In Lands of Foreign Currency Credit, Bank Lending Channels Run Through?

The Effects of Monetary Policy at Home and Abroad on the Currency Denomination of the Supply of Credit

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This Draft: October, 2014

* Corresponding author. We thank András Fülöp, Anna Naszódi, Judit Temesváry, Mingming Zhou, seminar participants at the Bank of Finland, the Central Bank of Hungary, Central European University, *Norges Bank*, Institute of Economics of the Hungarian Academy of Science, *Sveriges Riksbank* and the University of Bristol, Mannheim and Zürich, and conference participants at the Swiss Finance Research Days and LARGE-BOFIT Workshop on Banking and Finance in Emerging Markets (Strasbourg) for helpful comments. We are grateful to Miklós Koren and Ádám Szeidl for access to the *Complex* database. Győző Gyöngyösi and István Schindler provided excellent research assistance. Dzsamila Vonnák gratefully acknowledges financial assistance from the Summer Visitor Program of the Central Bank of Hungary and Hungarian Academy of Sciences Momentum Grant 'Firms, Strategy and Performance'. The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Central Bank of Hungary or their staff.

Abstract

We analyze the differential impact of domestic and foreign monetary policy on the local supply of bank credit in domestic and foreign currencies. We analyze a novel, supervisory dataset from Hungary that records all bank lending to firms including its currency denomination. Accounting for time-varying firm-specific heterogeneity in loan demand, we find that a lower domestic interest rate expands the supply of credit in the domestic but not in the foreign currency. A lower foreign interest rate on the other hand expands lending by lowly versus highly capitalized banks relatively more in the foreign than in the domestic currency. (98 words)

Keywords: Bank balance-sheet channel, monetary policy, foreign currency lending.

JEL: E51, F3, G21.

I. Introduction

Bank lending in a foreign currency to local businesses and households has been a widely observed phenomenon in many "dollarized" (or "euroized") countries around the world, in South-America, East Asia, and more recently in Eastern Europe. But also in the Euro area around ten percent of credit by resident financial institutions to the non-financial sector is granted in a foreign currency (European Central Bank and Brown, Peter and Wehrmüller (2009)).

Yet, despite the prevalence of such lending there is little or no empirical work identifying the impact of domestic monetary conditions on the local supply of credit in the domestic versus the foreign currency, and equally important there is no work identifying the impact of monetary policy set by the relevant central bank abroad (that issues the foreign currency) on the local supply of credit (in the different currencies).[1] Given the increased calls for tighter international monetary co-operation in the aftermath of the financial crisis this is a particularly acute policy issue for emerging economies.[2]

This paper therefore takes the next necessary step in the empirical literature that identifies – with micro-data – the impact of monetary policy on the provision of credit. While the impact of monetary policy on the *supply of credit* in the economy has been widely analyzed (Bernanke and Blinder (1992), Kashyap and Stein (2000), Jiménez, Ongena, Peydró and Saurina (2012)), recent research on the impact of the monetary policy rate on the *composition* of the supply of credit has so far focused on direct credit risk taken (Jiménez, Ongena, Peydró and Saurina (2014a) and

[1] Recent work investigates the determinants and effects of global liquidity at the aggregate level. Cerutti, Claessens and Ratnovski (2014) for example use country-to-country level data on cross-border bank flows to study the non-price determinants of the cross-border supply of credit. They find that global liquidity is driven primarily by uncertainty (VIX), US monetary policy (term premia but not federal funds rate *per se*), and UK and Euro Area bank conditions (proxied by leverage and TED spreads).

[2] For example, *Financial Times*, January 30, 2014, "India's Raghuram Rajan hits out at uncoordinated global policy."

references therein). In this paper we analyze the impact of monetary policy along currency denomination and we do so for both the domestic and the foreign monetary policies.[3]

In particular, we test two key hypotheses. First, we hypothesize that a monetary expansion by the domestic central bank decreases the local banks' cost of funding in the domestic currency but not (at least to the same extent) in the foreign currency, generating a differential impact on banks' loan supply decisions in the different currencies. Second, we hypothesize that a monetary expansion by the foreign central bank lowers the domestic (but potentially foreign owned) banks' cost of funding in the foreign currency but not in the domestic currency and examine, again, the local banks' consequent lending decisions in the domestic and foreign currencies.

Hungary provides an almost ideal setting to identify this currency compositional effect. Many local loans are denominated in Euro or in Swiss franc (in some sample years more than a third of the bank lending was), and the comprehensive credit register at the Central Bank of Hungary (*Magyar Nemzeti Bank*) contains granular information on all loans extended by all credit institutions operating in Hungary, including and – essential for our purposes – their currency denomination. And with an economic system dominated by banks, we can separate credit supply from demand by exploiting theoretically-motivated interactions between monetary conditions on the one hand and a key bank balance-sheet strength variable, i.e., the bank capital-to-total-assets ratio, on the other (Bernanke, Gertler and Gilchrist (1996), Kashyap and Stein (2000)). The definition of the bank capital-to-total-assets ratio we employ closely follows the theoretical literature that attributes a prominent role to net worth in determining the ability of

[3] Ioannidou, Ongena and Peydró (2014) assess if changes in the US federal funds rate have compositional effects on the supply of US dollar denominated credit granted in Bolivia, an almost entirely dollarized country. However they do not assess – as we do – the potencies of the bank lending channels in both the domestic and foreign currencies.

banks to obtain financing from their own financiers (Holmstrom and Tirole (1997), Holmstrom and Tirole (1998), Bernanke, Gertler and Gilchrist (1999), Gertler and Kiyotaki (2011)).

As common in the literature, we account for the stance of monetary policy with a change in the three-month interest rate (Angeloni, Kashyap and Mojon (2003)). We further comprehensively account for changes in domestic GDP growth and inflation (Taylor (1993)), at all levels of interaction where the domestic interest rate is also featured. To achieve identification we further focus on the *set of loans* in *various currencies* granted *in the same month* to *the same borrower* by one or more banks of varying balance-sheet strengths (by including in the specifications firm-time fixed effects). Within this set of loans, for which the (observed and unobserved) quality of potential borrowers is constant, we study how monetary conditions affect the granting of loans in different currencies depending on bank capital.

Given these ingredients we can identify the impact of the monetary conditions set by both domestic and foreign central banks on the supply of credit by local banks in both domestic and foreign currencies. We find that expansionary domestic monetary conditions substantially increase lending from banks with lower capital ratios in the domestic currency but not in the foreign currency. Expansionary foreign monetary conditions on the other hand spur lending in the foreign currency but not in the domestic currency. These estimated differences in potency of the bank lending channels in domestic and foreign currency are not only statistically significant but also economically relevant (as our detailed discussion in the paper demonstrates). So when credit is also granted in foreign currencies, domestic monetary policy drives only part of the local

supply of credit, and foreign monetary policies will also matter. In that case "multiple bank lending channels of various strengths may run through a country."[4]

Our paper relates to the large empirical literature on financial dollarization that studies the determinants of banks' domestic lending in foreign currency in Latin American and transition economies (Nagy, Jeffrey and Zettelmeyer (2011)). This literature finds that in general the lack of macroeconomic policy credibility, inflation volatility, low institutional quality, interest rate differentials, financial market development, and foreign funding of bank credit all contribute to a high level of foreign currency bank loans in these economies (e.g., Barajas and Méndez Morales (2003), De Nicolo, Honohan and Ize (2003), Rajan and Tokatlidis (2005), Rosenberg and Tirpák (2009), Basso, Calvo-Gonzalez and Jurgilas (2011)). In contrast to this literature that focuses on macro-level money, credit and output aggregates, and often highlights carry-trade on the demand side, we employ micro-level data to identify the impact of changes in monetary conditions on the supply of bank credit across currencies.[5]

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[4] We are clearly not the first to assess the potency of a domestic bank lending channel in Central and Eastern Europe or to consider the effectiveness of macroeconomic policies in the presence of financial dollarization. Matousek and Sarantis (2009) for example use bank-level data from eight countries in the region. They find evidence for the channel's existence – though with varying strength – in each country. Actually the weakest evidence for the channel comes from Hungary: Only bank size and liquidity appear to play some role in marking the banks' responses to changes in the monetary policy stance. Other recent work confirming the existence of a bank lending channel comes from individual countries, including again Hungary (Horváth, Krekó and Naszódi (2006)), the Czech Republic (Pruteanu-Podpiera (2007)), and Poland (Havrylchyk and Jurzyk (2005)). Using credit aggregates from four Central and Eastern European economies Brzoza-Brzezina, Chmielewski and Niedźwiedzińska (2010) for example find that restrictive monetary policy may lead to a substitution in the demand for domestic to foreign currency loans, while using credit aggregates from Latvia and Serbia Beņkovskis (2008) and Kujundžić and Otašević (2012) show that interest rate changes may affect credit in the domestic currency but seem to have limited impact on credit granted in the foreign currency. Relatedly, Mora (2013) analyzes a sample of 56 banks in Mexico and documents that banks with a low amount of foreign currency deposits are more (less) sensitive to domestic (foreign) monetary policy shocks than banks with a substantial amount of foreign currency deposits. Complementing extant work, however, we identify the impact of monetary conditions at home and abroad on the supply of credit by individual banks to individual firms in local and foreign currencies, directly accounting for time-varying firm-level loan demand (at a monthly frequency).

[5] Brown, Ongena and Yeşin (2011) analyze firm level data and document that foreign currency borrowing by small firms is related to (firm-level) foreign currency revenues suggesting that the macroeconomic and institutional

The rest of the paper is organized as follows. Section II describes foreign currency lending in Hungary, the country's credit register, and the resultant sample. Section III discusses the identification strategy. Section IV introduces the methodology and the variables. Section V contains the results assessing the potency of the bank lending channels in both domestic and foreign currency. Section VI concludes.

II. Foreign Currency Lending in Hungary and Data Sources

A. Foreign Currency Lending in Hungary

Hungary's transition from a centrally planned to a market economy started at the end of the 1980s and was accompanied by a major inflow of foreign bank capital into the financial sector. By the end of the 1990s the majority of the banks in the country were foreign owned. Since capital markets were still underdeveloped, during the transition period, bank loans provided the major funding source for economic growth.

In early 2000s, a credit expansion started fuelled by an intense competition in the banking sector. In parallel, the share of foreign currency denominated loans increased significantly both in the household and the corporate sector. While the most popular denominations were the Euro and the Swiss Franc (see Figures 1 and 2), other currencies like the US dollar and even the Japanese yen were also not uncommon for corporations. From 2004 onwards, with the disappearance of state-subsidized domestic currency mortgages, foreign currency loans became a major retail bank product. By the end of 2007, 56 percent of total outstanding loans to non-bank clients were denominated in foreign currency (Brown, Peter and Wehrmüller (2009)).

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environment may not be the only determinant of financial dollarization. Consequently their paper suggests that firm-level controls are essential to identify the effects of monetary conditions on bank lending in various currencies.

[Insert Figures 1 and 2 here]

On the supply side, the foreign ownership of banks and the intense competition in the banking sector both contributed significantly to the spread of foreign currency loans. On the demand side, the major reason for borrowing in a foreign currency was the lower interest rate accompanied by borrowers' low awareness of exchange rate risks.[6] In particular large corporations with revenues in Euro started to borrow in Euro to hedge their exchange rate exposures. The popularity of Swiss Franc loans is attributed to even lower interest rates and low Euro/Swiss Franc exchange rate volatility during the period. When the financial crisis hit Hungary in the Fall of 2008, the Hungarian Forint depreciated significantly against the major currencies. In subsequent years, the share of foreign currency lending decreased, Swiss Franc lending essentially vanished, but lending in Euro preserved its importance both in the household and corporate sectors.

B. The Hungarian Central Credit Information System (KHR)

The Hungarian Central Credit Information System (KHR) contains information on *all* outstanding loans extended by *all* credit institutions operating in Hungary. As such this credit register contains loans from commercial banks, branch offices of foreign banks, saving cooperatives, credit unions, specialized credit institutions and other financial enterprises. We restrict our sample to loans granted by commercial banks and branch offices of foreign banks

[6] The prospect of the introduction of the Euro as the national currency may also have been a contributing factor to the assessment of the foreign exchange risks involved (Fidrmuc, Hake and Stix (2013)).

and focus on commercial and industrial loans that represent 66 percent of total loans registered in the credit register.

We observe all outstanding loans denominated in the domestic as well as foreign currency, between 2005 and 2011, at a monthly frequency. We aggregate the data to the firm-month-currency level which will be the focal unit of observation in our analysis.

We match the thus-organized loan data to firm and bank characteristics. Firms' financial statement data are available from the Hungarian National Tax and Custom Administration (APEH) database that contains the balance sheet and income statement of all Hungarian firms with double-entry book-keeping. Banks' financial and ownership data are available from bank regulatory reports accessible at the Central Bank of Hungary. Because the credit register provides information only about the type of the lender (bank, branch office, savings cooperative, leasing company, or other type) but not the individual lender's identity, we obtain information on the extant bank-firm relationships from a firm register called Complex that contains each firm's bank account numbers. The first three digits of the bank account number (called GIRO code) uniquely identify the bank belonging to a particular account number. For the majority of firms, this information unambiguously identifies the lender since three quarters of the firms in our dataset borrow from one bank only. A quarter of the firms have multiple bank relationships (and 2.36 banks on average). For these firms, we are not able to uniquely identify the bank-firm relationship.

III. Identification Strategy

Do low monetary policy rates at home and/or abroad spur changes in the currency denomination of the credit that is supplied by banks? To address this question one needs to

disentangle the impact of the changes in the interest rate on the currency denomination in the supply of credit from changes in the volume of the supply and changes in the quality and the volume of the demand − while accounting for the impact of other key macro variables. This bank supply channel involves compositional changes in the supply of credit at the *bank-firm-currency denomination* level.

Our identification strategy consists of two crucial ingredients: (1) Interacting the change in the interest rate with bank capital and currency denomination, while saturating with firm-time fixed effects; (2) horseracing the interest rate, in its interaction with bank capital and currency denomination, with the corresponding triple interactions of other key macro variables, in particular GDP growth and inflation.

As we are assessing the within-firm credit composition (along currency), first-stage firm-level loan application information as in Puri, Rocholl and Steffen (2011), Jiménez, Ongena, Peydró and Saurina (2012), Berg and Kirschenmann (2014) and Jiménez, Ongena, Peydró and Saurina (2014a), for example, would be potentially less informative for our purposes. Given that we focus on the currency denomination of credit granted to a firm in a certain month knowing the currency requested by the firm would be helpful. However, and as far as we are aware, no credit register in the world records this type of information (Miller (2003)) and only one study so far employs information on the currency requested from loan applications made to one bank (Brown, Kirschenmann and Ongena (2013)).

