants affect the loan currency. This question has been analyzed previously with survey data for firms in 26 transition economies (Brown et al., 2011). Our analysis focuses on households and additionally studies whether there are differences between the FX lending behavior of domestically-owned banks and that of domestically-owned banks.

The empirical framework accounts for sample selectivity by employing a two-step Heckman selection model. The incidence of a FX loan is observed only if a respondent has a loan (either in local currency or in foreign currency). To avoid biased estimates, we jointly estimate these two probabilities. In particular, the selection equation defines the probability that a respondent has a loan,

$$P(L=1)=\Phi_L(X_L\beta_L+u_L). \quad (1)$$

In the second stage, the outcome equation, we again estimate a probit equation that the respondent has a FX loan

$$P(F=1|L=1)=\Phi_F(X_F\beta_F+u_F), \quad (2)$$

where the error terms are normally distributed,  $u_L \sim N(0,1)$ ,  $u_F \sim N(0,1)$ , and correlated,  $\text{corr}(u_L, u_F) = \rho$ . Our results confirm that both error terms are correlated and significant in some specifications.

The selection equation contains two variables for identification. First, similar to Beck and Brown (2014), we use information on whether there are children living in the respondent's household. This should positively affect the probability of taking out a loan. Since we control for loan characteristics in the outcome equation (e.g. whether the loan is a mortgage or a consumption loan), this information should not be correlated with the error term in the outcome equation. Second, the survey contains information on whether a respondent has contacted a bank with a view to obtaining a loan during the last 10 years, which, evidently, is strongly correlated with loan incidence.<sup>9</sup> All variables are defined in table A1, and descriptive statistics are presented in table A2 in the annex.

<sup>9</sup> Results from the selection equations are summarized in tables A3 and A4.

All subsequent regressions control for interacted country and time fixed effects. These dummy variables control for any macroeconomic, institutional and cultural differences across countries. Thus, the focus of the regression analysis is on the heterogeneity across individuals, holding country-wave differences constant.

### 3.1 Preferences for Foreign Currency Loans

We now turn to the demand side, seeking to determine the driving factors behind borrowers' choice of a loan currency. We measure demand using answers to the following question: "When you first asked for this loan at your bank, did you have a preference regarding the currency of your loan?" The answers to this question comprise several currencies from which we define a dummy variable "Preference for FX loan," which takes the value 1 if respondents answer that they requested a loan in foreign currency and the value 0 if respondents answer that they requested a loan in local currency. This specification omits all respondents who had no preference regarding the loan currency.

Table 6 shows the second-stage results with "Preference for FX loan" as the dependent variable. The corresponding first-stage results are selectively summarized in table A3. Of the variables used for identification, information on the loan application and the presence of children exert a sizeable and significant effect. Regarding the second-stage results, we focus first on column 1 and column 2.

In the respective sample about 23% of respondents said that they had a preference for a FX loan.<sup>10</sup> When splitting the sample by loan type, we find a foreign currency preference only for 15% of consumptions loans but for 39% of mortgages. This is also confirmed by regression results. Loans with a maturity of more than 10 years are 7 percentage points more likely to have been requested in foreign currency than in local currency (column 2 of table 6). Interestingly, we also find that foreign currency preferences were much more pronounced for loans that were granted prior to 2009 than for loans that were granted in 2009 or later, implying that households have reacted to the financial crisis.

With regard to the socioeconomic variables, the results in column 1 show a positively signed impact for persons with regular income in euro (12 percentage points), whereas the receipt of remittances is insignificant.<sup>11</sup> Persons who requested FX loans are also older, have completed a higher level of education and are more likely to own a car. Income is insignificant (column 1 of table 6). In column 2, which includes "loan term >10 years" and "took out loan in 2008 or before," the effect of income in euro and age vanishes, which can be traced to a correlation between these two variables and loan maturity.

The data set contains one variable which can be interpreted as a signal of a borrower's low level of creditworthiness: whether a respondent's application for a loan has been refused previously. The results indicate that such a refusal does not affect the currency preference of borrowers.

<sup>10</sup> If we include also those households who answered that they had no preference regarding the loan currency then we find that about 19% had a FX preference.

<sup>11</sup> Column 2 includes information on the loan, i.e., its maturity and when the loan was granted. This affects, for example, the size and significance of "income in euro" because the choice of loan type and "income in euro" are correlated.

