

# The Effect of Unconventional Monetary Policy on Cross-Border Bank Loans: Evidence from an Emerging Market

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We analyze the impact on cross-border credit of quantitative easing by the Federal Reserve, European Central Bank, and Bank of England. Relying on a comprehensive loan-level data set, we find that Fed QE strongly boosts cross-border credit granted to Turkish banks by banks located in the US, Euro Area and UK, while ECB and BoE QEs work moderately through banks in EA/UK and UK, respectively. In general QE works at the short end across bank locations and loan currencies, more strongly for weaker lenders and borrowers, and may have resulted in maturity mismatches at Turkish banks searching for yield. (99 words)

**Keywords:** bank lending channel; bank borrowing channel; monetary transmission; quantitative easing (QE); cross-border bank loans, micro-level data, capital requirements, financial deglobalisation

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# 1. Introduction

With the liberalization of the capital accounts and the deepening of the domestic financial markets, capital flows and their determinants have deservedly received more attention. The unprecedented magnitude of quantitative easing policies pursued by major Central Banks following the global financial crisis has further increased the attention.

International financial flows are of particular interest for emerging market economies. Indeed, a simple visual inspection of (nominal and real) exchange rates, credit cycles and international capital flows reveals a strong co-movement. Owing to the sensitivity of emerging economies to capital flows, determinants and the consequences of capital flows to emerging market have begun to be analyzed since 1990s.<sup>1</sup> Since then, financial globalization has continued relentlessly; all categories of cross-border flows to both advanced and emerging economies have increased exponentially (Lane and Milesi-Ferretti (2007)). Increased cross-border claims, generally accompanied by higher share of external funding in balance sheet of domestic economic units elevated the sensitivity of these economies to fluctuations in capital flows.

Growing evidence on the dominance of the “push factors” in driving the capital flows underlies the interest in central bank policies and developments in financial centers. Along these lines, Rey (2013) argues that the capital flows and credit cycles in international financial system are largely determined by the financial conditions set in the major financial centers, and irrespective of the exchange rate regimes, countries cannot pursue independent monetary policies unless the capital account is managed. Gathering a comprehensive historical cross country data, Reinhart and Reinhart (2009) for example document the decisive role of global factors on global capital flow cycles, and the close association of the latter with the crisis in emerging economies.<sup>2</sup>

Among the various types of capital flows, credit flows seems to be of greater importance in terms of its implications for financial stability of the recipient countries. Milesi-Ferretti and Tille (2011) finds that the countries with higher degree of international financial integration and higher reliance to bank flows hit worst by the retrenchment in capital flows following the global financial crisis. Consistent with this finding, Rey (2013) documents that among different kinds of capital flows, credit flows are the most strongly related to the global financial cycle. Further decomposing the bank

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<sup>1</sup> See for example Calvo, Leiderman and Reinhart (1996).

<sup>2</sup> Indeed, the view that push factors play a decisive role in capital flows also finds wide acceptance among policy makers. Rajan (2015) proposes that large central banks reinterpret their mandate in a way to internalize both the short and long term spillover effects of their policies. Along the same lines, Fischer (2015) states the importance of internalizing spill-back effects of US policies.

claims (credit flows) reveals that the bulk of bank claims are on banks again. Indeed, as underlined in the relevant literature, the link between the capital flows and the financial crises is mostly established through the increase in recipient countries' banking system leverage and ensuing rapid credit growth (Lane and McQuade (2014)).

Considering the strong consequences of capital flows on recipient countries and the relative importance of bank to bank flows in total flows, this paper estimates both the diffusion channels (by bank location and currency for example) and transmission mechanism of quantitative easing policies of three major central banks. In particular, we study bank-to-bank flows to Turkey. With its financial markets highly integrated with world capital markets and the dominance of the domestic banking sector in channeling foreign funds to the domestic economy, the Turkish economy presents a suitable example for investigating the monetary policy spillovers through cross-border bank flows. More importantly, our unique data set allows us to address important yet unanswered questions in the related literature.

Our data span the 2008-2014 period, and focus on the effects of quantitative easing (QE) policies implemented by three major central banks, i.e., the Federal Reserve (Fed), the European Central Bank (ECB), and the Bank of England (BoE). The sheer size of the QE operations and their direct implications on the financial markets as well as the banking sector liquidity, make this episode a convenient window for evaluating the spill-over effects and transmission mechanisms of monetary policies of major Central Banks.<sup>3</sup> We have access to bank-to-bank loan-level data including detailed information on both the debtor and creditor banks and the loan terms. In particular, our data set includes balance sheet, nationality and residency information of both borrowers and lenders, and individual loan maturity, currency and type. Exploiting the granularity of the data set, we answer questions left unaddressed in the literature due to the data limitations. Hence, our results go well beyond the exploration of a single country case.

In particular, we address the following questions:

(1) "Did QE policies of Fed, ECB and BoE affect the size of the cross-border bank loans received by Turkish Banks?";

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<sup>3</sup> In an attempt to mitigate the effects of the 2008 global financial crisis, central banks of major advanced economies initially cut their interest rates. However, these policies proved inadequate though policy rates hit the zero lower bound, hence the central banks started to pursue unconventional monetary policies. They employed several rounds of QE with various asset purchase programs, which resulted in abundant amount of liquidity in global as well as domestic markets (Appendix Tables A1, A2 and A3). Those operations inflated the balance sheets of the major central banks and their ratio to respective country's GDP – an indicator of monetary expansion – enormously (Graph 1a).

- (2) “Do the lender banks located at a different country other than the QE policy originating, play a role in transmitting the spillover effects of that QE policies?”;
- (3) “Is the effect of QE policy of a certain central bank limited only to the flows denominated in its respective currency?”;
- (4) “Did the increased cross-border lending resulting from the QE policies concentrated on certain maturities?”, and with respect to transmission channels;
- (5) “What type of lender banks in advanced countries utilized the improved liquidity conditions most?”; and
- (6) “What type of borrower banks (located in Turkey) utilized the improved liquidity conditions most?”.

While some of our results replicate previous findings in the extant literature with Turkish data, (though by using a uniquely comprehensive data set enabling us to control robustly for demand and/or supply side factors), most of our estimates are novel. Indeed, the majority of the studies related to monetary policy spillovers through cross-border bank lending focus on US case and investigate the effects of (pre-crisis and/or post-crisis) Fed policies on the international claims of US banks. These studies unanimously find that US monetary policy is one of the most important drivers of cross border lending by US banks.<sup>4</sup> Studies on the monetary shocks engineered by other major Central Banks, (ECB, BoE and BoJ) also point out to a significant spillover effect through cross-border bank lending.<sup>5</sup> In line with the extant literature, our analyses yield a clear answer to the first question, that is, QE policies of Fed, ECB and BoE significantly affected the cross-border lending to Turkish banks. In addition, with respect to their effectiveness Fed QE stands out, followed by ECB and BoE QEs.<sup>6</sup>

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<sup>4</sup> Correa and Murry (2009) documents the effects of US monetary policy on the cross-border lending of US banks. Cetorelli and Goldberg (2012) find that monetary policy shocks in US spill-over to other countries through the fund flows between the US parent banks and foreign offices. Temesvary, Ongena and Owen (2015) document the spillover effects of US monetary policy transmitted both through internal and external capital markets.

<sup>5</sup> Cerutti, Claessens and Ratnovski (2014) find that ECB and BoE monetary policy (represented by real policy rates and slope of the yield curve) is effective on cross-border lending, albeit substantially lower in impact compared to Fed policies. Using data from post-global financial crisis (2012-2015) period, Takáts and Temesvary (2016) show that ECB and BoJ monetary policies are also stimulating cross-border bank flows. Morais, Peydró and Ruiz (2017) investigate the effects of policy shocks in US, Eurozone and UK on the lending of global banks headquartered in those countries to their respective banks in Mexico through their subsidiaries. For all three central banks, they document positive spill-over effects through internal capital markets.

<sup>6</sup> In line with the studies focusing on BoE QE, our results imply that the large hike in regulatory capital adequacy ratio coinciding with the expansionary monetary policies, substantially curtailed the BoE QE on cross-border lending. Forbes, Reinhardt and Wieladek (2016) give a detailed description of the policies that could subdue UK headquartered banks' cross-border lending despite the extremely loose monetary policy stance followed after the global financial crisis. They surmise that in addition to a hike in the regulatory capital adequacy ratio (CAR), the lending for funding scheme has been also

Addressing the second question, we try to understand how the QE policies affect the cross-border claims of lenders (on Turkish banks) with respect to their residence/nationality. To our best knowledge, Avdjiev, Subelytė and Takáts (2016) and Takáts and Temesvary (2016) are the only papers that investigate a similar question. To explore the role of “currency networks” in cross-border bank lending, those papers measure the effects of Fed, ECB and BoE monetary policy shocks on the cross-border bank lending denominated in their respective currencies. Their results suggest that even if the lender and borrower system is not located in the country where the policy shock originates, cross-border lending denominated in a hard currency responds to the monetary shocks of the issuing central bank. To this end, we grouped the lender banks, first according to their country of residence, second with respect to their headquarter locations (nationality) and finally according to the HQ location–bank location combinations.<sup>7</sup> Our results suggest that in addition to banks located/headquartered in their own countries, QE of Fed and ECB also affected the cross border lending of banks, which are located / headquartered outside US and EA, respectively. However, BoE QE affects only UK headquartered banks. Besides, according to our estimations Fed QE has been more effective both in terms of the magnitude and the geographical reach of non-resident/non-native banks’ cross border lending to Turkey. Furthermore, we also test whether the cross-border lending of global banks received primarily by their affiliates. Our results suggest that irrespective of their relationship with the lender bank all banks located in Turkey increased their borrowing. In other words, both internal capital markets and external capital markets were operative in transmitting the spillover effects.

Our third question, whether the monetary shocks in one hard currency affect the international lending in another hard currency has not yet been investigated in the literature. In principle, this is possible; by directly relieving the global liquidity conditions, QE policies were easing the global banks’ access to liquidity. For instance, Fed QE directly improved the liquidity position of the banks holding US assets. However, the link needs not to be that direct. A US- or EU-headquartered bank, which now can more easily raise liquidity, would feel more comfortable to enlarge its claims on domestic or international borrowers, in any currency. Indeed, our results confirm the existence of such a spillover effect. According to our findings, Fed QE has stimulated cross-border lending not only in US dollar (USD) but also in euro (EUR) and British pound (GBP). On the other side improved liquidity in EUR

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instrumental in suppressing cross-border lending of UK Banks. Aiyar, Calomiris, Hooley, Korniyenko and Wieladek (2014) provide evidence on the negative effects of CAR on cross-border lending of UK banks.

<sup>7</sup> See Figure 1 for the grouping of all banks according to nation-location combinations.

seems to be effective only in EUR and GBP denominated cross-border lending. Lastly, BoE QE effect is found to be limited to GBP denominated cross-border lending only.

The fourth question is motivated by the potential financial stability implications of the maturity of cross-border bank borrowing for the recipient country. From the perspective of the lender banks, and according to “search for yield” or “risk taking channel”, one could argue that the maturities of new flows would lengthen in time as was observed for the other margins. However, our findings suggest that QE policies of all three central banks have increased short-term lending. This result in our view does not *per se* negate the existence of a search for yield motive or risk taking channel, but suggest that the borrower motives could also be important in determining the terms of the loans.<sup>8</sup>

After exploring the location and the currency dimension, in other words, the diffusion channels of QE stimulated cross-border bank lending, we investigate the precise mechanism through which QE policies impact the cross-border bank lending. In particular, we check whether the international bank-lending channel is operative. Relying on our detailed data set, which includes bank characteristics of both lenders and borrowers, we are able to check transmission mechanism both from the perspective of lenders and borrowers. While the extant literature provides evidence on the potency of a global bank lending channel (e.g., Cetorelli and Goldberg (2012), Cerutti, Claessens and Ratnovski (2014), Coleman, Correa, Feler and Goldrosen (2014), Ioannidou, Ongena and Peydró (2015), Ongena, Schindele and Vonnák (2015), Morais, Peydró and Ruiz (2017)), the global borrower bank channel has so far been overlooked. By shedding light on the international bank borrowing channel, our paper makes a novel contribution to the related literature.

Our identification strategy for the international bank lending (borrowing) channel is based on Khwaja and Mian (2008),<sup>9</sup> and on the proposition that less-capitalized and illiquid banks exhibit a stronger response to changes in domestic liquidity conditions than their well-capitalized and liquid peers as in Kashyap and Stein (2000). Having bank-level data on the borrower (lender) side at monthly frequency allowed us to confidently control for demand (supply) side factors. Results suggest that effects of QE policies of loans are significantly stronger for less-capitalized and liquidity-constrained lender and borrower banks. In other words, while less-capitalized and illiquid lender banks expand more loans, less-capitalized and illiquid borrower banks also acquire more loans. Therefore, we find strong evidence the existence of global bank lending and borrowing channels.

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<sup>8</sup> Indeed, for the determination of currency denomination of the credit flows borrowers' preferences may dominate (Avdjiev, Subelytė and Takáts (2016)).

<sup>9</sup> One needs to examine the same recipient bank borrowing from lender banks with different ex-ante exposures to QE in order to identify the global bank lending channel. Similar identification strategies have also been used in the related literature, though in different contexts. See, for instance, Iyer, da-Rocha-Lopes, Peydró and Schoar (2014) and Temesvary, Ongena and Owen (2015).

The rest of the paper is organized as follows. Section 2 specifies the empirical methodology and describes the structure of the used datasets. Section 3 provides relevant background on the cross-border bank credit in Turkey, Section 4 presents the empirical results of the estimations and Section 5 summarizes the results and provides the policy implications of our findings.

## **2. Data Set and Methodology**

We use three novel data sets for our empirical analysis: loan-level data on borrowing by Turkish banks from international banks, bank-level balance sheet data of Turkish banks, and bank-level balance sheet data of lender international banks. We obtain the first two data sets from the Central Bank of the Republic of Turkey (CBRT), and the last one from Fitch. All data sets cover the period of October 2008 and December 2014. While the first two data sets have a monthly frequency, the last one has a quarterly frequency.

At the macro level, we use data on macro variables both for Turkey and lender countries as well as global liquidity variables. Macro variables from Turkey include: industrial production index, domestic interest rates, inflation, and real exchange rate. Lender country variables comprise real GDP growth, inflation, policy rate of the related central bank, and real exchange rate. Global liquidity variables include VIX, US real policy rate, real credit growth, and total M2 growth rate of four finance centers (US, ECB, UK and Japan). These variables allow us to control for the business cycles and monetary policy stance in Turkey and lender countries, and to better isolate changes in QE from other changes in economic activity or monetary conditions. The definitions of the variables, data sources, and summary statistics are given in Table 1.

We merge loan-level data on borrowing from international banks to Turkish banks with the bank-level balance sheet data sets of Turkish banks and lender banks. This data set consists of detailed information on the cross-border bank loans that are borrowed from 143 countries and 1,046 banks or institutions in the various types of loans such as credit, deposit, credit for foreign trade finance, syndicated loans, securitization, repo and subordinated loans. In addition to the lender country and lender bank or institution, the dataset includes information on the volume, type, currency, interest rate, beginning, and maturity date of a loan. The country of a direct lender as well as its headquarter and if available, the country of a guarantor bank are also available in the dataset. The volume of loans can also be acquired as flow or stock. Lender country information is provided according to the ISO-Swift BIC Directory. However, there is no standardization (in terms of a unique identifier) related to the lender banks or institutions since we have only their names (some banks`

names are entered in different ways). Therefore, we match identities of lender banks manually. During this process, we proceed very carefully in order to prevent possible mistakes. Therefore, we think that our dataset is very unique in terms of characteristics of loans and supply side information as well as extensive amount of hand work.

