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Global Liquidity and Impairment of Local Monetary Policy☆

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Abstract

We show that global liquidity limits the effectiveness of local monetary policy on credit markets. The mechanism is via a bank carry trade in international markets when local monetary policy tightens. For identification, we exploit global (VIX, U.S. monetary policy) shocks and loan-level data —the credit and international interbank registers— from a large emerging market, Turkey. Softer global liquidity conditions attenuate the pass-through of local monetary policy tightening on loan rates, especially for banks with more access to international wholesale markets. Effects are also important for other credit margins and for risk-taking, e.g. riskier borrowers in FX loans or defaults.

JEL Classification: G01; G15; G21; G28; F30.

Keywords: Global Financial Cycle; Monetary Policy; Emerging Markets; Banks; Carry Trade.

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1. Introduction

The last few decades have witnessed a dramatic increase in international financial integration. Global external assets have reached almost 200% of the world GDP (Lane and Milesi-Ferretti, 2017), international bank claims have massively risen (Cetorelli and Goldberg, 2012a), especially in dollars (Ivashina, Scharfstein, and Stein, 2015; IMF, 2019) with global factors gaining further traction in affecting domestic financial conditions (IMF, 2017). Global risk aversion –as proxied by VIX or US monetary policy– are key drivers of the global financial cycle that moves local credit cycles (Miranda-Agrippino and Rey, 2015; Bruno and Shin, 2015). These developments feed into a lively academic and policy debate over to what extent local monetary policy can steer their local credit conditions, even in countries without fixed exchange rates (Rey, 2013; Fischer, 2014; Rajan, 2014; Obstfeld, 2015; Federal Reserve Jackson Hole, 2019). Despite growing interest on this debate, well-identified empirical evidence (and the associated mechanisms) is scant.

In this paper, we analyze whether (and if so, why) the transmission of local monetary policy on credit markets is impaired by the global financial cycle. For identification, we exploit global liquidity shocks in conjunction with administrative datasets from a large emerging market, Turkey. Differently from most central bank registers around the world, which do not have loan-level rates for corporate loans nor complete transaction level data from wholesale lending, we exploit loan-level data both from the credit register –tracking all loans to firms by Turkish banks, with information on both loan *interest rates* and volume– and the International Interbank Market Register –providing transaction-level information on the *universe of cross-border* (and local) borrowing by Turkish banks from global lenders, with also information on loan price and volume.

Briefly summarized, our robust results show that softer global liquidity conditions –proxied by lower VIX or softer US monetary policy– attenuate the pass-through of local monetary policy tightening on loan rates, with stronger attenuation effects for banks that borrow ex-ante more from international wholesale markets. The reduction in the effectiveness of local monetary policy is also important for other credit margins and there are key bank risk-taking effects —especially for riskier borrowers in foreign-currency (FX) loans, and with substantial higher ex-post defaults. The mechanism at work is via a carry trade by domestic banks from international wholesale funding markets.[1] Therefore, higher risk-taking takes place both on the liabilities and assets side of the

[1] When local monetary conditions tighten, borrowing in foreign currency becomes relatively cheaper (violations

balance sheet, stemming from foreign currency borrowing from global banks and softening of local loan conditions – a phenomenon that is relatively more pronounced among riskier borrowers.

Following the seminal contribution by Rey (2013), several papers (that we discuss in the literature review) have argued that the global financial cycle may limit the transmission of local monetary policy on local credit markets. However, up to our knowledge, causal empirical evidence – especially based on complete, administrative micro-datasets and exogenous shocks – and the mechanisms behind – is still scant. Our main contribution to the academic literature (and to the policy debate) is to show that global liquidity limits the effectiveness of local monetary policy on credit markets, even via domestic banks in local currency lending, and crucially, we uncover a novel mechanism behind such result. Consistently with recent theoretical insights, we highlight how interest rate differentials drive carry-trade flows on the global wholesale market for banks' financing, thereby reducing the effectiveness of local monetary policy transmission into credit dynamics, especially the pass-through to loan rates.

The remaining part of this Introduction is divided into two parts. First, we provide a detailed advance of the different parts of the paper. Second, we discuss at some length the related literature and its contrast with our paper.

A detailed advance of the paper. We analyze whether global liquidity conditions affect the degree of local monetary policy transmission to local credit markets, notably the pass-through to loan rates, as well as the risk-taking channel of monetary policy, including local loans in foreign currency, and the potential mechanism –via domestic banks' carry trade from global lenders in foreign currency in the international wholesale market.

Turkey provides an excellent laboratory to explore the nexus between global liquidity and local monetary policy transmission. First, the banking sector is the main provider of funding for firms (with other sources playing a negligible role), and Turkey is a large emerging market economy subject to foreign shocks, as it has large current account deficits and hence depends on global finance. Second, Turkey has two matched administrative, supervisory datasets crucial to tackle our questions: the Credit Register and the International Interbank Market Register.

We exploit the Credit Register (CR) of Turkey, that provides extensive information on virtually

of the covered interest rate parity allow profitable arbitrage, also through an investment of such funds in domestic lending). Turkey, like other emerging markets, is characterized by systematic violations of the covered interest parity –which makes cheaper (though riskier) to borrow in dollars in wholesale markets. Related evidence is discussed below.

all loans granted by all banks operating in Turkey. By exploiting the CR, we overcome a key identification challenge –namely, that global liquidity and local monetary conditions affect at the same time borrower (firm) and lender (bank) balance sheet conditions. By using firm×time fixed effects in loan-level regressions, we focus on within-firm variations in credit conditions across differently exposed banks (as in Jimenez, Ongena, Peydro, and Saurina, 2014). Importantly, the Turkish CR has loan-level interest rates, different from most credit registers owned by central banks around the world and crucial for our question. As in Baskaya, di Giovanni, Kalemli-Ozcan, Peydro, and Ulu (2017), our analysis focuses on domestic banks, as they are especially impacted by local monetary conditions, and have a more difficult access to global funds relatively to foreign banks.[2] Moreover, domestic banks rely significantly on cross-border foreign currency funds. Their non-core foreign-currency liabilities are 114% of their capital (13% of their asset size), and such liabilities move in tandem with global liquidity conditions (Figure 1).

To identify the underlying mechanism, we exploit a new register, the International Interbank Market Register (IIMR), which provides transaction-level information on the universe of domestic banks' cross border borrowing from global lenders (banks and other financial intermediaries). For example, a tighter local monetary policy (or softer global liquidity conditions) may render cross-border borrowing less costly for domestic banks; in turn, domestic banks, particularly the ones with higher ex-ante foreign-currency liabilities, may demand more funds from abroad (a bank carry trade), eventually affecting the degree of monetary policy transmission. IIMR contains the following information at the transaction level: interest rate charged, volume, maturity, date of origination, currency of denomination, unique identifiers for the borrower (domestic bank) and the lender (global bank), and the country where the headquarter of the lender resides. Therefore, by exploiting the highly granular IIMR, we can identify the mechanism by absorbing international liquidity supply-side effects by considering within-global-bank variations to Turkish banks' cross-border credit demand.

For global liquidity shocks, we use the VIX (a proxy of global risk aversion) as our benchmark global liquidity indicator following the large strand of literature that takes the VIX as a historically strong and robust factor that reflects the global financial cycle.[3] Moreover, given that international

[2] Results are similar if we include foreign banks. Results are also similar if we use all firms and/or not firm fixed effects.

[3] See, e.g., Forbes and Warnock (2012), Fratzscher (2012), Miranda-Agrippino and Rey (2015), Bruno and Shin

spillovers originating from the US monetary policy have received special interest in the literature and policy circles, and owing to the fact that the US dollar plays a key role in global financial markets and risk-taking,[4] we also use the Federal Reserve's balance sheet size (or the US monetary base (Morais, Peydro, Roldan-Pena, and Ruiz-Ortega, 2019)), the shadow Federal Funds rate (Wu and Xia, 2016) and US monetary policy surprises (Gertler and Karadi, 2015; Jarocinski and Karadi, 2019).

Our results are as follows. First, we show that banks with higher access to global liquidity (proxied by higher ex-ante degree of reliance on foreign-currency wholesale non-core funding) raise their loan rates to local firms significantly less following a local monetary policy tightening. The effect is not only statistically significant but also economically large. After a 100-basis-points increase in the local monetary policy rate (as in Kashyap and Stein (2000)), banks at the 3^{rd} quartile of non-core foreign currency liabilities-to-total-assets ratio (which we call for brevity as globally-funded or high foreign funding domestic banks) raise their loan rate on a similar type of loan to a given firm by 39 basis points less after the local monetary policy tightening (compared to banks at the 1^{st} quartile). This estimated effect is economically sizeable as the average within-firm standard deviation of loan rates, which corresponds to our level of identification, is 206 basis points. Not only do we control for firm-time fixed effects in the benchmark regressions, but we also control for other characteristics which are important for the bank lending channel of monetary policy, notably bank capital, liquidity and size (Kashyap and Stein, 2000; Jimenez, Ongena, Peydro, and Saurina, 2012). Interestingly, the estimated coefficient is statistically identical if we do not control for any firm, bank or loan control compared to saturating the regression with observable controls and many different sets of fixed effects (that increases the R-squared by almost 60 percentage points), thereby suggesting that our main variables of interest are exogenous to the firm balance sheet channel (demand) and other bank supply mechanisms (Altonji, Elder, and Taber, 2005; Oster, 2019).

Second, and more importantly, we find that softer global liquidity conditions directly weaken the transmission of a local monetary policy tightening. In particular, we find that softer global liquidity conditions lead ex-ante more globally-funded domestic banks to raise their loan rates significantly less after a local monetary policy tightening. The result is robust across all proxies for global

(2015), di Giovanni, Kalemli-Ozcan, Ulu, and Baskaya (2018), among many others.

[4] See, e.g., Rey (2013), Ivashina, Scharfstein, and Stein (2015), Morais, Peydro, Roldan-Pena, and Ruiz-Ortega (2019), Buch, Bussiere, and Hills (2018), Hofmann, Shim, and Shin (2017), IMF (2019) and Bräuning and Ivashina (forthcoming).

liquidity conditions. Economically, when there is a reduction in VIX of one standard deviation, banks that ex-ante rely more on foreign funding set 57 basis points lower loan rate for a given firm following a 100-basis-points local monetary policy tightening.[5] We obtain similar results when we consider higher Federal Reserve balance sheet size, higher US monetary base, lower US shadow interest rate, or unexpected easing in the US monetary policy as alternative indicators of softer global liquidity conditions (the economic impacts are 44, 46, 40, and 50 basis points given a one-standard-deviation easing in the respective global liquidity variable).

Third, we document that the global liquidity channel spurs banks' risk-taking (even after a local monetary policy tightening). In short, our findings point to overall laxer credit standards by globally-funded banks. Following a local monetary policy tightening, banks with higher ex-ante foreign funding reduce their supply of credit less mildly, are more likely to extend longer term credit, and are less likely to ask for collateral, with these effects being stronger when global liquidity conditions are softer. That is, not only there is a reduction in the pass-through to loan rates but also to other credit terms. Effects are nonetheless stronger for loan interest rates than for other credit margins. Moreover, when global liquidity conditions are softer, the increase in loan rates by globally-funded domestic banks is lower for ex-ante riskier (than safer) borrowers in FX loans (by 5 to 10 basis points after a 100-basis-points local monetary policy tightening).[6] Moreover, firms that were granted a loan from a globally-funded domestic bank when global liquidity conditions are softer are 32% more likely to default over the following year after a local monetary policy tightening (compared to average probability of future default); effects are even stronger among foreign-currency borrowers, whose probability of default increases by a factor of 42% relative to the average. In addition, riskier firms are more likely to switch to globally-funded banks after a local monetary policy tightening.

Finally, we explore the mechanism driving our results. Controlling for global bank (supply side) effects (by including lender-bank-headquarter's country×time or lender-bank×time fixed effects), we find that globally-funded domestic banks perform a carry trade following a local policy tightening. In particular, domestic banks with higher ex-ante foreign funding-to-total assets ratio raise their foreign-currency wholesale borrowing from abroad by 1% more following a 100-basis-

[5] By banks that rely more on foreign funding, we mean banks at the 3^{rd} quartile of the distribution of non-core foreign-currency liabilities-to-total assets ratio (which is 16.42) compared to banks at the 1^{st} quartile (8.99).

[6] For Turkish lira loans, we also find differential risk-taking effects though less robust statistically than for FX loans.

points tightening in the local monetary policy. Equally importantly, following a local monetary policy tightening, banks with higher foreign funding tap cheap foreign currency funding to earn higher yield on Turkish assets (indicating violation of the covered interest parity condition at a very disaggregated level). In particular, the interest differential that they face, the spread between average domestic interest rates (on Turkish domestic currency treasury bills) and the transaction-level cross-border borrowing rate rises (by 5 basis points), with stronger effects when the VIX is lower (by an additional 7 basis points), when the local policy rate is tightened (by 100 basis points).

In sum,[7] when there is a tightening of local monetary policy in an environment of soft global financial conditions, globally-funded domestic banks take more risk in their liabilities by borrowing more from foreign financial institutions in foreign currency, and also by softening more their lending conditions –especially a weaker pass-through to loan rates— and even more to ex-ante riskier borrowers or in FX loans, with substantial higher ex-post loan defaults.

Literature Review. In a seminal contribution, Rey (2013) highlights that global risk appetite – affecting liquidity conditions and asset prices across the world – drives cross-border flows and therefore may impair the effectiveness of local monetary policy also in countries with a floating exchange rate –thus breaking the traditional Mundelian trilemma. Other authors have taken a more nuanced view (Obstfeld, 2015; Han and Wei, 2018; Obstfeld, Ostry, and Qureshi, 2019), but while they underline the additional autonomy granted by a flexible exchange rate, they still argue that global liquidity conditions may affect domestic credit dynamics. In general, the notion that financial globalization may hinder the ability of central bankers to control domestic financial conditions has also gained traction among policy-makers (IMF, 2012, 2017).

The existing literature, however, offers little causal empirical evidence based on rich administrative datasets, thereby documenting the extent of the *influence of global liquidity on the effectiveness of local monetary policy, and the mechanisms behind*. Several studies document the spillovers of monetary policy from global financial centers onto local credit dynamics (e.g. Ioannidou, Ongena, and Peydro, 2015; Buch, Bussiere, and Hills, 2018), often focusing on the transmitting role of multinational banks (Cetorelli and Goldberg, 2012b; Temesvary, Ongena, and Owen, 2018; Morais, Peydro, Roldan-Pena, and Ruiz-Ortega, 2019). We contribute by showing how global liquidity con-

[7] Our results are robust to focusing on loans at the origination (newly originated loans), studying alternative time horizons for firm loan default to gauge ex-ante or ex-post firm riskiness, using estimated residuals from a Taylor-type rule for the local monetary policy rate, or policy asymmetries (splitting the sample into local policy tightening vs. easing episodes).

ditions impair the transmission of local monetary policy. In fact, we find that banks with higher reliance on wholesale funding in foreign currency exhibit a lower pass-through of variations in local policy rates to their borrowers and that –crucially– this phenomenon heightens during periods of loose global liquidity.

One important and innovative aspect of our study is that even banks with a purely domestic focus in lending are equally responsible for this result and hence for the transmission of international liquidity shocks. Traditionally, attention in the literature has rested predominantly on global banks (see, among the others, Giannetti and Laeven, 2012; Schnabl, 2012; Aiyar, Calomiris, Hooley, Korniyenko, and Wieladek, 2014; Cortés and Strahan, 2017; Morais, Peydro, Roldan-Pena, and Ruiz-Ortega, 2019) and investment funds (Jotikasthira, Lundblad, and Ramadorai, 2012).

Moreover, we uncover a mechanism which relies on banks' carry-trading cheap foreign currency financing with (relatively more) expensive domestic lending– either in local or in foreign currency. The carry trade is especially profitable following a local monetary tightening and/or a loosening of global liquidity stance, since they both imply a widening of the interest differential between Turkey and global markets. Covered interest rate parity (CIRP) violations, in turn, open the space for rewarding arbitrage also in the case of almost fully-hedged carry, which is likely to be the predominant case as banks normally hedge their foreign currency exposures (Ivashina, Scharfstein, and Stein, 2015; Bräuning and Ivashina, 2017).[8] The carry-trade mechanism in our paper relates to a recent model by Cavallino and Sandri (2018) –whereby carry-trade capital flows can generate perverse expansionary effects following a local policy rate hike. Also, our findings are consistent with cross-country evidence in Avdjiev, Du, Koch, and Shin (2019), who find that, in accordance with the strength and sign of deviations from CIRP, cross-border bank flows in US dollars expand (diminish) after a depreciation (appreciation) of the US dollar (see also Avdjiev, Koch, McGuire, and von Peter, 2018). Relative to these papers, we follow each step involved in banks' carry trade and highlight the potential relevance of the interbank market in driving the observed cross-country

[8] In the case of the Turkish Lira, systematic deviations from CIRP happened throughout most of our sample. Indeed, Du and Schreger (2016) compare 5-year government bonds yields for US and Turkey from 2005 to 2015 and find that they reflect substantial departures from CIRP. Similarly, Duran and Küçüksaraç (2012), reject the CIRP condition focusing on government bonds yields across different maturities along the period from 2008-2012. Hong, Oeking, Kang, and Rhee (2019) include Turkey in a sample of emerging markets for studying the impact of shocks to the cross-currency basis, a common metric for proxying departures from CIRP. Du and Schreger (2016) and Hong et al. (2019) equally provide evidence against CIRP for other emerging economies. Violations of CIRP takes place also within advanced economies, as shown also by, among the others, Borio, McCauley, McGuire, and Sushko (2016) and Du, Tepper, and Verdelhan (2018).

patterns.[9]

The associated risk-taking via higher global funding in wholesale markets and the stronger effects among riskier foreign currency borrowers link our paper to a relatively large body of literature on the risk-taking channel of monetary policy (see Fishburn and Porter, 1976; Borio and Zhu, 2008; Adrian and Shin, 2010; Allen and Rogoff, 2011; Diamond and Rajan, 2012; Dell'Ariccia and Marquez, 2013; Jimenez, Ongena, Peydro, and Saurina, 2014; Dell'Ariccia, Laeven, and Marquez, 2014; Dell'Ariccia, Laeven, and Suarez, 2017; Di Maggio and Kacperczyk, 2017). We contribute to this literature by proposing a new carry-trade based mechanism with different results than the analyses of the risk-taking channel without considering the international dimension. Different from the papers that do not analyze the international dimension (where they find low monetary rates increase risk-taking), we find that tighter local monetary conditions increase bank risk-taking both in assets (ex-ante softer lending conditions including pass-through, increase in riskier FX loans, and higher ex-post defaults) and in liabilities (higher borrowing from the international wholesale markets, which is a more fragile source of funding, in foreign currency).

Finally, other authors (including Houston, Lin, and Ma, 2012; Ongena, Popov, and Udell, 2013) have focused on the ability of global financial institutions to arbitrage local banking regulation. Our study shows that integration in the global interbank market allows financial institutions –irrespectively of their geographical reach in lending– to bypass a local monetary tightening with domestic lending. A globalized interbank market allows therefore financial institutions to arbitrage not only regulation and supervision, but also macroeconomic policy.