Table 6

### Demand for FX Loans

Dependent variable	Preference for FX loan (0.1)			
	All	All	Consumption loans	Mortgage loans
Sample	(1)	(2)	(3)	(4)
Regular income in euro	0.118*** (0.037)	0.049* (0.028)	0.066* (0.034)	0.007 (0.041)
Receives remittances	0.019 (0.024)	0.012 (0.016)	0.008 (0.017)	0.018 (0.028)
FX deposit preference	0.032* (0.018)	0.018 (0.013)	0.009 (0.009)	0.027 (0.025)
Trust in government	0.021 (0.017)	0.013 (0.012)	0.008 (0.011)	0.014 (0.020)
Loan refused	-0.017 (0.013)	-0.012 (0.008)	-0.004 (0.010)	-0.010 (0.017)
Loan term >10 years		0.069*** (0.019)	0.008 (0.024)	0.057* (0.033)
Took out loan in 2008 or before		0.067*** (0.019)	0.052*** (0.017)	0.058 (0.037)
Risk averse	0.010 (0.016)	0.018** (0.009)	0.022* (0.012)	0.007 (0.010)
Married	0.033* (0.019)	0.021* (0.011)	0.019* (0.011)	0.005 (0.018)
2 person household	-0.039 (0.034)	-0.015 (0.024)	-0.015 (0.025)	0.000 (0.025)
3+ person household	-0.027 (0.032)	-0.013 (0.026)	-0.025 (0.025)	0.021 (0.027)
Age	0.006** (0.003)	0.000 (0.003)	0.002 (0.003)	-0.005 (0.005)
Age squared	-0.008** (0.003)	-0.001 (0.003)	-0.003 (0.003)	0.005 (0.005)
Secondary education	0.017 (0.015)	-0.001 (0.010)	-0.013 (0.010)	0.026 (0.020)
Tertiary education	0.043** (0.018)	0.011 (0.012)	-0.011 (0.010)	0.051 (0.035)
Unemployed	0.004 (0.024)	0.007 (0.018)	-0.002 (0.016)	0.015 (0.026)
Retired	-0.025 (0.022)	-0.017 (0.015)	-0.011 (0.014)	-0.011 (0.017)
Self-employed	-0.028 (0.026)	-0.009 (0.017)	0.008 (0.016)	-0.043 (0.038)
No information on income provided	0.030 (0.028)	0.020 (0.021)	0.023 (0.015)	-0.001 (0.031)
Medium income	-0.008 (0.018)	0.000 (0.013)	-0.006 (0.013)	0.008 (0.019)
High income	0.031 (0.023)	0.023 (0.017)	0.018 (0.011)	0.010 (0.027)
No savings	-0.022 (0.016)	-0.011 (0.009)	-0.004 (0.011)	-0.019 (0.021)
Own house	0.000 (0.023)	0.003 (0.014)	0.013 (0.014)	-0.037 (0.035)
Own car(s)	0.039*** (0.013)	0.016* (0.010)	0.011 (0.012)	0.021* (0.012)
Rho	-0.14**	-0.16**	-0.14	-0.32*
Mean of dependent variable	0.23	0.24	0.15	0.39
Country*wave fixed effects	Yes	Yes	Yes	Yes
Log likelihood value	-3,941.4	-3,404.9	-2,469.0	-1,711.6
Total observations	11,812	11,484	10,732	10,097
Uncensored observations	2,467	2,139	1,387	752

Source: OeNB Euro Survey.

Note: The dependent variable in this table is FX loan preference, which takes a value of 1 if respondents answer that they requested a loan in foreign currency, 0 if they requested a loan in local currency. All models report the marginal effects from the outcome equation of a Heckman probit selection model. We employ information on whether the household has children and whether the household ever applied for a loan for identification. All models additionally include the following household control variables: inflation literacy, distance to banks. All models include fixed effects per country wave. Standard errors are reported in parentheses and are adjusted for clustering at the country-wave level. \*\*\*, \*\*, \* denote significance at the 0.01, 0.05 and 0.10 level, respectively. All variables are defined in the annex.

Furthermore, we find a weakly significant effect of “FX deposit preference.” Previous studies have found this variable to affect demand for FX loans (Fidrmuc et al., 2013; Beckmann and Stix, 2014). In our study, by contrast, this variable is found to be of minor importance – presumably because it measures FX preferences at the time of the survey interview and not at the time when the loan was taken out. Similarly, trust in government was also found to be insignificant.

Columns 3 and 4 split the sample into consumption loans and mortgages. First, regular income in euro plays a role mainly for consumption loans but has no effect on mortgages. Second, the financial crisis affected FX loan preferences with regard to consumption loans but not with regard to mortgages.

Finally, a word of caution is necessary regarding the central result of table 6, which shows that respondents had a FX preference mainly for mortgages. First, respondents could *ex post* rationalize their behavior by indicating that they had a preference or no preference for a foreign currency loan, in particular if they later ran into financial difficulties with their loans. Second, if respondents knew in advance that long-term funding would only be available in foreign currency, they might have included this information already in their loan currency preferences. We have no possibility to address the second issue – in other words, we must rely on the survey data. What we can do, however, is testing whether the results are influenced by borrowers’ bad experience with a loan in the past. In particular, we repeat the estimation by including one variable which measures whether respondents are in arrears with their loans. We find that the variable does not affect the results qualitatively (the results are not shown in the table).

### 3.2 Incidence of Foreign Currency Loans

Having investigated customers’ preferences regarding loan currencies in the previous section, we now turn to the actual incidence of FX loans. Table 7 presents the estimation results for the incidence of FX loans. We find that 31% of loans in our sample are FX loans, but only 23% of respondents (column 1 of table 6) said that they preferred their loan to be in foreign currency. It is noteworthy that these two figures can be compared as they refer to the same loans. One possible explanation of this discrepancy is that agents have a recall bias. However, even if we omit respondents with a bad loan experience, i.e. who are in arrears with their loans, the discrepancy is only slightly smaller (in this sample 28% of respondents have a FX loan). This is evidence that either banks played an active role in the choice of the loan currency (as suggested by results in Brown et al., 2014) and/or that loan applicants changed their mind during the loan application period.

