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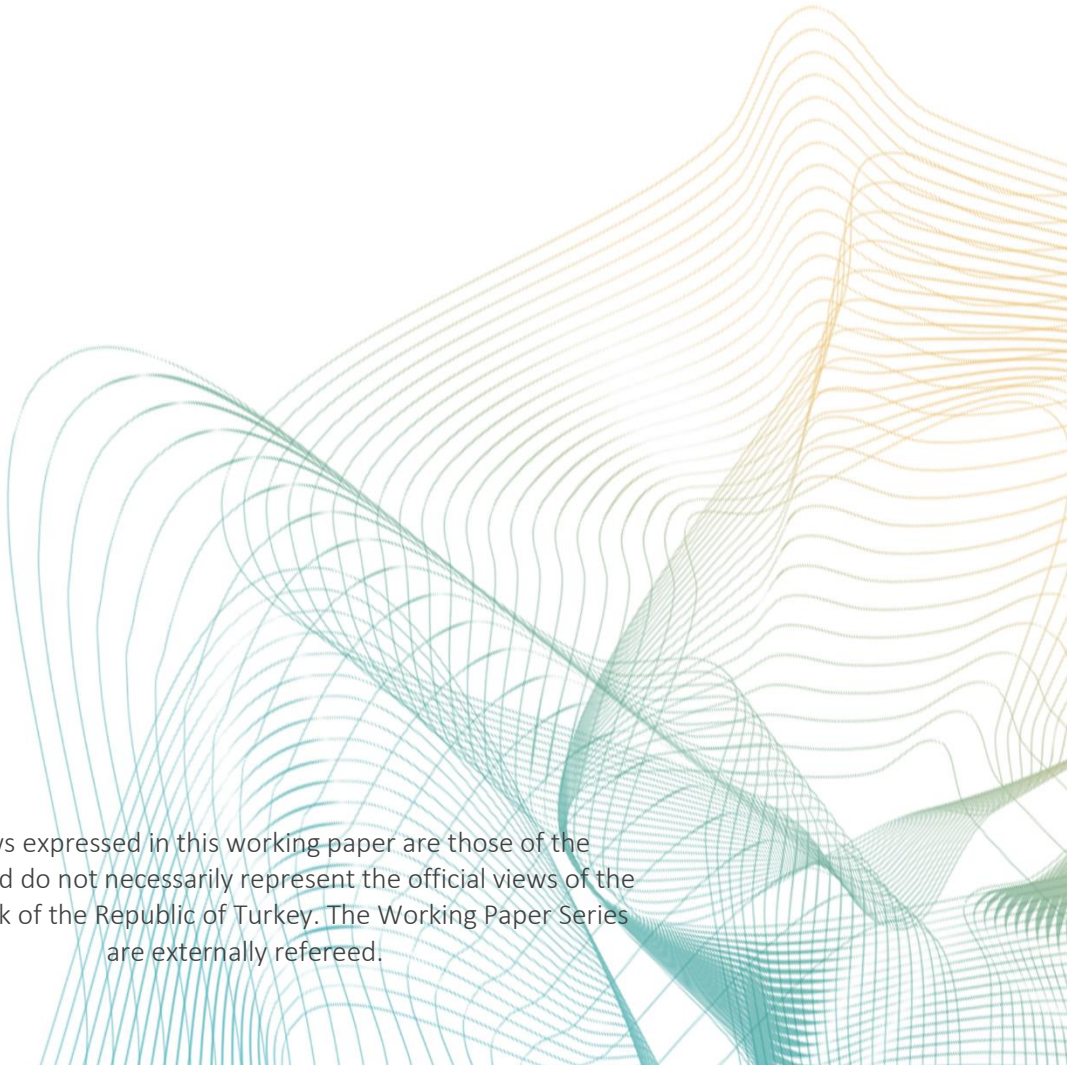

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Global Liquidity and the Impairment of Local Monetary Policy Transmission☆

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Abstract

We show that global liquidity limits the transmission of local monetary policy on credit markets. For identification, we exploit global liquidity shocks in conjunction with monetary policy changes and exhaustive loan-level data (the credit and international interbank market registers) from a large emerging market, Turkey. We show that softer global liquidity conditions —proxied by lower VIX or expansionary US monetary policy— attenuate the pass-through of local monetary policy tightening on loan rates, especially for banks that borrow ex-ante more from international wholesale markets. Effects are also important for other credit margins and for bank risk-taking —especially for risky borrowers in FX loans. The mechanism at work is via a bank carry trade from international markets when local monetary conditions tighten.

Keywords: Global Liquidity; Global Financial Cycle; Monetary Policy Transmission; Emerging Markets; Banks.

JEL Codes: E52; F30; G01; G15; G21.

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Non-Technical Summary

Last few decades have witnessed a dramatic increase in international financial integration. The global financial cycle, driven mainly by global risk appetite or US monetary policy, also move local credit cycles in emerging markets. It has been argued that global financial cycles potentially limit the transmission of local monetary policy on the local economy even in countries without fixed exchange rates (Rey, 2013). These developments feed into a lively academic and policy debate over to what extent local policy makers can steer their local credit conditions. Despite growing interest on this debate, well-identified empirical evidence is scarce.

We show in this paper that global liquidity limits the transmission of local monetary policy on local credit markets. For identification, we exploit global liquidity shocks in conjunction with monetary policy changes and exhaustive loan-level data (the credit and international interbank market registers) from a large emerging market, Turkey. Our robust results show that the pass-through of local monetary policy rates on loan rates is weaker by banks that ex-ante borrow more from international wholesale markets. The effects are stronger when the global liquidity conditions are softer, proxied by lower VIX, lower shadow Fed funds rates, or by higher Fed balance sheet or higher US monetary base. The results carry over other loan dimensions, i.e., softer global liquidity lead domestic banks with prior access to international wholesale funding to provide higher supply of credit, extend longer maturity or non-collateralized loans following a local monetary policy tightening. Our results also show that local monetary policy tightening may induce bank risk-taking, and easier global liquidity conditions may exacerbate this effect. The mechanism at work is via a bank carry trade: when local monetary conditions tighten, domestic banks borrow more funds from international wholesale markets, with relatively favorable foreign-domestic interest rate differential.

1. Introduction

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), and global factors gain further traction in affecting domestic financial conditions (IMF, 2017). VIX and US monetary policy are key drivers of the global financial cycle that move local credit cycles (Miranda-Agrippino and Rey, 2015, 2018; Bruno and Shin, 2015a), thereby potentially limiting the transmission of local monetary policy on the local economy even in countries without fixed exchange rates (Rey, 2013). These developments feed into a lively academic and policy debate over to what extent local policy makers can steer their local credit conditions (Fischer, 2014; Rajan, 2014; Obstfeld, 2015). Despite growing interest on this debate, well-identified empirical evidence is scarce.

In this paper, we analyze whether 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 data and monetary policy changes from a large emerging market, Turkey. We use loan-level data both from the credit register –tracking all loans to firms by Turkish banks, with information on both loan volume and interest rates– and the Financial Transactions Register –providing transaction-level details on the universe of cross-border borrowing by Turkish banks from global lenders, with also information on loan volume and price. Our robust results show that softer global liquidity conditions –proxied by lower VIX or expansionary 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. Effects are also important for other credit margins and for bank risk-taking —especially for risky borrowers in foreign-currency (FX) loans. The mechanism at work is via a bank carry trade from international markets when local monetary conditions tighten. Therefore, the higher risk-taking is both in liabilities and assets, by taking foreign currency borrowing from global banks and softening loan conditions, especially in the pass-through to loan rates and to riskier borrowers.

Macro-finance papers, in particular Rey (2013) and the literature following this path-breaking paper, have argued that the global financial cycle may limit the transmission of local monetary policy on local markets. However, as far as we know, there was no evidence, in particular exploiting administrative micro data, shocks and policy changes. Our main contribution to the academic

literature and to the policy debate is to show that global liquidity limits the transmission of local monetary policy on credit markets, and the mechanisms behind. Moreover, there is an emerging empirical literature that shows that the global financial cycle affects the local credit cycle (e.g., Ioannidou et al., 2015; di Giovanni et al., 2018; Buch et al., 2018), and a large literature on monetary policy (Kashyap and Stein, 2000; Jimenez et al., 2012, 2014) including an international channel (Cetorelli and Goldberg, 2012b; Buch et al., 2018; Morais et al., 2019). However, different from us, none of these papers study whether and how the global financial cycle limits the transmission of local monetary policy on local credit markets.

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. We also analyze whether global liquidity conditions affect the risk-taking channel of monetary policy, including local loans in foreign currency. Moreover, we analyze the mechanism by which local banks adjust their demand for cross-border funds following a change in the local monetary policy rate.

Turkey provides an excellent laboratory to explore the nexus between global liquidity and monetary policy transmission. First, banks are the main provider of funding for firms (with equity financing playing a negligible role), and Turkey is a large emerging market economy subject to foreign shocks (it has large current account deficits and hence depends on global finance). Second, Turkey has two administrative, supervisory datasets crucial to tackle our questions: the Credit Register and the Financial Transactions Register.

We use the Credit Register (CR), that provides extensive details on virtually all loans granted by all banks operating in Turkey. By exploiting the CR, we overcome a key identification challenge that global liquidity and local monetary conditions also affect borrower (firm) balance sheet conditions, and hence we can focus on within-firm variations (with firm-time fixed effects in loan level data as in Jimenez et al. (2014)) across banks differently affected. As in di Giovanni et al. (2018), we focus on loans granted by domestic (locally-owned) banks and non-core bank funding. We analyze domestic banks since one would expect the local policy transmission to be stronger particularly for domestic banks (compared to foreign-owned banks), with access to global funds weaker, rendering our question and the mechanism non-trivial.[1] Moreover, domestic banks rely significantly on cross-border foreign currency funds: their non-core foreign-currency liabilities are 13% of their asset size

[1] Results are similar if we include foreign banks.

(and 114% of bank capital), and such liabilities move in tandem with global liquidity conditions (Figure 1).

To identify the underlying mechanism, we use a new register, the Financial Transactions Register (FTR), that provides transaction-level details on the universe of domestic banks' cross border borrowing from global lender banks. Details include the volume, interest rate charged, maturity, date of origination, currency of denomination, unique identifiers for the borrower (domestic bank) and the lender ('global' bank), as well as for the case of the lender bank is a subsidiary of a global bank (e.g., Bank of America, London branch), it provides where the main headquarter resides (in this case, the US). 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 ("bank carry trade"), eventually affecting the degree of monetary policy transmission. By exploiting the highly granular FTR, we can analyze these issues and, moreover, absorb (lender) supply-side effects by considering within-global-bank variations to Turkish banks' cross-border credit demand. We also need to control for other macroeconomic shocks (e.g. local macroeconomic conditions and foreign exchange rate changes), not only in levels, but differentially across banks with higher non-core foreign funding.[2]

Our results are as follows:

First, we show that banks with a higher ex-ante degree of reliance on non-core foreign currency funds raise their loan rates significantly less following a local monetary policy tightening. The effect is not only statistically significant but also economically large. For instance, in a hypothetical scenario of a 100-basis-points increase in the local monetary policy rate (as in Kashyap and Stein (2000)), globally funded banks raise their loan rate on a similar type of loan to a given firm by 30 basis points less after the local monetary policy tightening. This estimated effect is economically sizeable as the average within-firm standard deviation of loan rate, 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

[2] Since softer global liquidity conditions or a monetary policy tightening at home in general lead to an appreciated domestic currency, one could expect banks with higher foreign-currency liabilities to have stronger improvement in their balance sheets. For evidence on how local monetary tightening affect foreign exchange rate in emerging market economies, see Catao et al. (2011) for Brazil, Bhattacharya et al. (2011) for India, Arratibel and Michaelis (2014) for Poland, Forero (2015) for Latin American countries, and references therein, and Alp and Elekdag (2011) for Turkey.

bank lending channel of monetary policy, notably bank capital, liquidity and size (Kashyap and Stein, 2000; Jimenez et al., 2012).