The paper proceeds as follows. Section 2 presents the data, our empirical strategy, as well as variable definitions and summary statistics. Section 3 presents the main findings, including robustness analyses. Section 4 briefly concludes.

2. Data and Empirical Strategy

2.1. Data

The Credit Register of Turkey (CR) provides extensive details on virtually all corporate loans granted by all banks operating in Turkey. The data is collected by the Banking Regulation and

[9] In a similar fashion, Allayannis, Brown, and Klapper (2003) and Bruno and Shin (2017) show that large and listed corporations from emerging economies exploit the interest rate differential (relatively to US) when determining the currency structure of their debt. Our analysis of the universe of loans for Turkey shows, however, that shocks to the relative cost of foreign/local currency debt are passed through to nearly all companies thanks to banks' intermediation.

Supervision Agency (BRSA), the authority in charge of supervising the Turkish banking system. Banks have to report outstanding loans at a transaction level monthly to the BRSA. In addition to the loan outstanding and unique identifiers for the borrower and the lender, the CR includes loan-level interest rate (absent in most credit registers), currency of denomination, whether the loan is collateralized or not, loan origination and termination dates, and a variable indicating whether the loan is non-performing (90 days overdue). We aggregate the CR at a bank-firm loan-type level for each month.[10] We then match the CR with the monthly bank balance sheets and income statements datasets.

We confine our interest to domestic (locally-owned) deposit-taking banks, banks for which one could expect a strong degree of local monetary policy transmission. This is not restrictive since such banks extend over 80% of total bank credit in Turkey over our sample period. Moreover, foreign banks' use of global funds may simply reflect headquarter-affiliate adjustments (Cetorelli and Goldberg, 2012a), and thus, may not be readily interpreted as reliance on global liquidity. We therefore exclude foreign banks in our estimations.[11] To avoid data management issues due to large size, we focus on firms covered by the Central Bank of the Republic of Turkey (CBRT) Company Accounts Database. The CBRT tracks this relatively large sample of firms since 1990, and assure its representativeness to monitor developments regarding the whole non-financial corporate sector and provide the public with comprehensive and systematic information.[12] In total, we have 19 domestic (locally-owned) deposit-taking banks, 21,323 firms -that work with at least two banks-, 795,548 firm-month observations, and 8 loan types (domestic vs. foreign currency, short- vs. long-term, collateralized vs. non-collateralized).

Our second database, which we exploit to uncover the underlying mechanism driving our results, is the International Interbank Market Register (IIMR). The IIMR provides transaction-level details on the universe of domestic banks' cross border borrowing. In particular, for each transaction, the database provides the volume, interest rate charged, date of origination and termina-

[10] In particular, we first classify loans as domestic vs. foreign currency denominated loans, short- (<1 year) vs. long-term (≥1 year) loans, and collateralized vs. non-collateralized loans. In total, we then have 8 loan types. Afterwards, we calculate bank-firm- loan-type level average loan rate at a given month using corresponding loan volumes as weights (i.e., interest rates attached to smaller loans receive lower weights).

[11] The results are robust to including foreign banks in the estimation (available upon request).

[12] The CBRT Company Accounts database aggregated at the (NACE4) sector level is publicly available at https://www.tcmb.gov.tr/wps/wcm/connect/EN/TCMB+EN/Main+Menu/Statistics/Real+Sector+Statistics/Company+Accounts/.

tion, currency of denomination, unique identifiers for the borrower (domestic bank) and the global lender, and the lender's headquarter's country of residence. Similar to the CR, the frequency of the IIMR is monthly. There are two banks that do not borrow from international wholesale markets (i.e., they are fully domestically funded, and hence not appear in the IIMR). These banks provide less than 1% of domestic banking sector credits. Over our sample period, (globally-funded) domestic banks borrow in US dollars (64%) or Euros (35%),[13] from a total of 659 global lenders (banks and other financial intermediaries) from 91 countries (with the majority being Euro-area (41%) or US headquartered (23%)).

2.2. Empirical Strategy

Our empirical strategy includes the following ingredients: First, we exploit global shocks, proxied by (US-based) VIX or US monetary policy. Our sample period is from January 2006 to December 2016, that encompasses several events that had global repercussions, e.g., the Lehman Brothers' collapse in September 2008, quantitative easing by advanced economy central banks, the European debt crisis that started to unfold in early 2010, as well as the aftermath of Bernanke's taper tantrum in May 2013. These episodes imply strong variation in VIX and US monetary policy, which are exogenous to Turkey.

Second, we identify credit supply side effects by exploiting the CR. That is, we study whether banks with different degrees of reliance on global liquidity differ in their pricing of a similar type of loan to a given firm following a change in the local monetary policy rate. To do so, we exploit the micro-level credit registry data and absorb any variation in unobserved borrower-specific characteristics by including firm×month fixed effects and focus on firms with multiple banking relationships (Khwaja and Mian, 2008).[14]

[13] Domestic banks borrow from abroad in Turkish lira (TRY) as well (constituting on average about 8% of total cross-border loans). So, the shares of US dollars and Euros in Turkish banks' cross-border borrowing are based on non-TRY loans. We did not include cross-border TRY loans since the vast majority of cross-border TRY loans are provided by Turkish banks' affiliates abroad (to their headquarters at home), which in part reflect affiliate-headquarter adjustments (not necessarily reflecting a response to a local policy tightening).

[14] Later, we discuss possible limitations of this widely used identification strategy, and conduct additional analyses (results are nevertheless robust to not including firm fixed effects or to all firms in the CR). Moreover, if banks with different degrees of reliance on global liquidity systematically work with firms with different characteristics, that may confound our results. However, as we report in Table OA6, bank loan portfolio characteristics (based on weighted average characteristics of firms present in the bank loan portfolio) are economically or statistically weakly related to the bank reliance on global liquidity (the (absolute levels of) cross-correlations vary from 0.04 to 0.19).

Third, we horserace bank reliance on global liquidity with bank capital, liquidity, and size, key bank variables that are shown in the literature to be reflecting banks' ability to insulate their loan portfolios following changes in market liquidity. For instance, one could expect smaller, less liquid banks (Kashyap and Stein, 1995, 2000), or weakly capitalized banks (Jimenez, Ongena, Peydro, and Saurina, 2012, 2014) to be less able to insulate their loan portfolios from changes in monetary policy, and in turn, reflect monetary policy decisions more strongly to their clients. Along these lines, we horserace ex-ante bank reliance on global liquidity with these key bank variables in levels and in all possible interaction terms (e.g., with local monetary policy or global shocks).

Fourth, we take changes in the local monetary policy rate conditional on domestic macroeconomic conditions. In particular, we control for domestic macroeconomic variables that are typical in monetary policy reaction functions for small open economies: a proxy for the GDP growth, inflation, and change in the real exchange rate. Macroeconomic controls are included exhaustively, in levels and in interactions with bank foreign funding, capital, liquidity, and size, and if applicable, with firm risk. By controlling for macroeconomic variables exhaustively, we also take into account the fact that banks may differ in how they reflect changes in macroeconomic conditions onto their loan rates. In later sections, we use estimated residuals from a Taylor-type rule instead of using changes in the local monetary policy rate.

Fifth, we employ weighted least squares with the natural logarithm of loan volumes being used as weights, that is, smaller loans receive lower weights.[15] In all columns, we include month of-the-year dummy variables (11 in total) to account for possible seasonal effects. Lastly, we double cluster standard errors at the bank-firm pair and month level, to take into account possible dependence in residuals for a given bank-firm pair across time and also across all loans by all banks for a given month (Petersen, 2009; Cameron, Gelbach, and Miller, 2011).

Finally, to show the mechanism, we then use the transaction-level database on domestic banks' cross-border borrowing exploiting the IIMR. We follow a similar empirical strategy, yet this time we identify the demand side by absorbing supply-side effects. Namely, we saturate the model with global (lender) bank's headquarter country$\times$month or global (lender) bank$\times$month fixed effects to control for the supply side of liquidity by global lenders. Our question boils down to whether domestic banks with higher ex-ante reliance on global liquidity demand more funds from abroad

[15] The results are strongly robust, and in essence numerically stronger, when we use unweighted least squares.

and tap cheaper foreign funds to earn higher yields on domestic assets following a local monetary policy tightening, and whether softer global liquidity conditions make these effects stronger.

2.2.1. Global Liquidity and Local Monetary Policy Transmission

We first study whether banks with higher reliance on foreign funding raise their loan rates differently following a local monetary policy tightening. In the most saturated version, our benchmark model, the empirical equation is structured as follows:

$$
\begin{aligned}
i_{bfa,t} = & \sum_{s=1}^{3} \beta_s \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
& + \sum_{s=1}^{3} \Theta_s \Delta MP_{t-s} \otimes (\text{Capital Ratio, Liquidity Ratio, Size})_{b,t-s} + ... \\
& + \sum_{s=1}^{3} \Gamma_s Macros_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
& + \sum_{s=1}^{3} \Upsilon_s Macros_{t-s} \otimes (\text{Capital Ratio, Liquidity Ratio, Size})_{b,t-s} + ... \\
& + \delta \mathcal{H}_{bi,t-1} + \zeta \mathcal{S}_{bf,t-1} + \text{Bank Controls}_b + \mu_b + \nu_{f,t} + \zeta_a + \varepsilon_{bfa,t} \qquad (1)
\end{aligned}
$$

where $i_{bfa,t}$, the dependent variable, is the interest rate on a loan at month t provided by bank b to firm f of a loan of type a. By loan type, we specifically mean the currency of denomination, maturity (short- or long-term) and collateral (collateralized or non-collateralized) property of the loan. We use the level of the loan rate, as opposed to its change, since about $\frac{1}{3}$ of the loans granted over our sample period are newly originated (for which one cannot have a change in its interest rate).[16]

ΔMP, our key policy variable, is the monthly change in the local monetary policy rate. $Macros$ are domestic macroeconomic variables typical in small open economy monetary policy rules: annual growth in industrial production index –as a proxy for GDP growth–, annual CPI inflation, and

[16] We define a loan as newly originated if it has a unique bank–firm–(loan-type)–(origination-date)–(termination-date). We do not discard 'newly originated' loans, since they presumably provide a sharper picture on the policy rate pass-through, as opposed to previously originated loans (e.g., credit lines) that potentially adjust slowly in response to monetary policy changes (and some potentially beyond our 3-month horizon). Indeed, when we focus solely on newly originated loans, our results are in general stronger (discussed in the next section). The results are qualitatively robust to using change in the loan rate as our dependent variable (available upon request), but we do lose significant number of observations.

monthly change in the real effective exchange rate –where an increase means a real domestic currency appreciation–.[17] We include one-to-three lags of ΔMP as it might take time for the monetary policy to affect banks' overall funding conditions and loan prices (see Kashyap and Stein, 2000). In line with the lag specification for the monetary policy rate, one-to-three lags of $Macros$ are included in the estimation. Moreover, as for the ΔMP, $Macros$ are interacted with bank foreign funding ratio, capital ratio, liquidity ratio, and size.

Our focus variable is the interaction of bank reliance on global liquidity (i.e., foreign funding ratio, defined as non-core foreign-currency liabilities-to-total assets ratio) with the change in the local monetary policy rate. Our main coefficient of interest is therefore $\sum_{s=1}^{3} \beta_s$. In particular, we test whether banks with higher foreign funding ratio raise their loan rates less following a local monetary tightening, i.e., $\sum_{s=1}^{3} \beta_s < 0$.[18]

μ_b are the bank fixed effects, controlling for unobserved time-invariant bank characteristics. $\nu_{f,t}$ denote firm×month fixed effects, absorbing all observed and unobserved firm-level heterogeneity in credit demand, and are therefore key to identify credit supply. ζ_a are the loan-type fixed effects, namely, currency, maturity and collateral types (separately or in combination, i.e., currency×maturity×collateral). Bank controls include the level of foreign funding ratio, capital ratio, liquidity ratio, size, nonperforming loans ratio, and return-on-assets. Consistent with the lag structure of interaction terms, one-to-three lags of levels of bank foreign funding ratio, capital ratio, liquidity ratio, and size are included. Non-performing loans ratio and return-on-assets are included with one lag. Importantly, we also show the results without any control whatsoever to check whether particular controls change the results (and hence are correlated with our main variables of interest).

Next, we explore whether softer global liquidity conditions attenuate local monetary policy

[17] $\otimes$ stands for tensor product. To save space, we lay out the empirical specification concisely. See equation OA.1 for the long version. Note that, for specifications that include firm×month fixed effects ($\nu_{f,t}$), the levels of ΔMP are naturally dropped from the model.

[18] Further controls are as follows: $\mathcal{H}_{bi}$ denotes "Herfindahl by bank", –by how much bank b extends credit to firm f to finance its activity in the sector i as a share of total bank credits granted to that sector (to proxy for the bank's business experience in the sector, sectoral competition that the bank faces, or to take into account the possibility that banks with higher reliance on foreign funding may systematically be concentrated in some sectors)–. $\mathcal{S}_{bf}$ captures the strength of the bank-firm relationship, proxied by the share of bank b credit in total bank credit of firm f over the previous 12 months prior to borrowing from bank b at t. We include the strength of the bank-firm relationship, as it may serve as an implicit contract between the parties and potentially affect observable contractual terms (Berger and Udell, 1995; Bharath, Dahiya, Saunders, and Srinivasan, 2011; Gambacorta and Mistrulli, 2014).

transmission. To do so, we extend equation (1) by incorporating measures of global liquidity conditions into the picture. Namely, we estimate

$$\begin{aligned} i_{bfa,t} = &\sum_{s=1}^{3} \beta_s \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\ &+ \sum_{s=1}^{3} \gamma_s \text{Global Liquidity Indicator}_t * \text{Foreign Funding Ratio}_{b,t-s} + ... \\ &+ \sum_{s=1}^{3} \delta_s \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} * \text{Global Liquidity Indicator}_t + ... \\ &+ CONTROLS + \mu_b + \nu_{f,t} + \zeta_a + \varepsilon_{bfa,t} \end{aligned} \tag{2}$$

where Global Liquidity Indicator is the log of the VIX (measured at the beginning of t) as the baseline. For robustness, we use the (log of) Federal Reserve balance sheet size, the (log of) the US monetary base, the shadow Federal funds rate (Wu and Xia, 2016),[19] or US monetary policy surprises (Jarocinski and Karadi, 2019).[20] Our focus variable is the triple interaction of changes in local monetary rate, bank foreign funding ratio, and global liquidity indicator. Our main coefficient of interest is then $\sum_{s=1}^{3} \delta_s$. For instance, if a lower VIX impairs local monetary policy tightening, we would expect $\sum_{s=1}^{3} \delta_s > 0$.

A natural concern related to equation (2) would be the possibility of local monetary policy responding directly to global liquidity indicators. To mitigate such endogeneity, we measure the global liquidity indicators at the current month t (whereas changes in the local monetary policy rate are lagged). Moreover, to avoid the possibility that a loan is granted before the observed Global Liquidity Indicator within month t, we use beginning of the month values for global liquidity indicators.[21] Also, we later use estimated residuals from a Taylor-type monetary policy rule that

[19] Studying a multi-factor shadow rate term structure model, Wu and Xia (2016) estimate a shadow measure for the Fed monetary policy stance, including the period after the funds rate hits the zero-lower bound in July 2009. Using a simple factor-augmented vector autoregression, they show that their proposed shadow federal funds rate exhibits similar dynamic correlations with key macro variables since July 2009 as the federal funds rate did in the data prior to the Great Recession.

[20] Using a Bayesian structural vector autoregression and high-frequency financial market surprises around monetary policy announcements, Jarocinski and Karadi (2019) estimate policy rate shocks for the Fed and the ECB –that controls for the information content of policy announcements.

[21] In particular, we use the opening value of the VIX at the first day of the month t, the latest weekly value for Fed balance sheet size or US monetary base at month $t-1$. For shadow Federal Funds rate, we use the monthly average (for t). For US monetary policy shocks, we use the sum of shocks up to and including t.

additionally includes the VIX –and aggregate credit growth (for reasons to be discussed more in detail in the robustness section).

$CONTROLS$ include all the variables in the equation (1), and additionally include bank capital ratio, liquidity ratio, and size in double interaction with the global liquidity indicator, in triple interactions with global liquidity indicator and local monetary policy changes (ΔMP), and in triple interactions with global liquidity indicator and domestic macroeconomic variables ($Macros$).

In later sections, we use (i) the log of loan volume, and indicator variables for (ii) maturity and (iii) collateral property of a loan, as alternative dependent variables (at the very same level of disaggregation). For maturity, we define an indicator variable that is equal to 1 if the loan is short term (<1 year), and 0 otherwise. For collateral, we similarly define an indicator variable, that is equal to 1 if the loan is non-collateralized, and 0 otherwise.

To analyze risk-taking, we estimate equation (2) separately for the subsample of firms that we define as "riskier" and for the remaining set of firms (that we define as "safer"). We label a firm as riskier if the firm had any non-performing loans (which are 90 days overdue) during the 3-year-period prior to borrowing, and safer otherwise.[22] Since recent non-performance might also be relevant for banks, we also assess shorter past horizons, 1- and 2-years, as well as study a longer horizon, i.e., 4 years. To corroborate bank risk taking, we also explore future firm loan defaults, not just simply ex-ante riskier firms.

For further evidence, we also introduce ex-ante firm riskiness in our estimation equation:

$$\begin{aligned} i_{bfa,t} =& \sum_{s=1}^{3} \delta_{1,s} \Delta MP_{t-s} * I(\text{Firm Risk}_{f,t}) + \sum_{s=1}^{3} \delta_{2,s} \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} \\ &+ \sum_{s=1}^{3} \delta_{3,s} \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) \\ &+ CONTROLS + \mu_b + \nu_{f,t} + \zeta_a + \varepsilon_{bfa,t} \end{aligned} \tag{3}$$

where $i_{bfa,t}$ and other variables are as defined above, and $CONTROLS$ include all relevant control variables in levels, and double and triple interactions.[23] $I(\text{Firm Risk}_{f,t})$ is the indicator variable

[22] Using past loan default information for ex-ante riskiness is widely used in the literature (see, e.g., Jimenez, Ongena, Peydro, and Saurina, 2014), and we essentially follow this route.

[23] That is, we control for (i) bank capital ratio, liquidity ratio, and size, and (ii) domestic macro controls, in all possible levels, and double and triple interactions. Similar as above, we also control for bank characteristics, Herfindahl

that we used above to label a firm as riskier: it takes a value 1 if firm f is riskier (has one or more non-performing loans during a 3-year period prior to t), and 0 otherwise. Note we include firm×month fixed effects, $\nu_{f,t}$, in order to properly identify bank risk-taking.

Our coefficient of interest is $\sum_{s=1}^{3} \delta_{3,s}$. We test whether banks with a higher degree of reliance on global liquidity raise their loan rates less for ex-ante riskier firms following a local monetary policy tightening. That would correspond to testing for whether $\sum_{s=1}^{3} \delta_{3,s} < 0$.