A central question we want to answer is whether there are differences between domestic- and foreign-owned banks as far as FX lending is concerned. The regression results of table 7 provide some evidence, showing marginal effects of selected variables on the probability of a FX loan. We control for (1) preferences of loan applicants, (2) loan characteristics and (3) information on loan applicants’ creditworthiness as measured by two direct variables as well as by socioeconomic variables. We stress that the socioeconomic information is measured at the time of the interview and not at the time of the loan application. However, our motivation for including these variables is that the socioeconomic variables (as they are correlated over time) proxy for borrowers’ creditworthiness at the time of the loan application.

Table 7

### Incidence of FX Loans

Dependent variable	Incidence of FX loans (0.1)		
	All	All	All
Sample	(1)	(2)	(3)
Regular income in euro	-0.050 (0.074)	-0.042 (0.073)	0.069 (0.052)
No currency preference	0.409*** (0.031)	0.417*** (0.030)	
Preference for FX loan	0.824*** (0.102)	0.800*** (0.088)	
Secondary education	-0.010 (0.049)	-0.007 (0.041)	-0.008 (0.032)
Tertiary education	0.015 (0.055)	0.027 (0.048)	0.043 (0.039)
Unemployed	0.000 (0.038)	0.003 (0.040)	0.011 (0.033)
Retired	0.044 (0.047)	0.052 (0.041)	0.017 (0.030)
Self-employed	0.013 (0.047)	0.002 (0.048)	-0.003 (0.041)
No information on income provided	0.081 (0.064)	0.090 (0.059)	0.071 (0.056)
Medium income	0.008 (0.032)	0.014 (0.028)	-0.004 (0.030)
High income	0.040 (0.051)	0.046 (0.044)	0.038 (0.051)
No savings	0.003 (0.022)	0.005 (0.018)	-0.033 (0.027)
Own house	-0.034 (0.032)	-0.028 (0.030)	-0.043* (0.023)
Own car(s)	0.069*** (0.022)	0.072*** (0.021)	0.101*** (0.022)
Loan refused	-0.025 (0.023)	-0.015 (0.027)	-0.024 (0.020)
Loan amount granted in part	0.066* (0.037)	0.048 (0.032)	0.077*** (0.029)
Loan term > 10 years	0.153*** (0.033)		
Took out loan in 2008 or before	0.076*** (0.022)	0.094*** (0.019)	0.186*** (0.030)
Domestically-owned bank	-0.026 (0.034)		
Domestically-owned bank, mortgage loan		0.052* (0.030)	0.152*** (0.054)
Foreign-owned bank, mortgage loan		0.100* (0.051)	0.217*** (0.055)
Domestically-owned bank, consumption loan		0.015 (0.041)	0.061 (0.040)
Rho	-0.59***	-0.51***	-0.31***
Mean of dependent variable	0.31	0.31	0.31
Country*wave fixed effects	Yes	Yes	Yes
Log likelihood value	-3,281.1	-3,342.5	-3,882.2
Total observations	12,493	12,560	12,585
Uncensored observations	2,420	2,487	2,512

Source: OeNB Euro Survey.

Note: The dependent variable in this table is FX loan, which takes a value of 1 if respondents hold a foreign currency loan, 0 if they hold a local currency loan. All models report the marginal effects from the outcome equation from a Heckman probit selection model. We employ information on whether the household has children and whether the household ever applied for a loan for identification. All models additionally include the following household control variables: inflation literacy, distance to banks, age, household size, married, risk aversion. All models include fixed effects per country wave. Standard errors are reported in parentheses and are adjusted for clustering at the country-wave level. \*\*\* \*\*, \* denote significance at the 0.01, 0.05 and 0.10-levels, respectively. All variables are defined in the annex.



With this limitation in mind, we first discuss the results of our control variables and then move on to the effect of bank ownership.<sup>12</sup> With regard to the control variables, we obtain three main results: First, the currency preferences of loan applicants have a very strong impact on the incidence of a FX loan. Those with a preference for a FX loan are about 80 percentage points more likely to finally have a FX loan than those who had a preference for a local currency loan. We also find that loan applicants who said that they had no explicit preference for a loan currency have a higher likelihood (by about 40%) to get a FX loan than those with a local currency preference. This likelihood is much lower in comparison to respondents with a FX loan preference, but also higher than the overall incidence of FX loans. However, if one suspected banks to massively steer customers, one would expect an even higher coefficient for those without a currency preference.

Second, with respect to the creditworthiness of borrowers, we find that respondents with a FX loan are more likely to own a car. All other socioeconomic variables are found to be insignificant. Additionally, we observe two variables that signal a low level of creditworthiness of respondents: first, whether a respondent's demand for a loan has been refused at least once since the year 2000 and second, whether the loan amount was only granted in part. In column 1, we do not find that the prior refusal of loans has any impact on the incidence of a FX loan. The variable "amount granted in part" is positive but only marginally significant. Seen together, these results do not suggest a systematic and strong relationship between these creditworthiness proxies and the likelihood of a FX loan.