Second, and more importantly, we find that softer global liquidity conditions directly weaken the transmission of a local monetary policy tightening. We use the VIX 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 global financial cycles.[3] Moreover, given that international spillovers originating from the US monetary policy have received special interest in the literature, and owing to the fact that the US dollar plays a key role in global financial markets and risk-taking, we also use the (log of) Federal Reserve's balance sheet size, the (log of) US monetary base, and to reflect both conventional and unconventional US monetary policy, the shadow Federal Funds rate (Wu and Xia, 2016), as alternative indicators for global liquidity conditions.[4]

Robust to all indicators, 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. Numerically, when log(VIX) is lower by one standard deviation, banks that ex-ante rely more on foreign funding set 41 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 or lower US shadow interest rate as alternative indicators of softer global liquidity (the economic impacts are 30, 32, and 26 basis points, respectively, given a one-standard-deviation easing in the respective global liquidity variable).

Third, there are risk-taking associated to this global liquidity channel.[6] In particular, when global liquidity conditions are softer, the increase in loan rates by globally funded domestic banks is lower for ex-ante risky (than less risky) borrowers in FX loans (by 5 to 10 basis points after a 100-basis-points local monetary policy tightening). For Turkish lira loans, we also find differential

[3] See, e.g., Forbes and Warnock (2012), Fratzscher (2012), Miranda-Agrippino and Rey (2015, 2018), Bruno and Shin (2015a), di Giovanni et al. (2018), among many others.

[4] See, e.g., Rey (2013), Morais et al. (2019), Buch et al. (2018), and Hofmann et al. (2017).

[5] By banks that rely more on foreign funding, we specifically mean banks at the 75th percentile of the distribution of non-core foreign-currency liabilities-to-total assets ratio (which is 16.6) compared to banks at the 25th percentile (10.9).

[6] Our findings point to an overall laxer credit standards by globally funded banks. Namely, 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.

risk-taking effects though less robust statistically (than for FX loans).

We complement the risk-taking analyses on two fronts. We first show greater ex-post loan defaults for firms borrowing from globally funded domestic banks. In particular, firms that were granted a loan from a globally funded domestic bank when global liquidity conditions are softer are 21% more likely to default on the loan at the bank over the following year after a local monetary policy tightening (compared to average probability of future default), with stronger effects for foreign-currency borrowers (29% higher probability of default at the bank within the following year). Second, firms are more likely to switch to globally-funded banks after a local policy tightening, with the ex-ante risky firms being more likely to switch.

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 monetary policy rule, or policy asymmetries (splitting the sample into local policy tightening vs. easing episodes).

Finally, we explore the mechanism driving our results. Controlling for the global banks (supply)-side effects (by including global bank headquarter's country$\times$time and global bank subsidiary$\times$time fixed effects), we find that globally funded domestic banks do a carry trade following a local policy tightening. In particular, domestic banks with higher ex-ante foreign funding borrow 0.9% more funds from abroad over the next quarter following a 100-basis-points tightening in the local monetary policy. Moreover, consistent with the increase in cross-border credit demand, cross-border interest rate gets higher, though mildly, indicating that they face a nearly perfectly-elastic supply of international funds after a local policy tightening. Lastly, we confirm that domestic banks experience a decline in the interest differential between foreign currency and domestic currency funding. That is, following a local monetary policy tightening, foreign funding becomes comparatively more favorable than local funding for globally funded banks.

In sum, 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 soften more their lending conditions (especially a weaker pass-through to loan rates), and even more to ex-ante riskier borrowers, with higher ex-post loan defaults.

Literature Review. Our main contribution to the literature is to show that global liquidity limits the transmission of local monetary policy on credit markets, and the mechanisms behind. There

has been a large empirical literature (that we summarize below) showing spillovers of the global financial cycles/liquidity, which originates in the US, onto emerging markets' credit cycles, but not on whether –and how– global liquidity limits the local transmission of monetary policies. Since Rey's seminal paper –which argues that global liquidity limits local monetary policy even with a floating exchange rate regime–, many papers have explored further aspects, such as whether it matters if global liquidity cycle is expansionary compared to when it is contractionary (Han and Wei, 2018), or whether exchange rate effects due to foreign currency exposure also play a role (Georgiadis and Mehl, 2016),[7] or offering a nuanced view, while a floating regime helps emerging market economies to be better positioned against external shocks, financial globalization still worsens the trade-offs monetary policy faces in navigating among multiple domestic objectives (Obstfeld, 2015). As far as we know, there is no study so far that explores the limits of the transmission of local monetary policy given the global financial cycle, exploiting extensive administrative micro data in conjunction with shocks and policy changes.

We also extend the understanding on how global conditions are transmitted to emerging markets through an international bank lending channel (Avdjiev et al., 2018; Buch et al., 2018; Correa et al., 2018; di Giovanni et al., 2018; Morais et al., 2019). Buch et al. (2018) and Correa et al. (2018), for instance, show evidence in favor of a cross-border portfolio channel, whereby local monetary policy affects lending to non-bank borrowers in foreign countries (via direct cross-border lending or through bank affiliates).[8] di Giovanni et al. (2018) use the Turkish Credit Register, and show how domestic banks (financing more from non-core liabilities) reflect changes in global financial conditions on local firms. Morais et al. (2019) take the Mexican case, where there is an unusually large presence of foreign banks, and show that a softening in foreign monetary policy increases the risk-taking of foreign banks through their respective regions. Differently from the international bank lending literature (see also Cetorelli and Goldberg, 2012b; Ioannidou et al., 2015; Temesvary et al., 2018; and many others), we study the effect of *global* liquidity conditions on the transmission

[7] Georgiadis and Mehl (2016) find countries that are net long in foreign currency experience larger valuation losses and wealth effects on their external balance sheets in response to an exchange rate appreciation when monetary policy is tightened, hence triggering stronger output effects. For countries with net open foreign currency-position (e.g., countries with large current account deficits, like Turkey), one can expect the reverse.

[8] Buch et al. (2018) present a meta-analysis of 19 coordinated country studies, and study the international transmission of monetary policies of the US, Euro area, Japan, and United Kingdom. They provide evidence for an inward transmission that foreign country monetary policies, particularly of the US, affect domestic credit to local non-bank borrowers.

of *local* monetary policy.[9]

More relatedly, Avdjiev et al. (2018) draw on the BIS international banking statistics, and find that a local monetary policy tightening induces an increased dollar lending to that country. They interpret this finding as an evidence for internationally active banks drawing into that country either due to the interest differential or for taking up the slack left by weaker local banks. Our studying the FTR – that provides both the *volume* and the *price* of cross-border borrowing at a global bank subsidiary-domestic bank-currency of denomination level–, we provide well-identified evidence for the "interest differential" view (that a local monetary policy tightening increasing the relative attractiveness of foreign funding at a micro level). Moreover, our results on the relatively easier credit to local firms by globally funded domestic banks and risky firms' higher tendency to switch to these banks after a local policy tightening suggest an excessive "taking up the slack".

We also contribute to the literature on the risk-taking channel of monetary policy (Adrian and Shin, 2010; Allen and Rogoff, 2011; Borio and Zhu, 2008; Diamond and Rajan, 2012). We identify a novel risk-taking channel of monetary policy, which emerges in a small economy setting. Existing literature points to various channels through which softer local monetary policy may increase bank risk taking.[10] Our results are different due to the presence of global liquidity and the bank carry trade channel that emerges in our small open economy setting. Our results imply that *tighter* local monetary policy induces higher bank risk-taking at home –through higher foreign borrowing by domestic banks and their softening of lending standards to ex-ante riskier borrowers– and softer global liquidity conditions exacerbate these effects.

The paper proceeds as follows. Section 2 presents the data and our empirical strategy. Section 3 presents variable definitions and summary statistics. Section 4 presents the main findings. Section

[9] Cetorelli and Goldberg (2012b), for instance, show that global banks can better insulate their loan portfolios from a tightening in the US monetary policy (by activating their internal capital markets), and by doing so, they contribute to the international propagation of US monetary policy changes. Temesvary et al. (2018) present evidence for the international transmission of US monetary policy through global banks' lending to non-affiliated parties abroad. Ioannidou et al. (2015) show that a lower US policy rate spurs granting of riskier loans to riskier borrowers in Bolivia during 1999-2003, a nearly-dollarized economy at the time.

[10] For instance, easier monetary policy may result in banks reallocating their portfolios by moving from safe towards riskier assets –portfolio allocation channel– (Fishburn and Porter, 1976), may compress intermediation margins and lead banks to search for yield and take on excessively high risk –search-for-yield channel– (Dell'Ariccia and Marquez (2013), Jimenez et al. (2014), or for an international setting, see Morais et al. (2019)), or may boost asset prices, improve balance sheet conditions, in turn, weaken banks' efforts to screen borrowers and thereby make banks take higher risk –risk-taking channel– (Dell'Ariccia et al. (2014), or for international spillovers, see Bruno and Shin (2015b), Hofmann et al. (2017)).

5 provides further insights and robustness analyses. Section 6 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 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. The CR is similar to credit registers of other countries. In addition to the loan outstanding and unique identifiers for the borrower and the lender, the CR includes interest rate (absent in most credit registers), maturity, 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.[11] We then match the CR with the monthly bank balance sheets and income statements datasets.

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 easings by advanced economy central banks, the European debt crisis that starts to unfold in early 2010, as well as the aftermath of Bernanke's taper tantrum in May 2013.

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 as restrictive as it may seem, since such banks extend a total of over 90% of total bank credits 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.[12]

Moreover, we focus on a large sample of firms, that covers over 50% of Turkey's economic activity –measured by total gross sales–, and performs fairly well in capturing the loan universe in

[11] 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).

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

terms of how loan rates evolve over time, how loans are distributed across sectors and loans with different maturities, collateral properties, or currency of denomination (Figures OA.1 and OA.2). The set of firms covered, tracked by Company Accounts Database, is used by the Central Bank of the Republic of Turkey (CBRT) in order to make inferences for the whole non-financial sector.