2.2.2. Mechanism: Carry Trade

Intuitively, following a local monetary policy tightening, cross-border borrowing may become more favorable compared to local funding particularly for banks with higher reliance on foreign funding, potentially due to a milder increase in foreign compared to local borrowing costs, and given the violation of the covered interest rate parity that we discussed in the Introduction. In turn, these banks may demand more funds from abroad after a local monetary policy tightening (a carry trade).

Our estimation is structured as follows:

$$
\begin{aligned}
Y_{bgc,t} = & \sum_{s=1}^{3} \alpha_s \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + \ldots \\
& + \sum_{s=1}^{3} \Theta_s \Delta MP_{t-s} \otimes (\text{Capital Ratio, Liquidity Ratio, Size})_{b,t-s} + \ldots \\
& + CONTROLS + \xi_{g,t} + \mu_b + \zeta_c + \varepsilon_{bgc,t} \qquad (4)
\end{aligned}
$$

where $Y_{bgc,t}$ is (i) the change in (log) volume of cross-border borrowing of domestic bank b from global bank g in currency c from $t-3$ to t; (ii) the change in the associated cross-border borrowing rate from $t-3$ to t; or (iii) the interest differential (the difference between the average domestic currency Turkish treasury yields (averaging across all maturities)[24] and cross-border borrowing rate at t).

To control for the supply side effects, we saturate the model with global bank's headquarter country×month fixed effects, and in the most saturated specification, global bank×month fixed

by bank-sector ($\mathcal{H}$), and the strength of the bank-firm relationship ($\mathcal{S}$). For the general specification, see equation OA.2 in Appendix A.

[24] The maturities for domestic currency Turkish treasury bills are 3 and 6 months, and 1, 2, 3, 4, 5, 7, 8, 9, and 10 years.

effects ($\xi_{g,t}$). These fixed effects soak up any variation in common global factors (e.g., the VIX), external macroeconomic factors, e.g., the role of US macro fundamentals for the case of Bank of America or J.P. Morgan Chase or Germany's macro fundamentals for Commerzbank lending to a Turkish bank, or for the most saturated specification, supply-side factors for a given global bank. $CONTROLS$ are (i) domestic bank controls (same as in the baseline regression, equation (1)); (ii) domestic macro controls in interaction with domestic bank variables; and (iii) the strength of the global bank-domestic bank relationship (which, like above, proxied by the share of loans granted by the global bank to the domestic bank in total cross-border loans the domestic bank has). ζ_c denote currency-type fixed effects (US dollars or Euros). Same as above, we also control for unobserved domestic bank characteristics by including domestic bank fixed effects (μ_b).

Our coefficient of interest is $\alpha \equiv \sum_{s=1}^{3} \alpha_s$. A positive and significant α in the most saturated specification implies that, among domestic banks that borrow from the same global bank in the same month in the same currency, more globally-funded banks increase *their demand* for foreign wholesale funds more (and enjoy a higher foreign interest differential) following a local policy tightening. In later analyses, we also explore whether these effects get stronger when the VIX is lower (by including the interaction of changes in the local policy rate and bank foreign funding ratio with the log of the VIX, and controlling for domestic macro controls in the triple interactions, as in equation (2)).

2.3. Definitions and Summary Statistics

Table 1 provides detailed definitions and the summary statistics of the variables used in the empirical analyses. Our key dependent variable is the loan interest rate, expressed in annual percentage terms, of a certain loan type provided by a bank to a firm. In some of our analyses, we focus on domestic currency (TRY) and foreign currency (FX) loans separately. Within-firm standard deviation of loan rates, which corresponds to our level of identification, has an average of 206 basis points. Corresponding statistics for domestic-currency and foreign-currency loan rates are 248 and 82 basis points, respectively. In some of our analyses, we also use (log) volume of a loan, and indicator variables for maturity or collateral property of a loan as alternative dependent variables.

To proxy for global liquidity conditions, we use several indicators (each one at a time): We use the (log of) VIX as the baseline, given the extant literature showing that the global capital flows and local credit cycles comove strongly with the VIX. For robustness, we use the (log of) Federal reserve assets (or the (log of) US monetary base (Morais et al., 2019)) to capture US unconventional monetary policy, the shadow Federal funds rate (Wu and Xia, 2016) or US monetary policy surprises (Jarocinski and Karadi, 2019) to capture both conventional and unconventional US monetary policy (where the latter reflect *unexpected* changes in the US monetary policy based on financial market surprises).

Figure 1 plots the evolution of global liquidity indicators (against domestic banks' foreign-currency non-core liabilities). On average, during when global liquidity conditions are softer (from mid 2009 to mid 2011 due to Fed Q1, or from 2012 to late 2013 due to Fed QE2), we observe a higher growth in banks' non-core borrowing from abroad. When global liquidity conditions are tighter (e.g., from Lehman's collapse (late 2008) to mid 2009, or from late 2013 onwards due to Bernanke's Taper Tantrum and the Fed's winding down the QEs), we observe a decline in banks' non-core borrowing from abroad.

Our key policy variable is the monthly change in the weighted average cost of liquidity provided by the central bank to the banking system, i.e., the effective central bank funding rate. We use the official rates until the end of 2010 and the effective funding rate afterwards. The Central Bank of Turkey has implemented a multiple interest rate framework after end-2010 (Basci and Kara, 2011), and the effective rate is the relevant measure of policy stance. Figure 2 presents how the monetary policy rate has evolved after 2006.

The key bank variables are foreign funding ratio, capital ratio, liquidity ratio, and size.[25] Foreign funding ratio is defined as the ratio of non-core foreign-currency liabilities to total assets.[26]

[25] Capital ratio is defined as the ratio of bank equity capital to total assets. It reflects the intensity of agency problems that banks face in times of financial stress, and in this regard, the ease at which banks can raise external funds (Holmstrom and Tirole, 1997; Gertler and Karadi, 2011; Gertler and Kiyotaki, 2011). Following the related literature, we use the book value of equity, and thus, our measure is the inverse of a pure leverage ratio (for a similar measure, see also Jimenez et al., 2012, 2014). Similar as above, we label a bank as 'strongly capitalized', if the bank is at the third quartile (13.09%), and as 'weakly capitalized', if the bank is at the first quartile (9.87%). Liquidity ratio is defined as the ratio of liquid assets (the sum of cash, receivables from the central bank, interbank money market and reverse repo transactions) to total assets. On average, banks hold 28.7 percent of their assets in liquid assets, a value substantially higher than generally reported for banks in mature markets. Moreover, relatively liquid banks (the third quartile) hold about 34.2% of their assets as liquid, while for less liquid banks, this ratio attains 20.65%. Size is the natural logarithm of total assets. Similar as to above, we use the quartiles to label a bank as large (the 3rd quartile) or small (the 1st quartile). The remaining bank variables are nonperforming loans ratio (the ratio of loans that are overdue 90 days to total loans), return-on-assets (pre-tax net profit to total assets), and at the bank-sector level, Herfindahl by bank (a bank's total credits to a sector as a share of total bank credits granted to that sector).

[26] Non-core foreign currency (FX) liabilities is the sum of FX payables to banks, FX payables to money and securities

For convenience in interpreting the results and reporting the economic impacts, we label a bank as a 'bank with a high degree of reliance on global liquidity' if the bank is at the third quartile (16.42%), and as a 'bank with a low degree of reliance on global liquidity', if the bank is at the first quartile (8.99%) of the distribution of foreign funding ratio.

We control for macroeconomic variables that are typical in monetary policy reaction functions for small open economies (in levels and in all relevant interactions): annual growth in industrial production index, ΔIPI, as an indicator for changes in aggregate economic activity (available at a monthly frequency, in line with the frequency of loan-level data); annual inflation, ΔCPI, defined as annual change in the consumer price index; and monthly change in the RER (where a higher RER is defined as a real appreciation of the domestic currency).

3. Empirical Results

3.1. Global Liquidity and Local Monetary Policy Transmission

Table 2 presents the first set of baseline results. We start with the least saturated specification that includes solely the change in the local monetary rate and its interaction with banks' foreign funding ratio, as well as the level of foreign funding ratio, with no controls or fixed effects (column 1). The estimated coefficient for the interaction term lays out our initial key effect: banks that ex-ante rely more on foreign funding raise their loan rates significantly less following a local monetary policy tightening. Economically, following a 100 basis-points increase in the local policy rate (in cumulative terms over the preceding 3 months), a bank at the 75th percentile of foreign funding ratio raises its loan rate by 43 basis points less (compared to a bank at the 25th percentile). This estimated effect is sizeable given that average within-firm standard deviation of loan rates is 206 basis points.

We then successively saturate our model. We control for "Herfindahl by bank", the strength of the bank-firm relationship, and absorb time-invariant bank characteristics –by including bank fixed effects– (column 2), and additionally control for time-invariant firm characteristics –by including firm fixed effects– (column 3). Our key result remains intact and numerically very similar.

In column (4), we then saturate the model with loan-type fixed effects (currency, maturity and collateral-type fixed effects), and control for domestic macroeconomic variables in levels and in

markets, FX funds from repo transactions and net FX securities issued.

interaction with bank capital, liquidity and size, as well as horse-race banks' reliance on foreign funding with these bank variables. We find that banks' reliance on foreign funding stands is relatively more important for the local policy rate pass-through than bank capital, liquidity or size. For instance, while a globally-funded domestic bank raises its loan rate by 42 basis points less following a 100-basis-points increase in the local policy rate, the estimated effects for well-capitalized, more liquid or larger banks are much smaller in magnitude (7, 5, and 0.4 basis points, respectively) and statistically not significant in most cases.

In column (5), we identify supply side effects by saturating the model with firm$\times$month fixed effects. Column (6) is the most saturated specification that additionally controls for loan-types –currency $\times$ maturity $\times$ collateral fixed effects–. Results show that banks with higher foreign funding set their loan rates by 39 basis points less *for a given firm* following a cumulative 100-basis-points increase in the local monetary policy rate.

Importantly, the estimated coefficient is statistically identical if we do not control for any firm, bank or loan control compared to saturating the regression with observable controls and many different sets of fixed effects (increasing the R-squared by almost 60 percentage points), thereby suggesting that our main variables of interest are exogenous to the firm balance sheet channel (demand) and other bank supply mechanisms (Altonji et al., 2005; Oster, 2019). Formally, we test for the relevance of potential omitted variable bias following Oster (2019). Oster (2019) shows that coefficient stability may be a sufficiently good indicator of limited omitted variable bias, only if changes in the estimated coefficient are scaled by the change in the R-squared when controls are included. She shows that bias-adjusted treatment effect, approximated by $\beta^* \approx \tilde{\beta} - \delta \left[\mathring{\beta} - \tilde{\beta}\right] \frac{R_{max} - \tilde{R}}{\tilde{R} - \mathring{R}}$, converges in probability to the true treatment effect; in our notation, $\tilde{\beta}$ and $\tilde{R}$ are the bias-unadjusted estimated coefficient and the R-squared from the model with larger controls, respectively. On the other hand, $\mathring{\beta}$ and $\mathring{R}$ are the estimated coefficient and the R-squared from the simplest model. Finally, δ captures the degree of self-selection into the treatment along unobservables –as a multiple of the observed degree of self-selection along observables– and R_{max} is the R-squared from the hypothetical regression that entails zero omitted variable bias. We follow the standard test parametrization proposed by Oster (2019) and fix $\delta = 1$ and $R_{max} = 1.3\tilde{R}$. We compute a bound for our coefficient of interest under the assumptions that self-selection along unobservables has comparable intensity as along observables and that R_{max} is sufficiently large. We compare column (1) with our most saturated specification, column (6). The estimated bound for the treatment coefficient,$[\tilde{\beta}, \beta^*]$, is

[-0.157,-0.151], which safely excludes zero. We therefore reject that the effect of banks' reliance on foreign funding on local policy rate transmission is driven by omitted variable bias.[27]

We then extend our model by additionally including the interaction of bank foreign funding (and other key bank variables) with the VIX (Table 3). The estimated coefficient for the interaction of bank foreign funding with the VIX implies that a lower VIX pushes banks with ex-ante higher foreign funding to set lower loan rates for a given firm (column 1). Although the estimated effect is not statistically significant at conventional levels, its significance is marginally higher than 10%.[28] More importantly for the question of our paper, in column (2), we explore whether global liquidity conditions affect local monetary policy transmission. To do so, we introduce a triple interaction, the interaction of bank foreign funding, changes in local policy rate, and the log of the VIX. We find that softer global liquidity conditions attenuate the transmission of a local monetary policy tightening, and the channel works through banks with higher reliance on foreign funding. Numerically, following a cumulative 100 basis points increase in the local monetary policy rate, banks with higher foreign funding raise their loan rates by 57 basis points less when the VIX is reduced by one standard deviation.[29]

In later columns, we study domestic and foreign currency loans separately (columns 3 to 8), or saturate the model with firm×currency×month fixed effects (columns 9 to 11). In columns (3) to (5), we focus on domestic currency denominated loans. Numerically, following a cumulative 100-basis-points tightening, a bank with higher foreign funding sets 75 basis points lower rates for domestic currency loans for a given firm when the VIX is lower by one standard deviation. This effect seems sizeable given that average within-firm standard deviation of domestic currency loan rates is about 250 basis points. In columns (6) to (8), we then turn our focus to foreign currency denominated loans. Evaluating the estimated coefficient for the respective triple interaction, we

[27] We also evaluated the bound for the treatment effect at much more conservative values for δ and R_{max}. For R_{max} as high as 1, and/or even for implausibly much high values for δ (up to $\delta = 26$), we continue to find that the bound excludes zero.

[28] Nonetheless, this effect will start to matter when we introduce firm riskiness and currency of denomination of loans, as we show below.

[29] We later show that a local monetary policy tightening also leads globally-funded banks to do carry-trade (by borrowing more from abroad and enjoy a favorable interest differential). To show that this is not confounding for our results, we show in Table OA5 that using bank foreign funding ratio measured fixed at December 2005 (before our sample period begins) does not alter the results. In later sections, we also show that these results are qualitatively robust to using a set of alternative indicators for global liquidity –that reflect conventional and/or unconventional US monetary policy.

find that following a cumulative 100-basis-points tightening, a bank with higher foreign funding sets about 13 basis points lower rates for foreign currency loans for a given firm when the VIX is lower by one standard deviation. This effect seems economically relevant given that average within-firm standard deviation of foreign currency loan rates is about 80 basis points.

A concern related to focusing on domestic and foreign-currency loans separately is that firms that are granted domestic currency loans and those that are granted foreign currency loans may be intrinsically different, or that domestic and foreign currency loans may differ, e.g., in their maturity or collateral properties.[30] In this regard, we now exploit within firm-currency-month variation (and continue saturating the model with collateral and maturity fixed effects). Our previous results are strongly robust. Following a 100-basis-points tightening in the local monetary policy, banks with a higher degree of reliance on global liquidity raise their loan rate for a given firm×currency by 59 basis points less when global liquidity conditions are softer.

3.2. Global Liquidity and the Risk-Taking Channel of Local Monetary Policy Tightening

Table 4 presents the results. In this table, we re-estimate our previous specifications for riskier and safer firms separately. In column (1), we explore how banks with higher foreign funding set their loan rates for a given riskier firm following changes in monetary policy or global liquidity conditions (as given by the interaction of bank foreign funding ratio with changes in local monetary policy rate, or with the VIX). In column (2), we then focus on safer firms. We observe that banks with higher foreign funding set lower rates for riskier firms following a local policy tightening or following softer global liquidity conditions. Comparing columns (1) and (2), we find that banks do this more strongly for riskier firms (as given by larger coefficients on these interaction terms), underlining bank risk taking.

In column (3), we study how global liquidity affects the risk-taking channel of monetary policy (by introducing the triple interaction of local monetary policy changes, bank foreign funding and the VIX). We find that following a local policy tightening, banks with higher foreign funding set 65 basis points lower loan rate for a given riskier firm when global liquidity conditions are softer (column 3). The estimate effect is milder for safer firms (56 basis points, column 4). However,

[30] Domestic currency loans are on average shorter term and more likely to be non-collateralized compared to foreign currency loans. In particular, the share of short-term (<1 year) loans in total loans is 76% for domestic currency loans and 27% for foreign currency loans, and the share of non-collateralized loans in total loans is 25% for domestic currency loans and 21% for foreign currency loans.

the difference in estimated coefficients appears not statistically significant (we later show that the difference is in fact significant for TL loans when VIX is above its average, and for FX loans when VIX is below its average).

In remaining columns, we focus on domestic-currency or foreign-currency denominated loans separately. Like above, we find that softer global liquidity conditions strengthen bank risk-taking following a local policy tightening (column 5 vs. 6, and column 7 vs. 8). In particular, following a 100 basis points policy tightening, banks with higher foreign funding set 79 basis points lower loan rate for domestic currency loans to a given ex-ante riskier firm (versus 75 basis points lower rates for safer firms), and 19 basis points lower rate for foreign currency loans to a given ex-ante riskier firm (versus 12 basis points lower rate for safer firms), when global liquidity conditions are softer. While the difference between how globally-funded banks set loan rates differently for riskier vs. safer firms seems not sizeable, pricing riskier and safer firms similarly (after a tightening of monetary policy) already hints banks' underpricing risk. Below, we show further evidence on bank risk-taking, with stronger statistical and economic effects.

An Alternative Specification for Bank Risk-Taking

To provide finer inference, we now introduce ex-ante firm riskiness in our estimation equation (Equation (3)). Table 5 presents the results. Given by the estimated negative and significant coefficient for the triple interaction ($\sum_{s=1}^{3} \delta_{3,s}$), we find that banks with higher foreign funding set statistically significantly lower rates for riskier firms following a local monetary policy tightening (numerically by 12 basis points lower rates, see column 1). The results carry through when we focus on domestic or foreign currency loans (columns 2 and 3). Taking into account that cross-sectional variation in foreign currency loan rates is rather small compared to domestic currency loan rates, banks' setting lower rates for foreign currency loans to riskier firms appears relatively large.

Next, we do the same exercises for periods of high VIX (during which the VIX is higher than its average over our sample period, i.e., 18.34) or low VIX (during which the VIX is lower than its average). The results show that globally-funded banks set statistically significantly lower loan rates for riskier firms as compared to safer firms following a local monetary policy tightening. For domestic currency loans by 23 basis points when global liquidity conditions are tighter (column 5), and for foreign currency loans by 7 basis points when global liquidity conditions are softer (column

9). There is also an asymmetry with respect to the global financial cycle, softening more FX loans when VIX is low, and tightening more local currency loans when VIX is high.

Other Loan Terms: Volume, Maturity, Collateral

We also explore other dimension of credit, i.e., volume, maturity or collateral, as softening of other credit margins are also important for the effectiveness of local monetary policy and for bank risk-taking.

For instance, a lower loan rate by high foreign funding banks may be accompanied with a lower supply of credit, or such banks may extend shorter maturity loans or ask for collateral for compensation. Table 6 shows that this is not the case.