Our first main objective is to understand how QE policies of major central banks affect to Turkish banks' cross-border loans. To do so, we use the following model:

$$(L_{ialcmf,t}) = \beta_0 + \sum_{k=1}^3 \beta_k (QE)_{t-k}^{Fed} + \sum_{k=1}^3 \gamma_k (QE)_{t-k}^{ECB} + \sum_{k=1}^3 \rho_k (QE)_{t-k}^{BoE} + \xi_1 (Bank)_{i,t-1}^{borrower} + \xi_2 (Bank)_{l,t-1}^{lender} + \xi_3 (Country)_{t-1}^{borrower} + \xi_4 (Country)_{c,t-1}^{lender} + \xi_5 (Global)_{t-1} + \lambda_i + \alpha_a + \eta_l + \theta_c + \mu_m + \zeta_f + \varepsilon_i$$

$(L_{ialcmf,t})$  denotes the natural logarithm of Turkish banks' (i) stock cross-border loans borrowed from country  $a$  and lender bank  $l$  with loan type  $c$ , maturity  $m$  and currency type  $f$  at time  $t$ . The QE variable denotes the quantitative easing policies of Fed, ECB and BoE, calculated as the ratio of total assets to respective country's GDP at time  $t$ . We include three lags of QE.<sup>10</sup> We also include the bank-specific variables for borrower and lender banks, the macroeconomic indicators related to Turkish economy and lender countries, and global liquidity indicators that have the potential to affect cross-border bank loans.  $\lambda_i$ ,  $\alpha_a$ ,  $\eta_l$ ,  $\theta_c$ ,  $\mu_m$  and  $\zeta_f$  denote the fixed effects for borrower bank  $i$ , lender country  $a$ , lender bank  $l$ , loan type  $c$ , maturity  $m$ , and currency type  $f$ .

Our second main objective is to understand how QE is transmitted to Turkish banks via cross-border loans. Therefore, we extend our model and use the following model:

$$(L_{ialcmf,t}) = \beta_0 + \sum_{k=1}^3 \beta_k (QE)_{t-k}^X + \sum_{k=1}^3 \gamma_k (QE)_{t-k}^X * C_{j,t-k} + \sum_{k=1}^3 \delta_k (C)_{j,t-k} + \xi_1 (Bank)_{i,t-1}^{borrower} + \xi_2 (Bank)_{l,t-1}^{lender} + \xi_3 (Country)_{t-1}^{borrower} + \xi_4 (Country)_{c,t-1}^{lender} + \xi_5 (Global)_{t-1} + \lambda_i + \alpha_a + \eta_l + \theta_c + \mu_m + \zeta_f + \varepsilon_i$$

Since we try to identify the channel through the QE policies of major central banks affect the Turkish banks' cross-border loans, we include the solvency and liquidity indicators of lender or

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<sup>10</sup> Our use of lagged values of the bank funding ratios ensures that these ratios may at most reflect past strategic choices of banks. The inclusion of three lags of the monthly QE changes ensures that we capture the cumulative effect of expansionary monetary policy shocks throughout the previous quarter. While the use of one lag with quarterly data sets has become standard in the literature, we also repeat the analysis using six and twelve lags of the monetary policy shocks to cover previous six months or year, and find that our results are robust to changes in the number of lags used.



borrower banks, and their interactions with the QEs. Therefore,  $C$  denotes the lender or borrower bank's net worth or liquidity ratio defined as capital ratio or liquid assets over total assets ratio, respectively. We also include three lags of net worth or liquidity ratio and their interactions in the model.

Since we aim to identify the global bank lending and borrowing channels of QE by controlling demand and supply sides separately, we also add *borrower bank\*time* for the global bank lending channel and *lender bank\*time* fixed effects for the global bank borrowing channel to the model. *Borrower bank\*time* fixed effects allow us to examine whether for the same borrower bank in the same month, the loans offered by different lender banks depend on QE. In this case, we control exhaustively for unobserved time-varying borrower bank fundamentals (such as creditworthiness, balance sheet characteristics etc.). This will restrict our sample to the borrower banks with at least two lender-bank relationships. Similarly, *lender bank\*time* fixed effects allow us to explore whether for the same lender bank in the same month differentiate the loans borrowed by different borrower banks with QE.

We also control exhaustively for unobserved time-varying lender bank fundamentals (such as risk appetite, balance sheet characteristics etc.). Moreover, we saturate our the regressions including the double interactions of all macro variables (Turkey, lender country and global liquidity variables) with the net worth or liquidity ratio variables of lender or borrower banks depending on the channel investigated.

### **3. An Overview of Cross-Border Borrowing by Banks in Turkey**

In this section we briefly present some important aggregate figures related to the cross-border borrowings of Turkish banks. Cross-border borrowings of Turkish Banks reached to USD 141 billion as of December 2014 from USD 11 billion in 2002, implying approximately a 1,300 percent increase in 12 years. Except a short period starting from the global financial crisis and lasting one year, the upward trend in the outstanding volume of foreign funding continued uninterrupted. Consequently, as of end-2014, the share of foreign funding in total liabilities reached to 19 percent, which is a historical high (Graph 2a and 2b).

USD has always been the dominant currency in Turkish Banks' foreign borrowings. Its share has further increased after 2010 (Graph 3a and 3b). On the other hand, in terms of the location of the lender banks, UK located banks lead the volume of intermediation, followed by Euro Area and US located banks (Graph 4a and 4b). In sum, most of the USD denominated debt of Turkish banks is due

to UK and Euro Area located banks. Furthermore, majority of those lender banks (which are based in UK or Euro area) are not headquartered in US (Graph 5a and 5b).

Graph 6a and 6b shows the historical amount of loans lent by US, UK and Euro Area headquartered and based banks to the Turkish banks, respectively. US headquartered banks carry out their international activities via their subsidiaries in UK and Euro Area. Moreover, European banks also carry out their international activities via their subsidiaries in UK.

Graph 7a and 7b show the amount of USD and EUR denominated loans of US based and headquartered banks, respectively.<sup>11</sup> In the aftermath of the QE policies, while USD denominated funding have increased rapidly in the US, the increase in EUR denominated loans have been more limited.

Graph 10a depicts the evolution of maturity structure of cross-border bank loans. Following the QE policies, short-term debt piled up rapidly while the long-term borrowings were subdued. After mid-2013, however, long-term borrowings began to pick up while the short-term borrowings decelerated. Graph 10b indicates that within the same period, the rise in short-term foreign exchange (FX) assets fell behind that of short-term FX liabilities, implying that Turkish banks increased maturity mismatch risk in FX denominated assets and liabilities.

## **4. Estimation Results**

### **A. Main Estimates**

Table 2a presents the effects of QE policies on cross-border borrowing by Turkish Banks. In all the specifications presented in Table 2a, we include fixed effects for borrower and lender banks, lender countries, maturities, loan and currency types to control non-monetary shocks and unobservable factors. In Column 2, in addition to the QE variables, we also include the macroeconomic indicators related to Turkey and the lender countries, and global liquidity indicators. Finally, in Column 3, we add lender and borrower bank variables.

Columns 1 through 3 show that QE policies of Fed and ECB increased the cross border borrowings of Turkish banks with Fed policies significantly more effective than that of ECB's. Controlling for lender and borrower bank variables (column 3) in addition to global and country

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<sup>11</sup> Graph 8a and 8b indicate the amount of USD and EUR denominated loans of Euro Area based and headquartered banks, respectively. The graph clearly shows that in the aftermath of the QE policies, not only USD but also EUR denominated funding have increased rapidly in the Euro Area. Moreover, Graph 9a and 9b show the amount of USD and EUR denominated loans of UK based and headquartered banks, respectively. Similarly, graph suggest that in the aftermath of the QE policies, not only USD but also EUR denominated funding have increased rapidly in the UK.

specific macro variables (column 2) do not change those results significantly.<sup>12</sup> However, results suggest that unlike the QE policies of those two central banks, QE policies of BoE's decreased the cross border borrowings of Turkish Banks in all above-mentioned specifications. Several papers focusing on the effects of BoE's QE, document that UK banks did not increase cross-border lending in response to BoE's QE policies due to the coinciding ratcheting up of regulatory capital adequacy ratios and the "Lending for Funding Scheme".<sup>13</sup> The importance of this observation for our regressions stems from the strikingly high correlation between the capital adequacy ratio (CAR) and BoE assets (Graph 1b). Hence, omitting the regulatory CAR might potentially yield misleading results as to the role of BoE's QE. Hence, we rerun the regressions now including CAR in the set of explanatory variables. As documented in columns 4 to 6, with the inclusion of CAR in the regressions, the sign of the BoE's QE turned to positive while other results remained same except that in new regressions relative effectiveness of Fed policies became even more pronounced.<sup>14</sup>

Quantitatively, a 1 standard deviation expansion in the assets held by the Fed (relative to the US GDP) causes a cumulative 7 (column 1) to 21 (column 3) percent increase in the outstanding volume of cross-border loans lent out to Turkish banks. Similarly, a 1 standard deviation increase in the ECB's assets (relative to the EA GDP) increases the volume of loans by 3 (column 1) to 7 (column 3) percent. After controlling the CAR policies of BoE, results also suggest that a 1 standard deviation increase in the BoE's assets leads to a cumulative 3 to 7 percent increase in cross-border borrowings of Turkish banks, effects which statistically significant at the 1 percent level and robust to various changes in model specification.

Regarding the qualitative aspect, our results confirm the findings of previous studies focusing on the implications of QE policies on international capital flows. Although the results depend on the data of a single recipient country, our unique data set allow us to control a larger set of variables i.e., identifying the loans based on borrower bank, lender country, lender bank, loan type, maturity and

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<sup>12</sup> There are many studies about the drivers of global cross-border bank lending, e.g., Giannetti and Laeven (2012), de Haas and van Lelyveld (2014), De Haas and Van Horen (2013), Buch, Koch and Koetter (2013), Cerutti, Claessens and Ratnovski (2014), Cerutti, Hale and Minoiu (2015) and McCauley, McGuire and Sushko (2015). However, exploring the effects of changes in monetary policies of major central banks on the global banks' cross-border lending activity is a particular important research topic recently. Bremus and Fratzscher (2015) for example show that quantitative easing policies in the home countries have encouraged cross-border lending, not only in Euro Area but also in non-Euro Area countries, while Temesvary, Ongena and Owen (2015) find that quantitative easing policies of the Fed significantly increased the US banks' bilateral cross-border flows. Moreover, there also exists a rich literature that investigate lending to emerging markets more specifically, e.g. Cetorelli and Goldberg (2011), Schnabl (2012), Ongena, Peydró and van Horen (2015), Avdjiev, Subelytė and Takáts (2016). Morais, Peydró and Ruiz (2017) for example find that expansionary monetary policy of major central banks, Fed, ECB and BoE, increases the supply of credit of foreign banks to Mexican firms.

<sup>13</sup> Forbes, Reinhardt and Wieladek (2016) who investigate the UK example of "deglobalization" in cross-border bank lending, show that due to the regulatory policies (minimum capital requirement) and unconventional policies (funding for lending scheme) and their interaction resulted in a substantial contraction in UK cross-border lending.

<sup>14</sup> We kept BoE's CAR in the set of explanatory variables in all of the following estimations.

currency type, and controlling the time-variant and -invariant effects stemmed from these parameters.<sup>15</sup>

The granularity of our data allows us to differentiate the cross border bank flows according to the location and nationality of lender banks, currency denomination of the loans and finally the maturity of the loans (Table 2b).

We find that Fed policies have been effective in stimulating cross-border bank flows (received by Turkish Banks) regardless of the location and/or headquarters of the lender banks. Indeed, considering the headquarters, Fed QE is found to be more effective on the cross-border lending of EA and UK headquartered banks than it is on US banks. The impact range of ECB QE is narrower than that of Fed; as only UK and EA headquartered banks are found to be responding to ECB easing. BoE QE has the weakest impact on the cross-border flows, as the BoE spillovers transmitted through only UK headquartered banks. In quantitative terms, a 1 standard deviation expansion in the assets held by the Fed increases the loans from banks headquartered in US, EA and UK and by 10, 22 and 15 percent, respectively. Therefore, we can conclude that compared to ECB and BoE, unconventional monetary measures implemented by Fed have made a great contribution to loosen global liquidity conditions.

When locations of the lenders considered, the picture remains almost the same, except that Fed QE does not seem to be significantly more effective in the EA or UK compared to the US.

Those findings are in line with the previous studies which highlighted the special role of USD in trade and financial transactions. As documented also by BIS data, banks located in EA and UK (and elsewhere outside the US) also lend USD denominated loans (Graph 5a and 5b). Indeed, the greater portion of cross-border bank flows directed to Turkey from EU and UK located / headquartered banks is denominated in USD (Graphs 5a through 9b).<sup>16</sup>

In columns 7 through 9, we examine how cross-border bank flows (independent of the location of lender banks) denominated in different currencies, namely USD, EUR and GBP, were affected by the three different central banks.<sup>17</sup> The dominant role of Fed QE also emerges in the currency

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<sup>15</sup> To our knowledge our work is the first to take in consideration the QE policies of major central banks simultaneously, and then document the effects on the cross-border banks loans in an emerging market. Moreover, the strong financial linkages of Turkish banks with these three regions, namely US, EA and UK, make Turkey an excellent empirical laboratory to identify and compare the effects of major central banks' unconventional monetary policies.

<sup>16</sup> Shin (2012) points out the dominant role of the European banks intermediating funds US to the rest of the world, and emphasizes that cross-border banking has been closely associated with the activity of European global banks that borrow in US dollars from money market funds in the United States. Moreover, Cerutti, Claessens and Ratnovski (2014) also find the significant role of US monetary policy and EA and UK bank conditions in global financial cycle.

<sup>17</sup> Avdjiev, Subelytė and Takáts (2016) show the importance of currency network in cross-border bank lending by examining the currency networks. They find that currency networks in cross-border bank lending have a significant impact on the size,

dimension of the flows. Presumably, expansionary policies implemented by major central banks loosen the liquidity and funding conditions more in their respective currency. Our findings show that Fed QE affected not only USD denominated but also EUR and GBP denominated flows. Whereas ECB's QE in addition to EUR denominated flows, increases USD flows as well presumably related to Eurodollar activity (albeit with a weak statistical significance), albeit small in magnitude. Similar to the results on lender headquarter / location exercises, BoE QE has the narrowest range of influence such that only GBP denominated flows are stimulated by BOE policies.

One noteworthy observation in those findings is that the Fed QE has relatively stronger impact on EUR flows compared to the ECB. This could be another manifestation of the findings stressing that Fed policies plays a crucial role in global liquidity conditions. With the Fed QE policies, representing the unprecedented example of Fed loosening, liquidity conditions for US and non-US headquartered banks improved substantially. This in turn bolstered the intermediary capacity of all global banks regardless of their location and enabled them to extent more loans in any currency.

Finally, the last two columns of Table 2b present the results for maturity dimension of the cross-border borrowing by Turkish banks. The results presented in columns 10 and 11 indicate that QE policies of Fed, ECB and BOE, have been effective on short-term loans. In quantitative terms, a 1 standard deviation expansion in the assets held by the Fed, ECB and BoE cause a cumulative 20, 7 and 5 percent increase in short-term loans, respectively. Moreover, Fed QE has been also effective on long-term lending, but with a negative effect. Considering the increased demand for longer maturities in the bond market following the QE policies, which brought asset returns down to unprecedented levels, our findings might be regarded at odds with the search for yield channel of capital flows. In subsequent sections we made additional analyses to better understand this finding.

### ***B. A Closer Look to the Lender Bank Locations***

In the previous analysis, location and the nationality of lender banks were handled separately. As shown by Figure 1, significant portion of the banks located in major financial centers are the affiliates of parent banks headquartered in other regions. Although those regressions provide information on the range of influence in term of geographic dimension of the three Central Banks in focus, they do not match the locations and nationality of banks.<sup>18</sup> To this end, we separated the

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distribution and direction of cross-border monetary policy spillovers. For the international role of the US dollar and the transmission of US funding and monetary shocks to foreign banks' balance sheets, see Bruno and Shin (2015).

<sup>18</sup> Unlike other previous studies, Avdjiev, Subelytė and Takáts (2016) have distinguished among the headquarters of the lending banks. In this regards, to identify lenders, we need to identify not only the location of lender banks but also the location of headquarters of these banks.

lender banks into nine groups according to nationality-location combinations (Figure 1). Columns 1 through 3 of Table 2c represent the effects of QE policies on the loans borrowed from US, EA and UK headquartered banks, which are located in US, respectively. Similarly, Columns 4 through 9 represent the effects of QE policies on the loans from US, EA and UK headquartered banks located in the EA and UK, respectively.