We now discuss the two aforementioned strategy components in more detail, along with our measures of credit granting.

A. Estimated Model

Our benchmark specification is a model that explains the extensive margin of the granting of loans in a currency given the firm had no precedent loan in the currency before. We also investigate the ending of lending across currencies and the increase in the amount of different currency lending.

1. Saturation with Fixed Effects and Triple Interactions

a) Firm-Time Fixed Effects

Given the prominent role of net worth in determining the borrowing by banks from their financiers, and given that the majority of banks may have little capital at stake, expansionary monetary policy by the central bank managing one currency may spur banks into lending in this respective currency but not necessarily (or at least not to an equal degree) in other currencies given imperfect hedging opportunities for either the bank and/or its financiers.[7]

However, this testable prediction can also be consistent with demand channels, in particular with the firm balance sheet and the interest rate channels of monetary policy (Bernanke and Gertler (1995)). Therefore, to suppress concurrent changes in the type (along balance sheet strength or export opportunities, for example) and volume of the firm demand for credit, we saturate our benchmark specifications with firm-time fixed effects. Observed and unobserved time-varying firm characteristics that are accounted for in this way include the net present value of firm projects, export and investment opportunities, agency problems, risk, pledgeable income and collateral. Identification comes from comparing changes in lending by one or more banks (that are different with respect to their capital-to-asset ratios) in the *same* month to the *same* firm

[7] According to Hungarian regulation, banks' reserve requirements do not differ for deposits in different currencies.

in different currencies. Only a quarter of the firms deal with multiple banks, so in robustness we break out the single-bank firms for which we know the exact bank – firm exposure.

2. Triple Interaction of Interest Rate, Bank Capital Ratio, and Currency Denomination

Given the set of fixed effects, identification of a bank lending channel comes from exploiting the testable prediction that when the monetary policy rate is lower for one particular currency, banks with lower net worth will lend more in this currency. Therefore, it is essential to have a sharp measure for the intensity of the agency conflict that besets banks' own borrowing from their financiers. The bank capital-to-assets ratio is such a measure (Holmstrom and Tirole (1997)). The ratio is also particularly meaningful in Hungary because off-balance sheet activity by banks has been almost non-existent.[8]

To identify the "currency composition channel" of monetary policy we interact the change in the interest rate with the lagged bank capital ratio (in the spirit of Kashyap and Stein (2000)) and the currency of the bank-firm exposure. When explaining new credit granted or credit growth we expect a negative sign for the estimated coefficient on this triple interaction term: When the domestic interest rate decreases, banks with a lower capital ratio are less likely to grant more credit in the foreign currency for example. However if the different currencies are substitutable for banks (through e.g. hedging),[9] this estimated coefficient should be close to zero,

[8] Banks in Hungary did not develop conduits or Structured Investment Vehicles (SIVs). Total bank assets therefore cover most of the banks' business. Securitization is also not practiced and therefore cannot be a significant motive for lending in the foreign currency.

[9] Currencies are unlikely to be perfectly substitutable for all banks in our sample. Brown, Kirschenmann and Ongena (2013) for example examine how bank funding affects the currency denomination of business loans by analyzing information on the requested and granted loan currency for all loans granted by one Bulgarian bank. They document that foreign currency lending is at least partially driven by the bank's eagerness to match the currency structure of assets with that of its liabilities.

while if lending in a foreign currency is perceived to facilitate extra risk taking the estimated coefficient may even be positive (or at least less negative).[10]

As bank capital may be correlated with other bank characteristics, we also add in corresponding triple interactions (i.e., in which bank capital is featured) of various bank characteristics. In accordance with the focus of our analysis, we cluster standard errors at the firm level.[11]

B. Horseracing Triple Interactions

1. Interest Rate

Banks are mostly funded by short-term debt, the interest rates of which will likely respond to changes in the monetary policy rate. As in Angeloni, Kashyap and Mojon (2003), we employ the yearly change in a three-month interest rate, for Hungarian Forint exposures on a Hungarian government bond, and for euro lending on a generic government bond. For Swiss Franc lending we use the annual change in the Swiss 3-month LIBOR interest rate.[12] For all three interest rates our sample period spans a full yet (across-interest-rates) distinct cycle and corresponding changes in the foreign exchange rate (see Figure 3).

[10] In this case the bank`s lower net worth (or "skin in the game") could lead to more foreign currency lending. Notice that in that case there could also be more risky lending in the domestic currency.

[11] Banks may prefer to lend in a currency in which the firm has revenues for example (even though revenue currency denomination may not always be fully observable, potentially leading to more foreign currency credit as in Brown, Ongena and Yeşin (2014)). Due to the high frequency of most variables` series clustering at the firm and time (i.e., year-month) level robs all estimated coefficients of their statistical significance. Clustering at the main bank level (as in e.g. Jiménez, Ongena, Peydró and Saurina (2014b)) throughout the analysis is impossible as we do not know the respective bank shares of the credit exposures.

[12] We use a three-month interbank rate because there is no three-month Swiss Treasury bill or government bond. We rerun all key exercises with the relevant three-month interbank rate from the three currency areas but results are unaffected.

[Insert Figure 3]

Assuaging concerns of reverse causality (e.g., future foreign currency lending by banks may imply current domestic monetary contraction) and omitted variables (variables correlated with the stance of monetary policy that can also influence bank lending) are the comprehensive sets of firm-time fixed effects which absorb any observed and unobserved time-varying heterogeneity across *all* included firms (comprising, for all practical purposes, the entire economy). For monetary conditions set in the euro area and Switzerland these concerns weigh considerably less.

2. Other Key Macro Variables

Despite the predominance of banks' short-term funding, their lending could also be affected by other key macro variables. Hence, the third crucial component in our identification strategy is to concurrently account for the effects of changes in GDP growth and prices as the main determinants of the monetary policy rate (but which may also capture firm investment opportunities and pledgeable income) and other aggregate variables including changes in exchange rate and foreign direct investment. We therefore horserace the triple interaction of changes in GDP growth, prices and other macro variables, with bank capital and currency denomination, with the equivalent triple interactions with the monetary policy rate.

Given their correlation with the interest rate, these macro variables in triples also feature as controls, to the extent that the firm-time fixed effects did not already soak up relevant macroeconomic variation.

Given our comprehensive data, sample period, identification strategy, and saturated specifications, we are confident that it is possible to make well-founded inferences on whether

short-term monetary policy rates affect banks' lending in different currencies, and in general on whether macroeconomic shocks result in changes in the composition of the supply of credit.

IV. Methodology and Variables

A. Model Line-Up

This Section presents and discusses our estimates. We estimate models with as dependent variables new credit granted (extensive margin), and also ending credit (extensive margin) and increase in the credit amount granted (intensive margin). To stepwise saturate with fixed effects and make robust inferences, we employ linear probability models.[13]

The sample period goes from January 2005 to December 2011. The total number of observations (i.e., total firm – credit in currency – year:month) equals 43,724,229, but given computing constraints the regressions in Tables II to VII employ a 10 percent random sample. Table I presents the summary statistics. Summary statistics for banks (firms) are based on the average values of the bank (firm) characteristics over the sample period. The number of banks in our sample is 39. The number of firms in our sample is 318,411.

B. Specification and Dependent Variables

The complete model before saturation with firm-time fixed effects, which is e.g., Model (5) in Table II, equals (in abridged form):

[13] Given the extensive sets of fixed effects we include and as we are primarily interested in the estimated coefficients on the triple interactions (as the next sections explain), we employ linear probability models (Ai and Norton (2003); Norton, Wang and Ai (2004)).

$$(1) \quad \text{CREDIT}_{ikt} = \alpha_i + \alpha_t + \beta IN\ FX_{ikt} + \delta \Delta INTEREST\ RATE_{t-1} * IN\ FX_{ikt} + \gamma\ \Delta INTEREST\ RATE_{t-1} * BANK\ CAPITAL_{bt-1} * IN\ FX_{ikt} + Controls + \varepsilon_{ikt}$$

The dependent variable is a measure of the CREDIT_{ikt} granted to firm i in currency k in month t. For each firm we know the set of banks the firm is having an account with but do not know the individual bank-firm credit exposure, except when the firm maintains only one bank which ("fortunately" in a sense) happens 74 percent of the time.

We first focus on the extensive margin of new credit, i.e., *New Granting of Credit*, which equals one if firm i receives credit in currency k in month t, conditional on having no debt in currency k in month t-1, and equals zero otherwise. Later we assess the ending of credit and growth in amount with two additional dependent variables: *Ending Credit* which equals one if firm i receives no more credit in currency k in month t, conditional on having received some credit in currency k in month t-1, and equals zero otherwise; and *Increasing the Amount of Credit* which equals one if the nominal amount of credit firm i holds in currency k in month t exceeds the nominal amount of credit in currency k in month t-1, and equals zero otherwise.[14]

The main independent variables are IN FX_{ikt}, the abridged label for *Credit Is Granted in Foreign Currency*, which equals one if the credit to firm i in month t is in currency k which is a foreign currency, and equals zero otherwise, $\Delta\text{INTEREST RATE}_{t-1}$ is the annual change in the

[14] Analyzing the extensive margin of new credit (in a binary manner) has many advantages. Such an analysis is comprehensive, comparable and directly interpretable across all loan types and conditions, it avoids having to adjust for exchange rate changes (which could create spurious correlations in our estimations), and it is least affected by the continuous decrease in firm-bank exposures according to their contracted repayment schedules. We will therefore also investigate in robustness the extensive margin of ending credit and the intensive margin of increasing credit in a binary manner.

relevant three month interest rate at *t-1*,[15] and BANK CAPITAL$_{bt-1}$ is the capital ratio at time *t-1* defined as the ratio of bank equity and retained earnings over total assets of the set of banks *b* granting the credit. These latter two variables are discussed more at length in the next section.

We are interested in the three coefficients, i.e., β, δ and γ, the coefficients on currency denomination and its double and triple interactions with the interest rate, and the interest rate and bank capital. The specification further loads in firm- and time fixed effects (represented by α_i and α_t), and as controls include the following sets of variables: (1) the triple interactions of the change in GDP and inflation, respectively, with bank capital, and currency denomination; (2) bank capital ratio, size, liquidity, profitability and non-performing loans; (3) firm capital ratio, size, liquidity, profitability and expected sales ratio and (4) in specifications with no time fixed effects the changes in the exchange rate, foreign direct investment, sovereign credit default swap spread and yield curve.

C. Main Independent Variables

1. Short-Term Interest Rate

The main variable of interest in our analysis is the yearly change in the three-month Forint interest rate that we measure by the yield on the three-month Hungarian government bond rate. The average change in the three-month interest rate during the sample period is -0.73 percentage points and it varies between -5.29 percentage points and 4.25 percentage points. To proxy for monetary policies from the other central banks that issue the currencies that are employed often, we also use the yearly change in three-month interest rates from the Eurozone and Switzerland.

[15] We also run specifications replacing the one-month lag of the interest rate with its two-, three-, four-, five-, or six-month lags. Results are similar.

The Euro interest rate is based on the average yield on the three-month Euro benchmark government bonds while the Swiss interest rate is the three-month Swiss interbank rate. The average Euro and Swiss three-month interest rates in the sample period are -0.19 percentage points and -0.05 percentage points, respectively. The former varies between -3.91 percentage points and 1.25 percentage points, the latter between -2.73 percentage points and 1.19 percentage points. Definitions and summary statistics of all variables are in Table I.

[Insert Table I here]

To comprehensively account for changes in domestic GDP growth and inflation (Taylor (1993)), we include both variables at all levels of interaction where the domestic interest rate is also featured.[16] The average GDP growth rate in Hungary during the sample period was 0.80 percent ranging between -8.00 percent and 4.70 percent, while average inflation was -0.40 percent, ranging between -1.05 and 6.73 percent. Additional macro controls are the annual change in the nominal effective exchange rate index of the Forint, foreign direct investment captured by the annual change in the amount of currency reserves at the Central Bank of Hungary, the annual change in the CDS rate on 5 year Hungarian sovereign bonds, and the annual change in the difference between 10-year and 1-year government bond yields. The macro variables are available monthly, except for GDP growth and currency reserves, which are

[16] Alternatively we run the interest rate first on GDP growth and inflation and employ the residuals of this regression rather than the interest rate itself. Results are very similar (and obviously independent of whether we then also feature in the second step GDP growth and inflation as independent variables). These results hold for both three-month government bond and interbank interest rates.

measured quarterly. For interim months, we use the end-of-quarter GDP growth rate and currency reserve values.

2. Bank Capital Ratio

Our key bank balance-sheet variable is the *Bank Capital Ratio* defined as the ratio of bank equity over total assets. The average bank capital ratio during the sample period is 12.76 percent.[17]

We include as control variables a number of bank characteristics that capture the time-variation in banks' loan supply.[18] In particular, we use the natural logarithm of total assets (*Bank Total Assets*) to proxy for bank size and the ratio of liquid to total assets (*Bank Liquidity Ratio*) to measure bank liquidity. We also include the *Bank Return on Assets* to measure profitability and the *Bank Doubtful Loan Ratio* to proxy for the current non-performance and riskiness of the bank's portfolio. We note that the firm fixed effects we include also control for the average time-invariant characteristics of the banks the firms maintain.

All bank balance-sheet and income statement variables are available at the monthly frequency. Balance-sheet variables for month *t* are proxied by their values at the end of month *t-1*, while bank performance variables for month *t* are the annualized values of their values measured over month *t-1*.

[17] For a few branch offices of foreign banks, the bank capital ratio takes negative values. In our final sample, observations with negative bank-capital ratio represent less than 0.03 percent of the total number of observations, and removing these few observations does not alter our main findings.

[18] Our data does not allow us to identify the individual bank-firm exposures when firms maintain multiple banks. Multiplicity occurs in around a quarter of the observations. We then simply average bank characteristics across the firms' banks.

D. Control Variables Including Fixed Effects

To control for the variation in the amount and quality of loan demand faced by the banks, we also include a set of firm characteristics, as well as firm and firm-time fixed effects in our specifications (with time equal to year:month). In particular, in all regressions without firm-time fixed effects, we include the *Firm Capital Ratio* measured by the ratio of the firm's equity capital to total assets, the natural logarithm of the firm's total assets (*Firm Total Assets*), the *Firm Liquidity Ratio* measured by the ratio of current to the total assets, the *Firm Return On Assets* that equals to the firm's net income over total assets, as control variables. To capture foreign linkages, we also use the *Firm Export Sales Ratio* calculated as the ratio of export sales over total sales.