On the contrary, following a local monetary policy tightening, banks with higher foreign funding raise their supply of credit more (or decrease their credit supply less), if global liquidity conditions are softer (column 1). Moreover, such banks are more likely to extend longer term credit (column 2), and are less likely to ask for collateral (column 3). Table 6 further shows that these effects are similar for riskier vs. safer firms.

Taken together, these findings point to a consistent picture: softer global liquidity conditions lead banks with relatively higher ex-ante foreign funding to soften their credit standards (relative to banks with lower foreign funding) following a local monetary policy tightening. Results are nevertheless stronger for pass-through to loan rates than other margins.

3.3. Further Results

Alternative Indicators for Global Liquidity

Irrespectively of the considered indicator for global liquidity, we find that softer global liquidity conditions attenuate the transmission of a local policy tightening (Table 7). For ease of comparison, column (1) replicates the baseline specification that uses the VIX. Column (2) shows that easier US unconventional monetary policy attenuates the transmission of tighter local monetary policy. Numerically, a one standard deviation increase in the (log of) Fed's balance sheet size makes domestic banks with higher foreign funding raise their loan rates by 44 basis points less after a cumulative 100 basis points tightening in the local monetary policy rate. We obtain qualitatively similar results when we consider an increase in the US monetary base, a decrease in the shadow Federal Funds rate, or a negative US monetary policy shock (the economic impacts are 46, 40 and 50 basis points, respectively).

Future Default

We also find greater ex-post loan defaults for firms borrowing from higher foreign funding banks, with stronger effects for foreign-currency borrowers (Table 8). In particular, we study whether a firm that is granted a loan by a higher foreign funding bank when global liquidity conditions are softer is more likely to default on a loan at the bank in the near future following a local monetary policy tightening. In interpreting the economic impacts, we report the probabilities in comparison to the average probability of future loan default of a firm.

We find that a firm that was granted a loan by a high foreign funding bank when the VIX is lower is 0.5% more likely to default at the bank in the following one year after a local monetary policy tightening (which is economically sizeable, given that the estimated effect is 32% of the average probability of loan default over the next year, see column 1). We find a numerically similar result for the 2-year future horizon (0.76%, see column 2).

We find stronger results for foreign currency borrowers (columns 3 and 4). In particular, a firm that was granted a foreign currency loan by a high foreign funding bank when the VIX is lower is 0.46% more likely to default at the bank in the following one year –and 0.67% in the following 2 years– after a local monetary policy tightening. Comparing these estimated effects with the average probability of default on foreign-currency loans, the effects appear sizeable (42% and 35% of the average of respective default probabilities). The effects are smaller for domestic currency borrowers –reported in columns 5 and 6–, when assessed against the average probability of default on domestic-currency loans.

In sum, our risk taking results are complementary. Following a local policy tightening, ex-ante riskier firms receive lower loan rates and experience less reduction in credit supply by banks with ex-ante higher foreign funding –and more strongly so for foreign currency loans and when global liquidity conditions are softer–, and firms that are granted loans by these banks are more likely to default in the future –with stronger effects for foreign currency borrowers–.

Do firms switch from locally-funded to globally-funded banks?

Given our findings that globally-funded domestic banks provide more loans with lower rates following a local policy tightening, one could also expect firms to switch from locally-funded to globally-funded domestic banks after the local policy tightening. To explore this possibility, we aggregate the CR at a firm level and estimate the following model:

$$\text{I(Switching)}_{f,t} = \sum_{s=1}^{3} \beta_{1,s} \Delta MP_{t-s} + \alpha\, I(\text{Low Foreign Funding Bank}_{f,t-3}) + Controls + \varepsilon_{f,t} \quad (5)$$

where $\text{I(Switching)}_{f,t}$ is an indicator variable that equals 1 if firm f switches from working with a low foreign funding bank at $t-3$ to a bank with a high foreign funding at t.[31] $I(\text{Low Foreign Funding Bank}_{f,t-3})$ is an indicator variable that equals 1 if the largest bank from which the firm borrows at month $t-3$ has foreign funding ratio below the median bank; and 0 otherwise.[32]

Table 9 presents the results. We find that firms are on average 2.3% more likely to switch from banks with low foreign funding to banks with higher foreign funding after a local policy tightening (column 1). Consistent with our previous results, we also find that riskier firms are more likely to switch to higher foreign funding banks after the policy tightening compared to safer firms (3.1% vs. 2.1%, columns 2 to 3). We find qualitatively similar results when we control for the change in the (relative) presence of high foreign funding banks (columns 4 to 6).

3.4. Mechanism: Carry Trade

Our findings show strong evidence for bank carry trade following a local monetary tightening. In particular, we show in Table 10 that domestic banks with higher foreign funding borrow more from abroad after a local policy tightening (columns 1 to 2). This effect is strongly robust to saturating the model successively with supply-side-related fixed effects (global (lender) bank's headquarter country×month fixed effects (column 1) or global (lender) bank×month fixed effects (column 2)). Numerically, a domestic bank with a higher foreign funding-to-total assets ratio raises its foreign currency non-core borrowing from abroad by 1.04% more following a 100-basis-points

[31] Here, we consider the largest bank a firm is working with for each month. By largest bank, we specifically mean the bank at which the firm has the highest outstanding loan.

[32] We include the following $Controls$ along with Morais et al. (2019): log(Number of Bank Relations), the log value of the number of domestic banks from which the firm is borrowing in month $t-3$; log(Maturity), the log value of the average loan maturity of a firm at month $t-3$; log(Volume), the log value of the total outstanding amount of loans of a firm at month $t-3$. Moreover, we also control for Δ Presence of High Foreign Funding Banks, i.e. the (log) change in the number of branches of high foreign funding banks (those above or equal to the median of foreign funding ratio) in the city that the firm operates in, relative to the (log) change in the number of branches of low foreign funding banks (those below the median of foreign funding ratio) in the city, from $t-3$ to t. We have bank branch-city information starting with January 2007, whereas our baseline sample period starts from April 2006. So, in columns (4) to (6) where we control for the change in the relative presence of high foreign funding banks, we have mildly lower number of observations.

tightening in the local monetary policy (column 2). Moreover, more capitalized banks demand less funds from abroad, in line with the intuition that such banks may be in less need of foreign funds after a tighter local monetary policy.

In columns (3) to (4), we further show that banks with higher funding also face higher foreign borrowing costs (albeit very small), resonating well with the notion that a rise in demand should lead to a rise in prices and confirming that our supply-side controls are well grounded. The estimated effect is small (and insignificant), suggesting that high foreign funding banks face an almost perfectly-elastic supply schedule in foreign wholesale markets after a local policy tightening.

Importantly, banks with higher foreign funding carry-trade cheap foreign currency funding with higher-yield domestic assets (columns 5 and 6). The (transaction-level) interest differential that they face, the spread between average interest rates on Turkish Treasury bills and the cross-border borrowing rate, rises following a local monetary policy tightening (numerically by 5 basis points after a 100 basis-points local policy tightening). We find this effect significantly stronger when the VIX is lower, by an *additional* 7 basis points if the VIX is lower by 1 standard deviation (column 9).[33]

3.5. Further Discussions and Robustness Analyses

Newly Originated Loans

Loans at the origination (newly originated loans) may offer a sharper reflection on how banks respond to changes in local monetary policy or the global liquidity stance. Exploiting the CR which also provides the exact date of origination of each loan, we now study our baseline specifications for the sub-sample of newly originated loans.

Our results are qualitatively robust, and for some cases, numerically stronger (Table OA1), though we lose a great number of loans. Column (1) shows that globally-funded domestic banks originate a new domestic-currency loan to a given firm at a cheaper rate (numerically, by setting 62 basis points lower loan rate to a given firm following a 100-basis-points monetary policy tightening). Such effect is more pronounced when the VIX is lower (quantitively speaking, by 79 basis points lower rate, see column 2). Moreover, they set 86 basis points lower rate for riskier firms (column 3), and by 79 basis points lower rate for safer firms (column 4).

[33] Moreover, following a local monetary policy tightening, a lower VIX do not significantly affect cross-border volume of borrowing (column 7), yet lower the cross-border borrowing rate (column 8).

For foreign currency loans that are newly originated (columns 5 to 8), bank loan pricing for riskier compared to safer firms is more pronounced (columns 7 vs. 8). Numerically, globally-funded banks set 17 basis points lower rates when they originate a new foreign currency loan to a given ex-ante riskier firm. The estimated effect for safer firms is comparatively smaller (4 basis points) and statistically not significant. These results resonate well with the bank carry-trade channel that we document below –consisting of globally-funded banks borrowing more from abroad at comparatively favorable terms after a local monetary policy tightening.

Alternative Horizons for Firm Past Loan Default

Our results are robust to using alternative horizons for past loan default to gauge firm riskiness (Table OA2). We take shorter horizons, since more recent performance might also be relevant for banks, and a longer horizon, i.e., 1, 2, and 4 years. We continue to find that softer global liquidity conditions make banks with higher foreign funding raise their loan rates less for riskier firms following a local policy tightening.

An Alternative Measure of Local Monetary Policy Stance: Policy Rule Residuals

So far, we have used changes in local monetary policy rate and control for domestic macroeconomic variables that are typical in monetary policy reaction functions for small open economies (real economic activity, inflation and real exchange rate). As local monetary policy may directly respond to global liquidity conditions, and after 2010, financial stability considerations played a larger role in the setting of local monetary policy in emerging markets, including Turkey (Kara, 2016; Fendoglu, 2017),[34] we use residuals from an estimated policy rule. In particular, we regress policy rate on its own lag, lagged deviation of inflation from its target, lagged deviations of (log) industrial production index, (log) real exchange rate, (log) aggregate domestic credit from their respective trends, and the lagged log of the VIX.[35] The estimated policy rule residuals are shown in Figure 3.

Our results are strongly robust to using monetary policy rule residuals (Table OA3). Lower VIX makes banks with higher foreign funding raise their domestic and foreign currency loan rates

[34] Thus, monetary policy may also have responded directly to changes in aggregate credit, i.e., aggregate credit beyond its effect of real economic activity, inflation or real exchange rate.

[35] In calculating the trend, we use Hodrick-Prescott filter with a smoothing parameter 14400 (as typical in monthly frequency data). The results are robust to using expected GDP growth in the policy rule.

significantly less following a local monetary policy tightening shock (as given by the estimated coefficients for the triple interactions). Moreover, such banks set lower rates for both riskier and safer firms (with the former receiving comparatively lower rates).

Asymmetries: Monetary Policy Tightening vs. Easing Episodes and Global Liquidity

Corroborating our baseline results, softer global liquidity conditions matter relatively more during episodes of local monetary policy tightening (Table OA4). In particular, we re-estimate our baseline findings for monetary policy tightening and easing episodes separately.[36] During a policy tightening episode and following a 100-basis-points tightening in the policy rate, banks with higher foreign funding raise their loan rates less when global liquidity softens, an estimated effect that almost double the baseline finding, and economically, corresponds to about half the average within-firm standard deviation of loan rates (column 1). For policy easing episodes, we find a much smaller effect (column 2). The differential effect, tightening vs. easing episodes, appear stronger for domestic currency loans (column 3 vs. 4), and not prevalent for foreign currency loans (column 5 vs. 6).

4. Conclusion

We analyze whether the effectiveness of local monetary policy on credit markets is impaired by the global financial cycle. Our answer is a robust yes. Moreover, we uncover the potential mechanism behind. For empirical identification, we exploit global liquidity shocks in conjunction with administrative datasets from a large emerging market, Turkey. We exploit loan-level data both from the credit register –tracking all loans to firms by Turkish banks, with information on both loan interest rates and volume– and the International Interbank Market Register –providing transaction-level information on the universe of cross-border (and local) borrowing by Turkish banks from global lenders, with also information on loan price and volume.

We show that softer global liquidity conditions –proxied by lower VIX or softer US monetary policy– attenuate the pass-through of local monetary policy tightening on loan rates, with stronger attenuation effects for banks that borrow ex-ante more from international wholesale markets. The

[36] We define the tightening episodes as periods during which change in the policy rate over the previous 3 months is greater than zero, and easing episodes as periods during which change in the policy rate over the previous 3 months is lower than or equal to zero.

reduction in the effectiveness of local monetary policy is also important for other credit margins and there are key bank risk-taking effects –especially for riskier borrowers in foreign-currency (FX) loans, and with substantial higher ex-post defaults. The mechanism at work is via a carry trade by domestic banks from international wholesale funding markets. Therefore, higher risk-taking takes place both on the liabilities and assets side of the balance sheet, stemming from foreign currency borrowing from global banks and softening loan conditions – a phenomenon that is relatively more pronounced among riskier borrowers.

Following the seminal contribution by Rey (2013), several papers have argued that the global financial cycle may limit the transmission of local monetary policy on local credit markets. However, up to our knowledge, causal empirical evidence –especially based on complete, administrative micro-datasets and exogenous shocks – and the mechanisms behind– is still scant. Our main contribution to the academic literature (and to the policy debate) is to show that global liquidity limits the effectiveness of local monetary policy on credit markets, even via domestic banks in local currency lending , and crucially, we uncover a novel mechanism behind such result. Consistently with recent theoretical insights, we highlight how interest rate differentials drive carry-trade flows on the global wholesale market for banks' financing, thereby reducing the effectiveness of local monetary policy transmission into credit dynamics, especially the pass-through to loan rates. For future work, one can look into whether capital controls or macroprudential policies with a capital flow management focus help strengthen local monetary policy transmission. We leave this point to future work.

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Tables

TABLE 1: SUMMARY STATISTICS

Variables	Definition	Unit	Mean	Median	SD	25%	75%	N
Dependent Variables								
$i_{bfa,t}$	Interest rate on a loan provided by bank *b* to firm *f* with loan-type *a* at month *t*	%	11.353	10.650	7.655	5.800	14.750	5,021,945
$i^{TRY}_{bfa,t}$	Interest rate on a domestic-currency loan provided by bank *b* to firm *f* with loan-type *a* at month *t*	%	13.468	12.850	7.842	9.450	16.000	3,681,428
$i^{FX}_{bfa,t}$	Interest rate on a foreign-currency loan provided by bank *b* to firm *f* with loan-type *a* at month *t*	%	5.542	5.350	2.136	4.000	6.830	1,340,517
log($Volume_{bfa,t}$)	Volume of loan from bank b to firm f with loan type a at month t	--	12.621	12.612	1.684	11.533	13.668	5,021,945
I(SHORT $TERM_{bfa,t}$)	Indicator variable that equals 1 if the loan's maturity (at the time of origination) is less than 1 year, and 0 otherwise	0/1	0.708	1	0.454	0	1	5,021,945
I($NONCOLL_{bfa,t}$)	Indicator variable that equals 1 if the loan is non-collateralized, and 0 otherwise	0/1	0.120	0	0.325	0	0	5,021,945
Independent Variables								
Macro-Level Variables								
Δ Policy Rate	Monthly change in the Monetary Policy Rate	%	-0.044	0.000	0.576	-0.260	0.114	129
Δ CPI	Year-over-year change in the consumer price index	%	8.260	8.171	1.719	7.205	9.500	129
Δ IPI	Year-over-year change in the industrial production index	%	3.778	4.354	7.041	1.726	7.906	129
Δ RER	Monthly change in the real effective exchange rate	%	-0.147	-0.008	2.783	-1.451	1.303	129
Global Macro-Level Variables								
log(VIX)	Natural logarithm of CBOE's volatility index on S&P500 index options	%	2.937	2.876	0.364	2.653	3.159	129
Shadow Federal Funds Rate	Shadow Federal Funds Rate, Wu-Xia(2016)	%	0.241	-0.545	2.475	-1.422	0.750	129
log(Federal Reserve Assets)	Natural logarithm of Federal Reserve's total assets	million USD	14.661	14.850	0.606	14.472	15.257	129
log(US Monetary Base)	Natural logarithm of US Monetary Base	million USD	7.659	7.858	0.581	7.317	8.213	129
US Mon. Pol. Shock	US monetary policy shock is from Jarocinski and Karadi (2019) and based on baseline VAR with sign restrictions.		-1.716	-1.688	0.185	-1.828	-1.606	129
Bank-Level Variables								
Foreign Funding Ratio	Non-Core FX Liabilities (FX Payables to Money Market, FX Payables to Securities Market, FX Payables to Banks, FX Funds from Repo Transactions and Net FX Securities Issued) to Total Assets	%	12.983	13.370	6.393	8.990	16.421	1,693
Capital Ratio	Total Equity to Total Assets	%	11.957	11.376	3.359	9.869	13.093	1,693
Liquidity Ratio	Liquid assets (cash + receivables from the central bank + interbank money market + reverse repo receivables) to total assets	%	28.719	27.099	11.417	20.652	34.181	1,693
Size	Natural logarithm of total assets	000s, TL	17.054	17.685	1.800	15.593	18.586	1,693
Additional Bank Controls								
ROA	Pre-tax net profit to total assets	%	1.146	1.153	0.654	0.77	1.579	1,693
NPL Ratio	Non-performing loans (with an overdue past 90 days) to total credit	%	0.877	0.591	0.887	0.259	1.177	1,693

(continues on the next page)

Table 1: Summary Statistics (continued)

Variables	Definition	Unit	Mean	Median	SD	25%	75%	N
Bank-Sector Level Control								
Herfindahl by bank-industry	Total loans provided by bank *b* to the sector *s* that the firm *f* operates in as a share of total banking loans to the sector *s*	%	7.400	4.134	9.716	1.101	10.557	21,871
Bank-Firm Level Control								
Strength of Bank-Firm Relationship	Share of loan amount from bank *b* to firm *f* in firm *f*'s total bank loans during the previous 12 months	%	0.230	0.159	0.211	0.073	0.323	2,285,355
Firm Level Credit Risk Variables								
Past Default (36 months)	Indicator variable that equals 1 if the firm f has at least one loan that is overdue past 90 days during the previous 36 months	0/1	0.181	0	0.385	0	0	795,548
Past Default (12 months)	Indicator variable that equals 1 if the firm f has at least one loan that is overdue past 90 days during the previous 12 months	0/1	0.113	0	0.317	0	0	795,548
Past Default (24 months)	Indicator variable that equals 1 if the firm f has at least one loan that is overdue past 90 days during the previous 24 months	0/1	0.153	0	0.360	0	0	795,548
Past Default (48 months)	Indicator variable that equals 1 if the firm f has at least one loan that is overdue past 90 days during the previous 48 months	0/1	0.200	0	0.400	0	0	795,548
Bank-Firm Level Credit Risk Variables								
Future Default (12 months)	Indicator variable that equals 1 if the firm f that received a loan today from bank b has at least one loan that is overdue past 90 days at bank b in the following 12 months	0/1	0.017	0	0.128	0	0	2,285,355
Future Default (24 months)	Indicator variable that equals 1 if the firm f that received a loan today from bank b has at least one loan that is overdue past 90 days at bank b in the following 24 months	0/1	0.028	0	0.166	0	0	2,285,355
Mechanism								
Δ log(Volume$_{bgc,t}$)	Change in the log volume of cross-border borrowing by domestic (borrower) bank b from global (lender) bank g in currency c, from *t-3* to *t*	%	0.297	0	39.04	-6.669	6.167	59,700
Δ ($i^*_{bgc,t}$)	Change in interest rate of the cross-border borrowing of domestic (borrower) bank b from global (lender) bank g in currency c, from *t-3* to *t*	%	-0.074	0	0.545	-0.079	0.018	58,881
Interest Differential ($i-i^*_{bgc,t}$)	The spread between the average Turkish domestic currency treasury yields (spanning all maturities) and cross-border borrowing rate of domestic (borrower) bank b from global (lender) bank g in currency c at *t*	%	8.374	7.896	2.807	6.708	10	59,157