Fed QE increases the lending of all 9 groups; that is, in addition to US located / headquartered banks, lenders who are located and headquartered outside the US, also increased their lending (to Turkish banks). Another notable finding is that US headquartered banks channeled their funding mostly through EA and UK located subsidiaries. ECB QE is effective on banks either located or headquartered in EA. For instance, among US located banks, only the EA headquartered ones responded to the ECB QE (column 3). On the other hand, BoE QE has been effective only on UK headquartered banks.

As an additional analysis, we combined the lender location and currency denomination dimension of the cross-border loans. As the results presented in Table 2d suggest, Fed QE increased cross-border lending from all three locations in all three currencies. ECB QE increased only EUR lending but from all three locations. Only exception where ECB QE stimulated USD lending is the EA located banks (presumably lending in Eurodollars). BoE have been effective through loans borrowed from banks located in EA and UK. BoE's QE have been effective most significantly on GBP denominated loans and through both EA and UK located banks. According to the results of nationality-residence regressions (Table 2c) EA located banks responding to BOE QE most likely to be UK headquartered.

In a subsequent analysis, we check the role of the recipient banks' affiliation in the increased volume of cross-border borrowing, in other words, the relative role of internal capital markets versus external capital markets. To explore this question with our data set, we first separated the borrower banks in Turkey with regards to partnership structure (as depicted in Figure 3). Columns 1 through 3 in Table 2e represent the effects of QE policies on the loans borrowed by the affiliates of US, EA and UK headquartered banks, respectively. Results suggest that each QE policy increased lending not only to affiliates (when considered singularly in Table 2e (1) or jointly in (2)) but also other banks including the ones headquartered in Turkey (in (2)). In other words, Fed and ECB QE increased the borrowing by all banks in Turkey independent of the ownership of the bank. Our results diverge from those of Morais, Peydró and Ruiz (2017), who for the case of Mexico, finds that monetary policy shocks induced by major Central Banks spill over through the lending of headquarters in the source country

to their subsidiaries in Mexico (i.e., U.S. monetary policy affects the credit supply of US banks' subsidiaries located in Mexico).

### ***C. Supply Side Channels***

Various transmission mechanisms were proposed to explain the link between QE policies and international capital flows. Risk taking and search for yield are commonly accepted as potential drivers of capital flows. In addition to these two motives, the volume effect through the bank-lending channel has also been conjectured to be important in observed spillover effects through cross-border loans. Our data set allows us to test for the existence of the bank-lending channel by using a comprehensive set of controls made possible by the granularity of the data.

Table 3a shows the channels through which the QE policies of Fed, ECB and BoE affect the lender banks with different capitalization levels by including the interaction of the QE with the capital ratio of the lender banks. We control the demand side by including *borrower bank-time* fixed effects, which enables us to identify the supply side and the existence of global bank lending channel. In all our specifications, we also include fixed effects for lender countries, maturities, loan and currency types to control non-monetary shocks and unobservable factors. In the first four columns we extend the set of explanatory variables gradually; in column 2 we include lender country variables, in column 3 we control for lender bank variables, on top of these, in column 4 we include the interaction of lender bank's capital ratio with all macroeconomic indicators in order to control for the business cycles or monetary conditions of Turkey and lending countries.

Results indicate that bank-lending channel was operative in transmitting the effects of QE policies of Fed and ECB. Banks with lower capital ratios increase their lending more compared to their well-capitalized counterparts. For BoE's QE, on the other hand, the bank-lending channel seems to be muted. Results show that less-capitalized banks responded more in terms of cutting cross-border loans. This result points out the importance of BoE's prudential regulation on cross-border lending because less-capitalized banks have been more inclined to cushion their cross-border lending as a result of micro-prudential policies in order to guarantee their CAR.

In columns 5 to 8 we run the same regressions after including regulatory minimum CAR levels in UK. With the inclusion of CAR, the relevant interaction term turns negative implying that bank-lending channel was also operative in the UK case as well.

To give an idea on the economic relevancy of the bank lending channel; the impact of a 1 standard deviation increase in Fed QE is 4 to 5 percent higher for less-capitalized banks (at the 25<sup>th</sup> percentile of capital ratio) compared to well-capitalized banks (at the 75<sup>th</sup> percentile of capital ratio).

Similarly, the impact of a 1 standard deviation increase in ECB QE is 1 to 4 percent higher for less-capitalized banks compared to well-capitalized banks.

In Table 3b, we repeat the same specifications as in Table 3a (columns 5 to 8) using the liquid assets over assets ratio as our measure of bank liquidity. Results provide us a strong evidence of the global bank-lending channel in cross-border bank loans. In other words, liquidity constrained lender banks exhibit a stronger response to QE than their liquidity-abundant counterparts. Quantitatively speaking, the impact of a 1 standard deviation increase in QE of Fed and ECB is respectively 7 and 5 percent higher for illiquid banks (at the 25<sup>th</sup> percentile of liquidity distribution) compared to liquidity-abundant banks (at the 75<sup>th</sup> percentile of liquidity).

#### ***D. Demand Side Channels***

Our analysis thus far has focused on the supply side of cross border lending, and we explore the existence of global bank lending channel. However, our data set also enables us to extend our study to assess the role of borrower bank characteristics. Therefore, we take one further step towards exploring the demand side or the existence of “global borrowing channel” by controlling supply side using *lender bank-time* fixed effect. Previous results indicated that QE policies supported the lender banks cross border bank supply, that is, the favorable liquidity effects of QE policies has been transmitted to Turkish banks. With this exercises, now we try to answer whether the “bank-lending channel” is also at work for borrower banks. To the best of our knowledge, our work is the first to document the working of the “global borrowing channel” through cross-border bank flows. By exploring the demand side, our results will complement the findings of aforementioned studies.

The first four columns of Table 4a, present the estimations investigating the existence of bank lending channel where banks’ capacity to raise liquidity resembled by banks’ capitalization ratio. As documented in detail in the table, through column 1 to 4 we expand the set of explanatory variables. We control for the supply side by including *lender bank-time* fixed effects to identify the demand side and the existence of global bank borrowing channel. The interaction term between borrower bank capital and QE included to identify the existence of “bank borrowing” channel obtain a negative sign at 1 percent significance level for all Central Bank QEs. Hence, the results suggest that less capitalized banks tended to borrow more with QE policies (while also the potential relevance of Eurodollar markets is again apparent). In other words, the results provide us with strong evidence of the global bank borrowing channel. The impact of a 1 standard deviation increase in Fed QE is 3 percent higher for less-capitalized (25<sup>th</sup>) banks compared to well-capitalized (75<sup>th</sup>) ones.



We ran the same specifications using liquidity positions of borrower banks instead of capitalization ratios. Columns show that liquidity constrained borrower banks exhibit a stronger response to the QE than their liquidity-abundant counterparts. Quantitatively, the impact of a 1 standard deviation increase in QE of Fed is 3 percent higher for illiquid (25<sup>th</sup>) borrower banks compared to liquid ones (75<sup>th</sup>). Hence, both exercises are supportive of the existence of a global borrowing channel.

### ***E. Lender and Borrower Banks with Different Ratios***

In the previous section, we show the existence of global bank lending and borrowing channels. In other words, results suggest that the cross-border flows of liquidity-constrained lender and borrower banks are affected by QE policies of major central banks significantly more than their liquidity-abundant counterparts. At this point, we try to analyze whether liquidity-constrained lender banks extended loans more to the liquidity-constrained or liquidity-abundant borrower banks. Therefore, in Table 5, we check the channels through which the QE policies of Fed, ECB and BoE affect the lender and borrower banks with different equity, liquidity and NPL ratios by including the interaction of the QE with the lender and borrower bank's respective ratios simultaneously.

Columns 1 through 3 represent the lender and borrower banks' equity, liquidity and NPL ratios, respectively. Results suggest that while liquidity-constrained lender banks extend more credit to the liquidity-constrained borrower banks, liquidity-abundant lender banks extend more credit to the liquidity-abundant borrower banks with QE policies of Fed and ECB. However, results also suggest that liquidity-abundant lender banks extend more credit to the liquidity-constrained borrower banks with the BoE QE due to uncontrolled effects of BoE's CAR policies. Therefore, we can conclude that banks with weak capital structure, low liquid asset ratio and poor asset quality that could not borrow at the desired level during illiquid period due to their weak ratios start to search for yield and borrow more during when the liquidity conditions become more favorable as a result of expansionary monetary policies of major central banks. At the same time, not only relatively weak borrower banks but also relatively weak lender banks start to search for yield and lend more during this liquid period. More strikingly, the increased borrowing and lending relationship in this period mainly stem from the relation between liquidity-constrained lender and borrower banks that both have weak ratios.

### ***F. Maturity and Risk-Taking Analysis***

Our results presented in Table 2b (Columns 10 and 11) clearly indicate that short-term cross-border loans respond more strongly to QE policies. Aggregated data in presented Graph 10a also

confirm the disproportional increase in short-term versus long-term cross border borrowing in the aftermath of the QE policies.

It might be the case that as global banks are not sure how long the favorable liquidity conditions emanating from QE policies would prevail, they might have preferred to keep their assets relatively liquid. However, that finding ostensibly is inconsistent with search for yield argument at the side of the lender banks, as better liquidity positions coupled with lower returns in advanced countries should have spurred the banks to lend at longer maturities where they can get higher returns. Indeed, that was happened in the bond markets as investors moved to the long-end of the yield curve in an attempt to elevate their returns. We conjecture that this observation could be the very result of risk taking motive but driven by borrower banks. Aggregate figures also support this argument. According to Graph 10b Turkish banks' maturity mismatch increased drastically in the aftermath of the QE policies. Hence, shortening maturities on the liability side owing mostly to the cross-border borrowing is not a reflection of changes in the asset side.<sup>19</sup>

To test whether the borrower banks are the ones who took on more maturity mismatch risk, we regress the (natural logarithm of) maturity of Turkish Banks' cross-border borrowing on QE and bank specific variables. Column 1 and 2 of Table 6 indicate that the average maturity of Turkish banks cross-border borrowing shortened with the QE policies of Fed, ECB and BoE. In fact, a 1 standard deviation increase in the assets held by Fed, ECB and BoE causes a cumulative 4, 6 and 1 percent decrease in the length of maturity, respectively. These effects are also statistically significant at a 1 percent level.

Columns 3 through 4 in Table 6 implies that liquidity constrained and less-capitalized lender banks have lent with relatively in shorter maturities than their liquidity-abundant and well-capitalized counterparts with QE policies of Fed and ECB. For example, the impact of a 1 standard deviation increase in the assets held by Fed and ECB on the length of maturity is 18 and 21 percent higher for less-capitalized banks compared to well-capitalized banks, respectively. Moreover, the percentage change in the maturity a 1 standard deviation increase in QEs of Fed and ECB are 19 and 7 percent higher for illiquid banks than liquid banks.

Similarly, columns 5 through 6 in Table 6 imply that liquidity constrained and less-capitalized borrower banks have borrowed at relatively shorter maturities than their liquidity-abundant and

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<sup>19</sup> Fed's monetary policy may have substantial spillovers in emerging markets' credit cycles such as excessive bank risk-taking (Rey (2013)). Expansive monetary policy rates may promote higher risk-taking by banks and other financial institutions due to the search-for-yield incentives (e.g., Adrian and Shin (2011), Allen and Rogoff (2011), Borio and Zhu (2012), Dell'Ariccia, Laeven and Marquez (2014), Jiménez, Ongena, Peydró and Saurina (2014), Ioannidou, Ongena and Peydró (2015), Dell'Ariccia, Laeven and Suarez (2016)).

well-capitalized counterparts with QE. For example, the impact of a 1 standard deviation increase in QEs of Fed and ECB on maturity is 17 and 10 percent higher for less-capitalized banks compared to well-capitalized banks. Moreover, the percentage change in the maturity following a 1 standard deviation increase in QE is 5 to 2 percent higher for illiquid banks than liquid banks.

It is hard to establish whether short term borrowing is driven by the risk appetite of the borrower or risk averseness of the lender, but the results imply that relatively weaker lenders lent to relatively weaker borrowers at short maturities. This observation suggests yet another reason why cross-border bank to bank flows are highly procyclical and potentially destabilizing for the recipient countries.

## 5. Robustness Checks

A possible concern with our results is that we use the natural logarithm of stock cross-border loans. To further check for robustness, we re-estimate the main results using the yearly change of the cross-border loans and QE policies. We use the yearly change in logarithmic value of stock cross-border loans as a dependent variable, and yearly change in the ratio of total assets to respective country's GDP as explanatory variables. The results indicate that our main findings are mostly robust to the specification used in the model.

First of all, we estimate the same specifications as in Table 2a and 2b. Table 7a represents the results. The estimation output tabulated in columns 1 and 2 cover all cross-border bank loans, while in the subsequent columns loans are separated according to location of the lender bank (columns 3 through 5), currency denomination of the loan (columns 6 through 8), and maturity of the loan (columns 9 and 10), respectively. Columns 1 and 2 show that QE policies of Fed, ECB and BoE increased the cross-border loans received by Turkish banks. Columns 3 through 5 suggest that Fed's QE have been effective in stimulating cross-border bank lending in all three regions. Similarly, while ECB QE has increased lending by both EA and UK located banks; BoE was effective only through the banks located in UK. All in all, the results suggesting that QE policies pursued by the Fed and ECB had significant repercussions beyond their borders are in line with previous results. Column 6 through 8 show that QE policies of Fed and ECB affect all USD, EUR and GBP denominated flows. Similarly, in addition to GBP, BoE's QE affects EUR denominated loans as well. Columns 9 and 10 indicate that while short-term loans increased with QE policies of Fed, ECB and BoE, long-term loans decreased with Fed QE. Interestingly, results suggest that ECB QE have affected not only short-term loan but also long-term loans, albeit with a more limited impact. Overall, similar to previous results, estimates

indicate that QE policies of major central banks have significant impacts on cross-border bank loans, and QE policies pursued by Fed and ECB had significant repercussions beyond their borders.

Secondly, we estimate the same specifications as in Table 3 and 4, which show the existence of lending and borrowing channels. Table 7b and 7c represents the results for lending and borrowing channels, respectively. Table 7b provides us a strong evidence of the global bank lending channel in cross-border bank loans. Columns 1 through 4 show that less-capitalized lender banks exhibit a stronger response to the QE policies than their well-capitalized counterparts. Moreover, Columns 5 through 7 indicate that liquidity constrained lender banks exhibit a stronger response to the QE than their liquidity-abundant counterparts.<sup>20</sup>

Table 7c provides us a strong evidence of the global bank borrowing channel in cross-border bank loans. Columns 1 and 2 show that less-capitalized borrower banks exhibit a stronger response to the QE than their well-capitalized peers. Moreover, Columns 3 and 4 indicate that liquidity constrained borrower banks exhibit a stronger response to the QE than their liquidity-abundant counterparts. Overall, similar to previous results, the results with new specifications provide us a strong evidence of the global bank lending and borrowing channels in cross-border bank loans.

## 6. Conclusion

International capital flows have strong consequences for recipient countries, especially for emerging economies. It is well documented that international capital flows are driven to a significant degree by the developments in financial centers, where monetary policy plays a decisive role. Thus understanding the diffusion channels and transmission channels of monetary policy spillovers is of critical importance. Among the different types of capital flows, of particular interest is cross-border bank-to-bank lending due to both its large share in total and highly procyclical pattern.

Focusing on the QE policies of Fed, ECB and BoE, this paper traces the spillover effects of monetary policies through cross-border bank loans received by banks located in Turkey. In this context, we analyze both the diffusion channels and transmission mechanism of QE policies through bank-to-bank cross-border flows. Having loan level data, matching lender and borrower banks and the detailed information on the location, nationality and balance sheet data of both counterparties we have been able to conduct an in-depth analysis of monetary spillovers.