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 Financial Transactions Register (FTR). The FTR 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, maturity, date of origination, currency of denomination, and unique identifiers for the borrower (domestic bank) and the lender ('global' bank). Moreover, it also provides the name of the country that the lender bank operates in (based on ISO-Swift codes), and for the case of the lender bank is a subsidiary (e.g., Bank of America, London branch), it provides where the main headquarter resides (in this case, the US). Similar to the CR, the frequency of the FTR is monthly.

Over our sample period (2006-2016), domestic banks borrow from a total of 908 global bank subsidiaries from 80 countries (with the majority being Euro-area (53%) or US headquartered (23%)) and denominated in 14 different foreign currencies (with 67% denominated in US dollars, and 31% denominated in Euros).

2.2. Empirical Strategy

Our empirical strategy includes the following ingredients:

First, we identify supply side effects. 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$\times$month fixed effects and focus on firms with multiple banking relationships (Khwaja and Mian, 2008).[13]

[13] Later, we discuss possible limitations of this widely celebrated identification strategy, and conduct additional analyses (e.g., exploring the possibility of firms switching across banks).

Second, 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 et al., 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 bank reliance on global liquidity with these key bank variables in levels and in all possible interaction terms.

Third, 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.

Finally, we employ weighted least squares with the natural logarithm of loan volumes being used as weights, that is, smaller loans receive lower weights.[14] 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$\times$firm *and* month level, to take into account possible dependence in residuals for a given bank-firm pair across time and across units for a given month (Petersen, 2009; Cameron et al., 2011).

To show the mechanism, we then use the transaction-level database on domestic banks' cross-border borrowing (FTR). We follow a similar empirical strategy, yet this time we identify the demand side by absorbing supply side effects. Namely, we introduce global (lender) bank$\times$year and global (lender) bank's headquarter country$\times$month fixed effects to control for the supply side. Our question then boils down to whether banks with higher reliance on global liquidity demand more

[14] The reason why we use weighted least squares is to avoid the possibility of smaller loans disproportionately represented in the sample. The results are strongly robust, and in essence numerically stronger, when we use unweighted least squares.

funds from abroad and face more favorable borrowing costs compared to local funding costs, following a local monetary policy tightening.

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. The empirical model 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).[15]

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,

[15] We define a loan as newly originated if it has a unique bank–firm–(loan-type)–(origination-date)–(termination-date). We would like to avoid discarding '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, though, to using change in the loan rate as our dependent variable (available upon request).

and monthly change in the real effective exchange rate –where an increase means a real domestic currency appreciation–.[16] 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. Inline 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., $\sum_{s=1}^{3} \beta_s < 0$. Moreover, in light of the literature, we expect strongly capitalized, relatively liquid, or larger banks to reflect monetary policy changes less onto their loan rates, i.e., $\sum_{s=1}^{3} \Theta_s < 0$, as they may find it easier to raise funds after a local monetary policy tightening.

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.[17] μ_b are the bank fixed effects, controlling for unobserved time-invariant bank characteristics. $\nu_{f,t}$ denote firm×month fixed effects, and to absorb any unobserved variation in demand side effects and identify the supply side. 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 levels of foreign funding ratio, capital ratio, liquidity ratio, size, non-

[16] $\otimes$ 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.

[17] The strength of the bank-firm relationship in essence serves as an implicit contract between the parties and potentially affect observable contractual terms (Berger and Udell, 1995; Bharath et al., 2011; Gambacorta and Mistrulli, 2014).

performing 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.

Next, we explore whether softer global liquidity conditions attenuate local monetary policy transmission. To do so, we extend equation (1) by incorporating measures of global liquidity conditions into the picture. Namely, we estimate

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

where Global Liquidity Indicator is the log of the VIX (measured at the beginning of t), or for robustness, the (log of) Federal Reserve balance sheet size, the (log of) the US monetary base, and the shadow Federal funds rate (Wu and Xia, 2016). 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 (to the extent possible).[18] Also, we later use estimated residuals from a Taylor-type monetary policy rule that additionally includes the VIX –and aggregate credit growth (to be discussed more in detail in the robustness section)–.

[18] 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).

$CONTROLS$ 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.

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

Since a local monetary policy tightening or softer global liquidity conditions in general induce an appreciated domestic currency, banks with *higher* foreign funding would have *stronger* improvement in their balance sheets. Along these lines, and given the possibility that a local policy tightening may render foreign borrowing relatively less costly, such banks may do carry trade (borrowing more from abroad with relatively favorable terms) following a local policy tightening. Accordingly, we study whether banks that rely more on global liquidity raise their loan rates less for a given *risky* firm following a local monetary policy tightening (compared to banks that rely less), and whether softer global liquidity conditions exacerbate this effect.

To do so, we estimate equation (2) for the subsample of firms that we define as "risky", and for the remaining set of firms (that we define as "riskless") separately. We label a firm as risky if the firm had any non-performing loans (which are 90 days overdue) during the 3-year-period prior to borrowing, and riskless otherwise.[19] 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.

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

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

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

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.[20] $I(\text{Firm Risk}_{f,t})$ is the indicator variable that we used above to label a firm as risky: it takes a value 1 if firm f is risky (has one or more non-performing loans during a 3-year period prior to t), and 0 otherwise. Note our including firm$\times$month fixed effects, $\nu_{f,t}$, in order to properly identify bank risk-taking.

Our coefficient of interest is δ_3. We test whether banks with a higher degree of reliance on global liquidity raise their loan rates less for ex-ante risky firms following a local monetary policy tightening. That would correspond to testing for whether $\sum_{s=1}^{3} \delta_3 < 0$.

2.2.3. 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 declining interest differential between foreign currency funding and domestic currency funding, and improvement in these banks' balance sheets due to domestic currency appreciation. In turn, these banks may demand more funds from abroad after a local monetary policy tightening, or, do 'carry trade'.

More specifically, we now explore whether banks with prior access to foreign wholesale markets do carry trade, by borrowing more funds from abroad following a local monetary policy tightening, and whether such borrowing becomes more favorable by commanding lower interest rates relative to local funding costs.

Our estimation equation resembles equation (1), and is structured as follows:

[20] 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 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.

$$
\begin{aligned}
Y_{bgc,t} = & \sum_{s=1}^{3} \beta_s \Delta MP_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
& + \sum_{s=1}^{3} \Theta_s \Delta MP_{t-s} \otimes (\text{Capital Ratio, Liquidity Ratio, Size})_{b,t-s} + ... \\
& + \sum_{s=1}^{3} \Gamma_s Macros_{t-s} * \text{Foreign Funding Ratio}_{b,t-s} + ... \\
& + \sum_{s=1}^{3} \Upsilon_s Macros_{t-s} \otimes (\text{Capital Ratio, Liquidity Ratio, Size})_{b,t-s} + ... \\
& + CONTROLS + \nu_{h,t} + \xi_{g,y} + \zeta_c + \varepsilon_{bgc,t} \qquad (4)
\end{aligned}
$$

where $Y_{bgc,t}$ is (i) the change in (log) cross-border borrowing of domestic bank b from global bank subsidiary g –with the headquarter country h– in currency c from month t to $t+3$; (ii) the change in the associated interest rate (at the same level of disaggregation); or (iii) the difference between foreign borrowing rate (at the domestic bank-global bank-currency type level) and local policy rate. We include headquarter country$\times$month fixed effects ($\nu_{h,t}$), and additionally, in the most saturated specification, global bank subsidiary$\times$year fixed effects ($\xi_{g,y}$), to control for the supply side. Note that our supply side controls already soaks up any variation in common global factors (e.g., the VIX). ζ_c denote for currency-type fixed effects. $CONTROLS$ are as in our baseline regression model, i.e., domestic bank variables and domestic macroeconomic controls, and their interactions.

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 interest rate, expressed in annual percentage terms, on a loan provided by a bank to a firm with a certain loan type. 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.

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 till end-2010 and the effective funding rate in the aftermath. The Central Bank of Turkey has implemented a multiple interest rate framework after end-2010 (Basci and Kara, 2011), and as studied by Kara (2015) and Binici et al. (2016), the effective rate is the relevant measure of policy stance for this period.

Figure 2 presents how the monetary policy rate has evolved after 2006. The policy rate has been hiked in mid-2006 owing to increasing concerns about emerging market economies, in 2010 as the European sovereign debt crisis unfolds, and after mid-2013 after the Taper tantrum speech. Monetary policy stance has been eased following the global liquidity crunch in late 2008, and after mid-2012 and mid-2014 as capital inflows restore.

The key bank variables are foreign funding ratio, capital ratio, liquidity ratio, and size. Foreign funding ratio is defined as the ratio of non-core foreign-currency liabilities to total assets.[21] 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 (16.6%), and as a 'bank with a low degree of reliance on global liquidity', if the bank is at the first quartile (11%) of the distribution of foreign funding ratio.

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 (12.1%), and as 'weakly capitalized', if the bank is at the first quartile (10%).

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 27.1 percent of their assets in liquid assets, a value substantially higher than generally

[21] Non-core foreign currency (FX) liabilities is the sum of FX payables to banks, FX payables to money and securities markets, FX funds from repo transactions and net FX securities issued.

reported for advanced economy banks. Moreover, relatively liquid banks (the third quartile) hold about 32.2% of their assets as liquid, while for less liquid banks, this ratio attains 21.8%.

Size is the natural logarithm of total assets. Similar as above, we use the quartiles to label a bank as large (the 3rd quartile) or small (the 1st quartile). The remaining bank variables are non-performing 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).

We include macroeconomic variables that are typical in monetary policy reaction functions for small open economies: annual growth in industrial production index, ΔIPI, as an indicator for changes in aggregate economic activity (available at a monthly frequency –inline 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).

4. Empirical Results

4.1. 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, with no controls or fixed effects (column 1). The estimated coefficient for the interaction term lays out the key effect: Banks that 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 33 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 similar to the one reported in column (1).

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 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 quite sizeably important for the local policy rate pass-through compared to bank capital, liquidity or size. For instance, while a globally-funded domestic bank raises its loan rate by 32 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 small in magnitude (4, 4, and 0.1 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 30 basis points less *for a given firm* following a cumulative 100-basis-points increase in the local monetary policy rate.

Finally, we observe that our key variable of interest, the interaction of changes in local monetary policy with bank foreign funding ratio, has an estimated coefficient that remains relatively stable as we successively include larger set of controls, which one can take as a sign of validity of our set of controls or that omitted variable bias is less of a concern. Along these lines, we conduct a formal test for the degree of omitted variable bias following Oster (2017). Oster (2017) shows that coefficient stability may be a sufficiently good indicator of limited omitted variable bias, only if movements 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, where $\tilde{\beta}$ and $\tilde{R}$ are the bias-unadjusted estimated coefficient and the R-squared from the model with larger controls, $\mathring{\beta}$ and $\mathring{R}$ are the estimated coefficient and the R-squared from the simple model, δ captures by at least how much observable controls are as important as unobservable controls, and R_{max} is the R-squared from the hypothetical regression that entails zero omitted variable bias. Based on Oster's preferred set of coefficients, i.e., $\delta = 1$ and $R_{max} = 1.3\tilde{R}$, 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.[22]

We then extend our model by additionally including the interaction of bank foreign funding (and other key bank variables) with the VIX (Table 3). As given the estimated coefficient for the interaction of bank foreign funding with the VIX, a lower VIX makes banks with ex-ante higher foreign funding to set lower loan rates for a given firm (column 1). Though, potentially due to having past changes in the local monetary policy rate and domestic macroeconomic variables already controlled for, this effect seems statistically insignificant and economically weak.[23] Moreover, inline with our previous results, we continue to find that banks with higher foreign funding weaken the policy rate pass-through sizeably and in a statistically significant way (as given by the estimated coefficient for the interaction of changes in local monetary policy and bank foreign funding).