Additional Statistics: Average within-firm standard deviation of loan rates is 206 basis points. Corresponding statistics for domestic-currency and foreign-currency loan rates are 248 and 82 basis points,

(end of the Table)

Table 2: Banks' reliance on Global Liquidity and Policy Rate Transmission

	(1)	(2)	(3)	(4)	(5)	(6)
Σ Δ MP	**2.243****	**2.63*****	**2.728*****	**3.394***		
	(0.955)	(0.972)	(0.98)	(1.927)		
Σ Δ MP * Foreign Funding Ratio$_b$	**-0.175*****	**-0.198*****	**-0.197*****	**-0.168****	**-0.157***	**-0.157***
	(0.063)	(0.067)	(0.07)	(0.08)	(0.084)	(0.083)
Σ Δ MP * Capital Ratio$_b$				**-0.061**	**-0.064**	**-0.069**
				(0.071)	(0.062)	(0.062)
Σ Δ MP * Liquidity Ratio$_b$				**-0.012**	**0.023**	**0.022**
				(0.02)	(0.017)	(0.017)
Σ Δ MP * Size$_b$				**-0.004**	**-0.136***	**-0.134***
				(0.102)	(0.077)	(0.077)
Σ Foreign Funding Ratio$_b$	**0.135*****	**0.009**	**0.024**	**0.159**	**0.119**	**0.119**
	(0.024)	(0.024)	(0.02)	(0.162)	(0.181)	(0.18)
Bank-Sector Control	No	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	No	Yes	Yes	Yes	Yes	Yes
Macro Controls x Bank Variables	No	No	No	Yes	Yes	Yes
Bank FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes	--	--
Currency FE	No	No	No	Yes	Yes	--
Maturity FE	No	No	No	Yes	Yes	--
Collateral FE	No	No	No	Yes	Yes	--
Currency x Maturity x Collateral FE	No	No	No	No	No	Yes
Firm-Month FE	No	No	No	No	Yes	Yes
Observations	5,021,945	5,021,945	5,021,945	5,021,945	5,021,945	5,021,945
R-squared	0.053	0.085	0.367	0.447	0.626	0.630

Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate						
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**-43.35**	**-49.04**	**-48.80**	**-41.61**	**-38.89**	**-38.89**
By High vs. Low Capital Ratio Banks *(p75-p25)*				**-6.56**	**-6.88**	**-7.42**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*				**-5.41**	**10.37**	**9.92**
By Large vs. Small Banks *(p75-p25)*				**-0.40**	**-13.57**	**-13.37**

Notes: The dependent variable is the interest rate on a loan extended by bank *b* to firm *f* with loan type *a*. In all columns, the sample is restricted to firms that work with at least two banks. All estimations are based on weighted ordinary least squares (with natural logarithm of loan volume used as weights). We control bank and macro variables in all columns. Bank controls include foreign funding ratio, capital ratio, liquidity ratio, size, profitability (return on assets, ROA), non-performing loans-to-total loans ratio (NPL ratio). Bank-sector control variable is the bank's concentration in the sector ("Herfindahl by bank", the share of bank b in total loans extended to the sector s that the firm f operates in). Bank-Firm control variable is the strength of the bank-firm relationship, reflected by the share of loan amount from bank b to firm f in firm f's total bank loans during the previous 12 months. For detailed definitions and summary statistics of the variables used in the estimations, see Table 1. "Yes" indicates that the corresponding set of variables or fixed effects are included. "No" indicates that corresponding fixed effects or variables are not included. "--" indicates that the corresponding fixed effects or variables are inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 3: Global Liquidity Cycles and Policy Rate Transmission

	All Loans		TL Loans			FX Loans			All Loans		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$		**0.634*****			**0.830*****			**0.149*****			**0.651*****
		(0.162)			(0.207)			(0.037)			(0.163)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$		**-0.14**			**-0.093**			**-0.304*****			**-0.165**
		(0.16)			(0.231)			(0.062)			(0.162)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$		**0.041**			**0.064***			**-0.01**			**0.046***
		(0.027)			(0.037)			(0.009)			(0.026)
Σ Δ MP * Size$_b$ * log(VIX)$_t$		**0.067**			**0.191**			**-0.012**			**0.023**
		(0.228)			(0.331)			(0.071)			(0.226)
Σ Δ MP * Foreign Funding Ratio$_b$	**-0.152***	**-1.916*****	**-0.197****	**-0.188****	**-2.482*****	**-0.021**	**-0.023**	**-0.443*****	**-0.161***	**-0.156***	**-1.966*****
	(0.082)	(0.498)	(0.097)	(0.094)	(0.621)	(0.019)	(0.019)	(0.117)	(0.084)	(0.082)	(0.499)
Σ Δ MP * Capital Ratio$_b$	**-0.07**	**0.213**	**-0.102**	**-0.105**	**0.001**	**-0.066*****	**-0.046****	**0.813*****	**-0.068**	**-0.075**	**0.277**
	(0.058)	(0.442)	(0.083)	(0.077)	(0.637)	(0.019)	(0.02)	(0.169)	(0.063)	(0.058)	(0.449)
Σ Δ MP * Liquidity Ratio$_b$	**0.02**	**-0.119**	**0.026**	**0.028**	**-0.182***	**0.003**	**0**	**0.027**	**0.023**	**0.022**	**-0.132***
	(0.018)	(0.08)	(0.023)	(0.024)	(0.111)	(0.004)	(0.004)	(0.026)	(0.017)	(0.018)	(0.08)
Σ Δ MP * Size$_b$	**-0.103**	**-0.225**	**-0.14**	**-0.099**	**-0.548**	**0.014**	**-0.017**	**0.008**	**-0.129***	**-0.095**	**-0.086**
	(0.085)	(0.697)	(0.107)	(0.118)	(1.013)	(0.03)	(0.028)	(0.198)	(0.076)	(0.084)	(0.691)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$	**0.094**	**0.126***		**0.146***	**0.198****		**0.006**	**0.012**		**0.092**	**0.124***
	(0.064)	(0.064)		(0.082)	(0.082)		(0.01)	(0.01)		(0.064)	(0.063)
Σ log(VIX)$_t$ * Capital Ratio$_b$	**-0.154****	**-0.164*****		**-0.278*****	**-0.271*****		**0.089*****	**0.071****		**-0.193*****	**-0.203*****
	(0.071)	(0.065)		(0.095)	(0.088)		(0.031)	(0.031)		(0.071)	(0.064)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$	**-0.039****	**-0.022**		**-0.031**	**-0.006**		**-0.016*****	**-0.013****		**-0.039****	**-0.022**
	(0.018)	(0.016)		(0.024)	(0.022)		(0.006)	(0.006)		(0.017)	(0.016)
Σ log(VIX)$_t$ * Size$_b$	**0.222****	**0.291*****		**0.331*****	**0.437*****		**-0.142*****	**-0.148*****		**0.235****	**0.299*****
	(0.104)	(0.105)		(0.128)	(0.134)		(0.042)	(0.043)		(0.101)	(0.103)
Bank Variables x log(VIX)	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	--	--	--	--	--	--	--	--	--	--	--
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity x Collateral FE	--	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	Yes	No	No	No	No	No	No	No	No	No
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	--	--	--
Firm-Currency-Month FE	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Observations	5,021,945	5,021,945	3,681,428	3,681,428	3,681,428	1,340,517	1,340,517	1,340,517	5,021,945	5,021,945	5,021,945
R-squared	0.631	0.633	0.578	0.579	0.581	0.710	0.711	0.712	0.670	0.671	0.673
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate when log(VIX)$_t$ is lower by 1 standard deviation											
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*		**-57.16**			**-74.84**			**-13.43**			**-58.70**
By High vs. Low Capital Ratio Banks *(p75-p25)*		**5.48**			**3.64**			**11.89**			**6.45**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*		**-6.73**			**-10.51**			**1.64**			**-7.55**
By Large vs. Small Banks *(p75-p25)*		**-2.43**			**-6.94**			**0.44**			**-0.84**

Notes: The dependent variable is the interest rate on a loan extended by bank *b* to firm *f* with loan-type *a*. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables or fixed effects are included. "No" indicates that corresponding fixed effects or variables are not included. "--" indicates that the corresponding fixed effects or variables are inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 4: Bank Risk Taking

	All Loans				TL Loans		FX Loans	
Set of Firms:	Riskier	Safer	Riskier	Safer	Riskier	Safer	Riskier	Safer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$			**0.716*** **	**0.623*** **	**0.873*** **	**0.828*** **	**0.208*** **	**0.136*** **
			(0.185)	(0.159)	(0.228)	(0.205)	(0.056)	(0.033)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$			**-0.077**	**-0.168**	**-0.058**	**-0.121**	**-0.31*** **	**-0.294*** **
			(0.19)	(0.16)	(0.265)	(0.235)	(0.074)	(0.061)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$			**0.083** **	**0.033**	**0.11** **	**0.055**	**-0.001**	**-0.012**
			(0.036)	(0.025)	(0.049)	(0.035)	(0.015)	(0.008)
Σ Δ MP * Size$_b$ * log(VIX)$_t$			**-0.261**	**0.169**	**-0.358**	**0.384**	**0.011**	**-0.023**
			(0.285)	(0.212)	(0.371)	(0.315)	(0.102)	(0.067)
Σ Δ MP * Foreign Funding Ratio$_b$	**-0.195*** **	**-0.14* **	**-2.169*** **	**-1.879*** **	**-2.628*** **	**-2.472*** **	**-0.618*** **	**-0.402*** **
	(0.077)	(0.083)	(0.548)	(0.491)	(0.668)	(0.618)	(0.17)	(0.104)
Σ Δ MP * Capital Ratio$_b$	**-0.101* **	**-0.056**	**0.022**	**0.303**	**-0.087**	**0.084**	**0.824*** **	**0.787*** **
	(0.057)	(0.059)	(0.527)	(0.446)	(0.731)	(0.652)	(0.208)	(0.167)
Σ Δ MP * Liquidity Ratio$_b$	**0.019**	**0.02**	**-0.236** **	**-0.097**	**-0.299** **	**-0.16**	**-0.01**	**0.034**
	(0.019)	(0.018)	(0.106)	(0.078)	(0.146)	(0.109)	(0.044)	(0.024)
Σ Δ MP * Size$_b$	**0.038**	**-0.139* **	**0.862**	**-0.577**	**1.161**	**-1.177**	**-0.009**	**0.038**
	(0.107)	(0.079)	(0.855)	(0.644)	(1.103)	(0.964)	(0.293)	(0.187)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$	**0.17** **	**0.072**	**0.207*** **	**0.101**	**0.261*** **	**0.177** **	**0.021**	**0.009**
	(0.071)	(0.064)	(0.072)	(0.063)	(0.089)	(0.081)	(0.016)	(0.009)
Σ log(VIX)$_t$ * Capital Ratio$_b$	**-0.288*** **	**-0.114**	**-0.285*** **	**-0.128* **	**-0.361*** **	**-0.234*** **	**0.059**	**0.071** **
	(0.08)	(0.072)	(0.074)	(0.066)	(0.094)	(0.09)	(0.048)	(0.031)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$	**-0.028**	**-0.043** **	**-0.002**	**-0.027* **	**0.006**	**-0.01**	**-0.008**	**-0.013** **
	(0.021)	(0.017)	(0.019)	(0.016)	(0.026)	(0.021)	(0.008)	(0.005)
Σ log(VIX)$_t$ * Size$_b$	**0.071**	**0.246** **	**0.098**	**0.307*** **	**0.247* **	**0.455*** **	**-0.176*** **	**-0.142*** **
	(0.121)	(0.108)	(0.124)	(0.109)	(0.147)	(0.139)	(0.058)	(0.043)
Bank Variables x log(VIX)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,140,025	3,881,920	1,140,025	3,881,920	891,546	2,789,882	248,479	1,092,038
R-squared	0.597	0.641	0.599	0.643	0.541	0.594	0.699	0.715
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate when log(VIX)$_t$ is lower by 1 standard deviation								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*			**-64.56**	**-56.17**	**-78.71**	**-74.65**	**-18.75**	**-12.26**
By High vs. Low Capital Ratio Banks *(p75-p25)*			**3.01**	**6.57**	**2.27**	**4.73**	**12.13**	**11.50**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*			**-13.62**	**-5.42**	**-18.06**	**-9.03**	**0.16**	**1.97**
By Large vs. Small Banks *(p75-p25)*			**9.48**	**-6.14**	**13.00**	**-13.94**	**-0.40**	**0.84**

Notes: The dependent variable is the interest rate on a loan extended by bank b to firm f with loan-type a. A firm is taken as "Riskier" if the firm has defaulted on a loan during the previous 36 months, and "Safer" otherwise. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables or fixed effects are included. "No" indicates that corresponding fixed effects or variables are not included. "--" indicates that the corresponding fixed effects or variables are inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 5: An Alternative Specification for Bank Risk-Taking

VIX (high or low):	All			High VIX			Low VIX		
Loan Types:	All Loans	TL Loans	FX Loans	All Loans	TL Loans	FX Loans	All Loans	TL Loans	FX Loans
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Σ Δ MP * Foreign Funding Ratio$_b$ * I(Firm Risk$_{f,t}$)	**-0.05*** **	**-0.038***	**-0.025*** **	**-0.056** **	**-0.092** **	**0.008**	**-0.024**	**-0.017**	**-0.028*** **
	(0.019)	(0.021)	(0.01)	(0.026)	(0.041)	(0.011)	(0.024)	(0.023)	(0.008)
Σ Δ MP * Capital Ratio$_b$ * I(Firm Risk$_{f,t}$)	**-0.091*** **	**-0.109*** **	**0.004**	**-0.077**	**-0.071**	**-0.025**	**-0.069**	**-0.047**	**-0.005**
	(0.031)	(0.043)	(0.018)	(0.072)	(0.098)	(0.032)	(0.062)	(0.071)	(0.023)
Σ Δ MP * Liquidity Ratio$_b$ * I(Firm Risk$_{f,t}$)	**-0.009**	**0**	**-0.011*** **	**0.02***	**0.022**	**-0.001**	**0.003**	**0.017**	**-0.011** **
	(0.008)	(0.011)	(0.004)	(0.012)	(0.016)	(0.006)	(0.014)	(0.017)	(0.005)
Σ Δ MP * Size$_b$ * I(Firm Risk$_{f,t}$)	**0.186*** **	**0.199*** **	**0.027**	**0.072**	**0.123**	**-0.05**	**0.246** **	**0.233** **	**0.069** **
	(0.066)	(0.073)	(0.031)	(0.078)	(0.103)	(0.042)	(0.101)	(0.11)	(0.034)
Σ Δ MP * Foreign Funding Ratio$_b$	**-0.145***	**-0.188***	**-0.015**	**0.133**	**0.182**	**0.027** **	**-0.262*** **	**-0.314*** **	**-0.049***
	(0.085)	(0.1)	(0.016)	(0.082)	(0.125)	(0.012)	(0.088)	(0.097)	(0.025)
Σ Δ MP * Capital Ratio$_b$	**-0.049**	**-0.075**	**-0.066*** **	**-0.328*** **	**-0.441*** **	**-0.126*** **	**-0.059**	**-0.091**	**0.006**
	(0.063)	(0.088)	(0.018)	(0.081)	(0.118)	(0.035)	(0.08)	(0.094)	(0.027)
Σ Δ MP * Liquidity Ratio$_b$	**0.024**	**0.026**	**0.004**	**0.024**	**0.029**	**-0.003**	**-0.013**	**-0.004**	**-0.012** **
	(0.017)	(0.024)	(0.004)	(0.022)	(0.031)	(0.005)	(0.018)	(0.023)	(0.006)
Σ Δ MP * Size$_b$	**-0.172** **	**-0.189***	**0.012**	**-0.28***	**-0.373** **	**0.022**	**-0.03**	**-0.024**	**-0.012**
	(0.072)	(0.1)	(0.031)	(0.141)	(0.185)	(0.07)	(0.138)	(0.175)	(0.034)
Bank Variables x I(Firm Risk)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro Controls x Bank Variables x I(Firm Risk)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	--	--	Yes	--	--	Yes	--	--
Maturity x Collateral FE	--	Yes	Yes	--	Yes	Yes	--	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,021,945	3,681,428	1,340,517	2,047,668	1,422,011	625,657	2,974,277	2,259,417	714,860
R-squared	0.631	0.578	0.710	0.687	0.636	0.694	0.598	0.547	0.715
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate to Ex-ante Riskier Firms									
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**-12.39**	**-9.41**	**-6.19**	**-13.87**	**-22.79**	**1.98**	**-5.94**	**-4.21**	**-6.94**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-9.78**	**-11.71**	**0.43**	**-8.27**	**-7.63**	**-2.69**	**-7.42**	**-5.05**	**-0.54**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-4.06**	**0.00**	**-4.96**	**9.02**	**9.92**	**-0.45**	**1.35**	**7.67**	**-4.96**
By Large vs. Small Banks *(p75-p25)*	**18.56**	**19.85**	**2.69**	**7.18**	**12.27**	**-4.99**	**24.54**	**23.25**	**6.88**

Notes: The dependent variable is the interest rate on a loan extended by bank *b* to firm *f* with loan-type *a*. I(Firm Risk) is a dummy variable that takes a value 1 if the firm has defaulted on a loan during a period of 36 months prior to borrowing, and 0 otherwise. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables are included in the estimation. Regarding the fixed effects, "Yes" indicates that corresponding fixed effects is included. "No" indicates that corresponding fixed effects is not included. "--" indicates that the respective fixed effect is inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 6: Other Credit Dimensions