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<sup>20</sup> In Columns 1, 2 and Columns 5, 6, we don't control control the CAR policies of BoE. Therefore, these columns argue the opposite of the above results for the BoE's QE since we do not control for the CAR of the BoE.

With respect to diffusion channels, we find that (i) among the three, Fed QE has been the most dominant, followed by ECB and BoE, respectively; (ii) Fed and ECB QE has stimulated the cross border lending even from banks not headquartered and/or not located in the source country, whereas BoE QE is effective only for UK headquartered banks, with again the Fed QE effect on lending from all regions being significantly stronger; (iii) dominance of Fed QE prevails over currencies as well: Fed QE stimulates lending in all three currencies, whereas ECB QE stimulates lending in USD and EUR albeit with much less in magnitude and BoE QE is effective only on GBP denominated flows, (iv) increased borrowing by recipient banks were not limited to the affiliates of global banks, all banks increased their cross-border borrowing irrespective of the ownership structure.

In addition to stimulating the cross-border lending independent of the country fundamentals, all QE policies are found to stimulate short-term lending (borrowing). This finding should be added to the list of established destabilizing aspects of global banking flows.

In terms of the transmission mechanism, in addition to international bank lending channel we investigate the bank-lending channel from the perspective of the borrower side as well, which to our knowledge has not been investigated in the extant literature before. Our identification strategy is based on the hypothesis that less-capitalized and illiquid banks exhibit a stronger response to changes in liquidity conditions than their counterparts. We find that less-capitalized and illiquid lender banks expand more loans with QE policies. Similarly, on the borrower bank side our results suggest that less capitalized and less liquid banks have utilized the improved supply conditions more. This finding suggest another explanation as to why the bank-to-bank flows potentially destabilizing, as the liquidity conditions reverse weaker lenders and borrowers would be the ones hit most.

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**Table 1**  
**Summary Statistics**

<b>Variable Names</b>	<b>Definition</b>	<b>Source</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Min.</b>	<b>10%</b>	<b>25%</b>	<b>50%</b>	<b>75%</b>	<b>90%</b>	<b>Max.</b>
<b><u>Dependent Variables</u></b>												
The Amount of Cross-border Bank Loans (Million USD)	The natural logarithm of Turkish banks' stock cross-border loans borrowed from country a and lender bank (l) with loan type c, maturity m and currency type f at time t	CBRT	185,754	7.30	3.46	0.00	1.95	4.80	8.06	10.00	11.23	15.00
Maturity of Cross-border Loans (day)	The natural logarithm of maturity of Turkish banks' stock cross-border loans borrowed from country a and lender bank (l) with loan type c at time t	CBRT	293,833	3.70	1.61	0.00	1.10	3.43	3.53	4.52	5.89	9.83
<b><u>Independent Variables</u></b>												
Fed's QE	Ratio of Federal Reserve's total balance sheet assets to US GDP	FED	185,755	19.35	3.88	12.36	14.95	15.92	18.18	23.29	25.47	25.62
ECB's QE	Ratio of European Central Bank's total balance sheet assets to Euro Area GDP	ECB	185,755	23.47	3.94	18.91	19.81	20.35	21.78	26.46	30.86	31.62
BoE's QE	Ratio of Bank of England's total balance sheet assets to UK GDP	BoE	185,755	19.56	4.04	7.32	15.02	15.74	21.73	23.15	23.90	24.89
UK's CAR	Quarterly change in the UK-resident banks' capital requirements that refer to both Pillar 1 and Pillar 2.	BoE	147,208	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.01
<b><u>Borrower Bank Variables</u></b>												
Borrower Bank Capital Ratio	Capital divided by total assets	CBRT	185,755	0.12	0.02	0.06	0.10	0.11	0.12	0.13	0.14	0.24
Borrower Bank Liquidity Ratio	Selected FX liquid assets divided by total assets (Selected FX liquid assets = cash + foreign banks(free) + receivables from CBRT, interbank money market, reverse repo transactions)	CBRT	185,755	0.07	0.03	0.02	0.04	0.05	0.07	0.09	0.12	0.28
Borrower Bank Total Assets	The natural logarithm of real total bank assets	CBRT	185,755	12.82	1.01	8.51	11.40	12.35	13.26	13.52	13.63	13.80
Borrower Bank Credit Ratio	Total loans divided by total assets	CBRT	185,755	0.58	0.07	0.27	0.48	0.54	0.59	0.63	0.67	0.83
Borrower Bank Deposit Ratio	Total deposits divided by total assets	CBRT	185,755	0.57	0.06	0.39	0.49	0.54	0.57	0.61	0.64	0.83
Borrower Bank ROA Ratio	Bank net profit divided by total assets	CBRT	185,755	0.02	0.01	-0.02	0.01	0.01	0.02	0.02	0.02	0.04
Borrower Bank NPL Ratio	Bank non-performing loans divided by bank total loans	CBRT	185,755	0.03	0.02	0.01	0.02	0.02	0.03	0.04	0.06	0.12
S-T Liabilities over S-T Assets	Bank short term liabilities divided by short term assets	CBRT	185,710	0.69	0.10	0.24	0.56	0.63	0.69	0.76	0.81	1.01
<b><u>Lender Bank Variables</u></b>												
Lender Bank Capital Ratio	Capital divided by total assets	Fitch	104,600	0.08	0.04	-0.04	0.03	0.05	0.07	0.10	0.12	0.52
Lender Bank Liquidity Ratio	Bank liquid assets divided by total assets (liquid assets = trading securities and at FV through income + loans and advances < 3 months + loans and advances to banks < 3 months)	Fitch	104,600	0.13	0.12	0.00	0.00	0.03	0.11	0.18	0.28	1.37
Lender Bank Total Assets	The natural logarithm of total bank assets	Fitch	103,762	12.48	2.34	3.74	9.57	11.05	13.30	14.33	14.71	15.17
Lender Bank Credit Ratio	Total loans divided by total assets	Fitch	103,762	0.48	0.18	0.00	0.24	0.35	0.49	0.63	0.70	0.92
Lender Bank Deposit Ratio	Total deposits divided by total assets	Fitch	103,762	0.63	0.15	0.00	0.43	0.53	0.64	0.76	0.82	0.96
Lender Bank ROA Ratio	Bank net profit divided by total assets	Fitch	104,600	0.16	1.43	-8.27	0.00	0.00	0.01	0.01	0.02	16.71
Lender Bank NPL Ratio	Bank non-performing loans divided by bank total loans	Fitch	104,600	0.03	0.04	0.00	0.00	0.01	0.03	0.04	0.09	0.73



Table 1 (continued)

Variable Names	Definition	Source	N	Mean	SD	Min.	10%	25%	50%	75%	90%	Max.
<b>Turkey(TR) Macro Variables</b>												
Δ Industrial Production	Monthly change in industrial production index (used instead of GDP due to discrepancy of frequencies)	TurkStat	185,755	0.73	8.44	-17.00	-9.85	-4.36	-0.56	7.44	12.57	21.46
Inflation Rate	Monthly change in consumer price index	TurkStat	185,755	8.02	1.75	4.00	5.57	6.63	8.16	9.21	10.43	11.93
Δ BIST o/n Interest Rate	Monthly change in Istanbul Stock Exchange(BIST) over/night interest rate	TurkStat	185,755	-0.05	1.64	-6.37	-1.16	-0.53	-0.01	0.23	0.79	7.27
Δ REER	Monthly change in real effective exchange rate based on consumer price index	TurkStat	185,755	-0.21	2.78	-12.26	-3.88	-1.58	0.10	1.41	2.84	5.97
<b>Lender Country Variables</b>												
Real GDP Growth	Yearly change in real GDP	IMF	130,908	2.07	3.60	-14.74	-2.47	0.47	2.30	4.01	6.01	19.30
Inflation Rate	Quarterly change in consumer price index	IMF	139,378	-0.02	1.49	-11.85	-1.14	-0.44	-0.01	0.47	1.18	11.04
Δ Policy Rate	Quarterly change in policy interest rate	IMF	131,552	-0.05	0.65	-4.75	-0.44	0.00	0.00	0.00	0.25	9.00
Δ REER	Quarterly change in real effective exchange rate	IMF	122,521	0.00	3.82	-76.24	-2.32	-1.06	0.17	1.11	2.41	17.55
<b>Global Liquidity Variables</b>												
Δ VIX	Monthly change in CBOE S&P 500 volatility index	Bloomberg	185,755	-0.09	4.86	-10.20	-4.45	-2.22	-0.34	0.90	3.27	31.37
Δ US real policy rate	Monthly change in US real effective federal funds rate	Bloomberg	185,755	0.03	0.45	-2.13	-0.43	-0.26	0.06	0.30	0.47	2.09
US real credit growth	Real private credit growth in US	Bloomberg	185,755	2.91	2.78	-5.60	-0.35	1.46	3.01	5.34	5.93	8.42
Total M2 growth	Total M2 growth rate of four financial centers(US, ECB, UK and Japan)	Bloomberg	185,755	3.12	3.96	-2.70	-1.46	0.27	1.88	5.57	8.92	13.84
<b>US-resident Lender Bank Variables</b>												
Lender Bank Capital Ratio	Capital divided by total assets	Fitch	9,282	0.09	0.03	0.00	0.05	0.07	0.09	0.10	0.11	0.26
Lender Bank Liquidity Ratio	Bank liquid assets divided by total assets (liquid assets = trading securities and at FV through income + loans and advances < 3 months + loans and advances to banks < 3 months)	Fitch	9,282	0.09	0.08	0.00	0.01	0.03	0.07	0.14	0.18	0.52
Lender Bank Total Assets	The natural logarithm of total bank assets	Fitch	9,268	13.69	1.06	6.30	12.27	12.86	14.10	14.53	14.67	15.17
Lender Bank Credit Ratio	Total loans divided by total assets	Fitch	9,268	0.40	0.18	0.00	0.14	0.30	0.40	0.56	0.62	0.88
Lender Bank Deposit Ratio	Total deposits divided by total assets	Fitch	9,268	0.65	0.12	0.17	0.51	0.62	0.67	0.74	0.76	0.89
Lender Bank ROA Ratio	Bank net profit divided by total assets	Fitch	9,282	0.01	0.01	-0.07	0.00	0.00	0.01	0.01	0.01	0.04
Lender Bank NPL Ratio	Bank non-performing loans divided by bank total loans	Fitch	9,282	0.03	0.02	0.00	0.00	0.01	0.03	0.04	0.05	0.18
<b>UK-resident Lender Bank Variables</b>												
Lender Bank Capital Ratio	Capital divided by total assets	Fitch	17,943	0.07	0.04	0.00	0.03	0.04	0.06	0.08	0.10	0.48
Lender Bank Liquidity Ratio	Bank liquid assets divided by total assets (liquid assets = trading securities and at FV through income + loans and advances < 3 months + loans and advances to banks < 3 months)	Fitch	17,943	0.15	0.10	0.00	0.04	0.09	0.14	0.19	0.29	0.79
Lender Bank Total Assets	The natural logarithm of total bank assets	Fitch	17,802	13.81	1.59	4.85	12.62	13.60	14.45	14.69	14.79	15.17
Lender Bank Credit Ratio	Total loans divided by total assets	Fitch	17,802	0.36	0.16	0.00	0.15	0.29	0.35	0.45	0.57	0.88
Lender Bank Deposit Ratio	Total deposits divided by total assets	Fitch	17,802	0.57	0.15	0.09	0.37	0.46	0.60	0.65	0.77	0.92
Lender Bank ROA Ratio	Bank net profit divided by total assets	Fitch	17,943	0.14	1.34	-8.27	0.00	0.00	0.01	0.01	0.01	16.71
Lender Bank NPL Ratio	Bank non-performing loans divided by bank total loans	Fitch	17,943	0.03	0.03	0.00	0.00	0.00	0.02	0.04	0.07	0.73

Table 1 (continued)

Variable Names	Definition	Source	N	Mean	SD	Min.	10%	25%	50%	75%	90%	Max.
<b>EA-resident Lender Bank Variables</b>												
Lender Bank Capital Ratio	Capital divided by total assets	Fitch	35,503	0.06	0.04	-0.04	0.02	0.04	0.06	0.08	0.11	0.43
Lender Bank Liquidity Ratio	Bank liquid assets divided by total assets (liquid assets = trading securities and at FV through income + loans and advances < 3 months + loans and advances to banks < 3 months)	Fitch	35,503	0.12	0.11	0.00	0.01	0.03	0.10	0.19	0.27	0.84
Lender Bank Total Assets	The natural logarithm of total bank assets	Fitch	35,038	12.58	1.83	5.42	10.20	11.44	12.97	14.08	14.44	14.99
Lender Bank Credit Ratio	Total loans divided by total assets	Fitch	35,038	0.54	0.16	0.00	0.33	0.42	0.57	0.65	0.71	0.92
Lender Bank Deposit Ratio	Total deposits divided by total assets	Fitch	35,038	0.60	0.14	0.06	0.42	0.50	0.59	0.69	0.80	0.94
Lender Bank ROA Ratio	Bank net profit divided by total assets	Fitch	35,503	0.04	0.67	-0.11	0.00	0.00	0.00	0.01	0.02	16.71
Lender Bank NPL Ratio	Bank non-performing loans divided by bank total loans	Fitch	35,503	0.05	0.05	0.00	0.00	0.01	0.03	0.08	0.11	0.66

**Table 2a**  
**The Amount of Turkish Banks' Cross-Border Borrowing**

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Location of Lender Banks</b>	All	All	All	All	All	All
<b>Headquarter of Lender Banks</b>	All	All	All	All	All	All
<b>Currency</b>	All	All	All	All	All	All
<b>Included Maturities</b>	All	All	All	All	All	All
$\Sigma$ Fed's QE{t-1 to t-3}	0.044 [0.002]***	0.042 [0.003]***	0.053 [0.004]***	0.019 [0.004]***	0.028 [0.005]***	0.056 [0.010]***
$\Sigma$ ECB's QE{t-1 to t-3}	0.036 [0.002]***	0.032 [0.003]***	0.035 [0.003]***	0.007 [0.003]**	0.011 [0.004]***	0.018 [0.006]***
$\Sigma$ BoE's QE{t-1 to t-3}	-0.032 [0.003]***	-0.032 [0.005]***	-0.024 [0.007]***	0.009 [0.004]**	0.015 [0.006]**	0.017 [0.010]*
$\Sigma$ BoE's CAR{t-1 to t-3}				-10.693 [4.695]**	-7.651 [2.884]***	-16.030 [4.126]***
Constant	8.440 [53.730]***	3.788 [9.690]***	9.194 [6.370]***	8.761 [49.390]***	4.842 [9.590]***	8.954 [5.410]***
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	No	Yes	Yes	No	Yes	Yes
Lender Country Variables	No	Yes	Yes	No	Yes	Yes
TR Macro Variables	No	Yes	Yes	No	Yes	Yes
Lender Bank Variables	No	No	Yes	No	No	Yes
Borrower Bank Variables	No	No	Yes	No	No	Yes
R2	0.733	0.689	0.652	0.724	0.683	0.640
Number of Observations	185,985	118,874	78,293	145,040	92,759	59,089
$\Delta\%$ in loans with Fed:	17.03	16.17	20.48	7.37	10.65	21.60
$\Delta\%$ in loans with ECB:	14.22	12.57	13.71	2.73	4.54	7.27
$\Delta\%$ in loans with BoE:	-12.99	-13.04	-9.64	3.63	5.91	7.08
$\Delta\%$ in loans with BoE's CAR:				-4.70	-3.36	-7.05