In column (2), we then explore whether global liquidity conditions affect local monetary policy transmission. To do so, we introduce a triple interaction, the interaction of bank foreign funding with changes in local policy rate, *with* the log of the VIX. In sum, 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 41 basis points less when the VIX is lower by one standard deviation.[24]

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 12). These analyses serve three purposes: First, it is natural to expect that local monetary policy rates transmit primarily to domestic-currency loan rates. We explore whether this holds. Second, it helps for better identification. Suppose local monetary policy tightens, thereby making the domestic currency more valuable and potentially help firms with foreign currency debt be more able to seek additional foreign currency credit. Since foreign currency loans likely come disproportionately from banks that have higher foreign funding, within-firm loan demand would shift toward these lenders in re-

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

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

[24] We later show that a local monetary policy tightening also leads globally funded banks to do carry-trade (by borrowing more from abroad). To show that this is not confounding for our baseline results, we show in Table A6 that using bank foreign funding ratio measured fixed at December 2005 (before our sample period begins) does not alter the results qualitatively.

sponse to a monetary policy tightening. Our demand-side controls would not account for this type of shift in borrowers-lender mix. Third, changes in global liquidity conditions may affect foreign and domestic currency loan rates differently.

In columns (3) to (5), we focus on domestic currency denominated loans. We find that banks with higher foreign funding set lower rates for domestic currency loans after a local policy tightening (column 3). Moreover, softer global liquidity conditions make globally funded banks set lower domestic currency loan rates, as given by the positive and significant estimated coefficient on the interaction of VIX with bank foreign funding ratio (column 4). Finally, softer global liquidity conditions weaken the transmission of local policy tightening (column 5). Numerically, following a cumulative 100-basis-points tightening, a bank with higher foreign funding sets 53 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. Columns (6) and (7) show that following a local policy tightening or softer global liquidity conditions, banks with higher foreign funding set lower rates for foreign currency loans. Though, these effects are not statistical significant. In column (8), we then look into whether global liquidity conditions affect the policy transmission. Evaluating the estimated coefficient for the respective triple interaction, we find that following a cumulative 100-basis-points tightening, a bank with higher foreign funding sets about 10 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 intrinsically be different, or that domestic and foreign currency loans may differ, e.g., in their maturity or collateral properties.[25] 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

[25] Domestic currency loans are on average shorter term and non-collateralized compared to foreign-currency loans. In particular, the share of short-term 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.

a higher degree of reliance on global liquidity raise their loan rate for a given firm×currency by 42 basis points less when global liquidity conditions are softer.

4.2. 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 risky and riskless firms separately. In column (1), we explore how banks with higher foreign funding set their loan rates for a given risky 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 riskless firms. We observe that banks with higher foreign funding set lower rates for risky firms following a local policy tightening or following softer global liquidity conditions. Comparing columns (1) and (2), we find that banks do so more strongly for risky 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 46 basis points lower loan rate for a given risky firm when global liquidity conditions are softer (column 3). The estimate effect is milder for riskless firms (40 basis points, column 4).

In remaining columns, we focus on domestic-currency or foreign-currency denominated loans separately. Similar as 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 56 basis points lower loan rate for domestic currency loans to a given ex-ante risky firm (versus 53 basis points lower rates for riskless firms), and 13 basis points lower rate for foreign currency loans to a given ex-ante risky firm (versus 9 basis points lower rate for riskless firms), when global liquidity conditions are softer. While the difference between how globally funded banks set loan rates differently for risky vs. riskless firms seems not sizeable, pricing risky and riskless firms similarly already hints banks' underpricing risk. Below, we show further evidence on bank risk-taking.

An Alternative Specification for Bank Risk-Taking

We previously show that softer global liquidity conditions lead banks with ex-ante higher foreign funding to set lower loan rates for risky firms following a local monetary policy tightening.

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 (δ_3), we find that banks with higher foreign funding set statistically significantly lower rates for risky firms following a local monetary policy tightening (numerically by 9 basis points lower rates, see column 1). The results carry through when we focus on domestic or foreign currency loans (columns 2 and 3).

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 risky compared to riskless firms following a local monetary policy tightening, for domestic currency loans by 17 basis points when global liquidity conditions are tighter (column 5), and for foreign currency loans by 5 basis points when global liquidity conditions are softer (column 9).

4.3. Additional Analyses

4.3.1. Other Loan Terms: Volume, Maturity, Collateral

Note that borrowers may trade off any loan parameter in exchange for other adjustments. In this regard, exploring other dimension of credit, i.e., volume, maturity or collateral, is important in order to better interpret our previous findings. 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 risky vs. riskless firms. Taken together, these findings point to a consistent picture: softer global liquidity conditions lead banks with higher foreign funding to relatively soften their credit standards (relative to banks with lower foreign funding) following a local monetary policy tightening.

4.3.2. Alternative Indicators for Global Liquidity

Robust to alternative indicators 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 30 basis points less after a cumulative 100 basis points tightening in the local monetary policy rate. We obtain qualitatively similar results when we consider a rise in the US monetary base or a decrease in the shadow Federal Funds rate (the economic impacts are 32 and 26 basis points, respectively).

4.3.3. 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 same cases, numerically stronger (Table 8). 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 47 basis points lower loan rate to a given firm following a 100-basis-points monetary policy tightening), do so even more strongly when the VIX is lower (namely, by 56 basis points lower rate, see column 2). Moreover, they set 61 basis points lower rate for risky firms (column 3), and by 56 basis points lower rate for riskless firms (column 4).

For foreign currency loans that are newly originated (columns 5 to 8), bank loan pricing for risky compared to riskless firms is more pronounced (columns 7 vs. 8). Numerically, globally funded banks set 12 basis points lower rates when they originate a new foreign currency loan to a given ex-ante risky firm. The estimated effect for riskless firms is comparatively smaller (3 basis points) and statistically not significant. These results resonate well with the bank carry-trade channel that we identify below –that the globally-funded banks borrow more from abroad at comparatively favorable terms after a local monetary policy tightening–.

4.3.4. 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 9). 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 21% more likely to default at the bank in the following one year after a local monetary policy tightening (21% of the average of probability of loan default over the next year, which is, 1.8%, see column 1). We find a numerically similar result for the 2-year future horizon (18%, see column 2).

We find stronger effects 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 29% more likely to default at the bank in the following one year –and 25% in the following 2 years– after a local monetary policy tightening. The effects are smaller for domestic currency borrowers –reported in columns 5 and 6– (18% and 16%, respectively).

In sum, our risk taking results are complementary. Following a local policy tightening, ex-ante risky 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–.

4.4. 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 3). This effect is strongly robust to saturating the model successively with supply-side-related fixed effects (global (lender) bank's headquarter country$\times$month fixed effects and global (lender) bank$\times$year fixed effects). Numerically, a domestic bank with a higher foreign funding ratio borrows 0.93% more from abroad over the following quarter following a 100-basis-points tightening in the local monetary policy (column

3). Moreover, well-capitalized, relatively liquid, or larger banks demand less funds from abroad following the local policy tightening (these effects are not significant, though), inline with the intuition that such banks may be in less need of foreign funds after a tighter local monetary policy.

In columns (4) to (6), we further show that banks with higher funding –which on average borrow more from abroad– also face higher foreign borrowing costs. The estimated increase in the price of foreign funding, despite the fact that it is economically small or statistically weak, resonate well with the notion that a rise in demand should lead to a rise in prices, confirming that our supply-side controls are well grounded. Moreover, economically weak results on the price margin point to a nearly perfectly elastic international supply schedule for globally funded domestic banks following a local policy tightening. Note also that the estimated increase in cross-border interest rate is small, essentially less than our hypothetical increase in local monetary policy rate (38 compared to 100 basis points), suggesting that foreign funding becomes relatively favorable.

We then study more in detail whether foreign funding becomes more favorable compared to local funding following a local policy tightening (columns 7 to 9). In these columns, our dependent variable is the difference between the cross-border interest rate (at the very same disaggregated level, local bank-global bank subsidiary-currency of denomination-month) and the local policy rate. The negative (and significant) coefficient on the interaction of changes in local monetary policy rate and bank foreign funding reveals that for banks with higher foreign funding, funding from abroad indeed becomes relatively favorable.

5. Further Discussions and Robustness Analyses

5.1. Bank Risk-Taking and Alternative Indicators for Global Liquidity

We next study the robustness of our risk-taking results to using alternative indicators for global liquidity conditions. Table A1 presents the results. We continue to find that softer global liquidity conditions (now measured by higher Fed balance sheet size, higher US monetary base, or lower shadow Fed funds rate) make globally-funded banks set lower loan rates for a given risky firm following a local policy tightening. The difference, though, between the loan rates set for risky vs. riskless firms by globally-funded banks (comparing columns for the sub-samples of risky and riskless firms, e.g., column (3) vs. (4)) is numerically close, potentially implying a stronger role for the VIX for bank risk-taking.

5.2. *Alternative Horizons for Firm Past Loan Default*

Our results are robust to using alternative horizons for past loan default to gauge firm riskiness (Table A2). 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 risky firms following a local policy tightening.

5.3. *An Alternative Measure of Local Monetary Policy Stance: Policy Rule Residuals*

So far, we condition changes in local monetary policy rate on domestic macroeconomic variables that are typical in monetary policy reaction functions for small open economies (real economic activity, inflation and real exchange rate). We remained concerned, though, on two fronts: First, local monetary policy may directly respond to global liquidity conditions. Second, 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). 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.

To mitigate such concerns, 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.[26] The estimated policy rule residuals are shown in Figure 3.

Our results are strongly robust to using monetary policy rule residuals (Table A3). Lower VIX makes banks with higher foreign funding raise their domestic and foreign currency loan rates significantly less following an unexpected local monetary policy tightening (as given by the estimated coefficients for the triple interactions). Moreover, such banks set lower rates for both risky and riskless firms (with the former receiving comparatively lower rates).

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

Corroborating our baseline results, softer global liquidity conditions matter particularly more strongly during episodes of local monetary policy tightening (Table A4). In particular, we re-

[26] 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.

estimate our baseline findings for monetary policy tightening and easing episodes separately.[27] 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 by 102 basis points 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 rate (column 1). For policy easing episodes, we find a much smaller effect, i.e., 21 basis points (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).