Dependent Variable:	Log(Volume)	Prob.(Short-Term)	Prob.(Non-Collateralized)	Log(Volume)		Prob.(Short-Term)		Prob.(Non-Collateralized)	
Set of Firms:	All	All	All	Riskier	Safer	Riskier	Safer	Riskier	Safer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$	**-0.011****	**0.011*****	**-0.006****	**-0.006**	**-0.013*****	**0.012*****	**0.01*****	**-0.005**	**-0.005****
	(0.005)	(0.003)	(0.003)	(0.006)	(0.005)	(0.003)	(0.003)	(0.004)	(0.003)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$	**0.011**	**-0.033*****	**0.011****	**0.000**	**0.015**	**-0.031*****	**-0.031*****	**0.006**	**0.011****
	(0.01)	(0.006)	(0.006)	(0.014)	(0.011)	(0.008)	(0.006)	(0.008)	(0.005)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$	**-0.005*****	**0.000**	**0.004*****	**0.001**	**-0.005*****	**0.001**	**0.000**	**0.005*****	**0.004*****
	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Σ Δ MP * Size$_b$ * log(VIX)$_t$	**0.065*****	**-0.018****	**-0.012***	**0.045*****	**0.064*****	**-0.029*****	**-0.017***	**-0.009**	**-0.011***
	(0.017)	(0.009)	(0.007)	(0.018)	(0.017)	(0.011)	(0.009)	(0.01)	(0.006)
Σ Δ MP * Foreign Funding Ratio$_b$	**0.025***	**-0.029*****	**0.016****	**0.011**	**0.031****	**-0.031*****	**-0.027*****	**0.013**	**0.014***
	(0.013)	(0.007)	(0.008)	(0.016)	(0.013)	(0.009)	(0.007)	(0.01)	(0.008)
Σ Δ MP * Capital Ratio$_b$	**-0.025**	**0.092*****	**-0.032****	**0.004**	**-0.039**	**0.089*****	**0.087*****	**-0.018**	**-0.032****
	(0.03)	(0.017)	(0.016)	(0.039)	(0.03)	(0.023)	(0.017)	(0.022)	(0.015)
Σ Δ MP * Liquidity Ratio$_b$	**0.014*****	**0.000**	**-0.013*****	**0.003**	**0.016*****	**-0.002**	**0.000**	**-0.014*****	**-0.012*****
	(0.006)	(0.004)	(0.003)	(0.008)	(0.006)	(0.005)	(0.004)	(0.005)	(0.003)
Σ Δ MP * Size$_b$	**-0.175*****	**0.054***	**0.04***	**-0.115****	**-0.173*****	**0.083*****	**0.05***	**0.028**	**0.039****
	(0.049)	(0.028)	(0.021)	(0.05)	(0.051)	(0.031)	(0.029)	(0.03)	(0.02)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$	**0.001**	**0.00**	**-0.002**	**0.002**	**0.001**	**0.000**	**0.000**	**-0.003***	**-0.002**
	(0.002)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)
Σ log(VIX)$_t$ * Capital Ratio$_b$	**0.017*****	**0.001**	**-0.009*****	**0.038*****	**0.012****	**-0.003**	**0.002**	**-0.004**	**-0.008*****
	(0.006)	(0.004)	(0.003)	(0.009)	(0.006)	(0.006)	(0.004)	(0.004)	(0.003)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$	**0.001**	**-0.002****	**0.002*****	**-0.002**	**0.001**	**-0.001**	**-0.002****	**0.000**	**0.002*****
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Σ log(VIX)$_t$ * Size$_b$	**-0.038*****	**-0.011***	**-0.008**	**-0.027****	**-0.035*****	**-0.004**	**-0.012***	**0.009**	**-0.014*****
	(0.009)	(0.006)	(0.006)	(0.013)	(0.01)	(0.007)	(0.006)	(0.009)	(0.005)
Bank Variables x log(VIX)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	--	--	Yes	Yes	--	--	--	--
Currency x Collateral FE	--	Yes	--	--	--	Yes	Yes	--	--
Currency x Maturity FE	--	--	Yes	--	--	--	--	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,021,945	5,021,945	5,021,945	1,140,025	3,881,920	1,140,025	3,881,920	1,140,025	3,881,920
R-squared	0.673	0.483	0.543	0.632	0.685	0.439	0.496	0.499	0.560
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Outcome Variable (% points) when log(VIX)$_t$ is lower by 1 standard deviation									
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**0.99**	**-0.99**	**0.54**	**0.54**	**1.17**	**-1.08**	**-0.90**	**0.45**	**0.45**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-0.43**	**1.29**	**-0.43**	**0.00**	**-0.59**	**1.21**	**1.21**	**-0.23**	**-0.43**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**0.82**	**0.00**	**-0.66**	**0.16**	**0.82**	**-0.16**	**0.00**	**-0.82**	**-0.66**
By Large vs. Small Banks *(p75-p25)*	**-2.36**	**0.65**	**0.44**	**-1.63**	**-2.32**	**1.05**	**0.62**	**0.33**	**0.40**

Notes: The dependent variables are Log(Volume), the natural logarithm of volume of credit provided by bank b to firm f with loan type a (columns 1-3); "Short-Term", an indicator variable that equals 1 if the loan's maturity (at the time of origination) is less than 1 year, and 0 otherwise (columns 4-6); "Non-Collateralized", an indicator variable that equals 1 if the loan is non-collateralized, and 0 otherwise (columns 7-9). A firm is taken as "Riskier" if the firm has defaulted on a loan during the previous 36 months, and "Safer" otherwise. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables or fixed effects are included. "No" indicates that corresponding fixed effects or variables are not included. "--" indicates that the corresponding fixed effects or variables are inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 7: Alternative Measures for Global Liquidity Cycles

	Global Variable$_t$				
	log(VIX)$_t$	log(Fed Assets)$_t$	log(US Monetary Base)$_t$	Shadow Fed Funds Rate$_t$	US Mon. Pol. Shock$_t$
	(1)	(2)	(3)	(4)	(5)
Σ Δ MP * Foreign Funding Ratio$_b$ * Global Variable$_t$	**0.634*** **	**-0.291*** **	**-0.317*** **	**0.065*** **	**1.096*** **
	(0.162)	(0.079)	(0.08)	(0.017)	(0.335)
Σ Δ MP * Capital Ratio$_b$ * Global Variable$_t$	**-0.14**	**-0.1***	**-0.104**	**0.02***	**0.583** **
	(0.16)	(0.061)	(0.065)	(0.012)	(0.271)
Σ Δ MP * Liquidity Ratio$_b$ * Global Variable$_t$	**0.041**	**-0.011**	**-0.01**	**0.006**	**0.143***
	(0.027)	(0.019)	(0.02)	(0.004)	(0.073)
Σ Δ MP * Size$_b$ * Global Variable$_t$	**0.067**	**0.144**	**0.169**	**-0.036**	**-0.709**
	(0.228)	(0.144)	(0.149)	(0.027)	(0.588)
Σ Δ MP * Foreign Funding Ratio$_b$	**-1.916*** **	**4.187*** **	**2.356*** **	**-0.086**	**1.741*** **
	(0.498)	(1.13)	(0.597)	(0.053)	(0.541)
Σ Δ MP * Capital Ratio$_b$	**0.213**	**1.292**	**0.616**	**-0.175*** **	**0.867***
	(0.442)	(0.885)	(0.499)	(0.056)	(0.463)
Σ Δ MP * Liquidity Ratio$_b$	**-0.119**	**0.184**	**0.097**	**0.019**	**0.257** **
	(0.08)	(0.276)	(0.149)	(0.017)	(0.118)
Σ Δ MP * Size$_b$	**-0.225**	**-2.121**	**-1.307**	**-0.011**	**-1.232**
	(0.697)	(2.112)	(1.146)	(0.081)	(0.963)
Σ Global Variable$_t$ * Foreign Funding Ratio$_b$	**0.126***	**-0.022**	**-0.022**	**-0.012**	**0.604*** **
	(0.064)	(0.035)	(0.036)	(0.008)	(0.125)
Σ Global Variable$_t$ * Capital Ratio$_b$	**-0.164*** **	**0.07**	**0.092**	**-0.036** **	**0.994*** **
	(0.065)	(0.07)	(0.073)	(0.016)	(0.235)
Σ Global Variable$_t$ * Liquidity Ratio$_b$	**-0.022**	**0.027** **	**0.035*** **	**-0.004***	**-0.069**
	(0.016)	(0.012)	(0.013)	(0.002)	(0.044)
Σ Global Variable$_t$ * Size$_b$	**0.291*** **	**-0.057**	**-0.064**	**-0.011**	**0.414**
	(0.105)	(0.084)	(0.084)	(0.019)	(0.262)
Bank Variables x Global Variable	Yes	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	Yes	Yes	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes
Observations	5,021,945	5,021,945	5,021,945	5,021,945	5,021,945
R-squared	0.633	0.632	0.633	0.633	0.634

Impact of a Cumulative 100 bpts Increase in the Local Policy Rate
on the Loan Rate when Global Variable$_t$ is easier by 1 standard deviation

	(1)	(2)	(3)	(4)	(5)
By High vs. Low Foreign Funding Ratio Banks (p75-p25)	**-57.16**	**-43.68**	**-45.62**	**-39.85**	**-50.22**
By High vs. Low Capital Ratio Banks (p75-p25)	**5.48**	**-6.51**	**-6.49**	**-5.32**	**-11.59**
By High vs. Low Liquidity Ratio Banks (p75-p25)	**-6.73**	**-3.01**	**-2.62**	**-6.70**	**-11.93**
By Large vs. Small Banks (p75-p25)	**-2.43**	**8.71**	**9.80**	**8.89**	**13.09**

Notes: The dependent variable is the interest rate on a loan extended by bank *b* to firm *f* with loan-type *a*. All columns include bank variables and their interactions with macro controls. *Shadow Fed Funds Rate* is from Wu and Xia (2016). *US Mon. Pol. Shock* is from Jarocinski and Karadi (2019) and based on baseline VAR with sign restrictions. "Yes" indicates that the corresponding set of variables are included in the estimation. Regarding the fixed effects, "Yes" indicates that corresponding fixed effects is included. "No" indicates that corresponding fixed effects is not included. "--" indicates that the respective fixed effect is inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 8: Future Default

Horizon of Future Default :	12 months	24 months	12 months	24 months	12 months	24 months
Borrower Type$_{fbt}$:	All		FX Borrower		TL Borrower	
	(1)	(2)	(3)	(4)	(5)	(6)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$	**-0.00604*** **	**-0.00845*** **	**-0.0051*** **	**-0.0074*** **	**-0.00573*** **	**-0.00795*** **
	(0.00163)	(0.00156)	(0.00134)	(0.00146)	(0.00184)	(0.0017)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$	**0.00798** **	**0.0134*** **	**0.00831*** **	**0.01348*** **	**0.00679* **	**0.01224*** **
	(0.00323)	(0.00325)	(0.003)	(0.00303)	(0.00352)	(0.00364)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$	**0.00054**	**0.00153*** **	**0.00089** **	**0.00156*** **	**0.00016**	**0.00131*** **
	(0.00048)	(0.00044)	(0.00037)	(0.00043)	(0.00059)	(0.00047)
Σ Δ MP * Size$_b$ * log(VIX)$_t$	**-0.00409**	**-0.00059**	**-0.01362** **	**-0.01356** **	**0.00009**	**0.0043**
	(0.00515)	(0.00476)	(0.0063)	(0.00654)	(0.0051)	(0.00457)
Bank Variables x log(VIX)	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,021,945	5,021,945	1,340,517	1,340,517	3,681,428	3,681,428
R-squared	0.518	0.503	0.578	0.557	0.544	0.530
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the prob. of future loan default of a firm f at bank b when log(VIX)$_t$ is easier by 1 standard deviation [as a ratio of dependent variable mean]						
By High vs. Low Foreign Funding Ratio Banks (p75-p25)	**0.54**	**0.76**	**0.46**	**0.67**	**0.52**	**0.72**
	[32.03]	[27.21]	[41.95]	[34.73]	[28.54]	[23.23]
By High vs. Low Capital Ratio Banks (p75-p25)	**-0.31**	**-0.52**	**-0.33**	**-0.53**	**-0.27**	**-0.48**
	[-18.36]	[-18.72]	[-29.65]	[-27.45]	[-14.67]	[-15.52]
By High vs. Low Liquidity Ratio Banks (p75-p25)	**-0.09**	**-0.25**	**-0.15**	**-0.26**	**-0.03**	**-0.22**
	[-5.21]	[-8.97]	[-13.33]	[-13.33]	[-1.45]	[-6.97]
By Large vs. Small Banks (p75-p25)	**0.15**	**0.02**	**0.49**	**0.49**	**0.00**	**-0.16**
	[8.74]	[0.77]	[45.12]	[25.64]	[-0.18]	[-5.06]

Notes: The dependent variable "Future Default" is a dummy variable that takes a value 1 if the firm *f* defaults on a loan at bank b during the next 12 or 24 months, and 0 otherwise. All columns include bank variables and their interactions with macro controls. If a loan that is granted by bank *b* at time *t* to firm *f* is foreign-currency denominated, we call firm *f* as "FX Borrower", and as "TL Borrower" if the loan is domestic-currency denominated. "Yes" indicates that the corresponding set of variables are included in the estimation. Regarding the fixed effects, "Yes" indicates that corresponding fixed effects is included. "No" indicates that corresponding fixed effects is not included. "--" indicates that the respective fixed effect is inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 9: Firm Switching Across Banks

Dependent Variable: I($Switching_{f,t}$): =1 if a firm switches from a low to a high foreign funding bank; 0 otherwise

Set of Firms:	All	Riskier	Safer	All	Riskier	Safer
	(1)	(2)	(3)	(4)	(5)	(6)
Σ Δ MP	**0.023*** **	**0.031*** **	**0.021*** **	**0.024*** **	**0.026*** **	**0.023*** **
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
I(Low Foreign Funding $Bank_{f,t-3}$)	**0.149*** **	**0.155*** **	**0.148*** **	**0.124*** **	**0.129*** **	**0.122*** **
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
log(Number of Bank Relations)	**0.001**	**0.004**	**-0.001**	**0.001**	**0.007** **	**0.001**
	(0.002)	(0.003)	(0.002)	(0.001)	(0.003)	(0.002)
log(Volume)	**-0.001*** **	**-0.004*** **	**-0.001* **	**-0.003*** **	**-0.007*** **	**-0.003*** **
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
log(Maturity)	**0.012*** **	**0.017*** **	**0.011*** **	**0.012*** **	**0.018*** **	**0.011*** **
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Δ Presence of High Foreign Funding Banks				**0.122*** **	**0.118*** **	**0.122*** **
				(0.001)	(0.003)	(0.001)
Observations	212,856	41,869	170,987	204,595	40,597	163,998
R-squared	0.089	0.099	0.088	0.145	0.135	0.149
Probability of a firm switching from a low to a high foreign funding bank following a cumulative 100 bpts local policy tightening	**2.30**	**3.10**	**2.10**	**2.40**	**2.60**	**2.30**

Notes: The observations are at the firm-month level. The dependent variable I($switching_{f,t}$) is an indicator variable that equals one if the largest bank from which the firm borrows at month t-3 has foreign funding ratio less than median bank and the firm switches at month t to a bank that has foreign funding ratio higher than median bank. A firm is taken as "Riskier" if the firm has defaulted on a loan during the previous 36 months , and "Safer" otherwise. I(Low Foreign Funding Ratiof,t-3) is an indicator variable that equals one if the largest bank from which the firm borrows at month t-3 has foreign funding ratio less than median bank; and 0 otherwise. log(Number of Bank Relations) is log value of the number of domestic banks from which the firm is borrowing in month t-3. log(Volume) is log value of the total outstanding amount of loans of a firm at month t-3. log(Maturity) is log value of the average loan maturity of a firm at month t-3. Δ Presence of High Foreign Funding Banks is the change in the number of branches of high foreign funding banks in the firm's city from month t-3 to month t, relative to the change in the number of branches of low foreign funding banks in the firm's city from month t-3 to month t. All columns include macro controls. Robust standard errors are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