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 2b**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<b>Headquarter of Lender Banks</b>	<b>US</b>	<b>UK</b>	<b>EA</b>	All	All	All	All	All	All	All	All
<b>Location of Lender Banks</b>	All	All	All	<b>US</b>	<b>UK</b>	<b>EA</b>	All	All	All	All	All
<b>Currency</b>	All	All	All	All	All	All	<b>USD</b>	<b>EUR</b>	<b>GBP</b>	All	All
<b>Included Maturities</b>	All	All	All	All	All	All	All	All	All	<b>≤ 1 Year</b>	<b>&gt; 1 Year</b>
Σ Fed's QE{t-1 to t-3}	0.026 [0.011]**	0.056 [0.015]***	0.040 [0.008]***	0.032 [0.010]***	0.025 [0.014]*	0.031 [0.006]***	0.040 [0.006]***	0.032 [0.006]***	0.027 [0.016]*	0.053 [0.010]***	-0.013 [0.007]*
Σ ECB's QE{t-1 to t-3}	0.005 [0.008]	0.026 [0.01]***	0.015 [0.006]***	0.001 [0.007]	0.014 [0.010]*	0.006 [0.004]**	0.007 [0.005]*	0.010 [0.005]**	-0.021 [0.013]	0.020 [0.003]***	-0.006 [0.005]
Σ BoE's QE{t-1 to t-3}	0.020 [0.013]	0.019 [0.009]**	-0.011 [0.017]	0.019 [0.011]	0.006 [0.016]	-0.010 [0.007]	0.003 [0.007]	0.001 [0.007]	0.044 [0.019]**	0.014 [0.005]***	0.008 [0.008]
Constant	7.341 [1.540]	25.945 [4.180]***	-0.219 [0.070]	2.082 [0.540]	22.024 [3.530]***	13.820 [5.820]***	10.713 [5.070]***	10.187 [5.220]***	17.961 [1.860]*	3.822 [2.220]**	40.310 [7.810]***
<b>Σ BoE's CAR{t-1 to t-3}</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Country Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TR Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.653	0.649	0.634	0.674	0.608	0.666	0.563	0.638	0.869	0.661	0.651
Number of Observations	11,044	6,784	24,219	10,646	7,260	28,563	23,904	20,425	1,286	51,656	7,433
Δ% in loans with Fed:	10.09	21.72	15.31	12.20	9.81	11.80	15.27	12.48	10.25	20.58	-4.92
Δ% in loans with ECB:	1.98	10.38	5.78	0.39	5.36	2.35	2.92	3.91	-8.19	7.90	-2.35
Δ% in loans with BoE:	8.13	7.65	-4.36	7.51	2.35	-3.85	1.11	0.48	17.97	5.67	3.40

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently. Σ indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 2c**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Location of Lender Banks	US	US	US	UK	UK	UK	EA	EA	EA
Headquarter of Lender Banks	US	UK	EA	US	UK	EA	US	UK	EA
$\Sigma$ Fed's QE{t-1 to t-3}	0.038 [0.013]***	0.137 [0.080]*	0.174 [0.071]**	0.089 [0.031]***	0.112 [0.049]**	0.114 [0.043]***	0.098 [0.070]*	0.170 [0.072]*	0.032 [0.009]***
$\Sigma$ ECB's QE{t-1 to t-3}	0.005 [0.009]	0.004 [0.052]	0.055 [0.042]*	0.006 [0.023]	0.058 [0.032]*	0.083 [0.031]***	0.149 [0.048]***	0.106 [0.053]**	0.013 [0.007]**
$\Sigma$ BoE's QE{t-1 to t-3}	0.016 [0.015]	0.095 [0.058]*	-0.025 [0.089]	-0.010 [0.034]	0.208 [0.061]***	0.102 [0.054]*	-0.014 [0.056]	0.071 [0.046]*	-0.014 [0.01]
Constant	3.531 [0.690]	19.925 [1.180]	14.356 [0.310]	-1.363 [0.130]	17.747 [2.490]**	35.486 [1.840]*	31.829 [1.600]	21.733 [1.100]	2.550 [0.850]
<b><math>\Sigma</math> BoE's CAR{t-1 to t-3}</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Country Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TR Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.662	0.617	0.866	0.892	0.598	0.892	0.923	0.927	0.642
Number of Observations	9,456	1,190	226	434	4,926	749	300	291	23,027
$\Delta\%$ in loans with Fed:	14.52	52.92	67.19	34.23	43.08	44.09	37.67	65.63	12.30
$\Delta\%$ in loans with ECB:	2.02	1.72	21.64	2.25	23.02	32.91	58.82	42.05	5.30
$\Delta\%$ in loans with BoE:	6.46	38.47	-10.14	-4.07	83.92	41.14	-5.80	28.83	-5.59

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 2d**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Location of Lender Banks	US	US	US	UK	UK	UK	EA	EA	EA
Currency	USD	EUR	GBP	USD	EUR	GBP	USD	EUR	GBP
$\Sigma$ Fed's QE{t-1 to t-3}	0.057 [0.015]***	0.058 [0.016]***	0.065 [0.034]*	0.043 [0.019]**	0.072 [0.021]***	0.108 [0.057]*	0.062 [0.024]***	0.048 [0.016]***	0.601 [0.118]***
$\Sigma$ ECB's QE{t-1 to t-3}	0.000 [0.012]	0.024 [0.013]*	-0.025 [0.03]	-0.020 [0.014]	0.076 [0.017]***	-0.051 [0.042]	0.027 [0.015]*	0.020 [0.01]**	-0.123 [0.093]
$\Sigma$ BoE's QE{t-1 to t-3}	0.017 [0.018]	-0.007 [0.018]	-0.005 [0.043]	0.029 [0.021]	0.058 [0.025]**	0.056 [0.061]	-0.030 [0.023]	-0.014 [0.014]	0.339 [0.116]***
Constant	2.063 [0.370]	13.976 [1.690]*	-83.772 [1.200]	17.616 [2.250]**	23.910 [3.980]***	6.400 [0.23]	11.628 [3.400]***	9.757 [3.610]***	-20.968 [1.960]*
<b><math>\Sigma</math> BoE's CAR{t-1 to t-3}</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Country Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TR Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.537	0.725	0.950	0.641	0.595	0.910	0.656	0.688	0.861
Number of Observations	6,448	3,158	199	2,966	1,641	218	5,617	11,403	283
$\Delta\%$ in loans with Fed:	21.91	22.34	25.05	16.76	27.73	41.70	24.10	18.58	231.59
$\Delta\%$ in loans with ECB:	0.14	9.34	-9.96	-7.74	29.88	-20.21	10.87	7.99	-48.75
$\Delta\%$ in loans with BoE:	6.84	-2.99	-1.87	11.69	23.43	22.66	-12.31	-5.75	137.06

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

Table 2e (1)

## The Amount of Turkish Banks' Cross-Border Borrowing

	(1)	(2)
$\Sigma$ Fed's QE{t-1 to t-3} *	0.022	0.022
BorrowerBank_US	[0.005]***	[0.01]**
$\Sigma$ Fed's QE{t-1 to t-3} *	0.020	0.064
BorrowerBank_non_US	[0.004]***	[0.010]***
<hr/>		
$\Sigma$ ECB's QE{t-1 to t-3} *	0.040	0.054
BorrowerBank_EA	[0.003]***	[0.006]***
$\Sigma$ ECB's QE{t-1 to t-3} *	0.005	0.014
BorrowerBank_non_EA	[0.003]**	[0.006]**
<hr/>		
$\Sigma$ BoE's QE{t-1 to t-3} *	0.039	0.041
BorrowerBank_UK	[0.008]***	[0.008]***
$\Sigma$ BoE's QE{t-1 to t-3} *	0.008	0.010
BorrowerBank_non_UK	[0.004]*	[0.005]**
<hr/>		
Constant	8.714	8.906
	[38.560]***	[5.220]***
<hr/>		
$\Sigma$ BoE's CAR{t-1 to t-3}	Yes	Yes
Lender Country Fixed Effects	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes
Loan Type Fixed Effects	Yes	Yes
Currency Fixed Effects	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes
Global Liquidity Variables	No	Yes
Lender Country Variables	No	Yes
TR Macro Variables	No	Yes
Lender Bank Variables	No	Yes
Borrower Bank Variables	No	Yes
R2	0.726	0.644
Number of Observations	145,040	59,089
<hr/>		
	8.58	8.65
$\Delta\%$ in loans with Fed:	7.87	24.57
<hr/>		
	15.72	21.38
$\Delta\%$ in loans with ECB:	2.15	5.50
<hr/>		
	15.79	16.64
$\Delta\%$ in loans with BoE:	3.35	4.19

Table 2e (2)

## The Amount of Turkish Banks' Cross-Border Borrowing

	(3)	(4)
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_US	0.037	0.068
	[0.008]***	[0.014]***
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_UK	0.130	0.195
	[0.032]***	[0.058]***
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_EA	0.072	0.030
	[0.022]***	[0.011]***
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_TR	0.037	0.083
	[0.005]***	[0.011]***
<hr/>		
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_EA	0.026	0.046
	[0.015]*	[0.017]***
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_US	0.030	0.013
	[0.020]	[0.010]
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_UK	0.066	0.066
	[0.022]***	[0.039]*
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_TR	0.020	0.045
	[0.004]***	[0.007]***
<hr/>		
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_UK	0.155	0.121
	[0.051]***	[0.07]*
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_US	-0.010	-0.008
	[0.009]	[0.014]
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_EA	0.058	0.037
	[0.007]***	[0.012]***
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_TR	0.006	-0.007
	[0.004]	[0.008]
<hr/>		
Constant	8.671	7.347
	[37.71]***	[4.080]***
<hr/>		
$\Sigma$ BoE's CAR{t-1 to t-3}	Yes	Yes
Lender Country Fixed Effects	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes
Loan Type Fixed Effects	Yes	Yes
Currency Fixed Effects	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes
Global Liquidity Variables	No	Yes
Lender Country Variables	No	Yes
TR Macro Variables	No	Yes
Lender Bank Variables	No	Yes
Borrower Bank Variables	No	Yes
R2	0.725	0.641
Number of Observations	145,040	59,089
<hr/>		
	14.18	26.17
$\Delta\%$ in loans with Fed:	50.14	75.28
	27.73	11.74
<hr/>		
	14.18	31.85
$\Delta\%$ in loans with ECB:	10.40	18.37
	11.73	5.20
	25.91	26.19
<hr/>		
	7.81	17.91
$\Delta\%$ in loans with BoE:	62.60	49.07
	-3.98	-3.31
	23.36	15.01
	2.49	-2.86

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). **BorrowerBank\_non\_US** represents the Turkish banks not having US headquartered partners. **BorrowerBank\_US** represents the affiliates or subsidiaries of US headquartered banks in Turkey. Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 2e**  
**The Amount of Turkish Banks' Cross-Border Borrowing**

	(1)	(2)
$\Sigma$ Fed's QE{t-1 to t-3} * BorrowerBank_US	0.022 [0.005]***	0.022 [0.01]**
$\Sigma$ Fed's QE{t-1 to t-3} * BorrowerBank_non_US	0.020 [0.004]***	0.064 [0.010]***
$\Sigma$ ECB's QE{t-1 to t-3} * BorrowerBank_EA	0.040 [0.003]***	0.054 [0.006]***
$\Sigma$ ECB's QE{t-1 to t-3} * BorrowerBank_non_EA	0.005 [0.003]**	0.014 [0.006]**
$\Sigma$ BoE's QE{t-1 to t-3} * BorrowerBank_UK	0.039 [0.008]***	0.041 [0.008]***
$\Sigma$ BoE's QE{t-1 to t-3} * BorrowerBank_non_UK	0.008 [0.004]*	0.010 [0.005]**
Constant	8.714 [38.560]***	8.906 [5.220]***
<b><math>\Sigma</math> BoE's CAR{t-1 to t-3}</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes
Loan Type Fixed Effects	Yes	Yes
Currency Fixed Effects	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes
Global Liquidity Variables	No	Yes
Lender Country Variables	No	Yes
TR Macro Variables	No	Yes
Lender Bank Variables	No	Yes
Borrower Bank Variables	No	Yes
R2	0.726	0.644
Number of Observations	145,040	59,089
$\Delta\%$ in loans with Fed:	8.58 7.87	8.65 24.57
$\Delta\%$ in loans with ECB:	15.72 2.15	21.38 5.50
$\Delta\%$ in loans with BoE:	15.79 3.35	16.64 4.19

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). **BorrowerBank\_non\_US** represents the Turkish banks not having US headquartered partners. Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.



**Table 2e**  
**The Amount of Turkish Banks' Cross-Border Borrowing**

	(1)	(2)
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_US	0.037 [0.008]***	0.068 [0.014]***
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_UK	0.130 [0.032]***	0.195 [0.058]***
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_EA	0.072 [0.022]***	0.030 [0.011]***
$\Sigma$ Fed's QE{t-1 to t-3}*BorrowerBank_TR	0.037 [0.005]***	0.083 [0.011]***
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_EA	0.026 [0.015]*	0.046 [0.017]***
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_US	0.030 [0.020]	0.013 [0.010]
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_UK	0.066 [0.022]***	0.066 [0.039]*
$\Sigma$ ECB's QE{t-1 to t-3}*BorrowerBank_TR	0.020 [0.004]***	0.045 [0.007]***
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_UK	0.155 [0.051]***	0.121 [0.07]*
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_US	-0.010 [0.009]	-0.008 [0.014]
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_EA	0.058 [0.007]***	0.037 [0.012]***
$\Sigma$ BoE's QE{t-1 to t-3}*BorrowerBank_TR	0.006 [0.004]	-0.007 [0.008]
Constant	8.671 [37.71]***	7.347 [4.080]***
<b><math>\Sigma</math> BoE's CAR{t-1 to t-3}</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes
Loan Type Fixed Effects	Yes	Yes
Currency Fixed Effects	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes
Global Liquidity Variables	No	Yes
Lender Country Variables	No	Yes
TR Macro Variables	No	Yes
Lender Bank Variables	No	Yes
Borrower Bank Variables	No	Yes
R2	0.725	0.641
Number of Observations	145,040	59,089
$\Delta\%$ in loans with Fed:	14.18 50.14 27.73 14.18	26.17 75.28 11.74 31.85
$\Delta\%$ in loans with ECB:	10.40 11.73 25.91 7.81	18.37 5.20 26.19 17.91
$\Delta\%$ in loans with BoE:	62.60 -3.98 23.36 2.49	49.07 -3.31 15.01 -2.86

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). **BorrowerBank\_US**, **BorrowerBank\_EA** and **BorrowerBank\_UK** represent the affiliates or subsidiaries of US, EA and UK headquartered banks in Turkey. Similarly, **BorrowerBank\_TR** represents the domestically owned Turkish banks. Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 3a**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type for lender banks with different capital ratios**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Location of Lender Banks</b>	All	All	All	All	All	All	All	All
<b>Currency</b>	All	All	All	All	All	All	All	All
<b>Included Maturities</b>	All	All	All	All	All	All	All	All
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Lender Bank Capital Ratio {t-1 to t-3}	-0.271 [0.055]***	-0.334 [0.068]***	-0.349 [0.071]***	-0.253 [0.093]***	-0.214 [0.051]***	-0.210 [0.073]***	-0.227 [0.076]***	-0.240 [0.107]**
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Lender Bank Capital Ratio {t-1 to t-3}	-0.183 [0.051]***	-0.145 [0.064]**	-0.128 [0.065]**	-0.150 [0.077]*	-0.053 [0.056]	-0.176 [0.074]**	-0.123 [0.075]*	-0.196 [0.106]*
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Lender Bank Capital Ratio {t-1 to t-3}	0.467 [0.085]***	0.374 [0.105]***	0.403 [0.107]***	0.344 [0.141]**	-0.474 [0.084]***	-0.491 [0.116]***	-0.510 [0.118]***	-0.626 [0.126]***
$\Sigma$ Lender Bank Capital Ratio {t-1 to t-3}	-1.651 [1.219]	-0.940 [1.394]	-1.837 [1.569]	-2.647 [2.297]	2.585 [1.92]	0.446 [2.461]	-0.857 [2.554]	0.175 [3.01]
<b>Control of BoE's CAR</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>(Borrower Bank*Month) Fixed Effects</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	-	-	-	-	-	-	-	-
Lender Country Variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TR Macro Variables	-	-	-	-	-	-	-	-
Lender Bank Variables	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Variables	-	-	-	-	-	-	-	-
Global Liquidity Variables*Lender Bank's Capital Ratio	No	No	No	Yes	Yes	Yes	Yes	Yes
Lender Country Variables*Lender Bank's Capital Ratio	No	No	No	Yes	Yes	Yes	Yes	Yes
TR Macro Variables*Lender Bank's Capital Ratio	No	No	No	Yes	Yes	Yes	Yes	Yes
R2	0.703	0.682	0.682	0.661	0.721	0.689	0.688	0.688
Number of Observations	104,222	85,676	84,903	77,971	78,609	59,640	58,885	58,885
$\Delta\%$ in loans with Fed:	-5.65	-6.98	-7.29	-5.29	-4.48	-4.40	-4.75	-5.01
$\Delta\%$ in loans with ECB:	-3.89	-3.07	-2.72	-3.18	-1.12	-3.74	-2.61	-4.16
$\Delta\%$ in loans with BoE:	10.18	8.14	8.78	7.49	-10.32	-10.70	-11.11	-13.63