Third, we find that loan maturity is a very decisive factor for the credit currency: Loans that have a maturity of more than 10 years are 15 percentage points more likely to be in foreign currency (column 1). Additionally, the results in column 1 of table 7 suggest a significant effect of the time when the loan was granted, i.e., loans that were taken out prior to 2009 are 8 percentage points more likely to be FX loans than loans that were granted in or after 2009. As we control for FX preferences, which as table 6 shows also depend on loan maturity and on the time when the loan was taken out, this effect can be mainly ascribed to the supply side.

Does it matter whether banks are domestically or foreign owned? It is likely that the customers of and the type of loans granted by domestically- and foreign-owned banks differ in many important aspects (e.g. foreign banks could be more engaged in mortgage lending, etc.). Our comprehensive set of explanatory variables enables us to control for (many of) these differences. The dummy variable for bank ownership should thus indicate the respective marginal effect, keeping preferences of customers, their creditworthiness and their loan maturity constant. The results of column 1 of table 7 show no significant effect of bank ownership on FX lending.

In column 2 we study whether there are differences regarding the denomination of consumption and mortgage loans.<sup>13</sup> Our results show that mortgages are more likely to be in foreign currency than consumption loans, which confirms the importance of FX funding for long-term financial decisions. We do not find a

<sup>12</sup> The respective results for the selection equation are summarized in table A4.

<sup>13</sup> This specification omits the loan maturity dummy as it is highly correlated with the type of the loan.

significant difference between domestic and foreign banks neither with regard to consumption loans nor with regard to mortgages.<sup>14</sup>

The results of columns 1 and 2 control for the currency preferences of borrowers. Our interpretation of these specifications is that the remaining parameters should reflect the factors that impact on the difference between the requested and the granted currency. Thus, these differences should mainly reflect supply effects, although we acknowledge that this separation might also be confounded by other factors (like a change in borrowers' opinions during the loan application process). To ascertain this we repeat the specifications in column 3 without the preference variables and we expect those variables to gain importance that also affect currency preferences. By and large, the column 3 results support this interpretation as the effect of the loan maturity and of mortgages increases.<sup>15</sup> Again, there is a slightly higher incidence of mortgages at foreign-owned banks than at domestically-owned banks (by 7 percentage points, which compares with a difference of 5 percentage points in column 2), however this difference is not significant statistically.

#### 4 Summary and Conclusions

This paper uses household survey data from nine CESEE countries to investigate how the choice of loan currency relates to loan characteristics, preferences of borrowers regarding the loan currency and bank ownership (domestic or foreign).

We find that both demand and supply factors play an important role in loan currency decisions. On average, 23% of borrowers requested FX loans. Estimations extend this evidence and show that FX loans are requested in particular for long-term loans. However, the actual incidence of FX loans (in the estimation sample of respondents) is higher than suggested by demand. This suggests that banks also play a role in FX lending dynamics. We find that banks are also more likely to grant loans in foreign currency that are large and long-term. Furthermore, descriptive results cautiously suggest that the quality of both foreign currency and local currency debtors is somewhat "better" at foreign-owned banks.

We also find that in Croatia and Hungary, foreign-owned banks had a higher share of FX loans than local currency loans, whereas in the remaining seven countries covered by the survey the shares of FX loans and local currency loans were statistically similar or the share of FX loans was lower. However, this picture can be misleading because compared to foreign-owned banks, domestically-owned banks may attract different customers that have different preferences or that demand different loans. In order to account for this issue, we run regressions that control for loan and customer characteristics. We find no significant difference between domestically- and foreign-owned banks with regard to loan currencies, neither for consumption loans nor for mortgages.

We note that our results are based on a relatively small number of observations and rely on survey respondents revealing the truth. Moreover, the regressions pool all countries and the respective results reflect an average effect across

<sup>14</sup> The difference between "dom. bank, mortgage loan" and "for. bank, mortgage loan" is not different from zero statistically.

<sup>15</sup> One caveat of these specifications is that we treat the decision about the bank where the loan was taken out as exogenous. Explicitly modeling this decision would require having information on regional bank competition and on the geographical proximity of domestic and foreign banks. As this information is unavailable we have opted for the simpler approach.

countries. Therefore, we advise to use the quantitative values with caution. Our findings mainly illustrate underlying tendencies; they are in line with findings in existing literature, which, however, focuses on firms rather than households and in particular on the existence of a demand effect for FX loans, the existence of supply effects and the quality of debtors. This implies that the present paper can be seen as a promising starting point for more detailed and elaborate analyses.