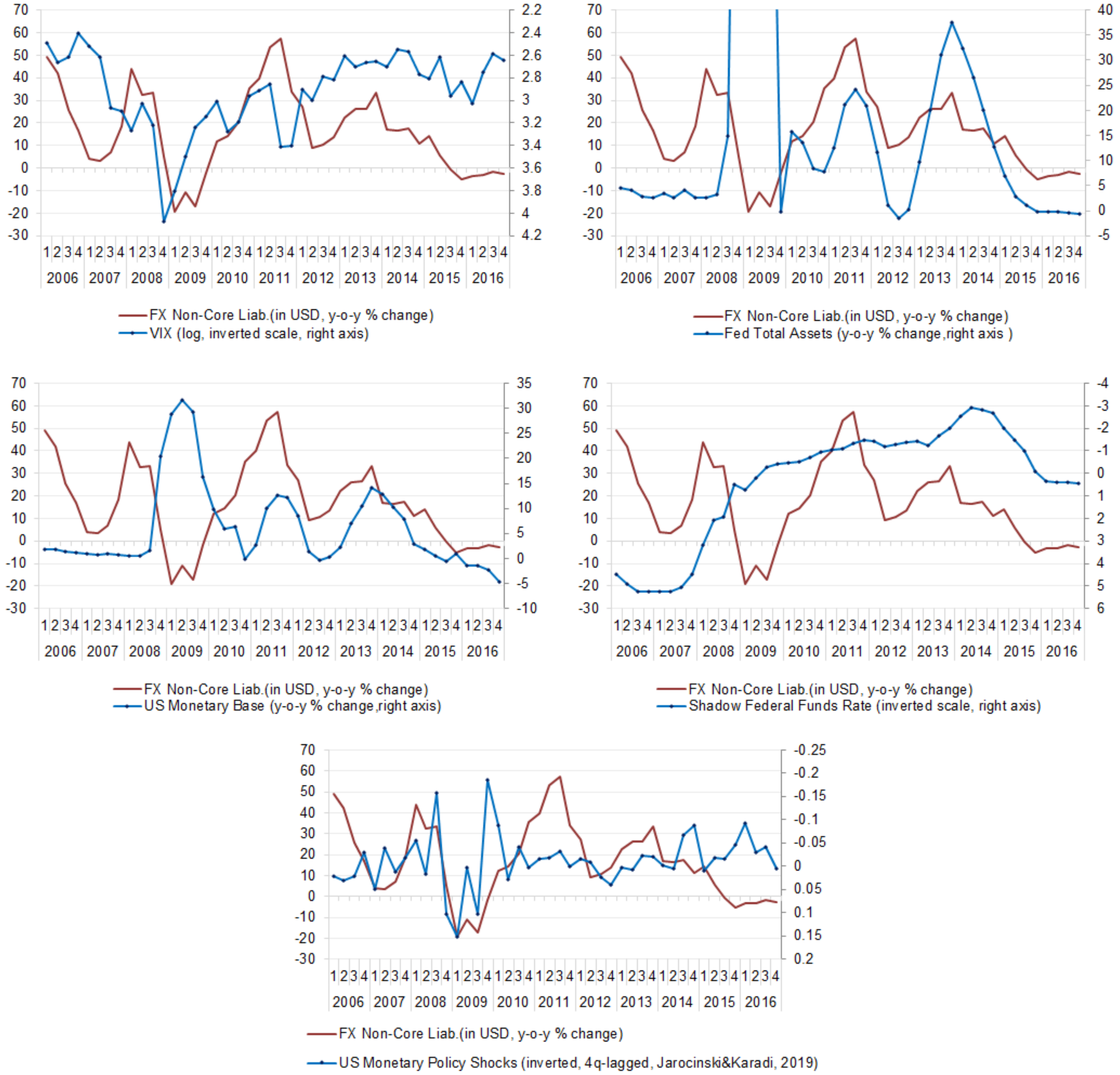
Table 10: Mechanism: Bank Carry-Trade

Dependent Variable:	Δ log(Volume$_{bgc,t}$)		Δ i*$_{bgc,t}$		Interest Differential (i-i*$_{bgc,t}$)		Δ log(Volume$_{bgc,t}$)	Δ i*$_{bgc,t}$	Interest Differential (i-i*$_{bgc,t}$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Σ Δ MP * Foreign Funding Ratio$_b$	**0.362****	**0.419*****	**0.002**	**0.002**	**0.022****	**0.022****	**-0.218**	**-0.125****	**0.224*****
	(0.161)	(0.158)	(0.006)	(0.006)	(0.01)	(0.01)	(1.46)	(0.059)	(0.083)
Σ Δ MP * Capital Ratio$_b$	**-1.105****	**-1.098****	**0.005**	**0.009**	**-0.032**	**-0.022**	**4.422**	**-0.036**	**-0.698*****
	(0.48)	(0.471)	(0.016)	(0.016)	(0.028)	(0.029)	(4.186)	(0.134)	(0.16)
Σ Δ MP * Liquidity Ratio$_b$	**-0.123**	**-0.225**	**0.014***	**0.013**	**0.004**	**0.005**	**-0.04**	**-0.011**	**0.146*****
	(0.152)	(0.147)	(0.008)	(0.008)	(0.008)	(0.008)	(0.911)	(0.037)	(0.041)
Σ Δ MP * Size$_b$	**-0.47**	**-0.189**	**0.001**	**0.007**	**0.05**	**0.05**	**1.948**	**-0.511*****	**0.438****
	(0.836)	(0.855)	(0.032)	(0.034)	(0.035)	(0.035)	(5.293)	(0.18)	(0.202)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$							**0.211**	**0.045****	**-0.074*****
							(0.524)	(0.021)	(0.029)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$							**-1.801**	**0.011**	**0.232*****
							(1.442)	(0.049)	(0.056)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$							**-0.077**	**0.008**	**-0.045*****
							(0.292)	(0.011)	(0.014)
Σ Δ MP * Size$_b$ * log(VIX)$_t$							**-0.776**	**0.175*****	**-0.136****
							(0.292)	(0.011)	(0.014)
Domestic (Borrower) Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Domestic (Borrower) Bank Variables x Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Domestic (Borrower) Bank F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global (Lender) Bank's Headquarter Country x Month F.E	Yes	No	Yes	No	Yes	No	No	No	No
Global (Lender) Bank x Month F.E	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Observations	59,700	59,700	58,881	58,881	59,157	59,157	59,700	58,881	59,157
R-squared	0.100	0.238	0.250	0.342	0.901	0.924	0.239	0.352	0.925
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on Domestic Banks' Cross-Border Foreign-Currency Borrowing									
	(in percentage terms)		*(in basis points)*		*(in basis points)*				
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**0.90**	**1.04**	**0.00**	**0.50**	**5.45**	**5.45**			
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-1.19**	**-1.18**	**0.01**	**0.97**	**-3.44**	**-2.36**			
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-0.55**	**-1.01**	**0.06**	**5.86**	**1.80**	**2.25**			
By Large vs. Small Banks *(p75-p25)*	**-0.47**	**-0.19**	**0.00**	**0.70**	**4.99**	**4.99**			
… when log(VIX)$_t$ is lower by 1 standard deviation							*(in percentage terms)*	*(in basis points)*	*(in basis points)*
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*							**-0.19**	**-4.06**	**6.67**
By High vs. Low Capital Ratio Banks *(p75-p25)*							**1.62**	**-0.99**	**-20.92**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*							**0.07**	**-0.72**	**4.06**
By Large vs. Small Banks *(p75-p25)*							**0.70**	**-15.78**	**12.26**

Notes: The dependent variable is the change in the logarithm of bank b's volume of borrowing in currency c from global bank g from *t-3* to *t* (columns 1,2,7), the change in the interest rate associated with the cross-border borrowing from *t-3* to *t* (columns 3,4,8), or the difference between the average Turkish domestic currency treasury yields (spanning all maturities) and cross-border borrowing rate at time *t* (columns 5,6,9). "Yes" indicates that the corresponding set of variables or fixed effects are included. "No" indicates that corresponding fixed effects or variables are not included. "--" indicates that the corresponding fixed effects or variables are inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at global (lender) bank-domestic (borrower) bank and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

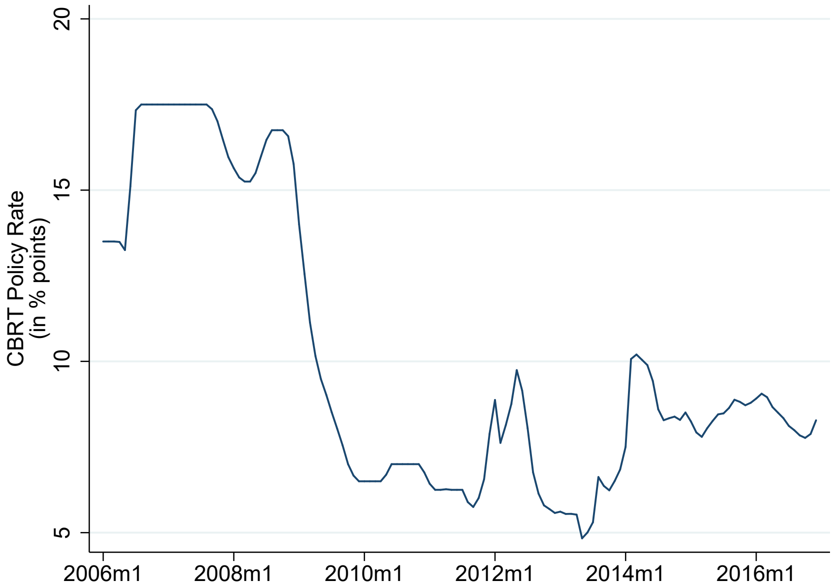
Figures

Figure 1: Global liquidity cycles and Turkish banks' non-core foreign-currency liabilities



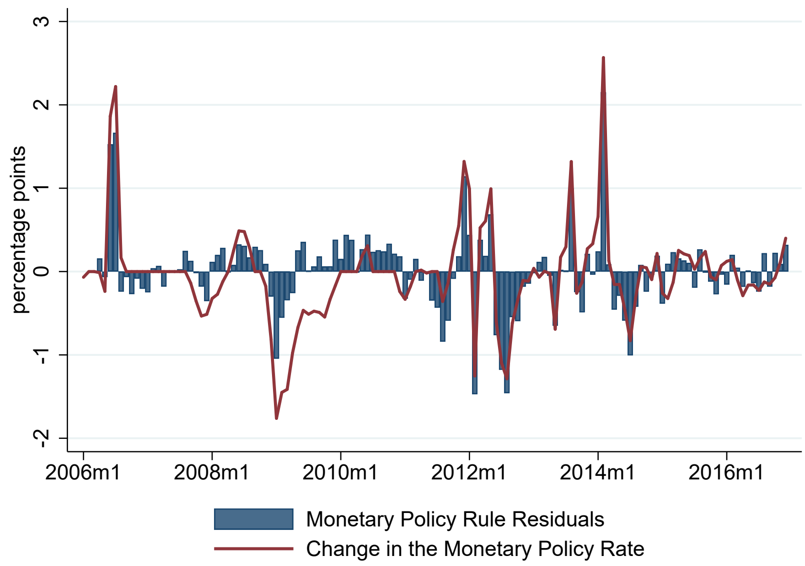
Notes. The figure shows the annual percentage change in non-core foreign-currency liabilities of deposit-taking Turkish banks against the measures of global liquidity indicators that we use in the empirical analyses. Federal Reserve Total Assets have increased by over 150% in late 2008, hence not shown for scaling purposes. Sources: Federal Reserve Economic Data (FRED), Central Bank of the Republic of Turkey, Jarocinski and Karadi (2019).

Figure 2: CBRT Monetary Policy Rate



Notes. The figure shows the evolution of Central Bank of the Republic of Turkey (CBRT) monetary policy rate, i.e., the weighted average cost of liquidity provided by the central bank to the banking system. We use the official rates till end-2010, and the effective funding rate in the aftermath. See Basci and Kara (2011) for details. Source. Central Bank of the Republic of Turkey.

Figure 3: Monetary Policy Rule Residuals



Notes. To obtain monetary policy rule residuals, we regress policy rate on its own lag, lagged deviation of inflation from its target, lagged deviations of (log) industrial production index, (log) real exchange rate, (log) aggregate domestic credit from their respective trends, and the lagged log of the VIX. In calculating the trend, we use Hodrick-Prescott filter with a smoothing parameter 14400 (as typical in monthly frequency data).

Online Appendix

Table OA1: Newly Originated Loans

Currency Type:	TL Loans				FX Loans			
Set of Firms:	All	All	Riskier	Safer	All	All	Riskier	Safer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$		**0.875*** **	**0.959*** **	**0.881*** **		**0.065** **	**0.185*** **	**0.039**
		(0.277)	(0.326)	(0.267)		(0.03)	(0.05)	(0.029)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$		**0.703***	**0.732***	**0.611***		**-0.182*** **	**-0.332*** **	**-0.152** **
		(0.365)	(0.422)	(0.363)		(0.06)	(0.088)	(0.063)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$		**0.215*** **	**0.351*** **	**0.186*** **		**-0.009**	**-0.023**	**-0.008**
		(0.064)	(0.084)	(0.061)		(0.007)	(0.017)	(0.007)
Σ Δ MP * Size$_b$ * log(VIX)$_t$		**0.175**	**-0.008**	**0.251**		**0.07**	**-0.016**	**0.097**
		(0.422)	(0.522)	(0.397)		(0.101)	(0.17)	(0.099)
Σ Δ MP * Foreign Funding Ratio$_b$	**-0.25** **	**-2.65*** **	**-2.895*** **	**-2.67*** **	**-0.021**	**-0.204** **	**-0.552*** **	**-0.125**
	(0.115)	(0.806)	(0.936)	(0.779)	(0.014)	(0.091)	(0.144)	(0.087)
Σ Δ MP * Capital Ratio$_b$	**0.169**	**-2.074** **	**-2.239***	**-1.774***	**0.007**	**0.525*** **	**0.936*** **	**0.442*** **
	(0.147)	(1.016)	(1.189)	(1.009)	(0.019)	(0.162)	(0.242)	(0.169)
Σ Δ MP * Liquidity Ratio$_b$	**0.042**	**-0.618*** **	**-1.006*** **	**-0.537*** **	**-0.002**	**0.024**	**0.057**	**0.021**
	(0.044)	(0.191)	(0.243)	(0.184)	(0.004)	(0.022)	(0.052)	(0.021)
Σ Δ MP * Size$_b$	**-0.136**	**-0.395**	**0.391**	**-0.741**	**0.04**	**-0.177**	**0.099**	**-0.252**
	(0.156)	(1.276)	(1.531)	(1.211)	(0.034)	(0.29)	(0.487)	(0.291)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$		**0.226**	**0.35** **	**0.186**		**0.006**	**0.015**	**0.003**
		(0.148)	(0.16)	(0.147)		(0.012)	(0.021)	(0.012)
Σ log(VIX)$_t$ * Capital Ratio$_b$		**-0.593*** **	**-0.68*** **	**-0.546*** **		**0.001**	**-0.061**	**0.012**
		(0.148)	(0.155)	(0.153)		(0.03)	(0.046)	(0.029)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$		**-0.062**	**-0.025**	**-0.068***		**-0.012** **	**0.001**	**-0.014** **
		(0.04)	(0.044)	(0.04)		(0.005)	(0.008)	(0.006)
Σ log(VIX)$_t$ * Size$_b$		**0.827*** **	**0.349***	**0.911*** **		**-0.048**	**-0.01**	**-0.07**
		(0.196)	(0.21)	(0.208)		(0.06)	(0.084)	(0.061)
Bank Variables x log(VIX)	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity x Collateral FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,533,241	1,533,241	351,807	1,181,434	234,437	234,437	43,044	191,393
R-squared	0.704	0.707	0.665	0.719	0.851	0.851	0.840	0.853
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**-61.93**				**-5.20**			
By High vs. Low Capital Ratio Banks *(p75-p25)*	**18.16**				**0.75**			
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**18.94**				**-0.90**			
By Large vs. Small Banks *(p75-p25)*	**-13.57**				**3.99**			
… when log(VIX)$_t$ is lower by 1 standard deviation								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*		**-78.89**	**-86.47**	**-79.43**		**-5.86**	**-16.68**	**-3.52**
By High vs. Low Capital Ratio Banks *(p75-p25)*		**-27.50**	**-28.63**	**-23.90**		**7.12**	**12.99**	**5.95**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*		**-35.29**	**-57.62**	**-30.53**		**1.48**	**3.78**	**1.31**
By Large vs. Small Banks *(p75-p25)*		**-6.36**	**0.29**	**-9.12**		**-2.54**	**0.58**	**-3.52**

Notes: The dependent variable is the interest rate on a newly originated loan extended by bank b to firm f with loan-type a. A firm is taken as "Riskier" if the firm has defaulted on a loan during the previous 36 months, and "Safer" otherwise. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables are included in the estimation. Regarding the fixed effects, "Yes" indicates that corresponding fixed effects is included. "No" indicates that corresponding fixed effects is not included. "--" indicates that the respective fixed effect is inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table OA2: Alternative Horizons for Firm Past Default

Horizon of Past Default:	36 months		12 months		24 months		48 months	
Set of Firms	Riskier	Safer	Riskier	Safer	Riskier	Safer	Riskier	Safer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$	**0.716*** **	**0.623*** **	**0.774*** **	**0.622*** **	**0.767*** **	**0.614*** **	**0.724*** **	**0.621*** **
	(0.185)	(0.159)	(0.211)	(0.158)	(0.197)	(0.157)	(0.182)	(0.159)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$	**-0.077**	**-0.168**	**0.09**	**-0.176**	**-0.053**	**-0.167**	**-0.1**	**-0.169**
	(0.19)	(0.16)	(0.247)	(0.156)	(0.21)	(0.158)	(0.182)	(0.16)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$	**0.083** **	**0.033**	**0.112** **	**0.034**	**0.075***	**0.034**	**0.08** **	**0.032**
	(0.036)	(0.025)	(0.046)	(0.025)	(0.039)	(0.026)	(0.035)	(0.025)
Σ Δ MP * Size$_b$ * log(VIX)$_t$	**-0.261**	**0.169**	**-0.612***	**0.151**	**-0.371**	**0.163**	**-0.281**	**0.182**
	(0.285)	(0.212)	(0.344)	(0.216)	(0.319)	(0.209)	(0.278)	(0.211)
Σ Δ MP * Foreign Funding Ratio$_b$	**-2.169*** **	**-1.879*** **	**-2.34*** **	**-1.876*** **	**-2.321*** **	**-1.85*** **	**-2.187*** **	**-1.874*** **
	(0.548)	(0.491)	(0.619)	(0.489)	(0.581)	(0.488)	(0.541)	(0.492)
Σ Δ MP * Capital Ratio$_b$	**0.022**	**0.303**	**-0.448**	**0.321**	**-0.039**	**0.297**	**0.071**	**0.309**
	(0.527)	(0.446)	(0.686)	(0.436)	(0.581)	(0.441)	(0.503)	(0.446)
Σ Δ MP * Liquidity Ratio$_b$	**-0.236** **	**-0.097**	**-0.311** **	**-0.099**	**-0.216***	**-0.099**	**-0.23** **	**-0.094**
	(0.106)	(0.078)	(0.135)	(0.078)	(0.112)	(0.078)	(0.102)	(0.078)
Σ Δ MP * Size$_b$	**0.862**	**-0.577**	**1.852***	**-0.501**	**1.202**	**-0.555**	**0.909**	**-0.612**
	(0.855)	(0.644)	(1.008)	(0.658)	(0.949)	(0.636)	(0.834)	(0.638)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$	**0.207*** **	**0.101**	**0.262*** **	**0.106***	**0.21*** **	**0.106***	**0.191*** **	**0.103**
	(0.072)	(0.063)	(0.083)	(0.063)	(0.076)	(0.063)	(0.069)	(0.064)
Σ log(VIX)$_t$* Capital Ratio$_b$	**-0.285*** **	**-0.128***	**-0.284*** **	**-0.138** **	**-0.291*** **	**-0.131** **	**-0.263*** **	**-0.129***
	(0.074)	(0.066)	(0.096)	(0.064)	(0.077)	(0.066)	(0.072)	(0.066)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$	**-0.002**	**-0.027***	**0.004**	**-0.024**	**-0.008**	**-0.025**	**-0.002**	**-0.028***
	(0.019)	(0.016)	(0.023)	(0.016)	(0.021)	(0.016)	(0.018)	(0.016)
Σ log(VIX)$_t$ * Size$_b$	**0.098**	**0.307*** **	**0.03**	**0.296*** **	**0.109**	**0.302*** **	**0.092**	**0.324*** **
	(0.124)	(0.109)	(0.135)	(0.107)	(0.128)	(0.108)	(0.118)	(0.109)
Bank Variables x log(VIX)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,140,025	3,881,920	742,403	4,279,542	980,347	4,041,598	1,246,801	3,775,144
R-squared	0.599	0.643	0.587	0.641	0.594	0.643	0.603	0.643
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate when Global Variable$_t$ is easier by 1 standard deviation								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**-64.56**	**-56.17**	**-69.79**	**-56.08**	**-69.15**	**-55.36**	**-65.28**	**-55.99**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**3.01**	**6.57**	**-3.52**	**6.88**	**2.07**	**6.53**	**3.91**	**6.61**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-13.62**	**-5.42**	**-18.39**	**-5.58**	**-12.31**	**-5.58**	**-13.13**	**-5.25**
By Large vs. Small Banks *(p75-p25)*	**9.48**	**-6.14**	**22.22**	**-5.48**	**13.47**	**-5.92**	**10.20**	**-6.61**

Notes: The dependent variable is the interest rate on a loan extended by bank b to firm f with loan-type a. A firm is taken as "Riskier" if the firm has defaulted on a loan during the corresponding horizon of past default , and "Safer" otherwise. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables are included in the estimation. Regarding the fixed effects, "Yes" indicates that corresponding fixed effects is included. "No" indicates that corresponding fixed effects is not included. "--" indicates that the respective fixed effect is inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table OA3: Monetary Policy Rule Residuals