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types) for lender banks with different capital ratios. Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 3b**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type for lender banks with different liquidity ratios**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Location of Lender Banks</b>	All	All	All	All	All	All	All	All
<b>Currency</b>	All	All	All	All	All	All	All	All
<b>Included Maturities</b>	All	All	All	All	All	All	All	All
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Lender Bank Liquidity Ratio {t-1 to t-3}	-0.060 [0.027]**	-0.101 [0.032]***	-0.100 [0.032]***	-0.101 [0.032]***	-0.046 [0.015]**	-0.173 [0.018]***	-0.173 [0.018]***	-0.134 [0.021]***
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Lender Bank Liquidity Ratio {t-1 to t-3}	-0.021 [0.022]	-0.074 [0.025]***	-0.056 [0.025]**	-0.060 [0.026]**	-0.066 [0.009]***	-0.112 [0.012]***	-0.112 [0.012]***	-0.095 [0.015]***
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Lender Bank Liquidity Ratio {t-1 to t-3}	0.080 [0.034]**	0.190 [0.040]***	0.188 [0.040]***	0.192 [0.040]***	-0.059 [0.012]***	-0.193 [0.015]**	-0.193 [0.015]***	-0.186 [0.017]**
$\Sigma$ Lender Bank Liquidity Ratio {t-1 to t-3}	0.102 [0.37]	0.278 [0.416]	-0.236 [0.424]	-0.498 [0.527]	11.850 [1.23]**	25.102 [1.556]*	25.102 [1.556]*	20.146 [1.693]*
<b>Control of BoE's CAR</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>(Borrower Bank*Month) Fixed Effects</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	-	-	-	-	-	-	-	-
Lender Country Variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TR Macro Variables	-	-	-	-	-	-	-	-
Lender Bank Variables	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Variables	-	-	-	-	-	-	-	-
Global Liquidity Variables*Lender Bank's Liquidity Ratio	No	No	No	Yes	Yes	Yes	Yes	Yes
Lender Country Variables*Lender Bank's Liquidity Ratio	No	No	No	Yes	Yes	Yes	Yes	Yes
TR Macro Variables*Lender Bank's Liquidity Ratio	No	No	No	Yes	Yes	Yes	Yes	Yes
R2	0.709	0.670	0.669	0.669	0.736	0.702	0.702	0.703
Number of Observations	109,782	83,694	82,738	82,738	78,609	59,640	59,640	59,640
$\Delta\%$ in loans with Fed:	-3.47	-5.83	-5.79	-5.87	-2.63	-10.01	-10.01	-7.73
$\Delta\%$ in loans with ECB:	-1.24	-4.35	-3.27	-3.52	-3.89	-6.59	-6.59	-5.60
$\Delta\%$ in loans with BoE:	4.83	11.47	11.33	11.60	-3.53	-11.62	-11.62	-11.22

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types) for lender banks with different liquidity ratios. Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 4**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type for borrower banks with different ratios**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
<b>Location of Lender Banks</b>	All	All	All	All	All	All	All	All	
<b>Currency</b>	All	All	All	All	All	All	All	All	
<b>Included Maturities</b>	All	All	All	All	All	All	All	All	
<b>Bank Ratio</b>		<b>Capital Ratio</b>				<b>Liquidity Ratio</b>			
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	-0.042 [0.116]	-0.423 [0.14]***	-0.339 [0.142]**	-0.391 [0.147]***	-0.042 [0.116]	-0.423 [0.14]***	-0.339 [0.142]**	-0.391 [0.147]***	
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	-0.005 [0.101]	-0.359 [0.121]***	-0.281 [0.123]**	-0.255 [0.125]**	-0.005 [0.101]	-0.359 [0.121]***	-0.281 [0.123]**	-0.255 [0.125]**	
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	0.342 [0.221]	-1.240 [0.267]***	-1.135 [0.269]***	-1.149 [0.273]***	0.342 [0.221]	-1.240 [0.267]***	-1.135 [0.269]***	-1.149 [0.273]***	
$\Sigma$ Borrower Bank Ratio {t-1 to t-3}	5.572 [1.786]***	14.455 [2.247]***	13.912 [2.258]***	14.365 [2.357]***	5.572 [1.786]***	14.455 [2.247]***	13.912 [2.258]***	14.365 [2.357]***	
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<b>(Lender Bank*Month) Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Borrower Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Global Liquidity Variables	-	-	-	-	-	-	-	-	
Lender Country Variables	-	-	-	-	-	-	-	-	
TR Macro Variables	No	Yes	Yes	Yes	No	Yes	Yes	Yes	
Lender Bank Variables	-	-	-	-	-	-	-	-	
Borrower Bank Variables	No	No	Yes	Yes	No	No	Yes	Yes	
Global Liquidity Variables*Borrower Bank's Ratio	No	No	No	Yes	No	No	No	Yes	
Borrower Country Variables*Borrower Bank's Ratio	No	No	No	Yes	No	No	No	Yes	
TR Macro Variables*Borrower Bank's Ratio	No	No	No	Yes	No	No	No	Yes	
R2	0.687	0.652	0.652	0.653	0.687	0.652	0.652	0.653	
Number of Observations	167,280	110,172	110,172	110,172	167,280	110,172	110,172	110,172	
$\Delta\%$ in loans with Fed:	-0.33	-3.31	-2.65	-3.06	-0.33	-3.31	-2.65	-3.06	
$\Delta\%$ in loans with ECB:	-0.04	-2.86	-2.24	-2.03	-0.04	-2.86	-2.24	-2.03	
$\Delta\%$ in loans with BoE:	2.80	-10.13	-9.27	-9.39	2.80	-10.13	-9.27	-9.39	

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types) for borrower banks with different capital ratios. Table 1 contains the definition of all variables and the summary statistics for each included variable. Global Liquidity Variables are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). Lender Country Variables are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. Turkey (TR) Macro Variables are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in reel effective exchange rate. Lender Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. Borrower Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 5**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type for lender and borrower banks with different ratios**

Bank Ratio	(1)	(2)	(3)
	Lender & Borrower Banks		
	Equity Ratio	Liquidity Ratio	NPL Ratio
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	26.367 [6.103]***	6.209 [2.446]**	18.142 [10.247]*
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	22.233 [4.749]***	11.748 [1.762]***	27.876 [9.276]***
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	-33.322 [8.149]***	-4.876 [2.757]*	-40.097 [12.648]***
Lender Country Fixed Effects	Yes	Yes	Yes
Lender Bank Fixed Effects	Subsumed	Subsumed	Subsumed
<b>(Lender Bank*Month) Fixed Effects</b>	Yes	Yes	Yes
Borrower Bank Fixed Effects	Subsumed	Subsumed	Subsumed
<b>(Borrower Bank*Month) Fixed Effects</b>	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes
Global Liquidity Variables	-	-	-
Lender Country Variables	-	-	-
TR Macro Variables	-	-	-
Lender Bank Variables	-	-	-
Borrower Bank Variables	-	-	-
Global Liquidity Variables*Borrower Bank's Ratio	-	-	-
Borrower Country Variables*Borrower Bank's Ratio	-	-	-
TR Macro Variables*Borrower Bank's Ratio	-	-	-
R2	0.665	0.614	0.655
Number of Observations	82,085	75,948	62,409

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types) for borrower banks with different liquidity ratios. Table 1 contains the definition of all variables and the summary statistics for each included variable. Global Liquidity Variables are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). Lender Country Variables are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. Turkey (TR) Macro Variables are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. Lender Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. Borrower Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

Table 6

## The maturity of Turkish banks' cross-border borrowing (from countries and lender banks with different loan and currency types)

Bank Ratio	(1)	(2)	(3)		(4)		(5)	(6)
			Lending Channels		Borrowing Channels			
			Capital	Liquidity	Capital	Liquidity		
$\Sigma$ Fed's QE{t-1 to t-3}	-0.035 [0.002]***	-0.010 [0.003]***						
$\Sigma$ ECB's QE{t-1 to t-3}	-0.018 [0.002]***	-0.015 [0.002]***						
$\Sigma$ BoE's QE{t-1 to t-3}	-0.016 [0.003]***	-0.003 [0.004]***						
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3}			0.868 [0.321]***	0.341 [0.055]***				
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3}			1.005 [0.21]***	0.134 [0.038]***				
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3}			-1.721 [0.425]***	-0.264 [0.066]***				
$\Sigma$ Lender Bank Ratio {t-1 to t-3}			-21.539 [4.072]***	-1.396 [0.897]*				
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}					2.237736 [0.482]***	0.344 [0.093]***		
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}					1.263055 [0.343]***	0.136 [0.061]**		
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}					1.108849 [0.599]*	0.199 [0.12]*		
$\Sigma$ Borrower Bank Ratio {t-1 to t-3}					-86.10976 [7.376]***	-11.254 [1.079]***		
Constant	-10.589 [20.430]***	-4.565 [3.240]***						
<b>Control of BoE's CAR</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	-	-		
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes		
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Subsumed	Subsumed		
<b>(Lender Bank*Month) Fixed Effects</b>	-	-	-	-	Yes	Yes		
Borrower Bank Fixed Effects	Yes	Yes	Subsumed	Subsumed	Yes	Yes		
<b>(Borrower Bank*Month) Fixed Effects</b>	-	-	Yes	Yes	-	-		
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes		
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes		
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes		
Global Liquidity Variables	No	Yes	Yes	Yes	Yes	Yes		
Lender Country Variables	No	Yes	Yes	Yes	Yes	Yes		
TR Macro Variables	No	Yes	Yes	Yes	Yes	Yes		
Lender Bank Variables	No	Yes	Yes	Yes	Yes	Yes		
Borrower Bank Variables	No	Yes	Yes	Yes	Yes	Yes		
(Global Liquidity Variables / Lender Country / TR Macro)*	-	-	Yes	-	-	-		
Lender Bank's Capital Ratio	-	-	-	Yes	-	-		
(Global Liquidity Variables / Lender Country / TR Macro)*	-	-	-	-	-	-		
Lender Bank's Liquidity Ratio	-	-	-	-	Yes	-		
(Global Liquidity Variables / Lender Country / TR Macro)*	-	-	-	-	-	-		
Macro)*Borrower Bank's Capital Ratio	-	-	-	-	-	-		
(Global Liquidity Variables / Lender Country / TR Macro)*	-	-	-	-	-	-		
Borrower Bank's Liquidity Ratio	-	-	-	-	-	Yes		
R2	0.667	0.638	0.637	0.637	0.646	0.646		
Number of Observations	293,833	198,473	174,178	174,178	176,206	176,206		
$\Delta\%$ in loans with Fed:	-13.54	-3.97	18.13	19.71	17.52	5.99		
$\Delta\%$ in loans with ECB:	-6.98	-5.74	21.35	7.86	10.06	2.40		
$\Delta\%$ in loans with BoE:	-6.44	-1.30	-37.50	-15.92	9.06	3.60		

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the natural logarithm of maturity of Turkish banks' new cross-border borrowing (from countries and lender banks with different loan and currency types). Table 1 contains the definition of all variables and the summary statistics for each included variable. Global Liquidity Variables are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). Lender Country Variables are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. Turkey (TR) Macro Variables are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. Lender Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. Borrower Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 7a**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Headquarter of Lender Banks</b>	All	All	All	All	All	All	All	All	All	All
<b>Location of Lender Banks</b>	All	All	<b>US</b>	<b>UK</b>	<b>EA</b>	All	All	All	All	All
<b>Currency</b>	All	All	All	All	All	<b>USD</b>	<b>EUR</b>	<b>GBP</b>	All	All
<b>Included Maturities</b>	All	All	All	All	All	All	All	All	<b>≤ 1 Year</b>	<b>&gt; 1 Year</b>
Σ Fed's QE{t-1 to t-3}	0.040 [0.005]***	0.033 [0.006]***	0.079 [0.023]***	0.056 [0.032]*	0.088 [0.019]***	0.085 [0.015]***	0.084 [0.016]***	0.053 [0.032]*	0.160 [0.010]***	-0.015 [0.010]*
Σ ECB's QE{t-1 to t-3}	0.059 [0.004]***	0.058 [0.005]***	0.037 [0.022]*	0.074 [0.024]***	0.089 [0.013]***	0.093 [0.008]***	0.056 [0.008]***	0.049 [0.017]***	0.088 [0.006]***	0.078 [0.006]***
Σ BoE's QE{t-1 to t-3}	0.011 [0.007]*	0.036 [0.008]***	-0.051 [0.050]	0.082 [0.033]**	0.022 [0.019]	0.003 [0.014]	0.065 [0.015]***	0.113 [0.029]***	0.016 [0.009]*	0.015 [0.009]
Constant	4.888 [13.370]***	6.675 [2.140]**	28.966 [2.110]**	65.509 [5.370]***	-13.834 [2.230]**	21.827 [4.130]***	18.192 [3.430]***	37.264 [2.260]**	31.191 [7.540]***	-8.954 [1.950]*
<b>Control of BoE's CAR</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Country Variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TR Macro Variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Bank Variables	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.276	0.196	0.188	0.233	0.194	0.143	0.187	0.432	0.156	0.348
Number of Observations	137,651	57,972	10,936	6,601	24,024	23,350	20,800	1,237	39,627	18,345

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the yearly change in the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types). Table 1 contains the definition of all variables and the summary statistics for each included variable. Global Liquidity Variables are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). Lender Country Variables are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. Turkey (TR) Macro Variables are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. Lender Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. Borrower Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently. Σ indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Table 7b**  
**Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type for lender banks with different ratios**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Location of Lender Banks</b>	All	All	All	All	All	All	All	All
<b>Currency</b>	All	All	All	All	All	All	All	All
<b>Included Maturities</b>	All	All	All	All	All	All	All	All
<b>Lender Bank Ratio</b>	<b>Capital Ratio</b>				<b>Liquidity Ratio</b>			
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3}	-0.913 [0.189]***	-1.248 [0.254]***	-1.023 [0.201]***	-0.645 [0.228]***	-0.167 [0.057]***	-0.210 [0.09]**	-0.248 [0.074]***	-0.311 [0.119]***
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3}	-0.292 [0.116]**	-0.357 [0.156]**	-0.308 [0.093]***	-0.192 [0.127]*	-0.172 [0.035]***	-0.262 [0.051]***	-0.133 [0.037]***	-0.334 [0.061]***
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Lender Bank Ratio {t-1 to t-3}	0.269 [0.158]*	0.632 [0.219]***	-0.699 [0.162]***	-0.720 [0.177]***	0.272 [0.046]***	0.252 [0.068]***	-0.182 [0.054]***	-0.243 [0.076]***
$\Sigma$ Lender Bank Ratio {t-1 to t-3}	0.809 [1.281]	-0.901 [1.667]	5.558 [1.536]***	4.211 [3.359]	-0.523 [0.281]	-1.942 [1.023]	0.604 [0.380]	-1.565 [1.302]
<b>Control of BoE's CAR</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Lender Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>(Borrower Bank*Month) Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global Liquidity Variables	-	-	-	-	-	-	-	-
Lender Country Variables	No	Yes	No	Yes	No	Yes	No	Yes
TR Macro Variables	-	-	-	-	-	-	-	-
Lender Bank Variables	No	Yes	No	Yes	No	Yes	No	Yes
Borrower Bank Variables	-	-	-	-	-	-	-	-
Global Liquidity Variables*Lender Bank's Capital Ratio	No	Yes	No	Yes	No	Yes	No	Yes
Lender Country Variables*Lender Bank's Capital Ratio	No	Yes	No	Yes	No	Yes	No	Yes
TR Macro Variables*Lender Bank's Capital Ratio	No	Yes	No	Yes	No	Yes	No	Yes
R2	0.262	0.225	0.274	0.234	0.262	0.225	0.273	0.234
Number of Observations	98,323	74,316	76,164	57,771	98,323	75,061	76,164	58,516

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the yearly change in the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types) for lender banks with different capital ratios. Table 1 contains the definition of all variables and the summary statistics for each included variable. Global Liquidity Variables are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). Lender Country Variables are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. Turkey (TR) Macro Variables are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. Lender Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. Borrower Bank Variables include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.