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

Given our findings that globally-funded domestic banks do carry-trade (borrow more from abroad at relatively cheaper rates) and 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 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.[28] $I(\text{Low Foreign Funding Bank}_{f,t-3})$ is an indicator variable that equals 1 if the largest bank from which the firm borrows at month $t-3$ has foreign funding ratio less than median bank; and 0 otherwise. 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 $t-3$, and log(Volume), the log value of the total outstanding amount of loans of a firm at month $t-3$.

[27] 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.

[28] 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.

Table A5 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 risky firms are more likely to switch to higher foreign funding banks after the policy tightening compared to riskless firms, a finding robust to using alternative horizons to gauge firm riskiness (columns 2 to 9). For our benchmark horizon of 36 months (columns 2 and 3), for instance, risky firms are 3.1% more likely to switch to globally funded domestic banks after the local policy tightening, whereas riskless firms are 2.1% more likely to switch.

6. Conclusion

There has been burgeoning evidence on the role of global financial cycles for local credit market conditions, which feeds into a lively debate, set forth by Rey (2013) and many following this seminal paper, about whether global liquidity limits the transmission of local monetary policy on credit markets. To our best knowledge, there is no evidence so far that exploits administrative loan-level data to tackle this question.

We use exhaustive loan-level data (the credit and international interbank market registers) – crucial to address the question– from a large emerging market economy, Turkey. We present robust evidence that softer global liquidity conditions attenuate the transmission of local monetary policy tightening on credit markets, particularly for banks with higher ex-ante reliance on global liquidity. The mechanism works through a bank carry trade: banks with prior access to foreign funding borrow more from abroad with relatively favorable interest differential after a local monetary policy tightening. Our results also imply that tighter local monetary policy induces higher bank risk-taking at home –through higher foreign borrowing by domestic banks and their softening of lending standards to ex-ante riskier borrowers, notably on FX loans– and that softer global liquidity conditions exacerbate these effects.

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	10.65	7.655	5.8	14.75	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	12.85	7.842	9.45	16	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	5.35	2.136	4	6.83	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	0.12	0	0.325	0	0	5,021,945
Independent Variables								
Macro-Level Variables								
Δ Policy Rate	Monthly change in the Monetary Policy Rate	%	-0.004	0	0.579	-0.226	0.171	5,021,945
Δ CPI	Year-over-year change in the consumer price index	%	8.199	8.102	1.611	7.241	9.228	5,021,945
Δ IPI	Year-over-year change in the industrial production index	%	3.656	3.939	5.998	1.726	6.5	5,021,945
Δ RER	Monthly change in the real effective exchange rate	%	-0.196	-0.027	2.639	-1.481	1.248	5,021,945
Global Macro-Level Variables								
log(VIX)	Natural logarithm of CBOE's volatility index on S&P500 index options	%	2.909	2.838	0.339	2.639	3.13	5,021,945
Shadow Federal Funds Rate	Shadow Federal Funds Rate, Wu-Xia(2016)	%	-0.412	-1.122	2.107	-1.524	0.37	5,021,945
log(Federal Reserve Assets)	Natural logarithm of Federal Reserve's total assets	million USD	14.825	14.889	0.543	14.648	15.31	5,021,945
log(US Monetary Base)	Natural logarithm of US Monetary Base	million USD	7.821	7.905	0.527	7.6	8.265	5,021,945
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	%	14.388	14.262	5.529	10.948	16.607	5,021,945
Capital Ratio	Total Equity to Total Assets	%	11.174	11.134	1.821	10.018	12.14	5,021,945
Liquidity Ratio	Liquid assets (cash + receivables from the central bank + interbank money market + reverse repo receivables) to total assets	%	27.093	26.66	7.551	21.824	32.19	5,021,945
Size	Natural logarithm of total assets	000s, TL	18.28	18.586	1.066	17.939	19.021	5,021,945
Additional Bank Controls								
ROA	Pre-tax net profit to total assets	%	1.22	1.171	0.498	0.908	1.552	5,021,945
NPL Ratio	Non-performing loans (with an overdue past 90 days) to total credit	%	0.679	0.522	0.627	0.18	0.968	5,021,945
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*	%	9.79	9.86	5.668	5.646	12.792	5,021,945
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	%	0.264	0.194	0.223	0.092	0.378	5,021,945
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	0.227	0	0.419	0	0	5,021,945
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	0.148	0	0.355	0	0	5,021,945
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	0.195	0	0.396	0	0	5,021,945
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	0.248	0	0.432	0	0	5,021,945
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	0.018	0	0.132	0	0	5,021,945
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	0.029	0	0.167	0	0	5,021,945
Financial Transactions Database (Cross-border borrowing)								
$\Delta \log(Volume_{bgc,t})$	Quarterly change in cross-border borrowing of domestic (borrower) bank b from global (lender) bank g in currency c (denominated in USD)	%	0.483	0	92.251	-6.364	5.738	105,846
$\Delta\ (i^*_{bgc,t})$	Quarterly change in interest rate of the cross-border borrowing of domestic (borrower) bank b from global (lender) bank g in currency c	%	-0.078	0	0.779	-0.1	0.032	89,722
Δ Interest Rate ($i^*_{bgc,t}$ - Policy Rate$_t$)	Difference between the interest rate of the cross-border borrowing of domestic (borrower) bank b from global (lender) bank g in currency c and local policy rate	%	-7.161	-6.814	3.098	-8.859	-4.846	89,722

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, respectively.

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)
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)*	**-33.01**	**-37.35**	**-37.16**	**-31.69**	**-29.62**	**-29.62**
By High vs. Low Capital Ratio Banks *(p75-p25)*				**-4.31**	**-4.53**	**-4.88**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*				**-4.15**	**7.95**	**7.60**
By Large vs. Small Banks *(p75-p25)*				**-0.14**	**-4.91**	**-4.83**

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 clustered at bank x 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)*		**-40.54**			**-53.08**			**-9.53**			**-41.63**
By High vs. Low Capital Ratio Banks *(p75-p25)*		**3.36**			**2.23**			**7.29**			**3.96**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*		**-4.80**			**-7.50**			**1.17**			**-5.39**
By Large vs. Small Banks *(p75-p25)*		**-0.82**			**-2.34**			**0.15**			**-0.28**

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 clustered at bank x 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:	Risky	Riskless	Risky	Riskless	Risky	Riskless	Risky	Riskless
	(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	--	--	--	--
Maturity x Collateral FE	--	--	--	--	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)*			**-45.79**	**-39.84**	**-55.83**	**-52.95**	**-13.30**	**-8.70**
By High vs. Low Capital Ratio Banks *(p75-p25)*			**1.85**	**4.03**	**1.39**	**2.90**	**7.43**	**7.05**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*			**-9.72**	**-3.87**	**-12.88**	**-6.44**	**0.12**	**1.41**
By Large vs. Small Banks *(p75-p25)*			**3.19**	**-2.07**	**4.38**	**-4.70**	**-0.13**	**0.28**

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 labeled as "risky" if the firm has defaulted on at least one loan during the 36 months period prior to borrowing, and "riskless" 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 clustered at bank x 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	TL	FX	All	TL	FX	All	TL	FX
	(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 I(Firm Risk)	--	--	--	--	--	--	--	--	--
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
Firm FE	--	--	--	--	--	--	--	--	--
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency x Maturity x Collateral FE	Yes	--	--	Yes	Yes	Yes	Yes	Yes	Yes
Maturity x Collateral FE	--	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 Risky vs. Riskless Firms									
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**-9.43**	**-7.17**	**-4.72**	**-10.56**	**-17.35**	**1.51**	**-4.53**	**-3.21**	**-5.28**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-6.44**	**-7.71**	**0.28**	**-5.45**	**-5.02**	**-1.77**	**-4.88**	**-3.32**	**-0.35**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-3.11**	**0.00**	**-3.80**	**6.91**	**7.60**	**-0.35**	**1.04**	**5.87**	**-3.80**
By Large vs. Small Banks *(p75-p25)*	**6.71**	**7.18**	**0.97**	**2.60**	**4.44**	**-1.80**	**8.87**	**8.40**	**2.49**

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 clustered at bank x firm and month level, and are given in parantheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 6: Other Credit Dimensions

	Other Loan Terms								
Dependent Variable:	Log(Volume)			Prob.(Short-Term)			Prob.(Non-Collateralized)		
Set of Firms:	All	Risky	Riskless	All	Risky	Riskless	All	Risky	Riskless
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Σ Δ MP * Foreign Funding Ratio$_b$ * log(VIX)$_t$	**-0.011****	**-0.006**	**-0.013*****	**0.011*****	**0.012*****	**0.01*****	**-0.006****	**-0.005**	**-0.005****
	(0.005)	(0.006)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$	**0.011**	**0**	**0.015**	**-0.033*****	**-0.031*****	**-0.031*****	**0.011****	**0.006**	**0.011****
	(0.01)	(0.014)	(0.011)	(0.006)	(0.008)	(0.006)	(0.006)	(0.008)	(0.005)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$	**-0.005*****	**0.001**	**-0.005*****	**0.000**	**0.001**	**0.000**	**0.004*****	**0.005*****	**0.004*****
	(0.002)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Σ Δ MP * Size$_b$ * log(VIX)$_t$	**0.065*****	**0.045*****	**0.064*****	**-0.018****	**-0.029*****	**-0.017***	**-0.012***	**-0.009**	**-0.011***
	(0.017)	(0.018)	(0.017)	(0.009)	(0.011)	(0.009)	(0.007)	(0.01)	(0.006)
Σ Δ MP * Foreign Funding Ratio$_b$	**0.025***	**0.011**	**0.031****	**-0.029*****	**-0.031*****	**-0.027*****	**0.016****	**0.013**	**0.014***
	(0.013)	(0.016)	(0.013)	(0.007)	(0.009)	(0.007)	(0.008)	(0.01)	(0.008)
Σ Δ MP * Capital Ratio$_b$	**-0.025**	**0.004**	**-0.039**	**0.092*****	**0.089*****	**0.087*****	**-0.032****	**-0.018**	**-0.032****
	(0.03)	(0.039)	(0.03)	(0.017)	(0.023)	(0.017)	(0.016)	(0.022)	(0.015)
Σ Δ MP * Liquidity Ratio$_b$	**0.014*****	**0.003**	**0.016*****	**0**	**-0.002**	**0**	**-0.013*****	**-0.014*****	**-0.012*****
	(0.006)	(0.008)	(0.006)	(0.004)	(0.005)	(0.004)	(0.003)	(0.005)	(0.003)
Σ Δ MP * Size$_b$	**-0.175*****	**-0.115****	**-0.173*****	**0.054***	**0.083*****	**0.05***	**0.04***	**0.028**	**0.039****
	(0.049)	(0.05)	(0.051)	(0.028)	(0.031)	(0.029)	(0.021)	(0.03)	(0.02)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$	**0.001**	**0.002**	**0.001**	**0**	**0**	**0**	**-0.002**	**-0.003***	**-0.002**
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
Σ log(VIX)$_t$ * Capital Ratio$_b$	**0.017*****	**0.038*****	**0.012****	**0.001**	**-0.003**	**0.002**	**-0.009*****	**-0.004**	**-0.008*****
	(0.006)	(0.009)	(0.006)	(0.004)	(0.006)	(0.004)	(0.003)	(0.004)	(0.003)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$	**0.001**	**-0.002**	**0.001**	**-0.002****	**-0.001**	**-0.002****	**0.002*****	**0.000**	**0.002*****
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Σ log(VIX)$_t$ * Size$_b$	**-0.038*****	**-0.027****	**-0.035*****	**-0.011***	**-0.004**	**-0.012***	**-0.008**	**0.009**	**-0.014*****
	(0.009)	(0.013)	(0.01)	(0.006)	(0.007)	(0.006)	(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	1,140,025	3,881,920	5,021,945	1,140,025	3,881,920	5,021,945	1,140,025	3,881,920
R-squared	0.673	0.632	0.685	0.483	0.439	0.496	0.543	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)*	**0.70**	**0.38**	**0.83**	**-0.70**	**-0.77**	**-0.64**	**0.38**	**0.32**	**0.32**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-0.26**	**0.00**	**-0.36**	**0.79**	**0.74**	**0.74**	**-0.26**	**-0.14**	**-0.26**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**0.59**	**0.12**	**0.59**	**0.00**	**-0.12**	**0.00**	**-0.47**	**-0.59**	**-0.47**
By Large vs. Small Banks *(p75-p25)*	**-0.79**	**-0.55**	**-0.78**	**0.22**	**0.35**	**0.21**	**0.15**	**0.11**	**0.13**