Currency Type:	TL Loans				FX Loans			
Set of Firms:	All	All	Riskier	Safer	All	All	Riskier	Safer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Σ Δ MPR * Foreign Funding Ratio$_b$ * log(VIX)$_t$		**0.768*** **	**0.837*** **	**0.749*** **		**0.12*** **	**0.18*** **	**0.106*** **
		(0.258)	(0.291)	(0.254)		(0.043)	(0.068)	(0.038)
Σ Δ MPR * Capital Ratio$_b$ * log(VIX)$_t$		**0.008**	**-0.22**	**0.062**		**-0.239*** **	**-0.205** **	**-0.237*** **
		(0.219)	(0.227)	(0.236)		(0.076)	(0.089)	(0.078)
Σ Δ MPR * Liquidity Ratio$_b$ * log(VIX)$_t$		**0.022**	**0.056**	**0.013**		**-0.01**	**-0.009**	**-0.01**
		(0.047)	(0.056)	(0.047)		(0.011)	(0.016)	(0.01)
Σ Δ MPR * Size$_b$ * log(VIX)$_t$		**0.205**	**-0.315**	**0.424**		**-0.036**	**-0.164**	**-0.016**
		(0.355)	(0.38)	(0.353)		(0.076)	(0.111)	(0.075)
Σ Δ MPR * Foreign Funding Ratio$_b$	**-0.219** **	**-2.372*** **	**-2.579*** **	**-2.317*** **	**-0.03***	**-0.374*** **	**-0.554*** **	**-0.33*** **
	(0.098)	(0.784)	(0.865)	(0.776)	(0.018)	(0.134)	(0.206)	(0.12)
Σ Δ MPR * Capital Ratio$_b$	**-0.269*** **	**-0.352**	**0.293**	**-0.499**	**0.001**	**0.684*** **	**0.565** **	**0.686*** **
	(0.078)	(0.633)	(0.635)	(0.693)	(0.02)	(0.215)	(0.25)	(0.221)
Σ Δ MPR * Liquidity Ratio$_b$	**-0.012**	**-0.078**	**-0.174**	**-0.052**	**-0.006**	**0.022**	**0.015**	**0.022**
	(0.022)	(0.147)	(0.17)	(0.148)	(0.005)	(0.033)	(0.049)	(0.032)
Σ Δ MPR * Size$_b$	**0.019**	**-0.561**	**1.103**	**-1.28**	**-0.048***	**0.054**	**0.439**	**-0.006**
	(0.104)	(1.094)	(1.161)	(1.085)	(0.029)	(0.231)	(0.326)	(0.228)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$		**0.223** **	**0.301*** **	**0.198** **		**0.013**	**0.022**	**0.009**
		(0.093)	(0.101)	(0.093)		(0.012)	(0.018)	(0.011)
Σ log(VIX)$_t$ * Capital Ratio$_b$		**-0.246** **	**-0.343*** **	**-0.204***		**0.109*** **	**0.086***	**0.107*** **
		(0.102)	(0.1)	(0.105)		(0.032)	(0.049)	(0.032)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$		**-0.024**	**-0.019**	**-0.027**		**-0.016*** **	**-0.011**	**-0.016*** **
		(0.021)	(0.025)	(0.021)		(0.006)	(0.008)	(0.005)
Σ log(VIX)$_t$ * Size$_b$		**0.324** **	**0.179**	**0.347*** **		**-0.158*** **	**-0.193*** **	**-0.15*** **
		(0.133)	(0.151)	(0.134)		(0.044)	(0.06)	(0.044)
Bank Variables x log(VIX)	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity x Collateral FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,649,513	3,649,513	888,639	2,760,874	1,315,288	1,315,288	246,337	1,068,951
R-squared	0.578	0.580	0.540	0.593	0.713	0.714	0.699	0.719
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**-54.25**				**-7.43**			
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-28.91**				**0.00**			
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-5.41**				**-2.71**			
By Large vs. Small Banks *(p75-p25)*	**1.90**				**-4.79**			
… when log(VIX)$_t$ is lower by 1 standard deviation								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*		**-69.25**	**-75.47**	**-67.53**		**-10.82**	**-16.23**	**-9.56**
By High vs. Low Capital Ratio Banks *(p75-p25)*		**-0.31**	**8.61**	**-2.43**		**9.35**	**8.02**	**9.27**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*		**-3.61**	**-9.19**	**-2.13**		**1.64**	**1.48**	**1.64**
By Large vs. Small Banks *(p75-p25)*		**-7.44**	**11.44**	**-15.40**		**1.31**	**5.96**	**0.58**

Notes: The dependent variable is the interest rate on a loan extended by bank b to firm f with loan-type a. MPR stands for the estimated residual from a fitted monetary policy rule --discussed in the text--. A firm is taken as "Riskier" if the firm has defaulted on a loan during the previous 36 months, and "Safer" otherwise. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables are included in the estimation. Regarding the fixed effects, "Yes" indicates that corresponding fixed effects is included. "No" indicates that corresponding fixed effects is not included. "--" indicates that the respective fixed effect is inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table OA4: Asymmetries: Local Monetary Policy Tightening vs. Easing Episodes and Global Liquidity

	All Loans		TL Loans		FX Loans	
Episodes of Local Monetary Policy:	Tightening	Easing	Tightening	Easing	Tightening	Easing
	(1)	(2)	(3)	(4)	(5)	(6)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$	**1.594*** **	**0.317**	**2.059*** **	**0.248**	**0.112**	**0.12*** **
	(0.258)	(0.201)	(0.316)	(0.256)	(0.089)	(0.027)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$	**0.733**	**0.564** **	**0.728**	**1.112*** **	**0.688** **	**-0.32*** **
	(0.599)	(0.244)	(0.667)	(0.327)	(0.339)	(0.072)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$	**0.487*** **	**0.111*** **	**0.667*** **	**0.166*** **	**-0.023**	**0.006**
	(0.104)	(0.029)	(0.122)	(0.04)	(0.049)	(0.013)
Σ Δ MP * Size$_b$ * log(VIX)$_t$	**-2.34*** **	**0.137**	**-2.932*** **	**0.325**	**-0.156**	**0.007**
	(0.675)	(0.258)	(0.891)	(0.353)	(0.349)	(0.107)
Σ Δ MP * Foreign Funding Ratio$_b$	**-4.617*** **	**-1.068* **	**-5.9*** **	**-0.884**	**-0.43* **	**-0.355*** **
	(0.696)	(0.617)	(0.854)	(0.785)	(0.24)	(0.077)
Σ Δ MP * Capital Ratio$_b$	**-2.12**	**-1.88*** **	**-2.229**	**-3.569*** **	**-1.778* **	**0.884*** **
	(1.6)	(0.72)	(1.772)	(0.949)	(0.896)	(0.228)
Σ Δ MP * Liquidity Ratio$_b$	**-1.329*** **	**-0.391*** **	**-1.813*** **	**-0.56*** **	**0.044**	**-0.032**
	(0.283)	(0.098)	(0.332)	(0.137)	(0.136)	(0.044)
Σ Δ MP * Size$_b$	**6.488*** **	**-0.339**	**8.155*** **	**-0.923**	**0.358**	**-0.056**
	(1.857)	(0.81)	(2.454)	(1.104)	(0.915)	(0.35)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$	**-0.147**	**-0.017**	**-0.175**	**-0.005**	**0.013**	**-0.001**
	(0.093)	(0.076)	(0.109)	(0.106)	(0.034)	(0.01)
Σ log(VIX)$_t$ * Capital Ratio$_b$	**-0.517*** **	**-0.049**	**-0.634*** **	**-0.058**	**-0.261* **	**0.057**
	(0.196)	(0.095)	(0.216)	(0.127)	(0.135)	(0.035)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$	**-0.126*** **	**-0.005**	**-0.127*** **	**0.026**	**-0.012**	**-0.006**
	(0.031)	(0.016)	(0.036)	(0.024)	(0.012)	(0.009)
Σ log(VIX)$_t$ * Size$_b$	**0.538** **	**0.272**	**0.717** **	**0.355**	**0.057**	**-0.137** **
	(0.255)	(0.176)	(0.3)	(0.232)	(0.113)	(0.063)
Bank Variables x log(VIX)	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	--	--	--	--	--	--
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Maturity x Collateral FE	--	--	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	Yes	No	No	No	No
Firm-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Currency-Month FE	No	No	No	No	No	No
Observations	1,868,928	3,153,017	1,418,419	2,263,009	450,509	890,008
R-squared	0.677	0.618	0.625	0.572	0.720	0.711
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate when log(VIX)$_t$ is lower by 1 standard deviation						
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**-143.72**	**-28.58**	**-185.65**	**-22.36**	**-10.10**	**-10.82**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-28.67**	**-22.06**	**-28.48**	**-43.50**	**-26.91**	**12.52**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-79.94**	**-18.22**	**-109.49**	**-27.25**	**3.78**	**-0.98**
By Large vs. Small Banks *(p75-p25)*	**84.98**	**-4.98**	**106.48**	**-11.80**	**5.67**	**-0.25**

Notes: The dependent variable is the interest rate on a loan extended by bank *b* to firm *f* with loan-type *a*. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables or fixed effects are included. "No" indicates that corresponding fixed effects or variables are not included. "--" indicates that the corresponding fixed effects or variables are inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table OA5: Baseline Findings with the Bank Foreign Funding Ratio measured fixed at December 2005

	(1)	(2)	(3)	(4)
Σ Δ MP * Foreign Funding Ratio$_b$ (2005m12) * log(VIX)$_t$		**0.134****	**0.147****	**0.135****
		(0.057)	(0.065)	(0.057)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$		**0.349****	**0.391****	**0.327***
		(0.165)	(0.163)	(0.173)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$		**0.076***	**0.157****	**0.061**
		(0.046)	(0.065)	(0.042)
Σ Δ MP * Size$_b$ * log(VIX)$_t$		**0.455****	**0.205**	**0.509*****
		(0.193)	(0.238)	(0.188)
Σ Δ MP * Foreign Funding Ratio$_b$ (2005m12)	**-0.07*****	**-0.445*****	**-0.464****	**-0.45*****
	(0.026)	(0.17)	(0.19)	(0.172)
Σ Δ MP * Capital Ratio$_b$	**-0.152***	**-1.173****	**-1.315*****	**-1.1****
	(0.084)	(0.486)	(0.469)	(0.515)
Σ Δ MP * Liquidity Ratio$_b$	**0.007**	**-0.238**	**-0.49****	**-0.191**
	(0.023)	(0.152)	(0.204)	(0.14)
Σ Δ MP * Size$_b$	**-0.232*****	**-1.424*****	**-0.627**	**-1.599*****
	(0.067)	(0.553)	(0.689)	(0.536)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$ (2005m12)		**0.1*****	**0.098*****	**0.096*****
		(0.025)	(0.027)	(0.025)
Σ log(VIX)$_t$ * Capital Ratio$_b$		**-0.128**	**-0.18****	**-0.113**
		(0.087)	(0.089)	(0.09)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$		**-0.058*****	**-0.023**	**-0.066*****
		(0.019)	(0.023)	(0.019)
Σ log(VIX)$_t$ * Size$_b$		**0.285*****	**0.18**	**0.296*****
		(0.107)	(0.126)	(0.109)
Bank Variables x log(VIX)	Yes	Yes	Yes	Yes
Bank-Sector Control	Yes	Yes	Yes	Yes
Bank-Firm Control	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	Yes	Yes	Yes
Firm-Month FE	Yes	Yes	Yes	Yes
Observations	5,021,945	5,021,945	1,140,025	3,881,920
R-squared	0.629	0.630	0.595	0.640

Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on the Loan Rate when log(VIX)$_t$ is lower by 1 standard deviation

	(1)	(2)	(3)	(4)
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*		**-24.20**	**-26.54**	**-24.38**
By High vs. Low Capital Ratio Banks *(p75-p25)*		**-13.65**	**-15.30**	**-12.79**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*		**-12.48**	**-25.77**	**-10.01**
By Large vs. Small Banks *(p75-p25)*		**-16.52**	**-7.44**	**-18.48**

Notes: The dependent variable is the interest rate on a loan extended by bank *b* to firm *f* with loan-type *a*. All columns include bank variables and their interactions with macro controls. "Yes" indicates that the corresponding set of variables or fixed effects are included. "No" indicates that corresponding fixed effects or variables are not included. "--" indicates that the corresponding fixed effects or variables are inapplicable or already included in the wider set of fixed effects or variables. Standard errors are double clustered at bank-firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table OA6: Balancedness

Loan portfolio characteristics	Correlation Coefficient with Bank Foreign Funding Ratio
W.Aveg. Firm Log(Total Assets)	0.163*
W.Aveg. Firm Tangible Fixed Assets	0.039
W.Aveg. Firm Log(Sales)	0.073
W.Aveg. Firm Log(Age)	0.009
W.Aveg. Firm Capital-to-Total Assets Ratio	-0.120
W.Aveg. Firm EBITDA-to-Total Asset Ratio	-0.109
W.Aveg. Firm ST Debt-to-Total Debt Ratio	-0.046
W.Aveg. I(Firm Risk)	0.191**

Notes: Loan portfolio characteristics are the weighted average firm variables, with weights proportional to the share of a firm in the bank's total non-financial corporate sector loans. I(Firm Risk) is dummy variable that is equal to 1 if the firm has defaulted on at least one bank loan during the previous 36 months prior to borrowing from the bank, and 0 otherwise. Sample size is 152 (we use averages at the bank level for each year). ** significant at 5%, and * significant at 10%.

Some of the Estimated Equations in Extended Forms (Not Intended for Publication).

Equation (1) in extended form

$$
\begin{aligned}
i_{bfa,t} = & \sum_{s=1}^{3} \beta_{2,s} \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{3,s}^{C} \Delta MP_{t-s} * \text{Capital Ratio}_{b,t-s} + \ldots \\
& + \sum_{s=1}^{3} \beta_{3,s}^{L} \Delta MP_{t-s} * \text{Liquidity Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{3,s}^{S} \Delta MP_{t-s} * \text{Size}_{b,t-s} + \ldots \\
& + \sum_{s=1}^{3} \beta_{4,s}^{\Delta IPI,FF} \Delta IPI_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{4,s}^{\Delta IPI,C} \Delta IPI_{t-s} * \text{Capital Ratio}_{b,t-s} + \ldots \\
& + \sum_{s=1}^{3} \beta_{4,s}^{\Delta IPI,L} \Delta IPI_{t-s} * \text{Liquidity Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{5,s}^{\Delta IPI,S} \Delta IPI_{t-s} * \text{Size}_{b,t-s} + \ldots \\
& + \sum_{s=1}^{3} \beta_{4,s}^{\Delta CPI,FF} \Delta CPI_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{4,s}^{\Delta CPI,C} \Delta CPI_{t-s} * \text{Capital Ratio}_{b,t-s} + \\
& + \sum_{s=1}^{3} \beta_{4,s}^{\Delta CPI,L} \Delta CPI_{t-s} * \text{Liquidity Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{4,s}^{\Delta CPI,S} \Delta CPI_{t-s} * \text{Size}_{b,t-s} + \ldots \\
& + \sum_{s=1}^{3} \beta_{4,s}^{\Delta RER,FF} \Delta RER_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{4,s}^{\Delta RER,C} \Delta RER_{t-s} * \text{Capital Ratio}_{b,t-s} \\
& + \sum_{s=1}^{3} \beta_{4,s}^{\Delta RER,L} \Delta RER_{t-s} * \text{Liquidity Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{4,s}^{\Delta RER,S} \Delta RER_{t-s} * \text{Size}_{b,t-s} + \ldots \\
& + \beta_5 \mathcal{H}_{bi,t-1} + \beta_6 \mathcal{S}_{bf,t-1} + \sum_{s=1}^{3} \beta_{7,s} \text{Foreign Funding Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{8,s} \text{Liquidity Ratio}_{b,t-s} + \ldots \\
& + \sum_{s=1}^{3} \beta_{9,s} \text{Capital Ratio}_{b,t-s} + \sum_{s=1}^{3} \beta_{10,s} \text{Size}_{b,t-s} + \beta_{11} \text{NPL Ratio}_{b,t-1} + \beta_{12} \text{ROA}_{b,t-1} + \ldots \\
& + \mu_b + \zeta_a + \nu_{f,t} + \varepsilon_{bfa,t} \qquad \text{(OA.1)}
\end{aligned}
$$

Equation (3) in extended form

$$
\begin{aligned}
i_{bfa,t} = &\sum_{s=1}^{3} \delta_{1,s} \Delta MP_{t-s} * I(\text{Firm Risk}_{f,t}) + \sum_{s=1}^{3} \delta_{2,s} \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
&+ \sum_{s=1}^{3} \delta_{3,s} \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{4,s} \Delta MP_{t-s} * \text{Capital Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{5,s} \Delta MP_{t-s} * \text{Capital Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{6,s} \Delta MP_{t-s} * \text{Liq. Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{7,s} \Delta MP_{t-s} * \text{Liq. Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{8,s} \Delta MP_{t-s} * \text{Size}_{b,t-s} + \sum_{s=1}^{3} \delta_{9,s} \Delta MP_{t-s} * \text{Size}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{1,s}^{\Delta IPI} \Delta IPI_{t-s} * I(\text{Firm Risk}_{f,t}) + \sum_{s=1}^{3} \delta_{2,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
&+ \sum_{s=1}^{3} \delta_{3,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{4,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Capital Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{5,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Capital Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{6,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Liq. Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{7,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Liq. Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{8,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Size}_{b,t-s} + \sum_{s=1}^{3} \delta_{9,s}^{\Delta IPI} \Delta IPI_{t-s} * \text{Size}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{1,s}^{\Delta CPI} \Delta CPI_{t-s} * I(\text{Firm Risk}_{f,t}) + \sum_{s=1}^{3} \delta_{2,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
&+ \sum_{s=1}^{3} \delta_{3,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{4,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Capital Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{5,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Capital Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{6,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Liq. Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{7,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Liq. Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{8,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Size}_{b,t-s} + \sum_{s=1}^{3} \delta_{9,s}^{\Delta CPI} \Delta CPI_{t-s} * \text{Size}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ...
\end{aligned}
$$

$$
\begin{aligned}
&... + \sum_{s=1}^{3} \delta_{1,s}^{\Delta RER} \Delta RER_{t-s} * I(\text{Firm Risk}_{f,t}) + \sum_{s=1}^{3} \delta_{2,s}^{\Delta RER} \Delta RER_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
&+ \sum_{s=1}^{3} \delta_{3,s}^{\Delta RER} \Delta RER_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{4,s}^{\Delta RER} \Delta RER_{t-s} * \text{Capital Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{5,s}^{\Delta RER} \Delta RER_{t-s} * \text{Capital Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{6,s}^{\Delta RER} \Delta RER_{t-s} * \text{Liq. Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{7,s}^{\Delta RER} \Delta RER_{t-s} * \text{Liq. Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{8,s}^{\Delta RER} \Delta RER_{t-s} * \text{Size}_{b,t-s} + \sum_{s=1}^{3} \delta_{9,s}^{\Delta RER} \Delta RER_{t-s} * \text{Size}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{10,s} \text{Foreign Funding Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + \sum_{s=1}^{3} \delta_{11,s} \text{Capital Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{12,s} \text{Liquidity Ratio}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + \sum_{s=1}^{3} \delta_{13,s} \text{Size}_{b,t-s} * I(\text{Firm Risk}_{f,t}) + ... \\
&+ \sum_{s=1}^{3} \delta_{s}^{NC} \text{Foreign Funding Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{s}^{C} \text{Capital Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{s}^{L} \text{Liquidity Ratio}_{b,t-s} + \sum_{s=1}^{3} \delta_{s}^{S} \text{Size}_{b,t-s} + ... \\
&+ \delta_1 \text{NPL Ratio}_{b,t-1} + \delta_2 \text{ROA}_{b,t-1} + \delta_3 \mathcal{H}_{bi,t-1} + \delta_4 \mathcal{S}_{bf,t-1} + \mu_b + \nu_{f,t} + \varepsilon_{bfa,t} \qquad \text{(OA.2)}
\end{aligned}
$$