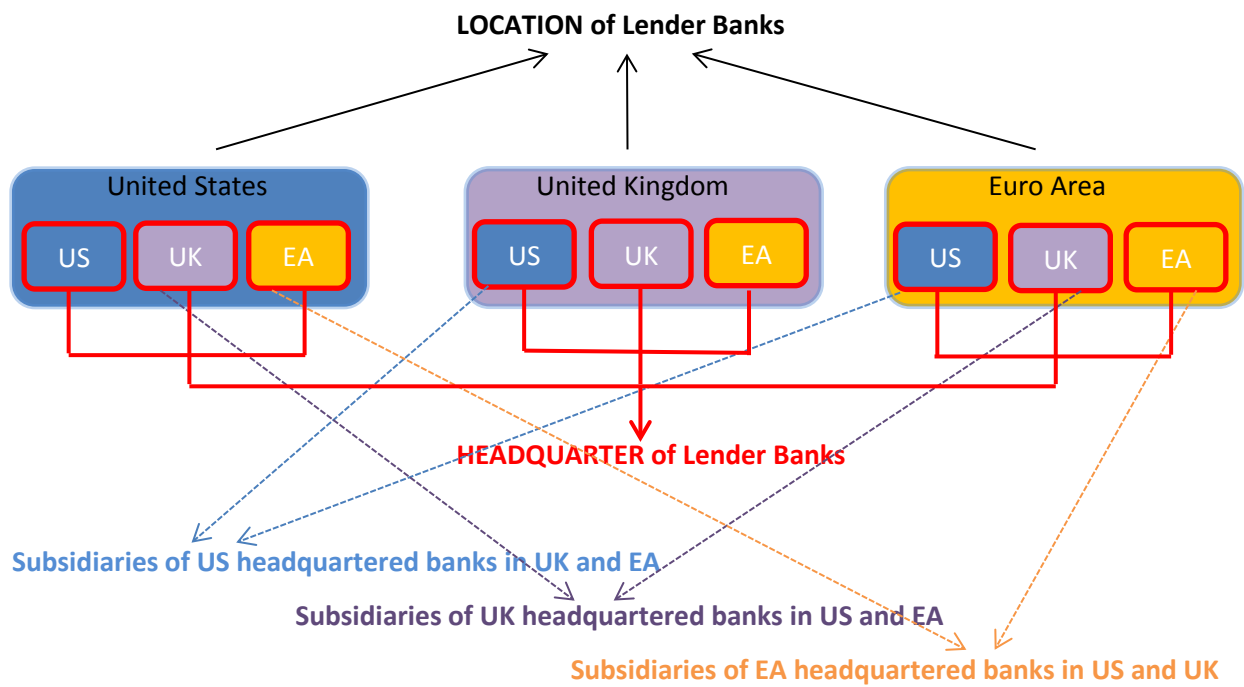
Table 7c

Turkish banks' cross-border borrowing across countries, bank, loan type, maturities and currency type for borrower banks with different ratios

	(1)	(2)	(3)	(4)
<b>Location of Lender Banks</b>	All	All	All	All
<b>Currency</b>	All	All	All	All
<b>Included Maturities</b>	All	All	All	All
<b>Borrower Bank Ratio</b>	<b>Capital Ratio</b>		<b>Liquidity Ratio</b>	
$\Sigma$ Fed's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	-0.823 [0.191]***	-0.558 [0.238]**	-0.221 [0.061]***	-0.334 [0.078]***
$\Sigma$ ECB's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	-1.123 [0.155]***	-1.230 [0.199]***	-0.337 [0.052]***	-0.341 [0.067]***
$\Sigma$ BoE's QE{t-1 to t-3} * $\Sigma$ Borrower Bank Ratio {t-1 to t-3}	0.403 [0.241]*	0.257 [0.320]	-0.437 [0.075]***	-0.418 [0.097]***
$\Sigma$ Borrower Bank Ratio {t-1 to t-3}	17.200 [2.070]***	13.551 [2.978]***	-0.572 [0.494]	1.476 [0.631]**
Lender Country Fixed Effects	Yes	Yes	Yes	Yes
<b>(Lender Bank*Month) Fixed Effects</b>	Yes	Yes	Yes	Yes
Borrower Bank Fixed Effects	Yes	Yes	Yes	Yes
Loan Type Fixed Effects	Yes	Yes	Yes	Yes
Currency Fixed Effects	Yes	Yes	Yes	Yes
Loan Maturity Fixed Effects	Yes	Yes	Yes	Yes
Global Liquidity Variables	-	-	-	-
Lender Country Variables	-	-	-	-
TR Macro Variables	No	Yes	No	Yes
Lender Bank Variables	-	-	-	-
Borrower Bank Variables	No	Yes	No	Yes
Global Liquidity Variables*Borrower Bank's Ratio	No	Yes	No	Yes
Borrower Country Variables*Borrower Bank's Ratio	No	Yes	No	Yes
TR Macro Variables*Borrower Bank's Ratio	No	Yes	No	Yes
R2	0.341	0.273	0.341	0.273
Number of Observations	160,972	105,785	160,972	105,785

Note. -- The table reports estimates from ordinary least squares regressions. The dependent variable is the yearly change in the natural logarithm of Turkish banks' cross-border borrowing (from countries and lender banks with different loan types, maturities and currency types) for borrower banks with different capital ratios. Table 1 contains the definition of all variables and the summary statistics for each included variable. *Global Liquidity Variables* are monthly change in VIX, monthly change in US real policy rate, real credit growth rate of US and total M2 growth rate of four financial centers (US, UK, EA, Japan). *Lender Country Variables* are real GDP growth, inflation rate, quarterly change in policy rate and quarterly change in real effective exchange rate. *Turkey (TR) Macro Variables* are monthly change in industrial production index, inflation rate, monthly change in BIST o/n interest rate and monthly change in real effective exchange rate. *Lender Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio and ROA Ratio. *Borrower Bank Variables* include the lagged values of Bank Total Assets, Capital Ratio, Liquidity Ratio, Credit Ratio, Deposit Ratio, ROA and NPL Ratio. Analysis covers the period of 2008:M10 – 2014:M12. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are placed adjacently.  $\Sigma$  indicates sum of the three coefficients on the indicated lag terms (and corresponding standard errors and significance level). "Yes" indicates set of characteristics or fixed effects. "No" indicates set of characteristics or fixed effects is not included. \*\*\* Significant at 1%, \*\* significant at 5%, \* significant at 10%.

**Figure 1: Regional Analysis of QE Policies (Separation of Lender Banks According to Location and Headquarter)**



**Figure 2: Regional Analysis of QE Policies\***

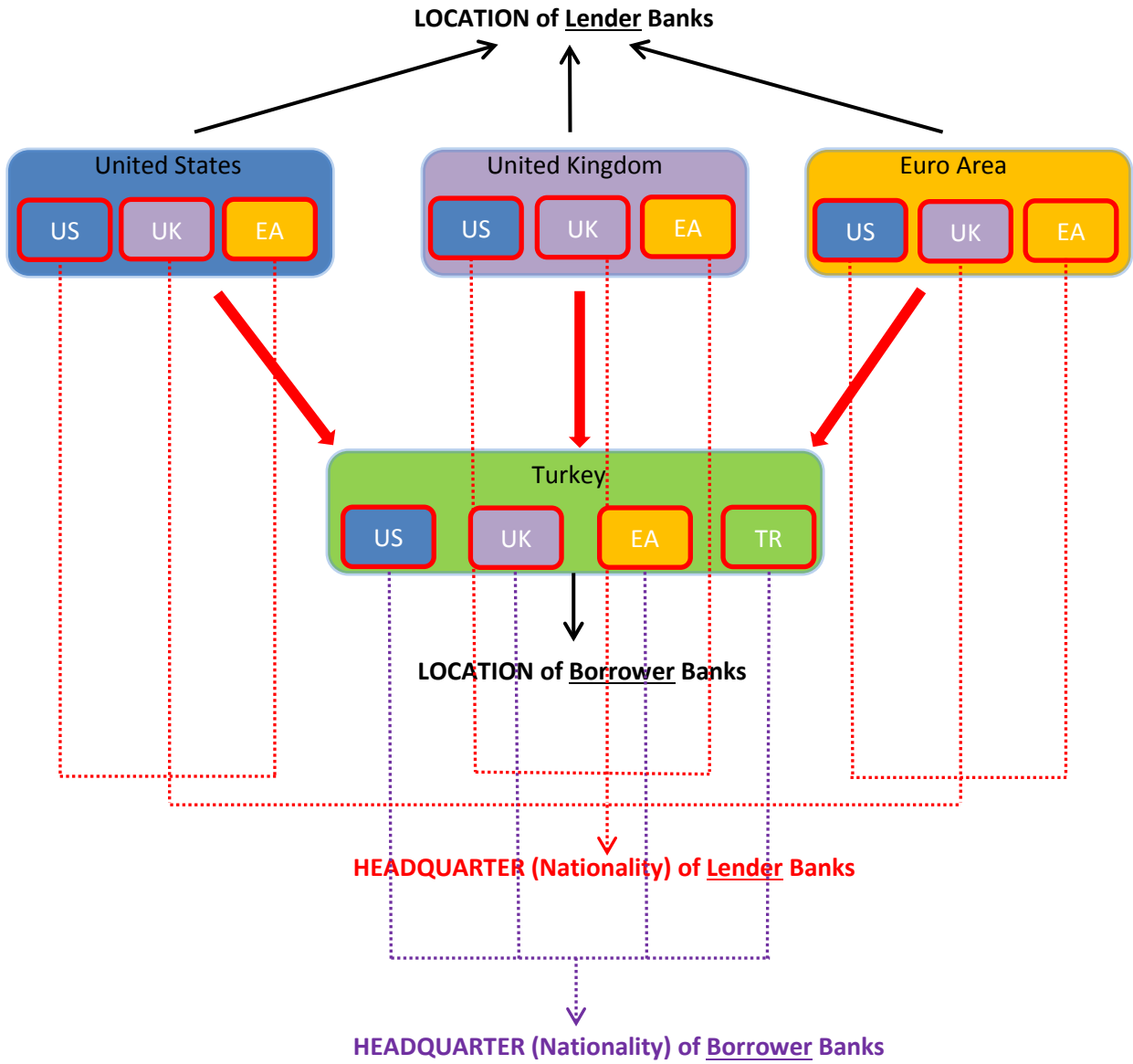
	Headquarter			Headquarter			Headquarter		
Fed	All Banks US HQ**			All Banks UK HQ			All Banks EA HQ		
ECB	All Banks US HQ			All Banks UK HQ			All Banks EA HQ		
BoE	All Banks US HQ			All Banks UK HQ			All Banks EA HQ		
Fed	US Loc***	UK Loc	EA Loc	US Loc	UK Loc	EA Loc	US Loc	UK Loc	EA Loc
ECB	US Loc	UK Loc	EA Loc	US Loc	UK Loc	EA Loc	US Loc	UK Loc	EA Loc
BoE	US Loc	UK Loc	EA Loc	US Loc	UK Loc	EA Loc	US Loc	UK Loc	EA Loc

\*The green color indicates that QE policy has significant effect at least 10 percent level on cross-border bank loans from respective region.

\*\* US HQ presents the US headquartered banks.

\*\*\* US Loc presents the US located banks.

Figure 3: Regional Analysis of QE Policies (Full Perspective)



## Appendix-I: Steps of Quantitative Easing Policies Implemented by Fed, ECB and BoE

**Table A1. Important Announcements by the Federal Reserve**

Date	Program	Brief Description
November 2008	QE1	LSAPs announced: Fed will purchase \$100 billion in GSE debt and \$500 billion in MBS.
March 2009	Extension of QE1	LSAPs expanded: Fed will purchase \$300 billion in long-term Treasuries and an additional \$750 and \$100 billion in MBS and GSE debt, respectively.
November 2010	QE2	QE2 announced: Fed will purchase \$600 billion in Treasuries.
September 2011	Operation Twist	Maturity Extension Program ("Operation Twist") announced: The Fed will purchase \$400 billion of Treasuries with remaining maturities of 6 to 30 years and sell an equal amount with remaining maturities of 3 years or less; MBS and agency debt principal payments will no longer be reinvested in Treasuries, but instead in MBS.
June 2012	Extension of Operation Twist	Maturity Extension Program extended: The Fed will continue to purchase long-term securities and sell short-term securities through the end of 2012. Purchases/sales will continue at the current pace, about \$45 billion/month.
September 2012	QE3	QE3 announced: The Fed will purchase \$40 billion of MBS per month as long as "the outlook for the labor market does not improve substantially...in the context of price stability."
May 2013	QE3	Bernanke said that "In the next few meetings, we could take a step down in our pace of purchase,"
October 2014	QE3	End of QE3

**Table A2. Important Announcements by the European Central Bank**

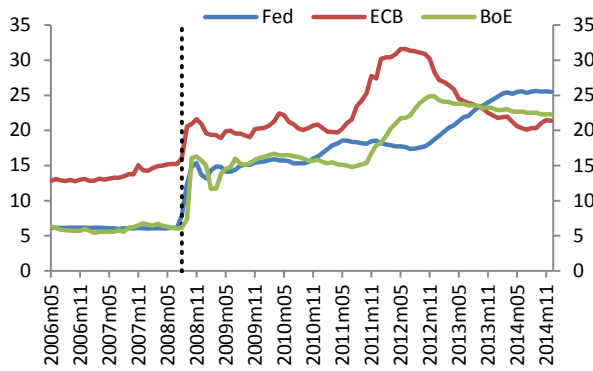
Date	Program	Brief Description
June 2009	LTRO	LTRO expanded: 6-month LTROs are announced.
May 2010	SMP	SMP announced: The ECB will conduct interventions in the euro area public and private debt securities markets; purchases will be sterilized.
December 2011	LTRO	LTRO expanded: 36-month LTROs are announced; eligible collateral is expanded.
September 2012	OMT	OMTs announced: Countries that apply to the European Stabilization Mechanism (ESM) for aid and abide by the ESM's terms and conditions will be eligible to have their debt purchased in unlimited amounts on the secondary market by the ECB.

**Table A3. Important Announcements by the Bank of England**

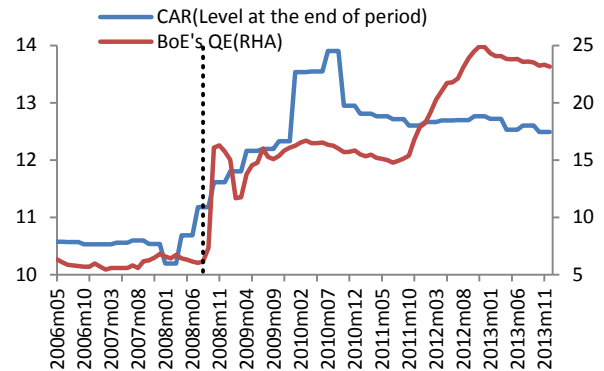
Date	Program	Brief Description
January 2009	APF	APF established: The BOE will purchase up to £50 billion of "high quality private sector assets" financed by Treasury issuance.
March 2009	APF	QE announced: The BOE will purchase up to £75 billion in assets, now financed by reserve issuance; medium- and long-term gilts will comprise the "majority" of new purchases.
May 2009	APF	QE expanded: The BOE will purchase up to £125 billion in assets.
August 2009	APF	QE expanded: The BOE will purchase up to £175 billion in assets; to accommodate the increased size, the BOE will expand purchases into gilts with remaining maturity of 3 years or more.
November 2009	APF	QE expanded: The BOE will purchase up to £200 billion in assets.
February 2010	APF	QE maintained: The BOE maintains the stock of asset purchases financed by the issuance of reserves at £200 billion; new purchases of private assets will be financed by Treasury issuance.
October 2011	APF	QE expanded: The BOE will purchase up to £275 billion in assets financed by reserve issuance; the ceiling on private assets held remains £50 billion.
November 2011	APF	Maximum private asset purchases reduced: HM Treasury lowers the ceiling on APF private asset holdings from £50 billion to £10 billion.
February 2012	APF	QE expanded: The BOE will purchase up to £325 billion in assets.
July 2012	APF	QE expanded: The BOE will purchase up to £375 billion in assets.

