International Banking and Cross-Border Effects of Regulation: Lessons from Turkey*

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How do regulatory changes in a foreign country affect the lending growth in another country? This paper addresses this question using bank-level data from Turkey and macroprudential measures from fifty-six countries over a sample period of 2006–13. We offer evidence for the existence of the inward transmission of foreign prudential regulations by showing that the macroprudential tightening abroad leads to lending growth by the banks in Turkey. We find that domestic affiliates of foreign banks play a more prominent role in this transmission. We show that the existence and the magnitude spillovers differ across bank characteristics or the prudential instruments. Finally, our results indicate that the spillovers depend on the financial cycles.

JEL Codes: F42, F44, G15, G21.

1. Introduction

How do regulatory changes in one country affect the lending growth in other countries? Given the globalization of the financial and banking systems, do domestic policies aiming at financial stability in an economy generate cross-border externalities such as an increase in the lending growth in the countries experiencing capital flows? With the recent global financial crisis, microprudential and macroprudential regulations implemented in many countries for increasing the stability and resilience of their financial system have made these questions even more important. Given the possibility of cross-border

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spillovers, these questions have taken center stage in the efforts for a more resilient and stable global financial system.[1]

In order to provide a better understanding of these questions, this paper analyzes the inward transmission of foreign prudential regulations into the Turkish economy via changes in lending growth by the banks operating in Turkey. To establish a causal link running from regulatory changes in one country to the lending growth in another country through cross-border spillovers, Turkey offers a valuable example as a small open economy with a fully liberal capital account regime and banking sector composed of both domestic banks and domestic affiliates of foreign banks with full access to international money and capital markets.[2]

In the last fifteen years, the Turkish economy experienced substantial gross capital inflows due to both external push factors such as the abundance of global liquidity and internal pull factors such as improvements in the fundamentals of the country as a result of comprehensive reforms. Capital inflows have been mostly intermediated through the banking sector, which, in turn, led to substantial loan growth, except for a brief contraction in the aftermath of the global financial crisis.[3] With high capital adequacy and liquidity ratios, and low non-performing loan (NPL) ratios, the Turkish banking sector was well positioned to intermediate capital flows to domestic loans. Despite their balance sheet strengths and international activities, none of the domestic banks in Turkey are large on the global scale. Therefore, we believe that domestic banks have a limited capacity to channel the changes in the Turkish macroprudential regulation abroad. On the other hand, with the strong links to the global financial markets, they have a potential for transmitting the effects of the

[1]See Buch and Goldberg (2017) for a review of literature on the cross-border spillover effects of the prudential regulations. Also, see the Financial Stability Board's (2015) annual report and see Freixas, Laeven, and Peydro (2015). Also, among others, Aiyar, Calomiris, and Wieladek (2014) and Forbes, Reinhardt, and Wieladek (2015) provide evidence for the existence of cross-border spillovers of prudential regulations.

[2]Turkey is among few emerging market countries that does not impose any form of capital account restrictions. For a review of literature on capital controls and their effectiveness, see Binici, Hutchinson, and Schindler (2010).

[3]Başkaya et al. (2017a, 2017b) show that low interest rates and a high liquidity environment driven by quantitative easing in advanced countries in the post-crisis period leads to higher credit growth in Turkey.

prudential regulations abroad (i.e., home country) on the lending behavior of the banks in Turkey (i.e., the host country).

To summarize the findings, we first provide some evidence for the inward transmission of foreign prudential regulations. However, the significance of a particular prudential tool depends on the specification that we use. Depending on the specification, we find that changes in LTV limits, reserve requirement ratios, interbank exposure limits, and concentration ratios can have a significant cross-border spillover.

Second, we find that the ownership structure of the banks is not immaterial in the transmission of the regulatory spillovers from abroad. We document significant heterogeneities with respect to whether the effect is transmitted by domestic banks or the domestic affiliates of foreign banks in Turkey. In three out of four specifications estimated with the sample of domestic affiliates of the foreign banks, we observe that the macroprudential tightening as measured with a composite macroprudential policy index (MPI) leads to higher loan growth in Turkey. In contrast, such a spillover effect is not supported by the estimation results obtained with the sample of all banks, as we do not observe such a cross-border spillover effect. This is consistent with the findings of existing studies on the role of inward transmission of foreign banks, such as the analysis of differential role of foreign banks in transmitting effects of U.S. monetary policy in Mexico by Bernardo, Peydro, and Ruiz (2015).