Firm characteristics are available at yearly frequency. For each month in a given year, our firm-level balance-sheet variables are proxied by their values taken at the end of the preceding year, while income statement variables are proxied by their values measured over year *t-1*.

V. Results

A. Effect of Domestic Monetary Policy on the Composition of Loan Supply

1. Domestic versus Foreign Currency Credit

We start analysing the effect of domestic monetary policy on banks' loan supply decisions focusing on domestic vis-à-vis foreign currency loans, without distinguishing between firms' exposures in Euro and Swiss Franc. We focus on the extensive margin of lending by examining the effect of monetary policy on changes in the likelihood of banks' first-time credit granting in a

certain currency (i.e., the extensive margin of new credit, henceforth abridged as "credit initiation").

Table II presents our first results. Models 1 to 4 provide a step-by-step development towards the base specification which is Model 4 and which includes all relevant interaction terms for the interest rate, GDP growth, and inflation. The estimated coefficients of the domestic interest rate variable are highly significant in all models and have the expected negative sign suggesting that an interest rate decrease expands credit. In addition, Model 2 shows that the coefficient of the interaction of the interest rate with the bank capital ratio is statistically significant and takes a positive sign implying that a lower interest rate boosts credit granting especially by banks with low capital-to-asset ratios. This estimate is consistent with the existence of a bank-lending channel in Hungary, similar to the U.S. (e.g. Kashyap and Stein (2000)) and Spain (Jiménez, Ongena, Peydró and Saurina (2012)).

The bottom panel in Table 2 presents the economic relevance of the estimated coefficients. A 25 basis point decrease in the domestic interest rate increases the likelihood of initiating credit by a lowly capitalized bank 0.019 percentage point more than for a highly capitalized bank (if we take the difference between low and high capitalization to be equal to two standard deviations of the sample capitalization ratio). The estimated effect is thus economically significant, taking into account that the sample probability of new credit for any firm is 0.23 percent implying a semi-elasticity of the difference in loan granting between lowly and highly capitalized banks of 8 percent.

[Insert Table II here]

We next study the compositional effect of monetary policy on banks' loan supply decisions in Models 4 to 7. The estimates in Model 4 show that the differential impact of an interest rate change between lowly and highly capitalized banks is magnified when lending occurs in the domestic currency and minimized when lending occurs in a foreign currency. The same result is obtained in Model 5, which includes time – i.e., year:month – fixed effects, in addition to the firm fixed effects that were present in Models 1 to 4. Model 4 shows that a 25 basis point decrease in the domestic interest rate generates a 0.029 percentage point higher likelihood of credit initiation by a lowly- than by a highly capitalized bank when credit is granted in the domestic currency (Hungarian Forint). This differential impact represents 13 percent of the probability of credit initiation in the sample and is thus economically relevant. Model 5 indicates that the estimated economic effect is even higher – 14 percent of the sample probability of granting first-time credit – when, besides firm fixed effects, we also include time fixed effects in the regression. Coefficients on triple interaction terms including the interest rate variable in Models 4 and 5 show, however, that when lending takes place in a foreign currency, the economic impact of bank capitalization on the likelihood of first-time credit granting is almost insignificant. According to Model 4 (Model 5), a 25 basis point decrease in the domestic interest rate generates a differential impact between low and high capitalization banks that equals only 4 percent (5 percent) of the unconditional probability of initiating credit in the sample.

Models 6 and 7 saturate the empirical specification with firm-time fixed effects that account for all time-varying firm-specific heterogeneity in loan demand (volume and quality). The estimated coefficients on the triple interactions of the interest rate, bank capitalization, and currency denomination, indicate that the differential impact of interest rate changes along capitalization on credit initiation in domestic and foreign currency is robust to accounting for all

time-varying firm heterogeneity in loan demand. The bottom panel in Table II shows that the size of the difference in the economic impact between the domestic and foreign currencies equals 8 and 4 percent, respectively. The two models differ in the sample employed: Model 7 restricts the sample to firms with only one bank relationship (making the bank singularly identifiable), which represent 74 percent of all firms in our sample. Model 7 reveals that our results on the currency compositional effect of monetary policy are robust to the restriction of our analysis to one-bank firms.

Concerning the effects of other key macro variables, Table II confirms the economic relevance of GDP growth and CPI inflation in banks' loan supply decisions. Model 1 shows that both GDP growth and inflation have negligible aggregate effect on credit granting. Model 2, however, indicates that there is heterogeneity in how banks respond to changes in these macroeconomic variables. High GDP growth and low inflation boost credit granting by lowly capitalized banks, while reduce lending by highly capitalized banks. This finding corresponds to results in Jiménez, Ongena, Peydró and Saurina (2012) suggesting that GDP growth increases the probability of loan granting by Spanish banks. Estimates on the triple interactions of the GDP growth or inflation variables, bank capital, and the foreign currency dummy in Model 4 suggest that the differential impacts of changes in GDP growth and inflation between lowly and highly capitalized banks are magnified when lending occurs in the domestic currency and minimized when lending occurs in a foreign currency. Models 5 to 7 show that these results are robust to the inclusion of time fixed effects or firm-time fixed effects.

Overall, the results of Models 4 to 7 suggest that there is also a compositional effect in banks' loan supply decisions when responding to a change in the domestic interest rate: Expansionary monetary policy increases the likelihood of credit initiation in the domestic

currency but banks' foreign currency lending is essentially unaffected. Put differently, the bank lending channel of the domestic monetary policy loses its potency when it comes to the supply of credit in the foreign currency.

2. Robustness: Other Macroeconomic and Bank Characteristics and Sample Splits

In this robustness section we first examine whether, besides GDP growth and inflation, banks' loan supply decisions are sensitive to shocks in other macroeconomic variables. In particular, we horserace triple interactions of bank capital, currency denomination, and various macroeconomic variables, including, besides GDP growth and inflation, the nominal effective exchange rate and the amount of foreign direct investment in the country.

The estimates in Models 1 and 2 in Table III suggest that neither changes in the exchange rate nor changes in foreign direct investment affect the currency composition of credit granting.[19] Inclusion of triple interactions of the two macro variables with bank capital and currency denomination does not alter our findings regarding the differential supply effects of monetary policy. The difference in the economic impact between the domestic and foreign currencies is 13 and 5 percent, similar in magnitude to the differential impact obtained in our baseline specifications (see Models 6 and 7 in Table II).

To test the sensitivity of our results to changes in the macroeconomic shock variable, in unreported regressions we also include either one of two regulatory dummies. The first dummy equals one after 2008:01, the introduction of Basle II, and equals zero before. The second

[19] To conserve space in Table III we focus on firms' aggregate foreign currency exposures without distinguishing between Euro and Swiss Franc loans (as we will do in the next section) and we present only the most saturated specification that includes firm-time fixed effects. Results are unaffected when splitting up by currency as the next section will show. To conserve space we henceforth also only report the estimated semi-elasticities.

dummy equals one after 2008:09, when Swiss francs lending by banks to households was no longer allowed, and equals zero before. These dummies are introduced at all levels, including the triple interactions with bank capital and the currency of exposure. But results on the triple interactions with the interest rate are unaffected in both cases.

[Insert Table III here]

So far we have focused on bank equity to total bank assets as the only bank balance-sheet characteristic that may affect changes in banks' lending decisions following monetary shocks (Holmstrom and Tirole (1997)). We now alter the measurement of bank capital and also follow the previous literature by examining whether bank size (the natural logarithm of bank assets) and bank liquidity (the ratio of liquid to total bank assets) also affect the impact of interest rate changes on banks' loan supply. Furthermore, we examine whether bank foreign ownership matters.

In Models 3 and 4 we employ as an alternative to the Bank Capital Ratio the (one-month lagged) Bank Regulatory Capital Ratio which is defined as regulatory capital over risk-weighted assets. The reasons for this replacement are twofold. First, bank capital is the outcome of strategic choices made by the bank, and even when pre-determined in time endogeneity concerns may linger. Regulatory capital suffers (somewhat less) on this account. Second, Popov and Udell (2012) for example document that especially regulatory capital constraints determine bank lending. Our results remain robust however to the choice of bank capital measure. Alternatively in further unreported regressions we also instrument the Bank Capital Ratio with for example

one and two-quarter lags of the Bank Regulatory Capital Ratio (and/or lags of the bank capital ratio itself). Again results are very similar.

In Models 5 and 6 we follow Kashyap and Stein (1995) and focus on the impact of monetary shocks on the supply of loans by banks of different size, measuring bank size by total assets. The estimated coefficients of triple interactions of the interest rate change, bank size, and currency denomination are all insignificant suggesting that following monetary shocks there is no currency compositional effect in the supply of loans identifiable from the adjustment of banks of different size. In Models 7 and 8 we add the Bank Capital Ratio and its interactions and observe that the estimated coefficient on the triple interaction term that includes the bank capital ratio is statistically significant and economically large, while the triple term that includes Bank Total Assets is at best marginally significant and is always economically very small.

In Models 9 and 10, inspired by Kashyap and Stein (2000)) or Jiménez, Ongena, Peydró and Saurina (2012), we examine the impact of monetary shocks on the supply of credit by banks with different liquidity ratios. The estimates suggest a differential impact of interest rate changes along the bank liquidity characteristic. Estimates of Model 9, for example, indicate that when credit is granted in the domestic currency a 25 basis point decrease in the domestic interest rate generates a 5 percent larger difference in the impact on the likelihood of credit granting between banks with low and high liquidity ratios, than when credit is granted in the foreign currency. In Models 11 and 12 we horserace the bank capital ratio with liquidity. The estimates indicate it is especially the bank capital ratio that drives adjustments in banks' loan supply decisions following monetary changes.

Because foreign ownership may affect banks' own funding across currencies differentially we horse race the bank capital ratio with foreign ownership in Models 13 and 14.[20] The estimated coefficients on foreign ownership are not statistically significant while the estimated coefficients on the triple interaction term with bank capital ratio again imply that when credit is granted in the domestic currency, a 25 basis point decrease in the domestic interest rate generates a 7 and 5 percent larger difference, respectively, in the impact on the likelihood of credit granting between banks with low and high capital ratios, than when credit is granted in a foreign currency.[21] In Model 1 in Table IV we further split the sample by foreign ownership of banks and find similar estimated coefficients on these triple interactions of interest.

[Insert Table IV here]

Next we study the period before and after the filing for bankruptcy by Lehman Brothers in 2008:09, which is now commonly considered as the start of the most acute phase of the global financial crisis that eventually also spread to Hungary. Models 3 and 4 contain the estimated coefficients from the period before Lehman. The difference in potency between the lending channels in domestic and foreign currency is larger than for the entire period. For the short

[20] Another issue may arise if foreign owned banks have more foreign currency-denominated liabilities on their balance sheets. A decrease in the Forint interest rate may then affect their capital-to-assets ratio through its effect on the exchange rate with the Forint. The Forint depreciation will increase the Forint equivalent of the value of foreign currency denominated liabilities on the banks' balance sheets and may concurrently decrease the capital-to-assets ratios of these banks. However all our specifications employ a one-month lagged capital ratio and in previous models this ratio was replaced or instrumented with one- and two- quarter lags of the regulatory capital ratio. In general foreign banks may follow a different business model (e.g., Giannetti and Ongena (2009), Gormley (2010), Beck, Ioannidou and Schäfer (2012), Giannetti and Ongena (2012)) than domestic banks which may change their sensitivity to changes in monetary conditions (see similarly Zaheer, Ongena and van Wijnbergen (2013) on Islamic banks and Morck, Yavuz and Yeung (2013) on state-owned banks).

[21] The estimated coefficients on foreign ownership are also not statistically significant when the bank capital ratio is not included.

period after Lehman none of the estimated coefficients are statistically significant (further unreported).[22]

Finally, in Models 5 and 6 in Table IV we focus our analysis on the 50 percent largest firms by total assets (the 50 largest percent by number of employees yields similar results). We are interested if the economic relevancy of the difference in potency between the two channels also pertains to these large firms.[23] It does, making the observed phenomenon also relevant in an aggregate sense.

3. Domestic versus Euro and Swiss Franc Credit

We continue analysing the effect of domestic monetary policy on banks' loan supply decisions now distinguishing between Euro and Swiss Franc loans. Again, we focus on the extensive margin of lending and analyse banks' first-time credit granting decisions.

Table V presents our estimates. Models 1 to 7 in Table V are equivalent to the similarly numbered models in Table II, except that in the specifications of Table V, the dummy variable *"Credit is Granted in Foreign Currency"* is decomposed into two distinctive dummy variables, *"Credit is granted in Euro"* and *"Credit is granted in Swiss Franc"*. This decomposition allows us to investigate whether the impact of monetary policy on the supply of credit depends on a specific foreign currency denomination or not.

[22] There are a number of potential explanations for this lack of statistical significance: (1) Banks may have substantially changed their lending policies if not voluntarily (e.g., Cetorelli and Goldberg (2011), de Haas and van Lelyveld (2014)) then various regulatory limits may have become binding (Rosenberg and Tirpák (2009)); (2) due to unconventional monetary policies changes in short-term interest rates may have become less representative of changes in monetary conditions; and/or (3) the subsample period may be simply too short to yield statistically significant estimates.

[23] We also assess results across EU and various other firm-size categorization schemes. Results are similar except for some largest-size classes. However, given the continuous financing needs of the largest firms, changes on their extensive margins of borrowing are also less frequent (potentially leading to less statistical significance). Notice that some small business owners in Hungary are thought to have personal bank accounts in Switzerland or the Euro area, making their (for us un-observable) personal financial situation potentially an omitted variable. We expect this effect to play less of a role for large firms.

[Insert Table V here]

The results confirm the evidence presented in Table II. The estimates of Model 2 in Table V for example again imply that a 25 basis point decrease in the domestic interest rate generates a statistically significant and an economically relevant difference (of 8 percent) between lowly and highly capitalized banks in the likelihood of initiating credit, confirming our earlier evidence of the existence of a domestic bank-lending channel.