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 "risky" if the firm has defaulted on a loan during the previous 36 months, and "riskless" 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 clustered at bank x 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$_t$
	(1)	(2)	(3)	(4)
Σ Δ MP * Foreign Funding Ratio$_b$ * Global Variable$_t$	**0.634*** **	**-0.291*** **	**-0.317*** **	**0.065*** **
	(0.162)	(0.079)	(0.08)	(0.017)
Σ Δ MP * Capital Ratio$_b$ * Global Variable$_t$	**-0.14**	**-0.1***	**-0.104**	**0.02***
	(0.16)	(0.061)	(0.065)	(0.012)
Σ Δ MP * Liquidity Ratio$_b$ * Global Variable$_t$	**0.041**	**-0.011**	**-0.01**	**0.006**
	(0.027)	(0.019)	(0.02)	(0.004)
Σ Δ MP * Size$_b$ * Global Variable$_t$	**0.067**	**0.144**	**0.169**	**-0.036**
	(0.228)	(0.144)	(0.149)	(0.027)
Σ Δ MP * Foreign Funding Ratio$_b$	**-1.916*** **	**4.187*** **	**2.356*** **	**-0.086**
	(0.498)	(1.13)	(0.597)	(0.053)
Σ Δ MP * Capital Ratio$_b$	**0.213**	**1.292**	**0.616**	**-0.175*** **
	(0.442)	(0.885)	(0.499)	(0.056)
Σ Δ MP * Liquidity Ratio$_b$	**-0.119**	**0.184**	**0.097**	**0.019**
	(0.08)	(0.276)	(0.149)	(0.017)
Σ Δ MP * Size$_b$	**-0.225**	**-2.121**	**-1.307**	**-0.011**
	(0.697)	(2.112)	(1.146)	(0.081)
Σ Global Variable$_t$ * Foreign Funding Ratio$_b$	**0.126***	**-0.022**	**-0.022**	**-0.012**
	(0.064)	(0.035)	(0.036)	(0.008)
Σ Global Variable$_t$ * Capital Ratio$_b$	**-0.164*** **	**0.07**	**0.092**	**-0.036** **
	(0.065)	(0.07)	(0.073)	(0.016)
Σ Global Variable$_t$ * Liquidity Ratio$_b$	**-0.022**	**0.027** **	**0.035*** **	**-0.004***
	(0.016)	(0.012)	(0.013)	(0.002)
Σ Global Variable$_t$ * Size$_b$	**0.291*** **	**-0.057**	**-0.064**	**-0.011**
	(0.105)	(0.084)	(0.084)	(0.019)
Bank Variables x Global Variable	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	5,021,945	5,021,945
R-squared	0.633	0.632	0.633	0.633

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)	**-40.54**	**-29.81**	**-31.51**	**-25.83**
By High vs. Low Capital Ratio Banks (p75-p25)	**3.36**	**-3.84**	**-3.88**	**-2.98**
By High vs. Low Liquidity Ratio Banks (p75-p25)	**-4.80**	**-2.06**	**-1.82**	**-4.37**
By Large vs. Small Banks (p75-p25)	**-0.82**	**2.82**	**3.21**	**2.74**

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 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 clustered at bank x firm and month level, and are given in parantheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 8: Loans at the Origination –Newly Originated Loans–

Currency Type:	TL Loans				FX Loans			
Set of Firms:	All	All	Risky	Riskless	All	All	Risky	Riskless
	(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)*	**-47.16**				**-3.96**			
By High vs. Low Capital Ratio Banks *(p75-p25)*	**11.95**				**0.50**			
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**14.51**				**-0.69**			
By Large vs. Small Banks *(p75-p25)*	**-4.91**				**1.44**			
… when log(VIX)$_t$ is lower by 1 standard deviation								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*		**-55.95**	**-61.32**	**-56.34**		**-4.16**	**-11.83**	**-2.49**
By High vs. Low Capital Ratio Banks *(p75-p25)*		**-16.86**	**-17.55**	**-14.65**		**4.36**	**7.96**	**3.64**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*		**-25.18**	**-41.11**	**-21.79**		**1.05**	**2.69**	**0.94**
By Large vs. Small Banks *(p75-p25)*		**-2.14**	**0.10**	**-3.07**		**-0.86**	**0.20**	**-1.19**

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 "risky" if the firm has defaulted on a loan during the previous 36 months, and "riskless" 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 clustered at bank x firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table 9: 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*** **	**-0.00837*** **	**-0.0051*** **	**-0.0074*** **	**-0.00573*** **	**-0.00795*** **
	(0.00164)	(0.00156)	(0.00134)	(0.00146)	(0.00184)	(0.0017)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$	**0.00798** **	**0.01331*** **	**0.00831*** **	**0.01348*** **	**0.00679***	**0.01224*** **
	(0.00323)	(0.00328)	(0.003)	(0.00303)	(0.00352)	(0.00364)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$	**0.00054**	**0.00156*** **	**0.00089** **	**0.00156*** **	**0.00016**	**0.00131*** **
	(0.00048)	(0.00043)	(0.00037)	(0.00043)	(0.00059)	(0.00047)
Σ Δ MP * Size$_b$ * log(VIX)$_t$	**-0.00409**	**-0.00074**	**-0.01362** **	**-0.01356** **	**0.00009**	**0.0043**
	(0.00514)	(0.00479)	(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	0.502	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)	**0.39**	**0.54**	**0.33**	**0.47**	**0.37**	**0.51**
	[21.46]	[18.46]	[29.49]	[24.52]	[18.32]	[15.74]
By High vs. Low Capital Ratio Banks (p75-p25)	**-0.19**	**-0.32**	**-0.20**	**-0.32**	**-0.16**	**-0.29**
	[-10.63]	[-11.01]	[-18.02]	[-16.75]	[-8.14]	[-9.09]
By High vs. Low Liquidity Ratio Banks (p75-p25)	**-0.06**	**-0.18**	**-0.10**	**-0.18**	**-0.02**	**-0.15**
	[-3.51]	[-6.30]	[-9.43]	[-9.47]	[-0.94]	[-4.75]
By Large vs. Small Banks (p75-p25)	**0.05**	**0.01**	**0.17**	**0.17**	**0.00**	**-0.05**
	[2.78]	[0.31]	[15.06]	[8.59]	[-0.06]	[-1.63]

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 clustered at bank x firm and month level, and are given in parantheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