We also test (i) whether the degree of inward transmission varies over the business cycles and financial cycles and (ii) whether bank characteristics play a key role in the transmission. In general, the effect differs from one prudential regulation to the other. Regarding the first question, we observe that the positive spillover effect of the prudential regulation in the home country is more pronounced when the home country is in the expansionary phase of the financial cycle. As to the second question, the lending growth by the large banks is less sensitive to the prudential regulations in the home country, whereas the banks with higher share of illiquid assets or higher international activity face a higher lending growth in response to prudential tightening in the home country.[4]

[4]Among others, Cetorelli and Goldberg (2011) and Wagner (2014) underline the role of international operational banks in the cross-border transmission of the effects of prudential regulations on lending growth.

The rest of this paper is organized as follows. Section 2 provides data and the stylized facts, section 3 presents the empirical analysis, and section 4 presents the concluding remarks.

2. Data and Stylized Facts for Turkey

The Turkish banking sector comprises fifty-two active institutions as of the third quarter of 2015. Among those fifty-two, thirty-four banks are classified as deposit banks and thirteen are investment and development banks. In terms of ownership structure, there are both private banks and state-owned banks in each of these categories. Besides conventional banking services, five banks, categorized as the participation banks, solely offer Islamic banking services.

In terms of ownership and affiliations, the banking industry is highly diverse. Global banks are active in Turkey through their affiliates and branches. The major share of deposit banking services is provided by foreign banks. Based on the classification of the Banking Regulation and Supervision Agency (BRSA) in Turkey, twenty deposit banks (out of thirty-four), four investment and development banks (out of thirteen), and three participation banks (out of five) have a majority of foreign ownership, defined as having foreign share larger than 50 percent of common equity capital. Among foreign banks, six of them operate as branches and the rest as subsidiaries.

During the sample period of our analysis, i.e., the first quarter of 2006 to the second quarter of 2013, we cover a total of forty-one banks for which we have collected data on locational banking statistics. Over the sample of analysis, there are very few mergers, acquisitions, and buyouts. We carefully addressed changes in bank ownership structure and corresponding parent-country macroprudential changes. Due to mergers and acquisitions (M&A) events, the number of banks that could be classified as domestic versus foreign (depending on the majority of equity capital) could have changed over time, leading to the number of twenty-one and twenty-four, respectively.[5] Additionally, as discussed in detail below, a few banks

[5]Over the sample period, there has not been a major change in the extensive margin neither due to mergers and acquisitions. In addition, the global financial crisis of 2008–09 did not lead to any bankruptcy in the Turkish banking system. The latter fact can be explained by the comprehensive set of banking-sector

classified as foreign banks could have multiple affiliations, for which we consider all countries having share in the bank when we conduct the exercise of transmission of home macroprudential policies through domestic affiliates of foreign banks.[6]

The bank-level data are collected by two authorities in Turkey, namely the Banking Regulation and Supervision Agency (BRSA) and the Central Bank of the Republic of Turkey (CBRT). The BRSA is the main microprudential authority and collects data for supervisory purposes. The CBRT collects bank-level data for financial stability purposes, among others. For this study, we mainly use data collected by the CBRT that includes monthly balance sheets and income statements as well as locational banking statistics as a part of balance-of-payment (BOP) statistics. The data used in this paper are confidential and not available to the public.

In the baseline empirical model presented in the next section, we report the results for all banks, including a comparative analysis across domestic versus foreign banks as well as subsidiaries versus branches. We use the International Banking Research Network (IBRN) Prudential Instruments Database described in Cerutti et al. (2017) for prudential regulations. The rest of the data come from the CBRT and are used in an unconsolidated way in the paper. Finally, all indicators are deflated with 2006 base-year prices (GDP deflator) and winsorized at 5 percent; quarterly growth rates (in log terms) are used.

Summary statistics for all banks used in the empirical exercise are presented in table 1, and further additional information is reported in table 8 in the appendix. Since balance sheet data are presented in Turkish lira (TL) and foreign borrowing in U.S. dollars, for consistency we converted all data to Turkish lira.