Furthermore, the coefficients of Models 4 to 7 again indicate that an interest rate decrease affects credit initiation by banks to a greater extent when credit is granted in the domestic currency than when lending occurs in Euro or Swiss Franc. According to Model 5 that incorporates both firm and time fixed effects, a 25 basis point decrease in the domestic interest rate results in a 0.03 percentage points higher likelihood of credit initiation by lowly than by highly capitalized banks when credit is granted in the domestic currency. The economic impact accounts for 19 percent of unconditional probability of credit initiation in the sample. When credit is granted in Euro or Swiss Franc, the equivalent differential effects are 4 and 5 percent, respectively, again suggesting a difference in the impact of domestic monetary policy on bank lending in the domestic and foreign currencies, but not between the two foreign currencies considered. The magnitudes of the estimated differential effects implied by the coefficients of Models 6 and 7, presented in the bottom panel of Table V, confirm this conjecture. Overall, Models 4 to 7 in Table V confirm our evidence of a currency compositional effect of domestic monetary policy on bank loan supply for this extensive margin of lending.

4. Further Robustness: Other Margins of Lending

So far we have focused on the positive extensive margin of lending by analysing banks' first-time credit granting decisions. To check our results concerning the compositional effects of monetary policy on banks' loan supply decisions, in this section, we consider other margins of lending. In particular, we consider the likelihood of banks' ending credit (negative extensive margin) and the likelihood of banks' increasing credit (intensive margin) in the domestic and foreign currencies.

[Insert Table VI here]

The regressions of Models 1 to 4 in Table VI focus on the impact of monetary policy on banks' decisions to end credit to borrowing firms. In Model 1, we include firm fixed effects in the regressions to control for firm heterogeneity in loan demand. Model 2 incorporates both firm and time fixed effects, while Model 3 and 4 represents our most saturated specification which includes firm-time (year:month) fixed effects. The sign of the triple interactions of the variables *Interest Rate Change*, *Bank Capital Ratio*, and *Credit is Granted in Euro* (or *Credit is Granted in Swiss Franc*) shows that the currency compositional supply effect is present along the negative extensive margin as well. A domestic monetary expansion decreases the likelihood of banks' ending credit, but only when credit is granted in the local currency (Hungarian Forint). The economic significance of the impact of monetary expansion on ending credit in Euro or Swiss Franc is negligible, as shown by the numbers at the bottom of Table VI. These estimates overall provide evidence for the presence of a compositional effect along this particular extensive

margin although the effect is statistically weaker (maybe because banks dither to cut firms off credit).

Models 5 to 8 in Table VI examine the impact of monetary conditions on the likelihood of banks' increasing the amount of credit to their borrowers. We find a strong compositional effect of monetary policy on bank loan supply along this intensive margin of lending as well. According to Model 6, when credit is granted in Hungarian Forint following a 25 basis point decrease in the domestic interest rate the difference in the response between banks with low and high capital ratios is 9 percent of the unconditional probability of increasing credit amount. In contrast, when credit is granted in Euro or Swiss Franc this differential impact does not exceed 1 or 2 percent, respectively, of the unconditional probability of increasing credit amount in the sample. The strong significance of the triple interaction terms in Models 7 and 8 indicates that this compositional effect is robust to saturation with firm-time fixed effects.

Overall, our evidence suggests that, besides affecting banks' first-time credit granting decisions, monetary policy has an impact on the currency composition of loan supply along the negative extensive margin and the (positive) intensive margin as well.

B. Compositional Effect of Domestic versus Foreign Monetary Policy

Besides analysing the effect of domestic monetary policy on banks' local lending decisions in the domestic and foreign currencies, we also consider the effects of monetary policy set by the central banks abroad issuing the foreign currency. Hence, in Table VII we extend our basic specification by including the annual change in the Euro and Swiss Franc interest rates as well as the corresponding interactions between interest rates, bank capitalization, and currency denomination. Among the macroeconomic variables the change in the nominal effective

exchange rate, i.e., *Δ Exchange Rate*, is replaced by two exchange rates, i.e., *Δ Exchange Rate Hungarian Forint to Euro* and *Δ Exchange Rate Hungarian Forint to CHF*.

Models 1 to 4 in Table VII again differ in the manner we control for firm-level heterogeneity in credit demand. Model 1 includes only firm fixed effects. Model 2 accounts for both firm and time fixed effects. Models 3 and 4 control for time-varying heterogeneity in the demand by the use of the firm-month fixed effects and represent our most saturated specifications.

[Insert Table VII here]

We present several results concerning the impact of monetary policy on bank loan supply along the extensive margin of lending. First, our earlier findings concerning the effect of *domestic* monetary policy on the composition of domestic loan supply are confirmed by all models.[24] A 25 basis point decrease in the domestic interest rate brings about a 0.032 to 0.035 percentage point higher likelihood in credit initiation for lowly than for highly capitalized banks, indicating a semi-elasticity of 20 to 22 percent, when the loan is granted in the domestic currency (Forint). The estimated semi-elasticities of credit initiation in Euro and Swiss Franc – as suggested by Model 2 – are 4 and 5 percent, respectively. Overall, the results confirm the existence of differential supply effects across the three currencies: Domestic monetary expansion

[24] The mandate of the Central Bank of Hungary is to target domestic inflation and its policy could have reacted to interest rates set by other relevant central banks. By including changes in Euro and Swiss interest rates we in effect also account for these additional elements that may be present in an open economy monetary policy rule. However our findings suggest that at least with respect to the transmission through bank lending, foreign interest rates do not play a significant role in the observed policy reaction function. We think it is also rather unlikely that the European Central Bank or the Swiss National Bank would react directly to policy rate changes in Hungary.

positively affects credit supply in Hungarian Forint, but has a negligible effect on the supply of credit in Euro and Swiss Franc.

Second, we present evidence that monetary changes in Switzerland influence the currency composition of the local supply of credit in Hungary. In all models of Table VII, the significance of the coefficients on the triple interaction of the variables *Interest Rate Change in Switzerland*, *Bank Capital Ratio*, and *Credit is Granted in Euro* (or *Credit is Granted in Swiss Franc*) indicate that changes in the Swiss interest rate have differential effects on the local supply of credit in the three different currencies. According to Model 2, when credit is granted in the domestic currency (Forint), a 25 basis point decrease in the Swiss interest rate results in a 0.216 percentage points *lower* likelihood of first-time credit granting by lowly than by highly capitalized banks.[25] This differential effect represents 136 percent of the unconditional probability of granting first time credit in the sample (0.16 percent). In contrast, when credit is granted in Euro or Swiss Franc, the difference in impact of a 25 basis point change in the Swiss interest rate between lowly and highly capitalized banks are -0.017 and -0.044 percentage points, respectively. The economic effects, for the two currencies, therefore amount to -11 and -28 percent of the likelihood of granting first-time credit in the sample. Consequently, a monetary expansion in Switzerland causes a relative contraction in credit supply in Forint but a relative expansion in the supply of Euro and especially Swiss Franc credit. This suggests that for the local supply of credit not only the domestic monetary policy matters, but also the monetary policy set by the central bank abroad that issues the foreign currency.

[25] For ease of comparison we use a 25 basis points change for all three interest rates. However, the standard deviation on the Euro and Swiss interest rates equal only 13 and 10 basis points, respectively.

Finally, we examine the effect of monetary policy in the Euro area on the local supply of credit in Hungary by including the Euro area interest rate with its relevant interaction terms in the regressions. The estimated coefficients of the triple interaction of the variables *Interest Rate Change in the Euro Area*, *Bank Capital Ratio*, and *Credit is Granted in Euro* (or *Credit is Granted in Swiss Franc*), are insignificant in all models suggesting that the effect of monetary policy in the Eurozone on local credit supply in Hungary does not vary by the currency denomination of the loans. This insignificance may arise from the fact that markets may at some point have expected the Forint to converge with the Euro over time and that therefore especially the longer maturity loans granted in Euros would be eventually be serviced in the new future domestic currency. We conclude that the impact of a monetary expansion in the Eurozone is therefore not fully identifiable in our sample. In contrast, the causal impact of a change in Swiss monetary conditions on the composition of domestic loan supply is clear and present.

VI. Conclusion

We analyze the differential impact of domestic and foreign monetary policy on the local supply of bank credit in domestic and foreign currencies. We analyze a novel, supervisory dataset from Hungary that records all bank lending to firms including its currency denomination. This paper therefore takes the next obvious step in the empirical literature that identifies – with micro-data – the impact of monetary policy on the provision of credit.

Accounting for time-varying firm-specific heterogeneity in loan demand, we find that a lower domestic interest rate expands the supply of credit in the domestic but not in the foreign currency. A lower foreign interest rate on the other hand expands lending by lowly versus highly capitalized banks relatively more in the foreign than in the domestic currency.

The implications of our findings for monetary policy making are straightforward but salient. Local bank lending in foreign currencies limits the flow of the transmission of domestic monetary policy through a bank lending channel in the domestic currency only. Lending in foreign currencies is seemingly mostly unaffected by domestic monetary policy. On the other hand, monetary policies pursued by central banks abroad may affect local bank lending in these foreign currencies.

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Figure 1. Annual Amount of New Lending to Corporations in Hungary by Currency, 2005-2011

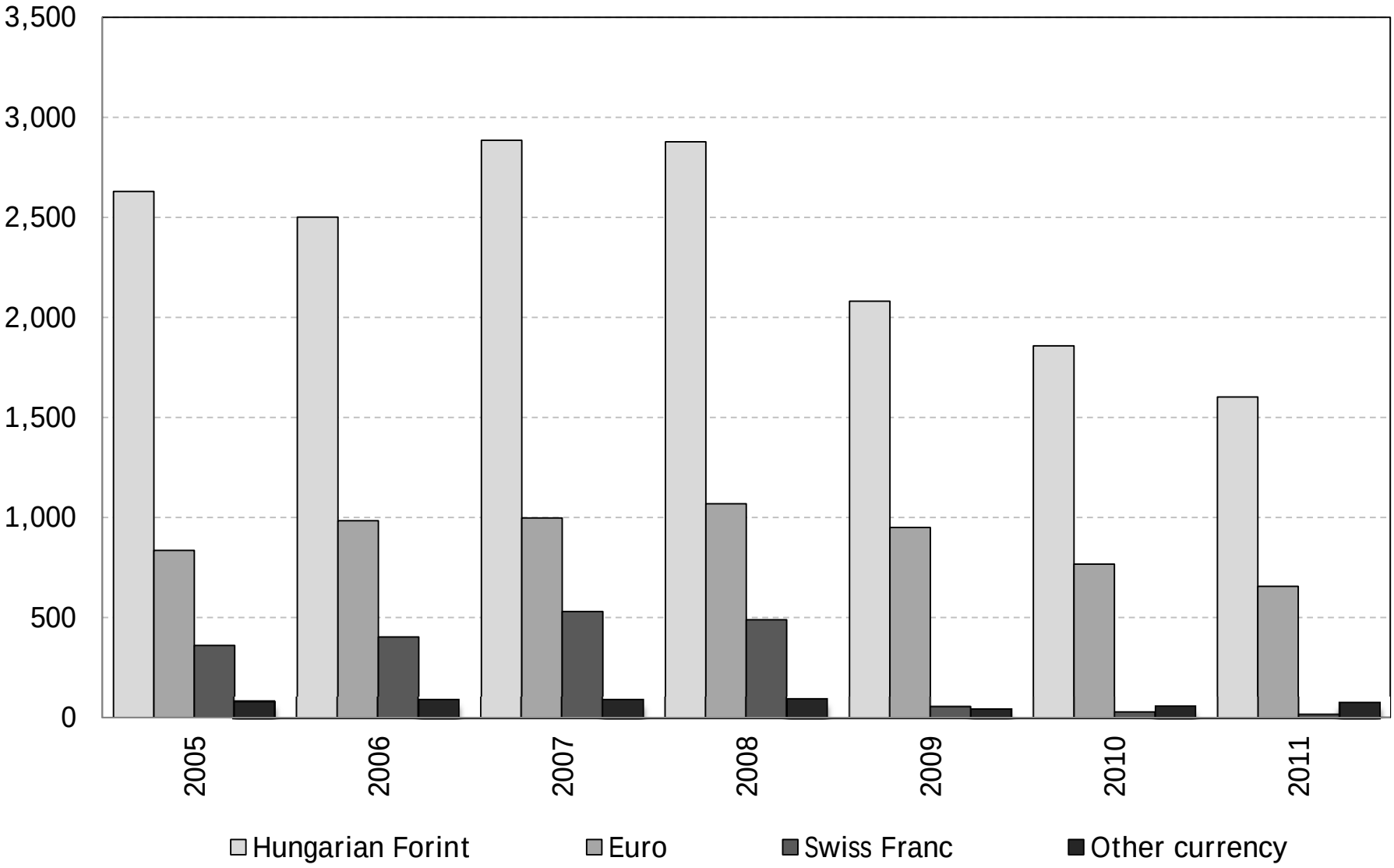

Figure 2. Annual Number of New Loans to Corporations in Hungary by Currency, 2005-2011