## Appendix-II: Time Series Charts of Cross-Border Borrowing by Banks in Turkey

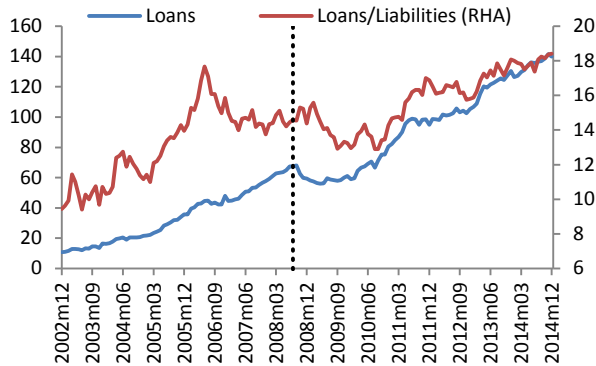
**Graph 1a: Total Central Bank Assets (% of GDP)**



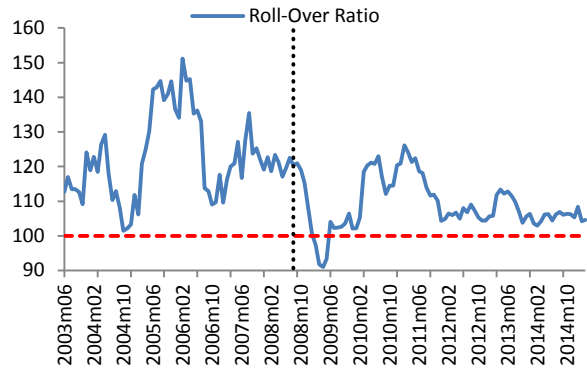
**Graph 1b: UK Capital Requirements and QE (%)**



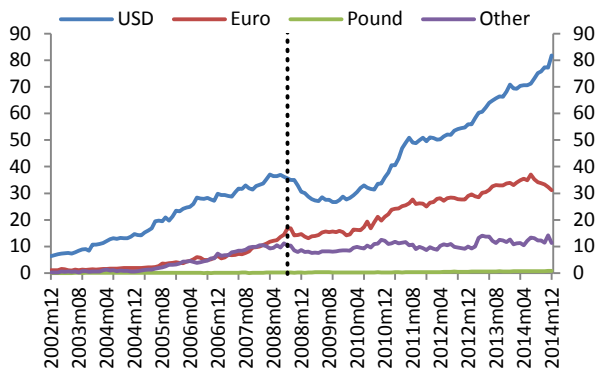
**Graph 2a: Amount of Turkish Banks' Cross-Border Loans and Ratio to Total Liabilities (Billion USD, %)**



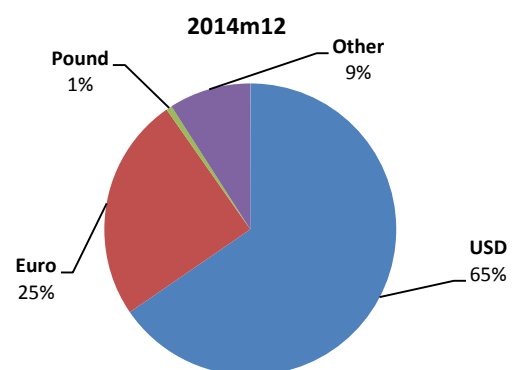
**Graph 2b: Banks' Roll-Over Ratio (%)**



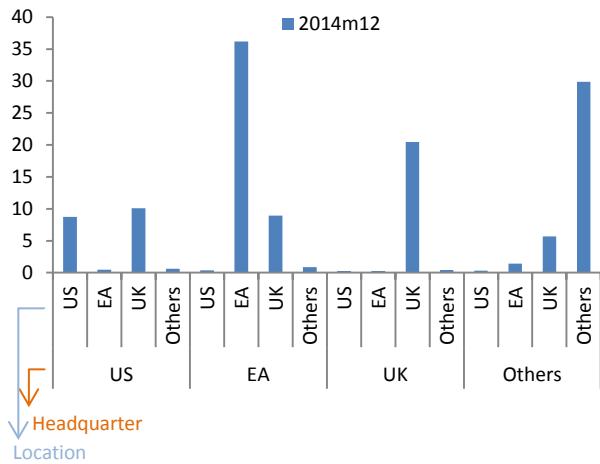
**Graph 3a: Currency Breakdowns of Cross-Border Loans (Billion USD)**



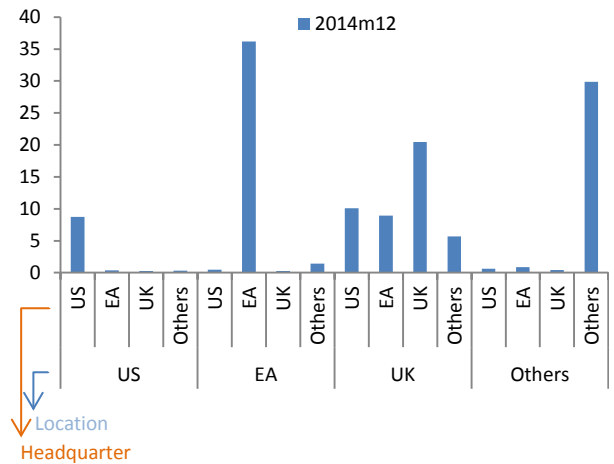
**Graph 3b: Currency Breakdowns of Cross-Border Loans (%)**



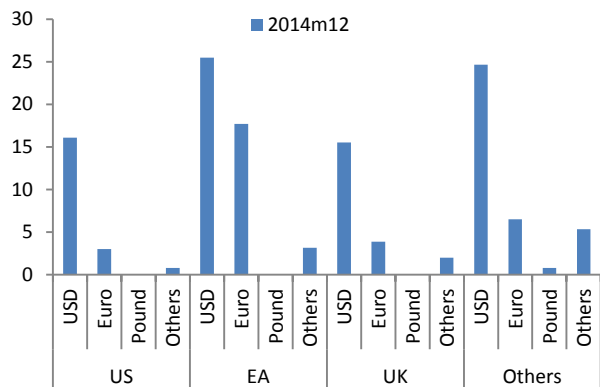
**Graph 4a: Regional Distribution of Cross-Border Loans (Based on Headquarters of Lender Banks, Billion USD)**



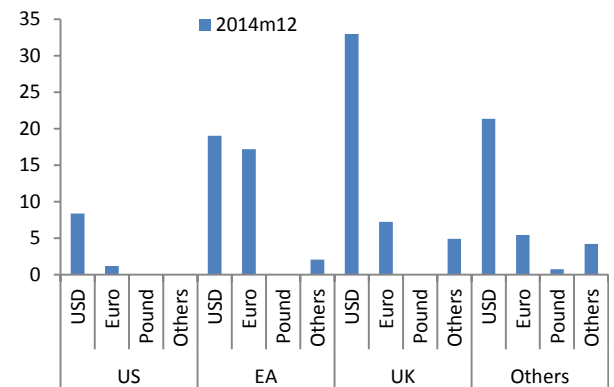
**Graph 4b: Regional Distribution of Cross-Border Loans (Based on Location of Lender Banks, Billion USD)**



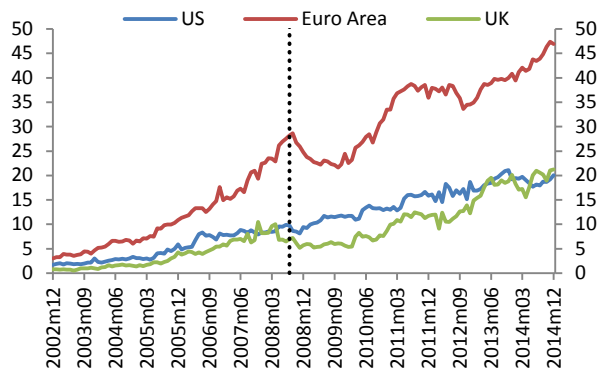
**Graph 5a: Currency Breakdowns of Cross-Border Loans (Based on Headquarters of Lender Banks, Billion USD)**



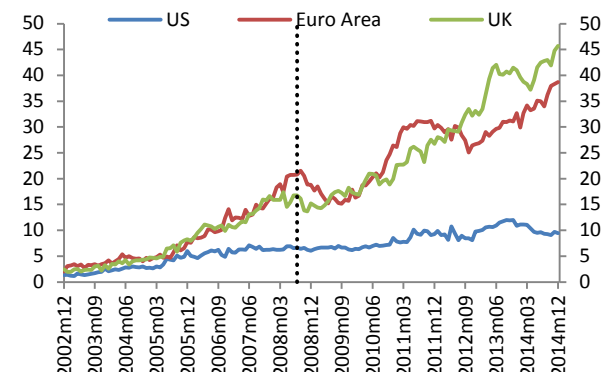
**Graph 5b: Currency Breakdowns of Cross-Border Loans (Based on Location of Lender Banks, Billion USD)**



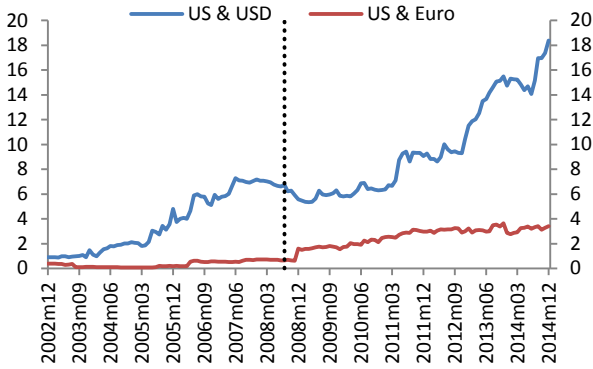
**Graph 6a: Regional Distribution of Cross-Border Loans (Based on Headquarters of Lender Banks, Billion USD)**



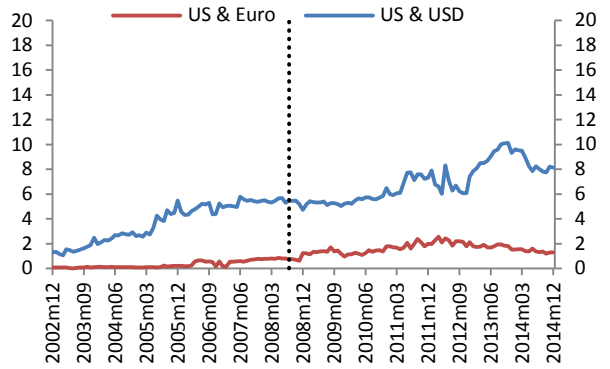
**Graph 6b: Regional Distribution of Cross-Border Loans (Based on Location of Lender Banks, Billion USD)**



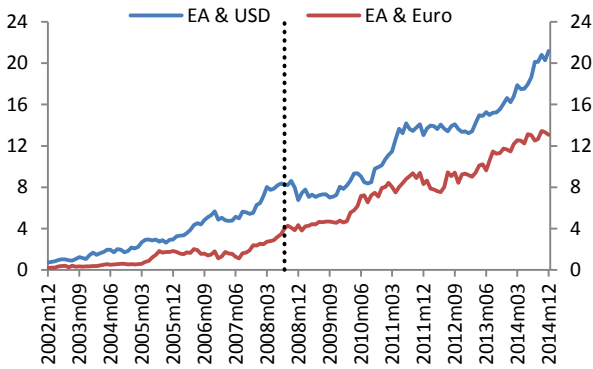
**Graph 7a: Currency Breakdowns of US Banks' Cross-Border Loans (Based on Headquarters of Lender Banks, Billion USD)**



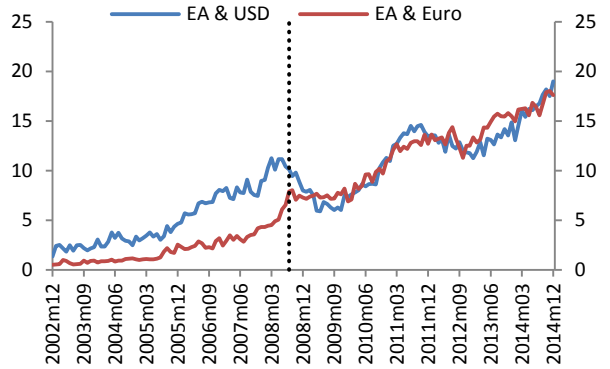
**Graph 7b: Currency Breakdowns of US Banks' Cross-Border Loans (Based on Location of Lender Banks, Billion USD)**



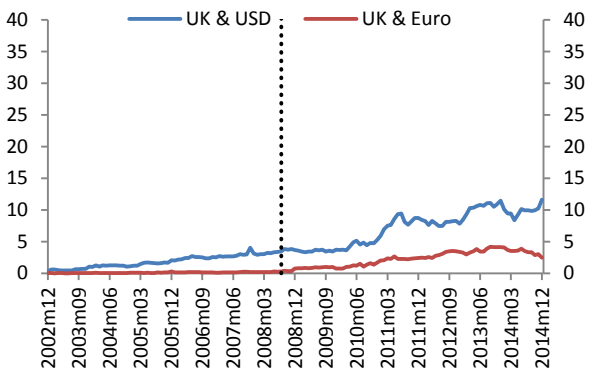
**Graph 8a: Currency Breakdowns of EA Banks' Cross-Border Loans (Based on Headquarters of Lender Banks, Billion USD)**



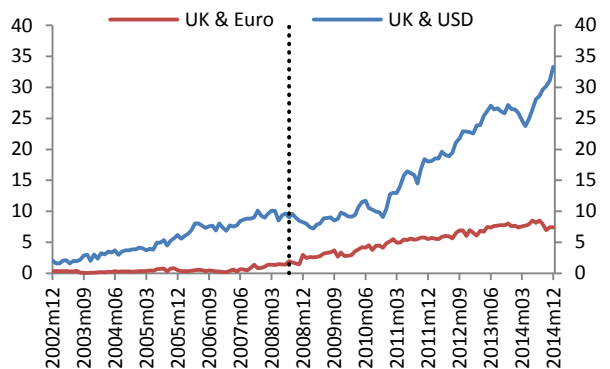
**Graph 8b: Currency Breakdowns of EA Banks' Cross-Border Loans (Based on Location of Lender Banks, Billion USD)**



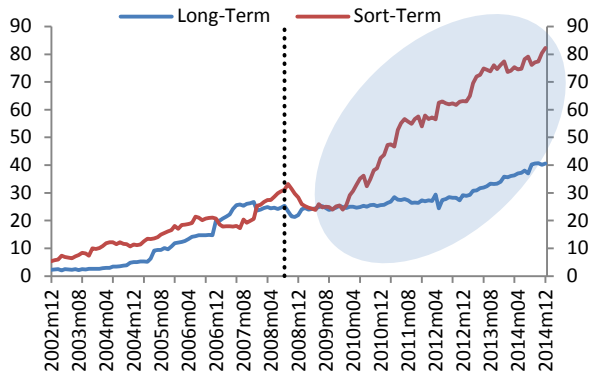
**Graph 9a: Currency Breakdowns of UK Banks' Cross-Border Loans (Based on Headquarters of Lender Banks, Billion USD)**



**Graph 9b: Currency Breakdowns of UK Banks' Cross-Border Loans (Based on Location of Lender Banks, Billion USD)**



**Graph 10a: Maturity Breakdowns of Cross-Border Loans (Billion USD)**



**Graph 10b: S-T Liabilities / S-T Assets (%)**