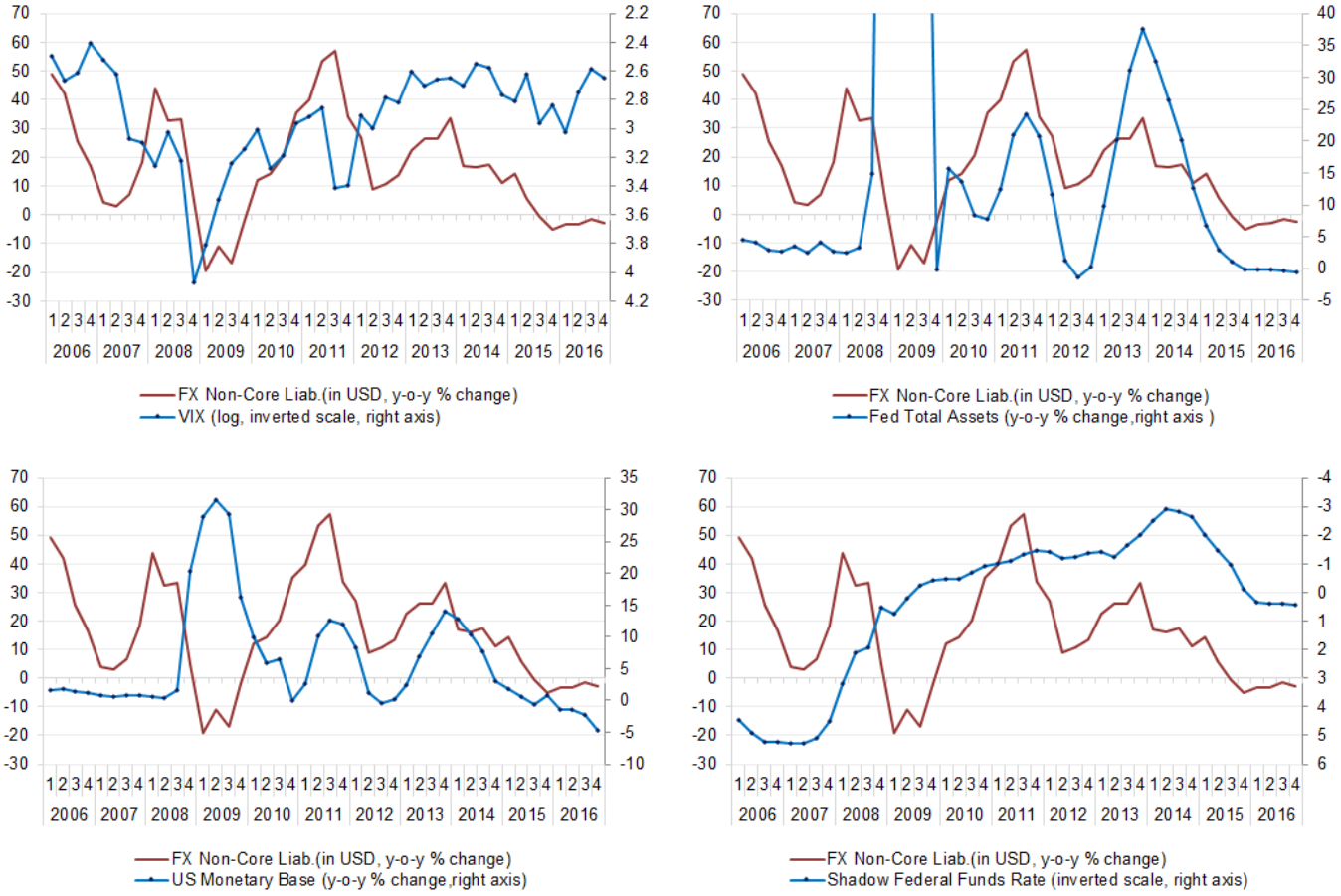
Table 10: Mechanism

Dependent Variable:	Δ log(Volume$_{bgc,t}$)			Δ ($i^*_{bgc,t}$)			Δ Interest Rate ($i^*_{bgc,t}$ - Policy Rate$_t$)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Σ Δ MP * Foreign Funding Ratio$_b$	**0.418****	**0.407***	**0.494****	**0.001**	**0.003***	**0.002**	**-0.004**	**-0.012*****	**-0.006****
	(0.19)	(0.215)	(0.227)	(0.001)	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)
Σ Δ MP * Capital Ratio$_b$	**-1.252***	**-0.91**	**-1.128**	**-0.016*****	**-0.031*****	**-0.029*****	**0.099*****	**0.044*****	**0.022****
	(0.655)	(0.802)	(0.849)	(0.005)	(0.007)	(0.007)	(0.018)	(0.011)	(0.01)
Σ Δ MP * Liquidity Ratio$_b$	**0.1**	**-0.041**	**-0.023**	**0.003*****	**0.006*****	**0.006*****	**0.092*****	**-0.009*****	**-0.004**
	(0.152)	(0.181)	(0.189)	(0.001)	(0.002)	(0.002)	(0.005)	(0.003)	(0.002)
Σ Δ MP * Size$_b$	**0.149**	**-0.527**	**-0.251**	**0.004**	**-0.024****	**-0.028*****	**-0.261*****	**0.082*****	**0.043*****
	(0.383)	(1.224)	(1.321)	(0.003)	(0.01)	(0.01)	(0.012)	(0.018)	(0.015)
Domestic (Borrower) Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro Controls x Domestic (Borrower) Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity 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	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Global (Lender) Bank x Year F.E.	No	No	Yes	No	No	Yes	No	No	Yes
Observations	105,846	105,846	105,846	89,722	89,722	89,722	89,722	89,722	89,722
R-squared	0.004	0.086	0.134	0.036	0.149	0.183	0.608	0.899	0.931
Impact of a Cumulative 100 bpts Increase in the Local Policy Rate on Domestic Banks' Cross Border Borrowing (in percentage terms)									
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*	**0.79**	**0.77**	**0.93**	**0.19**	**0.57**	**0.38**	**-0.75**	**-2.26**	**-1.13**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-0.89**	**-0.64**	**-0.80**	**-1.13**	**-2.19**	**-2.05**	**7.00**	**3.11**	**1.56**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**0.35**	**-0.14**	**-0.08**	**1.04**	**2.07**	**2.07**	**31.79**	**-3.11**	**-1.38**
By Large vs. Small Banks *(p75-p25)*	**0.05**	**-0.19**	**-0.09**	**0.14**	**-0.87**	**-1.01**	**-9.41**	**2.96**	**1.55**

Notes: The dependent variable is the quarterly change in the logarithm of bank b's volume of borrowing in currency c with loan-type a from global bank g (with headquarter country h) (columns 1-3), the quarterly change in the interest rate associated with the cross-border borrowing (columns 4-6), or the difference between the cross-border borrowing rate and local policy rate (columns 7-9). Transactions with no interest rate are excluded in columns 4-9. "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 clustered at global (lender) bank x domestic (borrower) bank level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

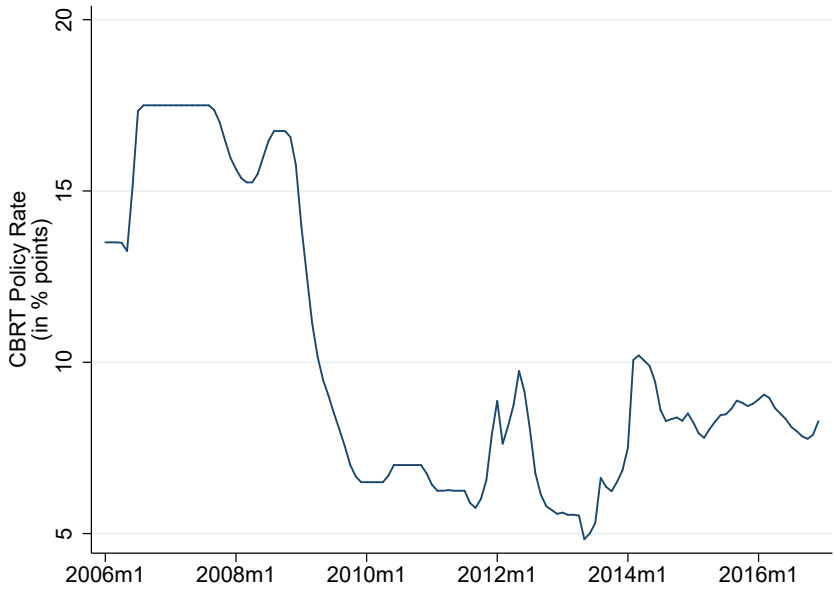
Figures

FIGURE 1: GLOBAL LIQUIDITY CYCLES AND TURKISH BANKS' NON-CORE FOREIGN-CURRENCY LIABILITIES



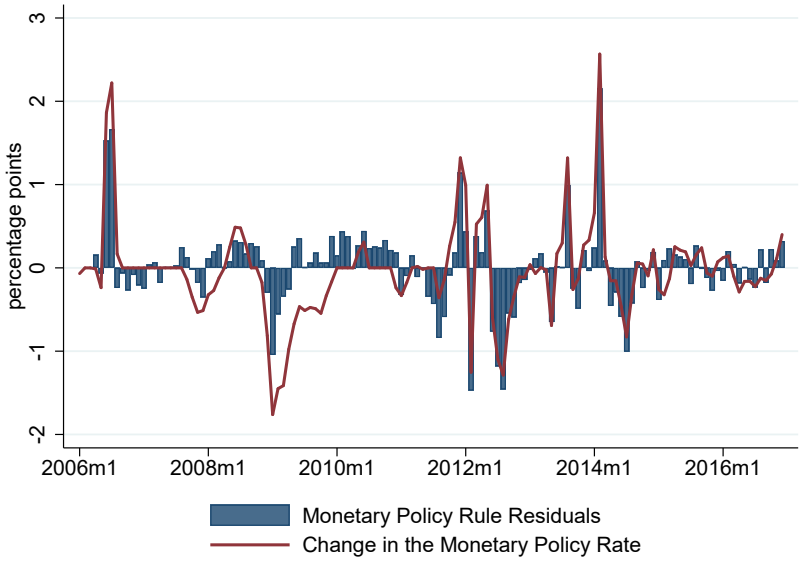
Notes. The figure shows the annual percentage change in non-core foreign-currency liabilities of deposit-taking Turkish banks against global liquidity indicators (used in the empirical analyses). Federal Reserve Total Assets have increased by over 150% in late 2008, hence not shown for scaling purposes.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

FIGURE 2: TURKISH MONETARY POLICY RATE



Notes. The figure shows the evolution of Central Bank of the Republic of Turkey 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), Kara (2015) and Binici et al. (2016) 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).

Appendix

Table A1: Bank Risk-Taking and Alternative Indicators for Global Liquidity

Global Variable$_t$:	log(VIX)$_t$		log(Fed Assets)$_t$		log(US Monetary Base)$_t$		Shadow Fed Funds Rate$_t$	
Horizon of Past Default:	36 months		36 months		36 months		36 months	
Set of Firms:	Risky	Riskless	Risky	Riskless	Risky	Riskless	Risky	Riskless
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Σ Δ MP * Foreign Funding Ratio$_b$ * Global Variable$_t$	**0.716*** **	**0.623*** **	**-0.288*** **	**-0.301*** **	**-0.317*** **	**-0.327*** **	**0.066*** **	**0.066*** **
	(0.185)	(0.159)	(0.092)	(0.078)	(0.095)	(0.079)	(0.02)	(0.016)
Σ Δ MP * Capital Ratio$_b$ * Global Variable$_t$	**-0.077**	**-0.168**	**-0.074**	**-0.084**	**-0.07**	**-0.091**	**0.023**	**0.016**
	(0.19)	(0.16)	(0.079)	(0.064)	(0.084)	(0.068)	(0.015)	(0.013)
Σ Δ MP * Liquidity Ratio$_b$ * Global Variable$_t$	**0.083****	**0.033**	**-0.024**	**-0.01**	**-0.024**	**-0.009**	**0.008****	**0.006**
	(0.036)	(0.025)	(0.019)	(0.021)	(0.019)	(0.022)	(0.004)	(0.004)
Σ Δ MP * Size$_b$ * Global Variable$_t$	**-0.261**	**0.169**	**0.214**	**0.107**	**0.248**	**0.131**	**-0.063***	**-0.026**
	(0.285)	(0.212)	(0.187)	(0.136)	(0.19)	(0.141)	(0.036)	(0.027)
Σ Δ MP * Foreign Funding Ratio$_b$	**-2.169*** **	**-1.879*** **	**4.14*** **	**4.331*** **	**2.36*** **	**2.429*** **	**-0.088**	**-0.084**
	(0.548)	(0.491)	(1.346)	(1.115)	(0.73)	(0.586)	(0.055)	(0.054)
Σ Δ MP * Capital Ratio$_b$	**0.022**	**0.303**	**0.925**	**1.059**	**0.364**	**0.509**	**-0.156*** **	**-0.179*** **
	(0.527)	(0.446)	(1.188)	(0.917)	(0.676)	(0.51)	(0.058)	(0.061)
Σ Δ MP * Liquidity Ratio$_b$	**-0.236****	**-0.097**	**0.382**	**0.161**	**0.208**	**0.085**	**0.026**	**0.019**
	(0.106)	(0.078)	(0.277)	(0.301)	(0.152)	(0.161)	(0.016)	(0.018)
Σ Δ MP * Size$_b$	**0.862**	**-0.577**	**-3.085**	**-1.613**	**-1.861**	**-1.042**	**0.03**	**-0.041**
	(0.855)	(0.644)	(2.76)	(1.994)	(1.488)	(1.087)	(0.094)	(0.081)
Σ Global Variable$_t$* Foreign Funding Ratio$_b$	**0.207*** **	**0.101**	**-0.106****	**0.001**	**-0.106****	**0.001**	**0**	**-0.016****
	(0.072)	(0.063)	(0.043)	(0.035)	(0.044)	(0.036)	(0.009)	(0.008)
Σ Global Variable$_t$* Capital Ratio$_b$	**-0.285*** **	**-0.128***	**0.17****	**0.04**	**0.209*** **	**0.059**	**-0.069*** **	**-0.026**
	(0.074)	(0.066)	(0.071)	(0.072)	(0.074)	(0.076)	(0.017)	(0.017)
Σ Global Variable$_t$ * Liquidity Ratio$_b$	**-0.002**	**-0.027***	**0.026**	**0.027****	**0.03***	**0.035*** **	**-0.005**	**-0.004***
	(0.019)	(0.016)	(0.016)	(0.012)	(0.016)	(0.013)	(0.003)	(0.002)
Σ Global Variable$_t$ * Size$_b$	**0.098**	**0.307*** **	**-0.121**	**-0.008**	**-0.109**	**-0.02**	**0.002**	**-0.024**
	(0.124)	(0.109)	(0.107)	(0.084)	(0.108)	(0.084)	(0.02)	(0.021)
Bank Variables x Global Variable$_t$	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	1,140,025	3,881,920	1,140,025	3,881,920
R-squared	0.599	0.643	0.598	0.643	0.598	0.643	0.598	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)*	**-45.79**	**-39.84**	**-29.50**	**-30.83**	**-31.51**	**-32.51**	**-26.23**	**-26.23**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**1.85**	**4.03**	**-2.84**	**-3.23**	**-2.61**	**-3.39**	**-3.43**	**-2.38**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-9.72**	**-3.87**	**-4.50**	**-1.88**	**-4.37**	**-1.64**	**-5.82**	**-4.37**
By Large vs. Small Banks *(p75-p25)*	**3.19**	**-2.07**	**4.19**	**2.10**	**4.71**	**2.49**	**4.79**	**1.98**