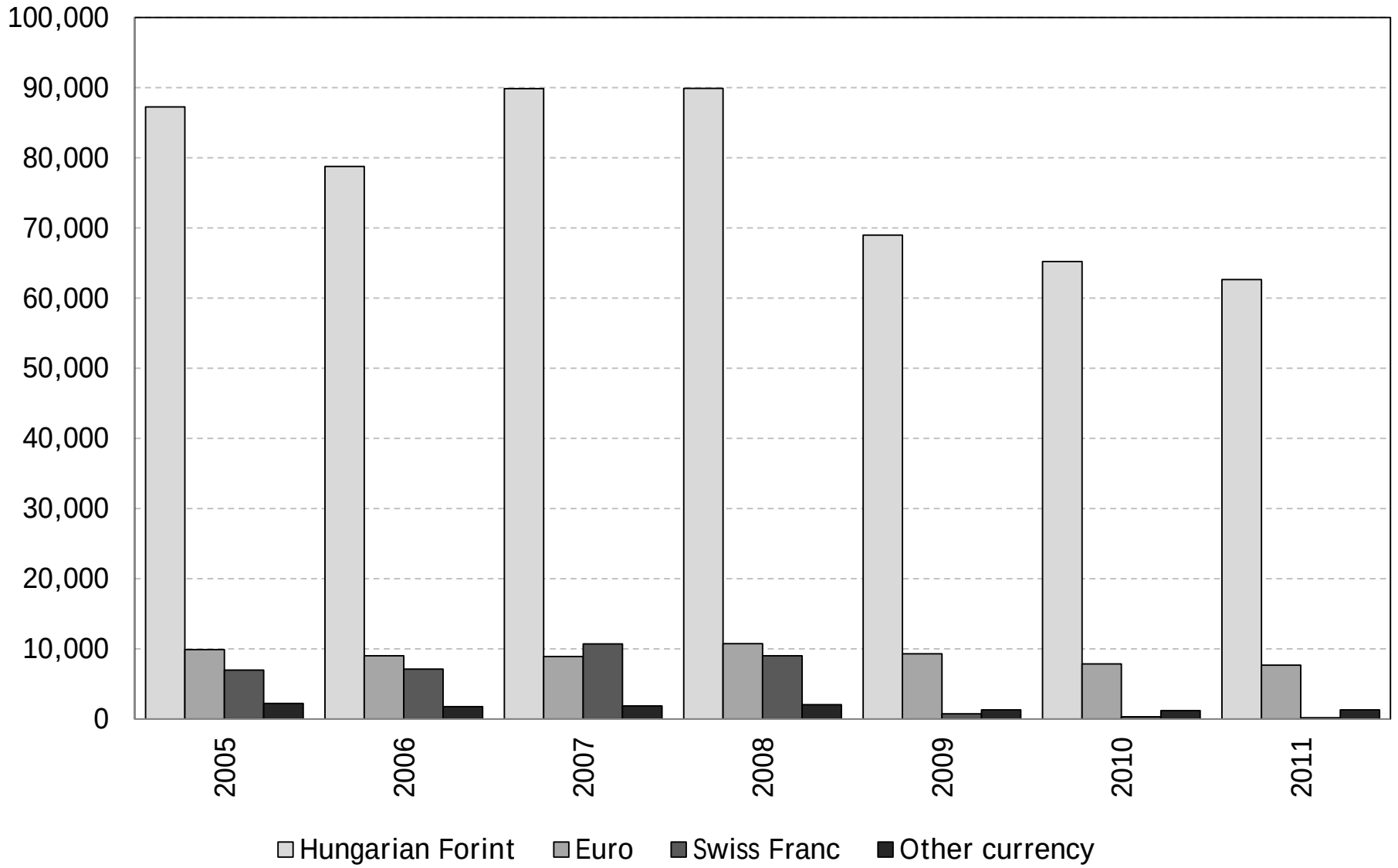

Figure 3. Interest Rates and Effective Exchange Rates in Hungarian Forint (HUF), Euro (EUR) and Swiss Francs (CHF)

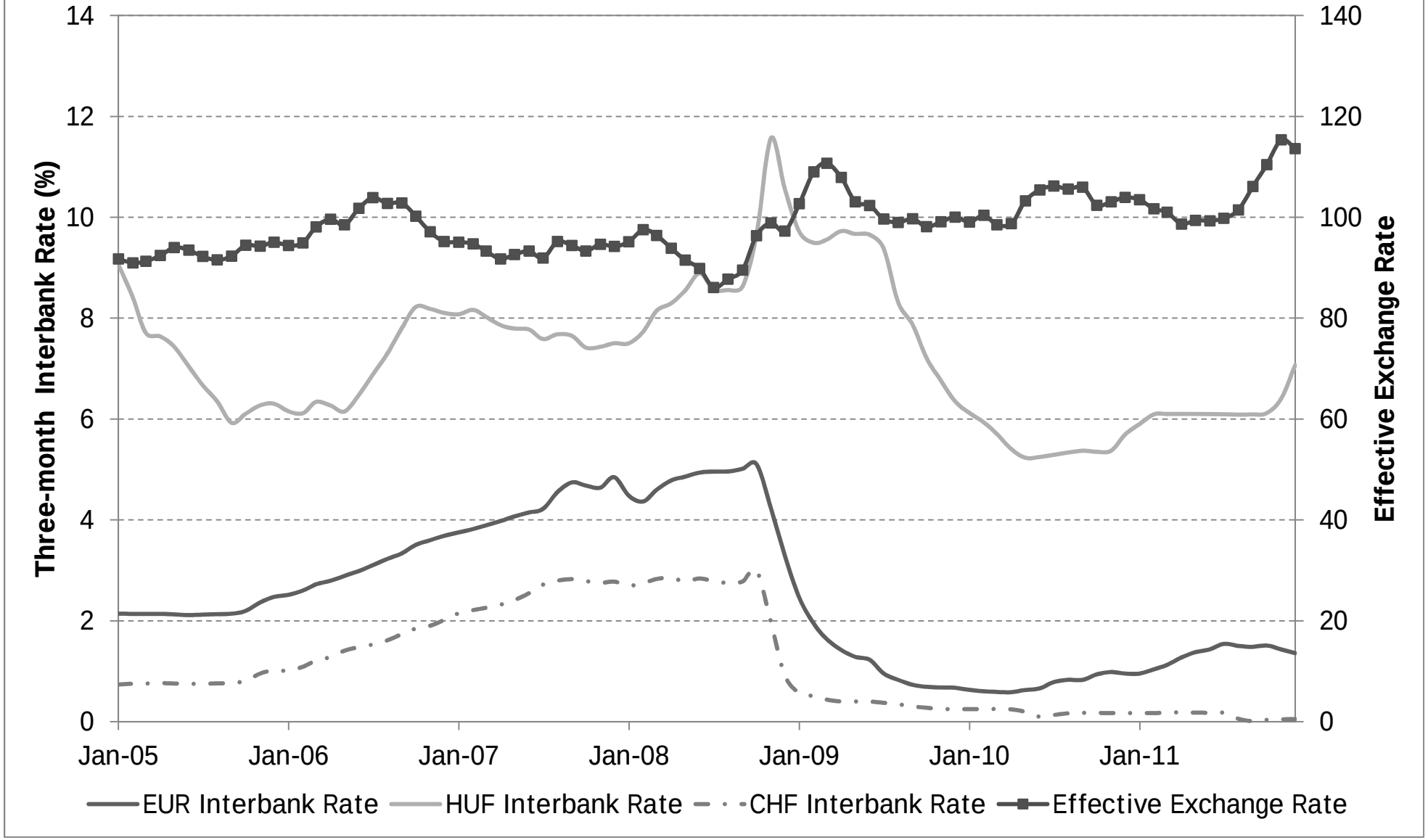

TABLE I
SUMMARY STATISTICS

Variable	Units	Definition	Mean	Std	Min	Median	Max
Dependent variables							
Euro and Swiss Franc Exposures Aggregated							
New Granting of $Credit_{ikt}$	0/1	=1 if firm i receives credit in currency k in month t, conditional on having received no credit in currency k in month t-1, =0 otherwise	0.0023	0.0481	0	0	1
Ending $Credit_{ikt}$	0/1	=1 if firm i receives no more credit in currency k in month t, conditional on having received some credit in currency k in month t-1, =0 otherwise	0.0018	0.0422	0	0	1
Increasing the Amount of $Credit_{ikt}$	0/1	=1 if the nominal amount of credit firm i holds in currency k in month t exceeds the nominal amount of credit in currency k in month t-1, =0 otherwise	0.0076	0.0871	0	0	1
Euro and Swiss Franc Exposures Disaggregated							
New Granting of $Credit_{ikt}$	0/1	=1 if firm i receives credit in currency k in month t, conditional on having received no credit in currency k in month t-1, =0 otherwise	0.0016	0.0399	0	0	1
Ending $Credit_{ikt}$	0/1	=1 if firm i receives no more credit in currency k in month t, conditional on having received some credit in currency k in month t-1, =0 otherwise	0.0012	0.0351	0	0	1
Increasing the Amount of $Credit_{ikt}$	0/1	=1 if the nominal amount of credit firm i holds in currency k in month t exceeds the nominal amount of credit in currency k in month t-1, =0 otherwise	0.0051	0.0713	0	0	1
Independent variables							
Macroeconomic variables							
Δ Interest $Rate_{t-1m}$	-	Annual change in the Hungarian 3-month government bond rate	-0.007	0.024	-0.053	0.001	0.043
Δ Interest Rate in $Euro\ Area_{t-1m}$	-	Annual change in the Euro area 3-month generic government bond rate	-0.002	0.013	-0.039	0.001	0.013
Δ Interest Rate in $Switzerland_{t-1m}$	-	Annual change in the Swiss 3-month LIBOR interest rate	0.000	0.010	-0.027	0.001	0.012
Δ Interbank Interest $Rate_{t-1m}$	-	Annual change in the Hungarian 3-month interbank rate	-0.008	0.024	-0.051	-0.002	0.041
Δ Interbank Interest Rate in $Euro\ Area_{t-1m}$	-	Annual change in the Euro area 3-month interbank rate	-0.001	0.015	-0.044	0.004	0.014
Δ Taylor Rule Residuals Government $Bonds_{t-}$	-	Annual change in the residuals of a regression of the Hungarian 3-month government bond rate on GDP growth and the inflation rate	-0.006	0.024	-0.060	-0.005	0.055
Δ Taylor Rule Residuals $Interbank_{t-1m}$	-	Annual change of in the residuals of a regression of the Hungarian 3-month interbank rate on GDP growth and the	-0.006	0.024	-0.053	-0.006	0.054
Δ GDP_{t-1q}	-	Annual growth rate in Hungarian gross domestic product	0.008	0.036	-0.080	0.017	0.047
Δ CPI_{t-1m}	-	Annual change in the Hungarian consumer price index	-0.004	0.027	-0.041	-0.010	0.067
Δ Exchange $Rate_{t-1m}$	-	Annual change in the nominal effective exchange rate index of the Forint	0.017	0.067	-0.115	0.018	0.158
Δ Exchange Rate Hungarian Forint to $Euro_{t-1}$	-	Annual change in the HUF/EUR exchange rate	0.017	0.070	-0.128	0.017	0.173
Δ Exchange Rate Hungarian Forint to CHF_{t-1r}	-	Annual change in the HUF/CHF exchange rate	0.052	0.104	-0.158	0.042	0.249
Foreign Direct $Investment_{t-1m}$	-	Annual change in the stock of Hungarian foreign direct investment	0.218	0.210	-0.047	0.162	0.758
Δ Credit Default Swap $Spread_{t-1q}$	-	Annual change in the Hungarian 5-year sovereign CDS spreads	0.516	1.424	-3.532	0.187	4.189
Δ Yield $Curve_{t-1m}$	-	Annual change in the difference between 10-year and 1-year government bond yields	0.000	0.010	-0.009	-0.004	0.027
Bank characteristics							
Bank Capital $Ratio_{bt-1m}$	-	Ratio of bank equity to total bank assets	0.13	0.15	-0.25	0.09	1.00
Bank Total $Assets_{bt-1m}$	000,000 Forint	Total bank assets	735,640	1,192,191	173	210,224	7,010,201
Ln(Bank Total $Asset)_{bt-1m}$	-	Natural logarithm of total bank assets	12.18	1.81	5.15	12.26	15.76
Bank Liquidity $Ratio_{bt-1m}$	-	Ratio of liquid assets to total bank assets	0.19	0.17	0.00	0.14	0.99
Bank Return On $Assets_{bt-1m}$	-	Ratio of pretax profits to total bank assets	0.00	0.05	-2.29	0.00	0.29
Doubtful Loan $Ratio_{bt-1m}$	-	Bank doubtful loan ratio	0.60	0.08	0.00	0.58	1.00
Foreign Owned $Bank_{bt-1m}$	0/1	=1 if bank is at least 50% foreign owned, =0 otherwise	0.93	0.25	0	1	1
Firm characteristics							
Firm Capital $Ratio_{it-1y}$	-	Ratio of firm equity to total firm assets	0.40	0.35	0.00	0.34	1.00
Firm Total $Assets_{it-1y}$	000 Forint	Total assets of the firm	122,737	587,597	18	9,593	7,275,757
Ln(Firm Total $Assets)_{it-1y}$	-	Natural logarithm of firm total assets	9.17	2.30	2.89	9.17	15.80
Firm Liquidity $Ratio_{it-1y}$	-	Ratio of current assets to total firm assets	0.72	0.30	0.00	0.83	1.00
Firm ROA_{it-1y}	-	Ratio of net income to total firm assets	-0.28	1.31	-9.41	0.00	0.92
Firm Export Sales $Ratio_{it-1y}$	-	Ratio of export sales over total firm sales	0.05	0.18	0.00	0.00	1.00

NOTE. -- The number of observations in the sample equals 43,724,229. Regressions in Tables II-VII are run employing a 10 percent random sample. The sample period is January 2005 to December 2011. Summary statistics for banks (firms) are based on the average values of the bank (firm) characteristics over the sample period. The time index on each variable indicates the timing of the variable in the main regressions with *t-1* indicating a one-period lag of a month (*m*), quarter (*q*) or year (*y*), respectively. Given the frequency of reporting for GDP and CDS the values of the preceding quarter and for firm characteristics the values of the preceding year are used. The number of banks in our sample is 39. The number of firms in our sample is 318,411.