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## Annex

Table A1

### Variable Definition

Variable Name	Definition
<b>Loan Information</b>	
Amount granted in part	Dummy variable derived from the question "I would like to ask you some questions about your loans. If you have more than one loan, please refer to the largest, most important loan. Was the amount you requested granted in full or only granted in part?"; answer "Granted in part" coded as 1, "Granted in full" as 0, "Don't know" and "No answer" coded as missing.
Applied	Dummy variable derived from the question "Since the year 2000, have you or any other member of your household ever contacted a bank with a view of obtaining a loan?"; "Yes" coded as 1, "No" as 0, "Don't know" and "No answer" coded as missing. Those who answer "Yes" are then asked "Was this before 2009?"
Consumption loan	Dummy variable derived from answers to the question "What is the purpose of your loan?"; answers "for consumption goods," "to finance a car" and "for other purposes" are coded as 1, "to finance a house or apartment" coded as 0.
Domestic bank	Dummy variable; 1 if the general ultimate owner at the highest consolidation level of the bank at which respondents hold their loan is based in the country where the respondent lives. Information on the general ultimate owner is taken from BankScope and checked and supplemented by information from Claessens and van Horen, 2013, as well as by Internet-based research.
FX loan preference, no currency preference	Dummy variables derived from the question "When you first asked for this loan at your bank, did you have a preference regarding the currency denomination of your loan?"; FX loan preference answers ("Yes, I had a preference for euro / Swiss franc / other") coded as 1, answer "Yes, I had a preference for local currency" coded as 0, "No, I did not have a preference," "Don't know," "No answer" and "Not applicable, I do not have my loan from a bank" coded as missing. No currency preference answers ("No, I did not have a preference") coded as 1, answers "Yes, I had a preference for a loan in local currency / euro / Swiss franc / other" coded as 0, answers "Don't know," "No answer" and "Not applicable, I do not have my loan from a bank" coded as missing.
FX loan Loan	Dummy variable that takes the value 1 if respondent has a FX loan, otherwise 0. Dummy variable coded as 1 if respondent has a loan. Derived from the question "Do you, either personally or together with your partner, have any loans?"; answers are "No," "Yes, my loans are solely denominated in foreign currency," "Yes, my loans are predominantly denominated in foreign currency," "Yes, about equal amounts of loans in local and foreign currencies," "Yes, my loans are predominantly denominated in local currency," "Yes, my loans are solely denominated in local currency."
Loan refused	Dummy variable derived from the question "Since the year 2000, has a bank ever discouraged you from applying for a loan or ever refused a loan?"; answer "Yes" coded as 1, "No" as 0, "Don't know" and "No answer" coded as missing.
Loan maturity, loan maturity >10 years	Based on the question "When you took out this loan, what was the overall maturity of the loan?"; measured in years. Loan maturity >10 years is a dummy variable which is 0 for answers 10 years or less and 1 for answers more than 10 years. "Don't know" and "No answer" are coded as missing.
Mortgage	Dummy variable derived from answers to the question "What is the purpose of your loan?" Coded as 0 for all respondents with a loan and 1 for those who answer "to finance a house or apartment."
No choice	Dummy variable derived from answers to the question "Did the bank provide you with an offer to take out the loan in any other currency than the one you got your loan in?"; answers "Yes, the bank offered a local currency / euro / Swiss franc / other currency" loan coded as 0, answer "No, the bank just offered the loan in one currency" coded as 1.
No currency match	Dummy variable derived from answers to the questions "When you first asked for this loan at your bank, did you have a preference regarding the currency denomination of your loan?" and the follow-up question "In which currency was this loan granted?"; answers in which the currency preference and the currency granted match are coded as 0, answers in which currency preference and currency granted do not match are coded as 1.
Plan loan	Dummy variable derived from the question "Do you plan to take out a loan within the next year and if so in what currency?"; answer "No" is coded as 0, answers "Yes, in local currency," "Yes, in euro," "Yes, in Swiss franc" and "Yes, in other foreign currency" are coded as 1. Answers "Don't know" and "No answer" are coded as missing.
Took out loan in 2008 or before	Dummy variable; 1 if the respondent took out the loan in 2008 or before, 0 if the respondent took out the loan in 2009 or later, missing if the respondent replies "Don't know" or "No answer."

Source: OeNB Euro Survey.