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 "risky" if the firm has defaulted on a loan during the previous 36 months, and "riskless" 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 clustered at bank x firm and month level, and are given in parantheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table A2: Alternative Horizons for Firm Past Default

Horizon of Past Default:	36 months		12 months		24 months		48 months	
Set of Firms	Risky	Riskless	Risky	Riskless	Risky	Riskless	Risky	Riskless
	(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)*	**-45.79**	**-39.84**	**-49.49**	**-39.77**	**-49.05**	**-39.26**	**-46.30**	**-39.71**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**1.85**	**4.03**	**-2.16**	**4.22**	**1.27**	**4.00**	**2.40**	**4.05**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-9.72**	**-3.87**	**-13.12**	**-3.98**	**-8.79**	**-3.98**	**-9.37**	**-3.75**
By Large vs. Small Banks *(p75-p25)*	**3.19**	**-2.07**	**7.48**	**-1.85**	**4.54**	**-1.99**	**3.44**	**-2.23**

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 "risky" if the firm has defaulted on a loan during the corresponding horizon of past default , and "riskless" 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 clustered at bank x firm and month level, and are given in parantheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table A3: Monetary Policy Rule Residuals

Currency Type:	TL Loans				FX Loans			
Set of Firms:	All	All	Risky	Riskless	All	All	Risky	Riskless
	(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)*	**-41.31**				**-5.66**			
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-19.03**				**0.00**			
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-4.15**				**-2.07**			
By Large vs. Small Banks *(p75-p25)*	**0.69**				**-1.73**			
… when log(VIX)$_t$ is lower by 1 standard deviation								
By High vs. Low Foreign Funding Ratio Banks *(p75-p25)*		**-49.11**	**-53.52**	**-47.90**		**-7.67**	**-11.51**	**-6.78**
By High vs. Low Capital Ratio Banks *(p75-p25)*		**-0.19**	**5.28**	**-1.49**		**5.73**	**4.92**	**5.68**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*		**-2.58**	**-6.56**	**-1.52**		**1.17**	**1.05**	**1.17**
By Large vs. Small Banks *(p75-p25)*		**-2.51**	**3.85**	**-5.18**		**0.44**	**2.01**	**0.20**

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 "risky" if the firm has defaulted on a loan during the previous 36 months, and "riskless" 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 clustered at bank x firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table A4: Asymmetries: Local Monetary Policy Tightening vs. Easing Episodes and Global Liquidity

Currency Type:	All Loans		TL Loans		FX Loans	
Local Monetary Policy Stance:	Tightening	Easing	Tightening	Easing	Tightening	Easing
	(1)	(2)	(3)	(4)	(5)	(6)
$\Sigma\,\Delta$ 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)
$\Sigma\,\Delta$ 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)
$\Sigma\,\Delta$ 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)
$\Sigma\,\Delta$ 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)
$\Sigma\,\Delta$ 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)
$\Sigma\,\Delta$ 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)
$\Sigma\,\Delta$ 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)
$\Sigma\,\Delta$ 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)*	**-101.93**	**-20.27**	**-131.67**	**-15.86**	**-7.16**	**-7.67**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-17.58**	**-13.52**	**-17.46**	**-26.66**	**-16.50**	**7.67**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-57.05**	**-13.00**	**-78.13**	**-19.44**	**2.69**	**-0.70**
By Large vs. Small Banks *(p75-p25)*	**28.61**	**-1.68**	**35.85**	**-3.97**	**1.91**	**-0.09**

Notes: The dependent variable is the interest rate on a loan extended by bank *b* to firm *f* with loan-type *a* . 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. 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 clustered at bank x firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Table A5: 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	Risky	Riskless	Risky	Riskless	Risky	Riskless	Risky	Riskless
Horizon of Past Default:		36 months		12 months		24 months		48 months	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Σ Δ MP	**0.023*** **	**0.031*** **	**0.021*** **	**0.032*** **	**0.022*** **	**0.034*** **	**0.021*** **	**0.03*** **	**0.021*** **
	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)
I(Low Foreign Funding Bank$_{f,t-3}$)	**0.149*** **	**0.155*** **	**0.148*** **	**0.146*** **	**0.15*** **	**0.149*** **	**0.149*** **	**0.155*** **	**0.148*** **
	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)
log(Number of Bank Relations)	**0.001**	**0.004**	**-0.001**	**0.010** **	**0.001**	**0.006***	**0.001**	**0.003**	**-0.001**
	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)
log(Volume)	**-0.001*** **	**-0.004*** **	**-0.001***	**-0.005*** **	**-0.001***	**-0.005*** **	**-0.001**	**-0.004*** **	**-0.001**
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
log(Maturity)	**0.012*** **	**0.017*** **	**0.011*** **	**0.015*** **	**0.011*** **	**0.018*** **	**0.011*** **	**0.017*** **	**0.011*** **
	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	212,856	41,869	170,987	26,614	186,242	35,669	177,187	46,219	166,637
R-squared	0.089	0.099	0.088	0.095	0.089	0.095	0.089	0.097	0.088
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**	**3.20**	**2.00**	**3.40**	**2.10**	**3.00**	**2.10**

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 "risky" if the firm has defaulted on a loan during the corresponding horizon of past default , and "riskless" 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(Maturity)* is log value of the average loan maturity of a firm at month *t-3* . *log(Volume)* is log value of the total outstanding amount of loans of a firm at month *t-3*."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. Robust standard errors are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

TABLE A6: BASELINE FINDINGS WITH THE BANK FOREIGN FUNDING RATIO MEASURED FIXED AT DECEMBER 2005

	(1)	(2)
Σ Δ MP * Foreign Funding Ratio$_b$ (2005m12) * log(VIX)$_t$		**13.45****
		(5.666)
Σ Δ MP * Capital Ratio$_b$ * log(VIX)$_t$		**0.349****
		(0.165)
Σ Δ MP * Liquidity Ratio$_b$ * log(VIX)$_t$		**0.076***
		(0.046)
Σ Δ MP * Size$_b$ * log(VIX)$_t$		**0.455****
		(0.193)
Σ Δ MP * Foreign Funding Ratio$_b$ (2005m12)	**-6.283****	**-44.457*****
	(2.607)	(16.983)
Σ Δ MP * Capital Ratio$_b$	**-0.156***	**-1.173****
	(0.08)	(0.486)
Σ Δ MP * Liquidity Ratio$_b$	**0.001**	**-0.238**
	(0.023)	(0.152)
Σ Δ MP * Size$_b$	**-0.2*****	**-1.424*****
	(0.066)	(0.553)
Σ log(VIX)$_t$ * Foreign Funding Ratio$_b$ (2005m12)	**8.313*****	**9.993*****
	(2.398)	(2.48)
Σ log(VIX)$_t$ * Capital Ratio$_b$	**-0.14**	**-0.128**
	(0.086)	(0.087)
Σ log(VIX)$_t$ * Liquidity Ratio$_b$	**-0.063*****	**-0.058*****
	(0.019)	(0.019)
Σ log(VIX)$_t$ * Size$_b$	**0.242****	**0.285*****
	(0.106)	(0.107)
Bank Variables x log(VIX)	Yes	Yes
Bank-Sector Control	Yes	Yes
Bank-Firm Control	Yes	Yes
Bank FE	Yes	Yes
Currency x Maturity x Collateral FE	Yes	Yes
Firm-Month FE	Yes	Yes
Observations	5,021,945	5,021,945
R-squared	0.629	0.630

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)*	**-17.09**
By High vs. Low Capital Ratio Banks *(p75-p25)*	**-8.37**
By High vs. Low Liquidity Ratio Banks *(p75-p25)*	**-8.90**
By Large vs. Small Banks *(p75-p25)*	**-5.56**

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 clustered at bank x firm and month level, and are given in parentheses. *** Significant at 1%, ** significant at 5%, and * significant at 10%.

Online Appendix (Not 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} + ... \\
& + \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} + ... \\
& + \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} + .. \\
& + \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} + ... \\
& + \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} + ... \\
& + \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} + ... \\
& + \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} + ... \\
& + \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} + ... \\
& + \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}
$$

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

FIGURE OA.1: COMPARISON: CBRT SAMPLE OF CREDIT REGISTER AND THE UNIVERSE (LOAN RATES)

Note. Solid lines correspond to the weigthed average loan rate for the CBRT sample of credit register, and solid lines with square markers correspond to the loan rate for the whole universe. The two series follow each other closely. TL denotes for Turkish liras. Source. Authors' own calculations and the Central Bank of the Republic of Turkey.

FIGURE OA.2: COMPARISON: CBRT SAMPLE OF CREDIT REGISTER AND THE UNIVERSE (SECTORAL DISTRIBUTION AND LOAN TYPES (MATURITY, COLLATERAL, CURRENCY, ETC.))

Note. Solid bars correspond to the ratio of loans extended to each category to total loans, for the CBRT sample of credit register. Bars with pattern correspond to the universe. In 2010, for instance, loans extended to the manufacturing sector constitute about 42% of loans regarding the CBRT sample of credit register, and 35% regarding the universe. Correlation between the two series ranges from 0.89 to 0.96. For the loan type categories (the second and the fourth figures), we report the categories that constitute more than 1% of total loans. Source. Authors' own calculations and the Central Bank of the Republic of Turkey.

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(Hülya Saygılı, Kemal Türkcan Working Paper No. 18/13, October 2018)