TABLE II

THE GRANTING OF CREDIT IN DOMESTIC OR FOREIGN CURRENCY TO BORROWERS CURRENTLY WITHOUT CREDIT IN DOMESTIC OR FOREIGN CURRENCY (EXTENSIVE MARGIN)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	*All Firms*	*All Firms*	*All Firms*	*All Firms*	*All Firms*	*All Firms*	*Single-Bank Firms*
Δ Interest Rate	-0.0101***	-0.0343***	-0.0134***	-0.0506***			
	(-3.37)	(-6.64)	(-3.62)	(-6.43)			
Δ Interest Rate * Bank Capital Ratio		0.2554***		0.3914***	0.4411***		
		(6.13)		(5.58)	(6.25)		
Δ Interest Rate * Credit Is Granted in Foreign Currency			0.0067**	0.0327***	0.0327***	0.0284***	0.0135**
			(2.36)	(4.24)	(4.24)	(4.36)	(2.14)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Foreign Currency				-0.2721***	-0.2721***	-0.2361***	-0.1370**
				(-3.80)	(-3.80)	(-3.95)	(-2.37)
Δ GDP	0.0021	0.0095**	0.0130***	0.0249***			
	(0.53)	(2.05)	(3.07)	(4.41)			
Δ GDP * Bank Capital Ratio		-0.0817***		-0.1291***	-0.0791*		
		(-3.19)		(-3.11)	(-1.91)		
Δ GDP * Credit Granted in Foreign Currency			-0.0216***	-0.0308***	-0.0308***	-0.0264***	-0.0197***
			(-13.07)	(-7.02)	(-7.02)	(-7.04)	(-5.73)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Foreign Currency				0.0948**	0.0948**	0.0767**	0.0650*
				(2.19)	(2.19)	(2.08)	(1.95)
Δ CPI	0.0031	-0.0075*	0.0024	-0.0203***			
	(1.26)	(-1.74)	(0.76)	(-2.99)			
Δ CPI * Bank Capital Ratio		0.1136***		0.2421***	0.2414***		
		(3.23)		(3.85)	(3.81)		
Δ CPI * Credit Is Granted in Foreign Currency			0.0015	0.0255***	0.0255***	0.0192***	0.0058
			(0.56)	(3.64)	(3.64)	(3.65)	(1.24)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Foreign Currency				-0.2569***	-0.2569***	-0.1855***	-0.0650
				(-3.80)	(-3.80)	(-3.85)	(-1.63)
Δ Exchange Rate	-0.0007	-0.0008	-0.0007	-0.0008			
	(-0.63)	(-0.76)	(-0.63)	(-0.76)			
Foreign Direct Investment	-0.0012***	-0.0012***	-0.0012***	-0.0012***			
	(-2.87)	(-2.75)	(-2.87)	(-2.75)			
Δ Credit Default Swap Spread	0.0001**	0.0002***	0.0001**	0.0002***			
	(2.30)	(2.59)	(2.30)	(2.59)			
Δ Yield Curve	-0.0093	-0.0098	-0.0093	-0.0098			
	(-0.81)	(-0.85)	(-0.81)	(-0.85)			
Bank Capital Ratio	-0.0022	-0.0005	-0.0022	-0.0026	-0.0087***		
	(-1.13)	(-0.25)	(-1.13)	(-1.15)	(-3.73)		
Bank Total Assets	-0.0010***	-0.0009***	-0.0010***	-0.0009***	-0.0001		
	(-6.93)	(-6.74)	(-6.93)	(-6.74)	(-0.44)		
Bank Liquidity Ratio	-0.0079***	-0.0078***	-0.0079***	-0.0078***	-0.0027***		
	(-10.36)	(-10.16)	(-10.36)	(-10.16)	(-3.11)		
Bank Return On Assets	0.0009	0.0021	0.0009	0.0021	0.0030		
	(0.47)	(1.07)	(0.47)	(1.07)	(1.48)		
Bank Doubtful Loan Ratio	-0.0174***	-0.0178***	-0.0174***	-0.0178***	0.0148***		
	(-10.12)	(-10.02)	(-10.12)	(-10.02)	(5.98)		
Credit Granted in Foreign Currency	-0.0029***	-0.0029***	-0.0027***	-0.0031***	-0.0031***	-0.0027***	-0.0020***
	(-41.80)	(-41.80)	(-37.49)	(-17.15)	(-17.15)	(-19.43)	(-15.06)
Bank Capital Ratio * Credit Is Granted in Foreign Currency				0.0043***	0.0043***	0.0041***	0.0022*
				(2.59)	(2.59)	(3.21)	(1.90)
Firm Capital Ratio	0.0022***	0.0022***	0.0022***	0.0022***	0.0024***		
	(10.09)	(10.13)	(10.09)	(10.13)	(10.68)		
Firm Total Assets	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0002**		
	(-3.97)	(-3.97)	(-3.97)	(-3.97)	(-2.18)		
Firm Liquidity Ratio	0.0012***	0.0012***	0.0012***	0.0012***	0.0012***		
	(4.43)	(4.41)	(4.43)	(4.41)	(4.37)		
Firm Return On Assets	0.0002***	0.0002***	0.0002***	0.0002***	0.0002***		
	(8.45)	(8.43)	(8.45)	(8.43)	(6.20)		
Firm Export Sales Ratio	-0.0005	-0.0005	-0.0005	-0.0005	-0.0004		
	(-1.20)	(-1.15)	(-1.20)	(-1.15)	(-0.96)		
Constant	0.0308***	0.0306***	0.0307***	0.0307***	0.0024	0.0036***	0.0024***
	(14.53)	(14.40)	(14.49)	(14.40)	(0.86)	(118.61)	(83.85)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	--	--
Time Fixed Effects	No	No	No	No	Yes	--	--
Firm - Time Fixed Effects	No	No	No	No	No	Yes	Yes
Number of Observations	2,075,500	2,075,500	2,075,500	2,075,500	2,075,500	2,385,314	1,762,190
Percentage Point Difference in Impact of a Decrease in Interest Rate by 25 bps on the Likelihood of Granting of First-Time Credit by Lower versus Higher Capitalized Banks (Δ=2 Standard Dev							
in Hungarian Forint or in Foreign Currency	-	*0.0189*	-	-	-	-	-
in Hungarian Forint	-	-	-	*0.0290*	*0.0326*	-	-
in Foreign Currency	-	-	-	*0.0088*	*0.0125*	-	-
Difference in Impact Between Foreign Currency and Hungarian Forint	-	-	-	*-0.0201*	*-0.0201*	*-0.0175*	*-0.0101*
Difference in Impact of a Decrease in Interest Rate by 25 bps on the Likelihood of Granting of First-Time Credit by Lower versus Higher Capitalized Banks (Δ=2 Standard Deviations) as Percent of Unconditional Probability of Granting First-Time Credit in Sample (= 0.23%)							
in Hungarian Forint or in Foreign Currency	-	*8%*	-	-	-	-	-
in Hungarian Forint	-	-	-	*13%*	*14%*	-	-
in Foreign Currency	-	-	-	*4%*	*5%*	-	-
Difference in Impact Between Foreign Currency and Hungarian Forint	-	-	-	***-9%***	***-9%***	***-8%***	***-4%***

NOTE. -- The table reports estimates from ordinary least squares regressions. The dependent variable is a dummy that equals one if the firm is granted credit in domestic (foreign) currency in a particular year:month conditional on having received no credit in this currency in the month before and equals zero otherwise. All independent variables are either lagged one month or calculated over the preceding month. Table 1 lists the definition of all variables. Coefficients are listed in the first row, t-statistics based on robust standard errors clustered at the firm level are reported in the row below in parentheses, and the corresponding significance levels are in the adjacent column. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of fixed effects are comprised in the wider included set of fixed effects. Time Fixed Effects include an effect for every year:month. *** Significant at 1%, ** significant at 5%, * significant at 10%.

TABLE III

THE GRANTING OF CREDIT IN DOMESTIC OR FOREIGN CURRENCY TO BORROWERS CURRENTLY WITHOUT CREDIT IN DOMESTIC OR FOREIGN CURRENCY (EXTENSIVE MARGIN), INTERACTIONS WITH MACROECONOMIC VARIABLES, BANK REGULATORY CAPITAL, SIZE AND LIQUIDITY, AND FOREIGN OWNERSHIP

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
In Models (3) to (14): *Other Bank Characteristic*	Additional Macroeconomic Variables in Interactions		*Bank Regulatory Capital Ratio*		*Bank Total Assets*				*Bank Liquidity Ratio*				*Foreign Owned Bank*	
Sample	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*
Δ Interest Rate * Credit Is Granted in Foreign Currency	0.0500***	0.0258**	0.0300***	0.0153***	-0.0156	-0.0486*	0.0120	-0.0348	0.0275***	0.0062	0.0578***	0.0252***	0.0482***	0.0068
	(4.00)	(2.26)	(4.94)	(2.85)	(-0.49)	(-1.70)	(0.36)	(-1.17)	(4.54)	(1.11)	(6.03)	(2.72)	(2.83)	(0.43)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Foreign Currency	-0.4010***	-0.1675					-0.2408***	-0.1435**			-0.3125***	-0.1858***	-0.2291***	-0.1439**
	(-3.40)	(-1.62)					(-4.02)	(-2.49)			(-4.94)	(-3.01)	(-3.83)	(-2.47)
Δ Interest Rate * *Bank Characteristic* * Credit Is Granted in Foreign Currency			-0.0164***	-0.0099***	0.0014	0.0034*	0.0011	0.0034*	-0.1254***	-0.0257	-0.1236***	-0.0301	-0.0210	0.0075
			(-4.88)	(-3.49)	(0.65)	(1.72)	(0.50)	(1.73)	(-3.97)	(-0.86)	(-3.72)	(-0.95)	(-1.27)	(0.48)
Δ GDP * Credit Is Granted in Foreign Currency	-0.0372***	-0.0288***	-0.0210***	-0.0143***	-0.0630***	-0.0253*	-0.0704***	-0.0301*	-0.0256***	-0.0178***	-0.0299***	-0.0222***	-0.0269***	-0.0193**
	(-5.29)	(-4.48)	(-7.35)	(-5.94)	(-3.58)	(-1.66)	(-3.90)	(-1.91)	(-7.60)	(-5.69)	(-5.54)	(-4.56)	(-2.86)	(-2.13)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Foreign Currency	0.1138*	0.1452**					0.0751**	0.0616*			0.0595	0.0526	0.0765**	0.0633*
	(1.68)	(2.44)					(2.04)	(1.86)			(1.57)	(1.55)	(2.07)	(1.88)
Δ GDP * *Bank Characteristic* * Credit Is Granted in Foreign Currency			0.0024*	0.0013	0.0031***	0.0008	0.0031***	0.0008	0.0624***	0.0396***	0.0546***	0.0373**	0.0004	-0.0003
			(1.66)	(1.15)	(2.59)	(0.79)	(2.60)	(0.73)	(3.87)	(2.62)	(3.31)	(2.42)	(0.04)	(-0.03)
Δ CPI * Credit Is Granted in Foreign Currency	-0.0033	-0.0097	0.0039	-0.0019	-0.0008	0.0134	0.0244	0.0211	0.0020	-0.0054	0.0139*	0.0001	0.0658***	0.0205
	(-0.39)	(-1.31)	(0.87)	(-0.52)	(-0.03)	(0.60)	(0.89)	(0.89)	(0.35)	(-1.05)	(1.94)	(0.02)	(4.45)	(1.36)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Foreign Currency	-0.0787	0.0218					-0.1794***	-0.0614			-0.1802***	-0.0821*	-0.1627***	-0.0558
	(-1.08)	(0.35)					(-3.71)	(-1.53)			(-3.67)	(-1.95)	(-3.37)	(-1.40)
Δ CPI * *Bank Characteristic* * Credit Is Granted in Foreign Currency			-0.0024	0.0001	0.0002	-0.0009	-0.0004	-0.0011	-0.0206	0.0251	0.0123	0.0398	-0.0503***	-0.0160
			(-0.95)	(0.06)	(0.09)	(-0.60)	(-0.22)	(-0.67)	(-0.62)	(0.86)	(0.36)	(1.28)	(-3.39)	(-1.06)
Δ Exchange Rate * Credit Is Granted in Foreign Currency	0.0102**	0.0111***												
	(2.50)	(3.02)												
Δ Exchange Rate * Bank Capital Ratio * Credit Is Granted in Foreign Currency	-0.0675*	-0.1081***												
	(-1.74)	(-3.15)												
Δ FDI * Credit Is Granted in Foreign Currency	-0.0028*	-0.0029**												
	(-1.74)	(-2.02)												
Δ FDI * Bank Capital Ratio * Credit Is Granted in Foreign Currency	0.0081	0.0293**												
	(0.53)	(2.20)												
Δ Credit Default Swap Spread * Credit Is Granted in Foreign Currency	-0.0009***	-0.0007***												
	(-3.90)	(-3.45)												
Δ Credit Default Swap Spread * Bank Capital Ratio * Credit Is Granted in Foreign Currency	0.0053**	0.0051***												
	(2.47)	(2.62)												
Credit Is Granted in Foreign Currency	-0.0017***	-0.0011***	-0.0029***	-0.0021***	-0.0061***	-0.0033***	-0.0064***	-0.0034***	-0.0032***	-0.0026***	-0.0038***	-0.0029***	-0.0015***	-0.0007**
	(-4.74)	(-3.10)	(-24.82)	(-20.31)	(-7.40)	(-4.07)	(-7.52)	(-4.12)	(-24.44)	(-20.69)	(-20.11)	(-16.20)	(-4.44)	(-2.01)
Bank Bank Capital Ratio * Credit Is Granted in Foreign Currency	-0.0007	-0.0055*					0.0040***	0.0021*			0.0047***	0.0030**	0.0045***	0.0027**
	(-0.21)	(-1.76)					(3.11)	(1.78)			(3.66)	(2.45)	(3.57)	(2.37)
Bank Characteristic * Credit Is Granted in Foreign Currency			0.0003***	0.0002***	0.0003***	0.0001*	0.0003***	0.0001*	0.0051***	0.0048***	0.0059***	0.0051***	-0.0013***	-0.0014***
			(5.30)	(4.83)	(4.62)	(1.87)	(4.45)	(1.77)	(7.83)	(8.05)	(8.66)	(8.33)	(-3.91)	(-4.21)
Constant	0.0036***	0.0024***	0.0036***	0.0024***	0.0036***	0.0024***	0.0036***	0.0024***	0.0036***	0.0024***	0.0036***	0.0024***	0.0036***	0.0024***
	(118.61)	(83.86)	(116.64)	(82.06)	(118.56)	(83.82)	(118.61)	(83.84)	(118.58)	(83.86)	(118.65)	(83.89)	(118.60)	(83.83)
Firm - Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2,385,314	1,762,190	2,303,752	1,697,084	2,385,314	1,762,190	2,385,314	1,762,190	2,385,314	1,762,190	2,385,314	1,762,190	2,385,314	1,762,190
Difference in Impact of a Decrease in Interest Rate by 25 bps on the Likelihood of Granting of First-Time Credit by Lower versus Larger/Higher Regulatory Capitalized, Sized, Liquid, Foreign-Owned and/or Capitalized Banks (1 =2 Standard Deviations) as Percent of Unconditional Probability of Granting First-Time Credit in Sample (= 0.23%)														
Difference in Impact Between Foreign Currency and Hungarian Forint due to														
Bank Capital Ratio	***-13%***	***-5%***	***-***	***-***	***-***	***-***	***-8%***	***-5%***	***-***	***-***	***-10%***	***-6%***	***-7%***	***-5%***
Regulatory Bank Capital Ratio	***-***	***-***	***-7%***	***-4%***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***
Bank Total Assets	-	-	-	-	*1%*	*1%*	*0%*	*1%*	-	-	-	-	-	-
Bank Liquidity Ratio	-	-	-	-	-	-	-	-	*-5%*	*-1%*	*-4%*	*-1%*	-	-
Foreign Owned Bank	-	-	-	-	-	-	-	-	-	-	-	-	*-1%*	*0%*

NOTE. -- The table reports estimates from ordinary least squares regressions. The dependent variable is a dummy that equals one if the firm is granted credit in domestic (foreign) currency in a particular year:month conditional on having received no credit in this currency in the month before and equals zero otherwise. All independent variables are either lagged one month or calculated over the preceding month. Bank Regulatory Capital is the ratio of regulatory capital over risk-weighted assets. Table 1 lists the definition of all other variables. Coefficients are listed in the first row, t-statistics based on robust standard errors clustered at the firm level are reported in the row below in parentheses, and the corresponding significance levels are in the adjacent column. "Yes" indicates that the set of fixed effects is included. Time Fixed Effects include an effect for every year:month. *** Significant at 1%, ** significant at 5%, * significant at 10%.