Table A1 continued

## Variable Definition

Variable Name	Definition
<b>Personal Characteristics, Sentiments</b>	
FX deposit preference	Dummy variable derived from the question "Suppose you had about two times an average monthly salary to deposit in a savings account. Would you choose to deposit this amount in local currency, euro, U.S. dollar, Swiss franc, or other foreign currency?"; answer category "local currency" is coded as 0, all foreign currencies are coded as 1.
Inflation literacy	Dummy variable derived from the question "Suppose that the interest rate on your savings account was 4% per year and inflation was 5% per year. Disregarding any bank fees – after one year, would you be able to buy more than, exactly the same, or less than today with the money in this account?"; answers "less" coded as 1, answers "more," "exactly the same" and "don't know" coded as 0. "No answer" observations are excluded.
Risk averse	Derived from answers to the statement that "in financial matters, I prefer safe investments over risky investments." Categorical variable ranging from 1 ("strongly disagree") to 6 ("strongly agree").
Trust in government	Based on question "I would like to ask you a question about how much trust you have in the government. Please tell me if you tend to trust it or tend not to trust it. 1 means 'I trust completely', 2 means 'I somewhat trust', 3 means 'I neither trust nor distrust', 4 means 'I somewhat distrust' and 5 means 'I do not trust at all.'"; dummy variable coded as 1 if respondents somewhat or completely trust, all other coded as 0.
<b>Socioeconomic Variables</b>	
Age, age squared	Age of respondent divided by 10, age squared of respondent divided by 100.
Children	Dummy variable which takes the value 1 if children younger than 18 years old live in the household.
Distance to banks	Derived from answers to the statement "For me, it takes quite a long time to reach the nearest bank branch."; answers are "strongly agree," "agree," "somewhat agree," "somewhat disagree," "disagree," "strongly disagree;" categorical variable ranging from 1 ("strongly disagree") to 6 ("strongly agree").
Education (primary, secondary, tertiary)	Dummy variables; degree of education (university level, secondary and primary education).
Household size (1 person, 2 persons, 3+ persons)	Size of household: 1 person, 2 persons, 3 or more persons.
Income (low, medium, high; answer refused)	Dummy variables which take the value 1 for each net household income terciles (high, medium, low). Sample values are used to construct terciles. For those respondents who did not give an answer an additional dummy variable is defined (answer refused).
Labor market status (employed, unemployed, retired, self-employed)	Dummy variables coded as 1 if respondent belongs to a selected occupational category.
Married	Dummy variable; 1 if the respondent is married.
No savings	Dummy variable that takes the value 1 if respondent does not have any of the following form of savings: cash, savings deposits, life insurance, mutual funds, stocks, pension funds, bonds or current account.
Own car(s)	Dummy variable that takes the value 1 if the respondent owns one or more cars.
Own house	Dummy variable that takes the value 1 if the respondent owns a house or an apartment.
Receives remittances	Derived from answers to the question "Do you personally or your partner receive any money from abroad? E.g. from family members living or working abroad, pension payments, etc.?"; dummy variable coded as 1 if answer is "yes, regularly" or "yes, infrequently," else 0.
Regular income in euro	Dummy variable; 1 if the respondent regularly receives income in euro.

Source: OeNB Euro Survey.