TABLE IV

THE GRANTING OF CREDIT IN DOMESTIC OR FOREIGN CURRENCY TO BORROWERS CURRENTLY WITHOUT CREDIT IN DOMESTIC OR FOREIGN CURRENCY (EXTENSIVE MARGIN), BY SAMPLE

Model	(1)	(2)	(3)	(4)	(5)	(6)
	Overall Sample	*Only Foreign Owned Banks*		*2005:01-2008:09*		*Only Firms > Median in Total Assets*
Sample	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*	*All Firms*	*Single-Bank*
Δ Interest Rate * Credit Is Granted in Foreign Currency	0.0276***	0.0231***	0.1029***	0.0763***	0.0368***	0.0182*
	(3.87)	(3.30)	(6.10)	(4.52)	(3.69)	(1.72)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Foreign Currency	-0.2194***	-0.2091***	-0.7400***	-0.6309***	-0.2932***	-0.1827*
	(-3.50)	(-3.38)	(-4.94)	(-4.21)	(-3.17)	(-1.90)
Δ GDP * Credit Is Granted in Foreign Currency	-0.0258***	-0.0182***	0.0124	0.0221	-0.0340***	-0.0279***
	(-6.46)	(-4.81)	(0.81)	(1.55)	(-5.76)	(-4.75)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Foreign Currency	0.1126***	0.0708**	-0.1921	-0.1110	0.0667	0.0557
	(3.05)	(2.00)	(-1.39)	(-0.94)	(1.14)	(0.98)
Δ CPI * Credit Is Granted in Foreign Currency	0.0215***	0.0136**	-0.0057	-0.0122	0.0192**	0.0048
	(4.05)	(2.55)	(-0.57)	(-1.29)	(2.55)	(0.65)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Foreign Currency	-0.1617***	-0.1192***	-0.0421	0.1102	-0.1984***	-0.0647
	(-3.69)	(-2.64)	(-0.48)	(1.36)	(-2.94)	(-1.08)
Credit Is Granted in Foreign Currency	-0.0026***	-0.0019***	-0.0041***	-0.0035***	-0.0039***	-0.0032***
	(-17.75)	(-13.01)	(-9.93)	(-8.29)	(-18.39)	(-14.67)
Bank Bank Capital Ratio * Credit Is Granted in Foreign Currency	0.0054***	0.0026**	0.0116***	0.0082**	0.0062***	0.0047**
	(4.34)	(2.09)	(3.58)	(2.42)	(3.29)	(2.48)
Constant	0.0029***	0.0022***	0.0051***	0.0035***	0.0053***	0.0039***
	(89.35)	(69.22)	(98.76)	(69.90)	(110.75)	(77.14)
Firm - Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	1,615,640	1,336,152	1,160,416	845,040	1,408,422	919,230
Difference in Impact of a Decrease in Interest Rate by 25 bps on the Likelihood of Granting of First-Time Credit by Lower versus Higher Capitalized Banks (Δ=2 Standard Deviations) as Percent of Unconditional Probability of Granting First-Time Credit in Sample (= 0.23%)						
Difference in Impact Between Foreign Currency and Hungarian Forint	***-7%***	***-7%***	***-24%***	***-20%***	***-9%***	***-6%***

NOTE. -- The table reports estimates from ordinary least squares regressions. The dependent variable is a dummy that equals one if the firm is granted credit in domestic (foreign) currency in a particular year:month conditional on having received no credit in this currency in the month before and equals zero otherwise. All independent variables are either lagged one month or calculated over the preceding month. Table 1 lists the definition of all variables. Coefficients are listed in the first row, t-statistics based on robust standard errors clustered at the firm level are reported in the row below in parentheses, and the corresponding significance levels are in the adjacent column. "Yes" indicates that the set of fixed effects is included. Time Fixed Effects include an effect for every year:month. *** Significant at 1%, ** significant at 5%, * significant at 10%.

TABLE V

THE GRANTING OF CREDIT IN HUNGARIAN FORINT, EURO, OR SWISS FRANC TO BORROWERS CURRENTLY WITHOUT CREDIT IN THOSE CURRENCIES (EXTENSIVE MARGIN)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	*All Firms*	*All Firms*	*All Firms*	*All Firms*	*All Firms*	*All Firms*	*Single-Bank Firms*
Δ Interest Rate	-0.0059***	-0.0216***	-0.0104***	-0.0461***			
	(-2.92)	(-6.19)	(-3.27)	(-6.15)			
Δ Interest Rate * Bank Capital Ratio		0.1657***		0.3752***	0.4099***		
		(5.90)		(5.45)	(5.94)		
Δ Interest Rate * Credit Is Granted in Euro			0.0066**	0.0369***	0.0369***	0.0322***	0.0153**
			(2.40)	(4.92)	(4.92)	(5.08)	(2.45)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Euro				-0.3176***	-0.3176***	-0.2763***	-0.1614***
				(-4.53)	(-4.53)	(-4.74)	(-2.81)
Δ Interest Rate * Credit Is Granted in Swiss Franc			0.0068**	0.0365***	0.0365***	0.0321***	0.0180***
			(2.50)	(4.92)	(4.92)	(5.11)	(2.95)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Swiss Franc				-0.3108***	-0.3108***	-0.2734***	-0.1814***
				(-4.47)	(-4.47)	(-4.72)	(-3.21)
Δ GDP	0.0016	0.0059*	0.0195***	0.0325***			
	(0.59)	(1.85)	(6.33)	(6.76)			
Δ GDP * Bank Capital Ratio		-0.0473***		-0.1391***	-0.1061***		
		(-2.69)		(-3.43)	(-2.63)		
Δ GDP * Credit Is Granted in Euro			-0.0323***	-0.0493***	-0.0493***	-0.0430***	-0.0290***
			(-19.92)	(-11.49)	(-11.49)	(-11.71)	(-8.52)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Euro				0.1811***	0.1811***	0.1530***	0.1142***
				(4.27)	(4.27)	(4.24)	(3.46)
Δ GDP * Credit Is Granted in Swiss Franc			-0.0215***	-0.0308***	-0.0308***	-0.0271***	-0.0211***
			(-13.80)	(-7.33)	(-7.33)	(-7.55)	(-6.39)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Swiss Franc				0.0943**	0.0943**	0.0812**	0.0746**
				(2.26)	(2.26)	(2.29)	(2.32)
Δ CPI	0.0025	-0.0053*	0.0026	-0.0203***			
	(1.47)	(-1.80)	(0.95)	(-3.08)			
Δ CPI * Bank Capital Ratio		0.0825***		0.2436***	0.2414***		
		(3.48)		(3.88)	(3.82)		
Δ CPI * Credit Is Granted in Euro			-0.0028	0.0197***	0.0197***	0.0150***	0.0037
			(-1.13)	(2.91)	(2.91)	(2.97)	(0.83)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Euro				-0.2382***	-0.2382***	-0.1789***	-0.0642*
				(-3.61)	(-3.61)	(-3.81)	(-1.68)
Δ CPI * Credit Is Granted in Swiss Franc			0.0024	0.0253***	0.0253***	0.0198***	0.0064
			(0.94)	(3.73)	(3.73)	(3.89)	(1.42)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Swiss Franc				-0.2451***	-0.2451***	-0.1833***	-0.0628
				(-3.73)	(-3.73)	(-3.93)	(-1.62)
Credit Granted in Euro	-0.0034***	-0.0034***	-0.0031***	-0.0038***	-0.0038***	-0.0034***	-0.0024***
	(-50.65)	(-50.65)	(-45.26)	(-21.65)	(-21.65)	(-24.66)	(-18.79)
Bank Capital Ratio * Credit Is Granted in Euro				0.0072***	0.0072***	0.0066***	0.0039***
				(4.38)	(4.38)	(5.27)	(3.43)
Credit Granted in Swiss Franc	-0.0033***	-0.0033***	-0.0031***	-0.0038***	-0.0038***	-0.0034***	-0.0023***
	(-50.79)	(-50.79)	(-46.17)	(-21.99)	(-21.99)	(-24.96)	(-18.50)
Bank Capital Ratio * Credit Is Granted in Swiss Franc				0.0072***	0.0072***	0.0065***	0.0038***
				(4.43)	(4.43)	(5.32)	(3.39)
Constant	0.0217***	0.0215***	0.0216***	0.0218***	0.0040**	0.0036***	0.0024***
	(15.29)	(15.16)	(15.19)	(15.24)	(2.14)	(95.22)	(66.73)
Macroeconomic variables	Yes	Yes	Yes	Yes	No	No	No
Bank Characteristics	Yes	Yes	Yes	Yes	Yes	No	No
Firm Characteristics	Yes	Yes	Yes	Yes	Yes	No	No
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	--	--
Time Fixed Effects	No	No	No	No	Yes	--	--
Firm - Time Fixed Effects	No	No	No	No	No	Yes	Yes
Number of Observations	3,113,250	3,113,250	3,113,250	3,113,250	3,113,250	3,577,971	2,643,285
Difference in Impact of a Decrease in Interest Rate by 25 bps on the Likelihood of Granting of First-Time Credit by Lower versus Higher Capitalized Banks (Δ =2 Standard Deviations) as Percent of Unconditional Probability of Granting First-Time Credit in The Sample (= 0.16%)							
in Hungarian Forint or in Foreign Currency		*8%*	-	-	-	-	-
in Hungarian Forint	-	-	-	*17%*	*19%*	-	-
In Euro	-	-	-	*3%*	*4%*	-	-
in Swiss Franc	-	-	-	*3%*	*5%*	-	-
Difference in Impact Between Euro and Hungarian Forint	-	-	-	***-15%***	***-15%***	***-13%***	***-8%***
Difference in Impact Between Swiss Franc and Hungarian Forint				***-14%***	***-14%***	***-13%***	***-8%***

NOTE. -- The table reports estimates from ordinary least squares regressions. The dependent variable is a dummy that equals one if the firm is granted credit in Hungarian Forint / Euro / Swiss Franc in a particular year:month conditional on having received no credit in this currency in the month before and equals zero otherwise. All independent variables are either lagged one month or calculated over the preceding month. Table 1 lists the definition of all variables. Coefficients are listed in the first row, t-statistics based on robust standard errors clustered at the firm level are reported in the row below in parentheses, and the corresponding significance levels are in the adjacent column. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of fixed effects are comprised in the wider included set of fixed effects. Time Fixed Effects include an effect for every year:month. *** Significant at 1%, ** significant at 5%, * significant at 10%.

TABLE VI

THE REPAYMENT OF CREDIT BY BORROWERS WITH CREDIT IN HUNGARIAN FORINT, EURO, AND SWISS FRANC (NEGATIVE EXTENSIVE MARGIN) AND THE INCREASE IN THE AMOUNT OF CREDIT BORROWERS HOLD IN HUNGARIAN FORINT, EURO, OR SWISS FRANC (INTENSIVE MARGIN)