Table A2

## Descriptive Statistics

	Min/ Max	HU	PL	BG	RO	AL	BA	HR	MK	RS	Total
Age	19/94	47.20 (14.41)	46.95 (16.52)	47.65 (15.94)	49.81 (15.80)	40.84 (14.61)	46.83 (15.24)	46.73 (14.75)	49.10 (16.13)	44.41 (13.33)	46.61 (15.42)
Age squared	4/88	24.36 (14.23)	24.77 (16.41)	25.24 (15.86)	27.31 (15.97)	18.81 (12.90)	24.25 (14.97)	24.01 (14.46)	26.71 (16.33)	21.50 (12.49)	24.10 (15.11)
Loan amount granted in part	0/1	0.02 (0.15)	0.01 (0.11)	0.02 (0.12)	0.01 (0.11)	0.01 (0.10)	0.00 (0.06)	0.03 (0.18)	0.01 (0.12)	0.02 (0.14)	0.02 (0.13)
Applied for loan	0/1	0.39 (0.49)	0.41 (0.49)	0.35 (0.48)	0.26 (0.44)	0.19 (0.39)	0.37 (0.48)	0.54 (0.50)	0.31 (0.46)	0.40 (0.49)	0.36 (0.48)
Children	0/1	0.29 (0.45)	0.37 (0.48)	0.32 (0.47)	0.25 (0.43)	0.45 (0.50)	0.39 (0.49)	0.35 (0.48)	0.33 (0.47)	0.43 (0.50)	0.35 (0.48)
Consumption loan	0/1	0.38 (0.49)	0.80 (0.40)	0.75 (0.43)	0.69 (0.46)	0.55 (0.50)	0.69 (0.46)	0.49 (0.50)	0.69 (0.46)	0.84 (0.37)	0.64 (0.48)
Distance to banks	1/6	2.33 (1.32)	2.87 (1.36)	2.76 (1.80)	3.06 (1.65)	3.10 (1.70)	3.24 (1.67)	2.47 (1.63)	3.34 (1.83)	3.33 (1.76)	2.94 (1.68)
Secondary education	0/1	0.42 (0.49)	0.38 (0.49)	0.68 (0.47)	0.49 (0.50)	0.46 (0.50)	0.42 (0.49)	0.56 (0.50)	0.48 (0.50)	0.62 (0.48)	0.50 (0.50)
Tertiary education	0/1	0.15 (0.35)	0.17 (0.38)	0.22 (0.41)	0.29 (0.45)	0.24 (0.43)	0.15 (0.36)	0.18 (0.39)	0.16 (0.37)	0.23 (0.42)	0.20 (0.40)
FX deposit preference	0/1	0.52 (0.50)	0.16 (0.36)	0.42 (0.49)	0.30 (0.46)	0.27 (0.45)	0.53 (0.50)	0.63 (0.48)	0.55 (0.50)	0.77 (0.42)	0.46 (0.50)
FX loan	0/1	0.52 (0.50)	0.24 (0.43)	0.31 (0.46)	0.40 (0.49)	0.18 (0.39)	0.23 (0.42)	0.82 (0.38)	0.22 (0.42)	0.70 (0.46)	0.44 (0.50)
FX loan preference	0/1	0.24 (0.43)	0.08 (0.27)	0.10 (0.29)	0.18 (0.38)	0.10 (0.30)	0.03 (0.18)	0.38 (0.48)	0.11 (0.31)	0.24 (0.43)	0.18 (0.38)
Household size: 2 persons	0/1	0.37 (0.48)	0.33 (0.47)	0.34 (0.47)	0.37 (0.48)	0.13 (0.34)	0.24 (0.43)	0.28 (0.45)	0.20 (0.40)	0.17 (0.38)	0.27 (0.44)
Household size: 3+ persons	0/1	0.41 (0.49)	0.53 (0.50)	0.54 (0.50)	0.41 (0.49)	0.85 (0.36)	0.67 (0.47)	0.62 (0.49)	0.72 (0.45)	0.74 (0.44)	0.61 (0.49)
High income	0/1	0.21 (0.41)	0.23 (0.42)	0.23 (0.42)	0.24 (0.43)	0.29 (0.45)	0.24 (0.42)	0.22 (0.42)	0.31 (0.46)	0.21 (0.41)	0.24 (0.43)
Medium income	0/1	0.23 (0.42)	0.23 (0.42)	0.22 (0.41)	0.23 (0.42)	0.30 (0.46)	0.24 (0.43)	0.29 (0.46)	0.28 (0.45)	0.22 (0.41)	0.25 (0.43)
No information on income provided	0/1	0.29 (0.45)	0.29 (0.46)	0.29 (0.45)	0.33 (0.47)	0.17 (0.37)	0.29 (0.45)	0.25 (0.43)	0.10 (0.30)	0.31 (0.46)	0.25 (0.43)
Inflation literacy	0/1	0.64 (0.48)	0.44 (0.50)	0.76 (0.43)	0.41 (0.49)	0.32 (0.47)	0.46 (0.50)	0.69 (0.46)	0.47 (0.50)	0.64 (0.48)	0.54 (0.50)
Loan	0/1	0.45 (0.28)	0.41 (0.22)	0.43 (0.25)	0.37 (0.17)	0.32 (0.12)	0.45 (0.28)	0.48 (0.36)	0.42 (0.22)	0.41 (0.21)	0.42 (0.23)
Loan from domestically-owned bank	0/1	0.53 (0.50)	0.39 (0.49)	0.08 (0.27)	0.16 (0.37)	0.13 (0.34)	0.23 (0.42)	0.15 (0.35)	0.41 (0.49)	0.50 (0.50)	0.29 (0.45)
Loans refused	0/1	0.06 (0.24)	0.05 (0.21)	0.06 (0.23)	0.02 (0.15)	0.02 (0.15)	0.03 (0.17)	0.13 (0.33)	0.05 (0.21)	0.06 (0.24)	0.05 (0.22)
Loan term >10 years	0/1	0.51 (0.50)	0.17 (0.38)	0.13 (0.34)	0.19 (0.39)	0.06 (0.23)	0.05 (0.22)	0.32 (0.47)	0.04 (0.20)	0.11 (0.31)	0.21 (0.40)
Married	0/1	0.59 (0.49)	0.66 (0.47)	0.71 (0.45)	0.64 (0.48)	0.71 (0.45)	0.71 (0.45)	0.68 (0.46)	0.83 (0.37)	0.73 (0.44)	0.70 (0.46)
Mortgage	0/1	0.62 (0.49)	0.20 (0.40)	0.25 (0.43)	0.31 (0.46)	0.45 (0.50)	0.31 (0.46)	0.51 (0.50)	0.31 (0.46)	0.16 (0.37)	0.36 (0.48)
No currency preference	0/1	0.06 (0.25)	0.03 (0.18)	0.05 (0.22)	0.01 (0.11)	0.01 (0.07)	0.04 (0.20)	0.12 (0.32)	0.03 (0.16)	0.04 (0.20)	0.04 (0.21)
No savings	0/1	0.71 (0.46)	0.63 (0.48)	0.71 (0.45)	0.77 (0.42)	0.34 (0.47)	0.83 (0.38)	0.54 (0.50)	0.30 (0.46)	0.70 (0.46)	0.60 (0.49)
Own car(s)	0/1	0.56 (0.50)	0.71 (0.45)	0.65 (0.48)	0.35 (0.48)	0.43 (0.49)	0.56 (0.50)	0.80 (0.40)	0.56 (0.50)	0.64 (0.48)	0.58 (0.49)

Source: OeNB Euro Survey.

Note: The descriptive statistics shown in this table are average values for fall 2012 and fall 2013. The average across countries "Total" is not weighted by country size.