Dependent Variable	ENDING CREDIT (NEGATIVE EXTENSIVE MARGIN)				INCREASING THE AMOUNT OF CREDIT (INTENSIVE MARGIN)			
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	*All firms with debt*	*All firms with debt*	*All firms with debt*	*Single-Bank firms with debt*	*All Firms*	*All Firms*	*All Firms*	*Single-Bank Firms*
Δ Interest Rate	0.0409**				-0.0667***			
	(2.03)				(-5.50)			
Δ Interest Rate * Bank Capital Ratio	-0.3213	-0.3179			0.5384***	0.5995***		
	(-1.62)	(-1.61)			(4.96)	(5.51)		
Δ Interest Rate * Credit Is Granted in Euro	-0.0456**	-0.0456**	-0.0454**	-0.0663**	0.0441***	0.0441***	0.0352***	0.0166*
	(-2.17)	(-2.17)	(-2.21)	(-2.57)	(3.58)	(3.58)	(3.39)	(1.78)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Euro	0.4262**	0.4262**	0.4192**	0.5779**	-0.4528***	-0.4528***	-0.3576***	-0.2202**
	(2.00)	(2.00)	(2.01)	(2.32)	(-3.99)	(-3.99)	(-3.79)	(-2.56)
Δ Interest Rate * Credit Is Granted in Swiss Franc	-0.0318	-0.0318	-0.0311	-0.0346	0.0570***	0.0570***	0.0479***	0.0261***
	(-1.49)	(-1.49)	(-1.49)	(-1.31)	(4.64)	(4.64)	(4.64)	(2.83)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Swiss Franc	0.2994	0.2994	0.2953	0.2792	-0.5242***	-0.5242***	-0.4300***	-0.2936***
	(1.39)	(1.39)	(1.41)	(1.11)	(-4.61)	(-4.61)	(-4.56)	(-3.45)
Δ GDP	0.0317**				0.0668***			
	(2.07)				(7.36)			
Δ GDP * Bank Capital Ratio	-0.1373	-0.1845			-0.5041***	-0.4424***		
	(-0.94)	(-1.26)			(-6.69)	(-5.94)		
Δ GDP * Credit Is Granted in Euro	-0.0266*	-0.0266*	-0.0244*	-0.0220	-0.1055***	-0.1055***	-0.0949***	-0.0616***
	(-1.79)	(-1.79)	(-1.70)	(-1.25)	(-12.13)	(-12.13)	(-12.85)	(-9.59)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Euro	0.2063	0.2063	0.1770	0.1836	0.6881***	0.6881***	0.6119***	0.4784***
	(1.33)	(1.33)	(1.19)	(1.07)	(8.18)	(8.18)	(8.59)	(7.67)
Δ GDP * Credit Is Granted in Swiss Franc	-0.0429***	-0.0429***	-0.0427***	-0.0308*	-0.0771***	-0.0771***	-0.0712***	-0.0486***
	(-2.81)	(-2.81)	(-2.91)	(-1.69)	(-9.29)	(-9.29)	(-10.11)	(-7.98)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Swiss Franc	0.2228	0.2228	0.2165	0.1869	0.5464***	0.5464***	0.5003***	0.4062***
	(1.39)	(1.39)	(1.41)	(1.04)	(6.71)	(6.71)	(7.25)	(6.80)
Δ CPI	-0.0868***				-0.0322***			
	(-4.48)				(-3.18)			
Δ CPI * Bank Capital Ratio	0.8733***	0.8453***			0.3603***	0.3608***		
	(4.22)	(4.09)			(3.98)	(3.98)		
Δ CPI * Credit Is Granted in Euro	0.1006***	0.1006***	0.0943***	0.0547***	0.0275***	0.0275***	0.0173**	0.0061
	(4.82)	(4.82)	(4.97)	(2.82)	(2.58)	(2.58)	(2.11)	(0.83)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Euro	-0.8884***	-0.8884***	-0.8250***	-0.4437**	-0.3228***	-0.3228***	-0.2061***	-0.0295
	(-3.93)	(-3.93)	(-4.04)	(-2.40)	(-3.29)	(-3.29)	(-2.86)	(-0.46)
Δ CPI * Credit Is Granted in Swiss Franc	0.0876***	0.0876***	0.0792***	0.0257	0.0368***	0.0368***	0.0265***	0.0103
	(4.35)	(4.35)	(4.27)	(1.31)	(3.52)	(3.52)	(3.31)	(1.38)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Swiss Franc	-0.9010***	-0.9010***	-0.8134***	-0.2406	-0.3391***	-0.3391***	-0.2309***	-0.0440
	(-4.17)	(-4.17)	(-4.11)	(-1.29)	(-3.53)	(-3.53)	(-3.27)	(-0.67)
Credit Granted in Euro	-0.0084***	-0.0084***	-0.0084***	-0.0094***	-0.0123***	-0.0123***	-0.0110***	-0.0046***
	(-15.74)	(-15.74)	(-17.32)	(-16.09)	(-22.54)	(-22.53)	(-24.83)	(-11.62)
Bank Capital Ratio * Credit Is Granted in Euro	0.0168***	0.0168***	0.0163***	0.0258***	-0.0023	-0.0023	-0.0008	-0.0205***
	(3.05)	(3.05)	(3.32)	(4.64)	(-0.44)	(-0.44)	(-0.21)	(-5.00)
Credit Granted in Swiss Franc	-0.0082***	-0.0082***	-0.0081***	-0.0087***	-0.0134***	-0.0134***	-0.0119***	-0.0048***
	(-15.70)	(-15.70)	(-17.09)	(-15.03)	(-24.34)	(-24.34)	(-26.68)	(-12.42)
Bank Capital Ratio * Credit Is Granted in Swiss Franc	0.0161***	0.0161***	0.0156***	0.0226***	0.0037	0.0037	0.0039	-0.0191***
	(2.98)	(2.98)	(3.20)	(4.09)	(0.71)	(0.71)	(0.95)	(-4.73)
Constant	-0.0097***	0.0001	0.0085***	0.0080***	0.0275***	-0.0072**	0.0128***	0.0072***
	(-3.25)	(0.03)	(90.19)	(64.36)	(9.80)	(-2.00)	(89.16)	(64.10)
Macroeconomic variables	Yes	No	No	No	Yes	No	No	No
Bank Characteristics	Yes	Yes	No	No	Yes	Yes	No	No
Firm Characteristics	Yes	Yes	No	No	Yes	Yes	No	No
Firm Fixed Effects	Yes	Yes	--	--	Yes	Yes	--	--
Time Fixed Effects	No	Yes	--	--	No	Yes	--	--
Firm - Time Fixed Effects	No	No	Yes	Yes	No	No	Yes	Yes
Number of Observations	1,117,353	1,117,353	1,160,565	617,775	3,113,250	3,113,250	3,577,971	2,643,285
Difference in Impact of a Decrease in Interest Rate by 25 bps on the Likelihood of Ending Credit and Increasing the Amount of Credit by Lower versus Higher Capitalized Banks (Δ=2 Standard Deviations) As Percent of Unconditional Probability of Ending Credit (=0.12%) and Increasing The Amount of Credit (=0.51%) in Sample								
in Hungarian Forint	-19%	-19%	-	-	8%	9%	-	-
in Euro	6%	7%	-	-	1%	2%	-	-
in Swiss Franc	-1%	-1%	-	-	0%	1%	-	-
Difference in Impact Between Euro and Hungarian Forint	**26%**	**26%**	**25%**	**35%**	**-7%**	**-7%**	**-5%**	**-3%**
Difference in Impact Between Swiss Franc and Hungarian Forint	**18%**	**18%**	**18%**	**17%**	**-8%**	**-8%**	**-6%**	**-4%**

NOTE. -- The table reports estimates from ordinary least squares regressions. The dependent variable Ending Credit is a dummy that equals one if the firm has no more credit in Hungarian Forint / Euro / Swiss Franc in a particular year:month conditional on having had credit in this currency in the month before and equals zero otherwise. The dependent variable Increasing the Amount of Credit is a dummy that equals one if the firm increases the nominal amount of credit it receives in Hungarian Forint / Euro / Swiss Franc and equals zero otherwise. All independent variables are either lagged one month or calculated over the preceding month. Table 1 lists the definition of all variables. Coefficients are listed in the first row, t-statistics based on robust standard errors clustered at the firm level are reported in the row below in parentheses, and the corresponding significance levels are in the adjacent column. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of fixed effects are comprised in the wider included set of fixed effects. Time Fixed Effects include an effect for every year:month. *** Significant at 1%, ** significant at 5%, * significant at 10%.

TABLE VII

THE GRANTING OF CREDIT IN HUNGARIAN FORINT, EURO, AND SWISS FRANC TO BORROWERS CURRENTLY WITHOUT CREDIT IN THOSE CURRENCIES (EXTENSIVE MARGIN), EFFECTS OF EURO AND SWISS FRANC INTEREST RATES

Model	(1)	(2)	(3)	(4)
Sample	*All Firms*	*All Firms*	*All Firms*	*Single-Bank Firms*
Δ Interest Rate	-0.0545***			
	(-6.43)			
Δ Interest Rate * Bank Capital Ratio	0.4385***	0.4661***		
	(5.96)	(6.30)		
Δ Interest Rate * Credit Is Granted in Euro	0.0457***	0.0457***	0.0383***	0.0213***
	(5.62)	(5.62)	(5.68)	(3.24)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Euro	-0.3831***	-0.3831***	-0.3161***	-0.1936***
	(-5.07)	(-5.07)	(-5.15)	(-3.29)
Δ Interest Rate * Credit Is Granted in Swiss Franc	0.0422***	0.0422***	0.0354***	0.0217***
	(5.25)	(5.25)	(5.30)	(3.37)
Δ Interest Rate * Bank Capital Ratio * Credit Is Granted in Swiss Franc	-0.3601***	-0.3601***	-0.3000***	-0.2010***
	(-4.81)	(-4.81)	(-4.92)	(-3.47)
Δ Interest Rate in Euro Area	-0.0695			
	(-1.60)			
Δ Interest Rate in Euro Area* Bank Capital Ratio	0.3985	0.4517		
	(1.08)	(1.23)		
Δ Interest Rate in Euro Area * Credit Is Granted in Euro	0.1094**	0.1094**	0.1148***	0.0873***
	(2.52)	(2.52)	(3.23)	(2.64)
Δ Interest Rate in Euro Area * Bank Capital Ratio * Credit Is Granted in Euro	-0.3633	-0.3633	-0.4330	-0.4464
	(-0.93)	(-0.93)	(-1.38)	(-1.53)
Δ Interest Rate in Euro Area * Credit Is Granted in Swiss Franc	0.1018**	0.1018**	0.1131***	0.0925***
	(2.43)	(2.43)	(3.29)	(2.87)
Δ Interest Rate in Euro Area * Bank Capital Ratio * Credit Is Granted in Swiss Franc	-0.4129	-0.4129	-0.5158*	-0.5481*
	(-1.09)	(-1.09)	(-1.70)	(-1.94)
Δ Interest Rate in Switzerland	0.5153***			
	(11.03)			
Δ Interest Rate in Switzerland * Bank Capital Ratio	-2.9439***	-2.9235***		
	(-7.17)	(-7.10)		
Δ Interest Rate in Switzerland * Credit Is Granted in Euro	-0.5037***	-0.5037***	-0.4256***	-0.3834***
	(-10.46)	(-10.46)	(-10.88)	(-9.82)
Δ Interest Rate in Switzerland * Bank Capital Ratio * Credit Is Granted in Euro	2.6950***	2.6950***	2.0223***	1.9931***
	(6.31)	(6.31)	(6.00)	(5.87)
Δ Interest Rate in Switzerland * Credit Is Granted in Swiss Franc	-0.3908***	-0.3908***	-0.3328***	-0.3199***
	(-8.20)	(-8.20)	(-8.63)	(-8.14)
Δ Interest Rate in Switzerland * Bank Capital Ratio * Credit Is Granted in Swiss Franc	2.3287***	2.3287***	1.7968***	1.8049***
	(5.55)	(5.55)	(5.46)	(5.35)
Δ GDP	-0.0508***			
	(-3.59)			
Δ GDP * Bank Capital Ratio	0.4345***	0.4422***		
	(3.35)	(3.39)		
Δ GDP * Credit Is Granted in Euro	0.0381***	0.0381***	0.0231**	0.0358***
	(2.58)	(2.58)	(1.99)	(3.25)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Euro	-0.3592***	-0.3592***	-0.1955*	-0.2235**
	(-2.66)	(-2.66)	(-1.91)	(-2.40)
Δ GDP * Credit Is Granted in Swiss Franc	0.0313**	0.0313**	0.0167	0.0264**
	(2.09)	(2.09)	(1.42)	(2.35)
Δ GDP * Bank Capital Ratio * Credit Is Granted in Swiss Franc	-0.3383**	-0.3383**	-0.1840*	-0.1831**
	(-2.50)	(-2.50)	(-1.79)	(-1.96)
Δ CPI	-0.0761***			
	(-7.84)			
Δ CPI * Bank Capital Ratio	0.6147***	0.6015***		
	(6.82)	(6.65)		
Δ CPI * Credit Is Granted in Euro	0.0776***	0.0776***	0.0601***	0.0474***
	(7.61)	(7.61)	(7.52)	(6.38)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Euro	-0.5912***	-0.5912***	-0.4176***	-0.2973***
	(-6.18)	(-6.18)	(-5.76)	(-4.75)
Δ CPI * Credit Is Granted in Swiss Franc	0.0671***	0.0671***	0.0508***	0.0393***
	(6.58)	(6.58)	(6.34)	(5.24)
Δ CPI * Bank Capital Ratio * Credit Is Granted in Swiss Franc	-0.5308***	-0.5308***	-0.3705***	-0.2476***
	(-5.63)	(-5.63)	(-5.19)	(-3.92)
Credit Granted in Euro	-0.0042***	-0.0042***	-0.0037***	-0.0027***
	(-20.36)	(-20.36)	(-22.86)	(-17.70)
Bank Capital Ratio * Credit Is Granted in Euro	0.0098***	0.0098***	0.0077***	0.0053***
	(5.32)	(5.32)	(5.63)	(4.11)
Credit Granted in Swiss Franc	-0.0040***	-0.0040***	-0.0035***	-0.0025***
	(-19.87)	(-19.87)	(-22.29)	(-16.69)
Bank Capital Ratio * Credit Is Granted in Swiss Franc	0.0092***	0.0092***	0.0071***	0.0047***
	(5.09)	(5.09)	(5.40)	(3.73)
Constant	0.0165***	0.0055***	0.0036***	0.0024***
	(11.06)	(2.91)	(95.23)	(66.76)
Macroeconomic variables	Yes	No	No	No
Bank Characteristics	Yes	Yes	No	No
Firm Characteristics	Yes	Yes	No	No
Firm Fixed Effects	Yes	Yes	--	--
Time Fixed Effects	No	Yes	--	--
Firm - Time Fixed Effects	No	No	Yes	Yes
Number of Observations	3,113,250	3,113,250	3,577,971	2,643,285
Percentage Point Difference in Impact of a Decrease in Forint Interest Rate by 25 bps on the Likelihood of Granting of First-Time Credit by Lower versus Higher Capitalized Banks (Δ =2 Standard Deviations) as Percent of Unconditional Probability of Granting First-Time Credit in Sample (= 0.16%)				
in Hungarian Forint	*20%*	*22%*	-	-
in Euro	*3%*	*4%*	-	-
in Swiss Franc	*4%*	*5%*	-	-
Difference in Impact Between Euro and Hungarian Forint	*-18%*	*-18%*	*-15%*	*-9%*
Difference in Impact Between Swiss Franc and Hungarian Forint	*-17%*	*-17%*	*-14%*	*-9%*
Difference in Impact of a Decrease in Swiss Franc Interest Rate by 25 bps on the Likelihood of Granting of First-Time Credit by Lower versus Higher Capitalized Banks (Δ=2 Standard Deviations) as Percent of Unconditional Probability of Granting First-Time Credit in Sample (= 0.16%)				
in Hungarian Forint	*-137%*	*-136%*	-	-
in Euro	*-12%*	*-11%*	-	-
in Swiss Franc	*-29%*	*-28%*	-	-
Difference in Impact Between Euro and Hungarian Forint	*125%*	*125%*	*94%*	*93%*
Difference in Impact Between Swiss Franc and Hungarian Forint	*108%*	*108%*	*84%*	*84%*
Difference in Impact Between Hungarian Forint and Swiss Franc	*-108%*	*-108%*	*-84%*	*-84%*
Difference in Impact Between Euro and Swiss Franc	*-17%*	*-17%*	*-10%*	*-9%*

NOTE. -- The table reports estimates from ordinary least squares regressions. The dependent variable is a dummy that equals one if the firm is granted credit in Hungarian Forint / Euro / Swiss Franc in a particular year:month conditional on having received no credit in this currency in the month before and equals zero otherwise. All independent variables are either lagged one month or calculated over the preceding month. Table 1 lists the definition of all variables. Coefficients are listed in the first row, t-statistics based on robust standard errors clustered at the firm level are reported in the row below in parentheses, and the corresponding significance levels are in the adjacent column. "Yes" indicates that the set of fixed effects is included. "No" indicates that the set of fixed effects is not included. "--" indicates that the indicated set of fixed effects are comprised in the wider included set of fixed effects. Time Fixed Effects include an effect for every year:month. *** Significant at 1%, ** significant at 5%, * significant at 10%.