Table A2 continued

### Descriptive Statistics

	Min/ Max	HU	PL	BG	RO	AL	BA	HR	MK	RS	Total
Own house	0/1	0.86 (0.35)	0.90 (0.31)	0.94 (0.23)	0.79 (0.40)	0.92 (0.27)	0.81 (0.39)	0.92 (0.27)	0.90 (0.30)	0.91 (0.29)	0.89 (0.32)
Receives remittances	0/1	0.04 (0.19)	0.03 (0.17)	0.05 (0.22)	0.07 (0.26)	0.21 (0.40)	0.11 (0.31)	0.08 (0.27)	0.09 (0.28)	0.07 (0.25)	0.08 (0.28)
Regular income in euro	0/1	0.02 (0.14)	0.01 (0.11)	0.01 (0.08)	0.02 (0.13)	0.04 (0.20)	0.04 (0.19)	0.05 (0.22)	0.04 (0.19)	0.03 (0.16)	0.03 (0.17)
Retired	0/1	0.24 (0.43)	0.25 (0.43)	0.25 (0.43)	0.38 (0.49)	0.11 (0.31)	0.25 (0.43)	0.26 (0.44)	0.25 (0.43)	0.16 (0.37)	0.24 (0.43)
Risk averse	0/1	0.56 (0.50)	0.56 (0.50)	0.75 (0.44)	0.63 (0.48)	0.58 (0.49)	0.51 (0.50)	0.64 (0.48)	0.81 (0.39)	0.74 (0.44)	0.64 (0.48)
Self-employed	0/1	0.06 (0.24)	0.07 (0.26)	0.06 (0.24)	0.06 (0.24)	0.24 (0.42)	0.03 (0.17)	0.05 (0.23)	0.06 (0.23)	0.05 (0.21)	0.08 (0.27)
Took out loan in 2008 or before	0/1	0.74 (0.44)	0.28 (0.45)	0.50 (0.50)	0.59 (0.49)	0.24 (0.43)	0.40 (0.49)	0.57 (0.50)	0.21 (0.41)	0.26 (0.44)	0.45 (0.50)
Trust in government	0/1	0.25 (0.43)	0.18 (0.39)	0.20 (0.40)	0.21 (0.40)	0.52 (0.50)	0.17 (0.37)	0.18 (0.38)	0.44 (0.50)	0.25 (0.44)	0.27 (0.44)
Unemployed	0/1	0.11 (0.32)	0.10 (0.29)	0.13 (0.33)	0.16 (0.37)	0.25 (0.43)	0.39 (0.49)	0.18 (0.39)	0.39 (0.49)	0.26 (0.44)	0.22 (0.41)

Source: OeNB Euro Survey.

Note: The descriptive statistics shown in this table are average values for fall 2012 and fall 2013. The average across countries "Total" is not weighted by country size.

Table A3

### Demand for FX Loans (Selection Equation)

Dependent variable	Loan(0,1)			
	All	All	Consumption loans	Mortgage loans
Model	(1)	(2)	(3)	(4)
Loan refused	-0.034*** (0.007)	-0.023*** (0.005)	-0.011*** (0.003)	-0.004*** (0.001)
Inflation literacy	0.001 (0.006)	0.002 (0.005)	0.003 (0.003)	-0.001 (0.001)
Distance to banks	-0.002 (0.002)	-0.002 (0.001)	-0.000 (0.001)	-0.001* (0.000)
Children	0.028*** (0.008)	0.021*** (0.007)	0.010** (0.004)	0.004** (0.002)
Applied for loan	0.325*** (0.015)	0.233*** (0.023)	0.117*** (0.021)	0.038*** (0.008)
Loan mean	0.21	0.19	0.13	0.07
Log likelihood value	-3,941.4	-3,404.9	-2,469.0	-1,711.6
Total observations	11,812	11,484	10,732	10,097
Uncensored observations	2,467	2,139	1,387	752
Country*wave fixed effects	Yes	Yes	Yes	Yes
Rho	-0.14**	-0.16**	-0.14	-0.32*

Source: OeNB Euro Survey.

Note: Marginal effects Heckman probit regression. \*\*\*, \*\*, \* denote significance at the 0.01, 0.05 and 0.10 level, respectively.



Table A4

**Incidence of FX Loans (Selection Equation)**

Dependent variable	Loan (0.1)		
	All	All	All
Model	(1)	(2)	(3)
Loan refused	-0.091*** (0.029)	-0.091*** (0.027)	-0.093*** (0.027)
Inflation literacy	0.013 (0.024)	0.014 (0.022)	0.014 (0.023)
Distance to banks	-0.014*** (0.004)	-0.014*** (0.004)	-0.014*** (0.004)
Children	0.091*** (0.023)	0.097*** (0.024)	0.097*** (0.026)
Applied	1.052*** (0.061)	1.046*** (0.058)	1.049*** (0.058)
Mean of loan	0.23	0.20	0.20
Country*wave fixed effects	Yes	Yes	Yes
Log likelihood value	-3,281.1	-3,342.5	-3,882.2
Total observations	12,493	12,560	12,585
Uncensored observations	2,420	2,487	2,512
Rho	-0.59***	-0.51***	-0.31***

Source: Authors' estimations.

Note: Marginal effects Heckman probit regression. \*\*\*, \*\*, \* denote significance at the 0.01, 0.05 and 0.10 level, respectively.