2.1 Data on Prudential Instruments

Data for prudential instruments for the countries with which the banks in Turkey are engaged in cross-border borrowing have been

reforms starting from the early 2000s as well as effective macroeconomic and prudential policies implemented during the sample period.

[6]Details on the ownership structure of both domestic banks and affiliates of foreign banks operating in Turkey are provided by the BRSA and the Turkish Banking Association.

Table 1. Descriptive Statistics

Balance Sheet Characteristics	Mean	Median	75th Percentile	Standard Deviation
Log Total Assets	15.06	15.08	16.86	2.33
Capital Ratio (%)	23.07	13.58	23.29	21.24
Illiquid Assets Ratio (%)	53.42	60.89	68.91	22.31
International Ratio (%)	3.98	0.00	5.82	7.13
Deposits Ratio (%)	38.88	52.97	62.19	28.38
Loans (Ln Change * 100)	6.98	7.39	12.16	17.70

taken from the IBRN Prudential Instruments Database described in Cerutti et al. (2017). We use data on six classes of prudential changes, including capital requirements, capital buffers, loan-to-value (LTV) ratios, reserve requirements for local currency, interbank exposure limit, and concentration ratio. All prudential instruments, except reserve requirements on foreign-currency liabilities, display sufficient variation and are used in our regression analysis (table 2). Over the sample period, Turkish authorities also implemented several regulatory measures, particularly on reserve requirements and risk weighting.

In the construction of foreign-exposure-weighted regulation ($ExpP$), we used total asset and liabilities from the host country as a weighting metric, multiplying prudential measure at time t with lagged weight (from $t-1$ to $t-3$) to avoid simultaneity. Further discussion on specific regression models and construction of exposure-weighted prudential measures are described by Buch and Goldberg (2017).

2.2 Stylized Facts

Several features of Turkey's recent past make it interesting to carry out an empirical analysis on the impact of international regulatory changes on the lending behavior of the banks in Turkey. First, Turkey experienced strong credit growth. Annual credit growth rates reached 40 percent in the third quarter of 2011 in nominal terms following the quantitative easing of the Federal Reserve and a brief

Table 2. Summary Statistics on Changes in Prudential Instruments

Inward: Specification A						
	Base Data (Before Aggregating to Exposure-Weighted Measures)					Exposure-Weighted Observations
Instrument	**No. of Country-Time Changes**	**No. of Country-Time Changes (Tightening)**	**No. of Country-Time Changes (Loosening)**	**No. of Bank-Time Changes**	**Proportion Base-MPP Non-zero**	**Proportion $ExpP_t$ Non-zero**
Prudential Index	334	241	93	2,887	17.38	79.16
General Capital Requirements	63	63	0	874	3.70	23.22
Sector-Specific Capital Buffer	50	37	13	341	2.60	25.14
Loan-to-Value Ratio Limits	68	51	17	723	9.20	45.16
Reserve Requirements: Foreign	66	43	23	284	3.43	22.67
Reserve Requirements: Local	155	82	73	910	8.06	40.40
Interbank Exposure Limit	18	17	1	360	2.88	20.20
Concentration Ratios	22	21	1	262	2.07	23.95
Inward: Specification B						
Instrument	**No. of Country-Time Changes**	**No. of Country-Time Changes (Tightening)**	**No. of Country-Time Changes (Loosening)**	**No. of Bank-Time Changes**	**Proportion $HomeP_t$ Non-zero**	
Prudential Index	56	47	9	57	10.487	
General Capital Requirements	17	17	0	18	3.881	
Sector-Specific Capital Buffer	8	8	0	6	1.498	
Loan-to-Value Ratio Limits	7	6	1	7	7.527	
Reserve Requirements: Foreign	1	1	0	1	0.187	
Reserve Requirements: Local	17	3	14	16	3.184	
Interbank Exposure Limit	7	7	0	7	2.389	
Concentration Ratio	15	15	0	15	4.076	

Source: IBRN.
Notes: This table shows summary statistics on changes in prudential instruments for banks located in Turkey over the 2006–13 period. Data on the instruments come from the IBRN Prudential Instruments Database described in Cerutti et al. (2017) and are at the quarter level. The number of changes in prudential instruments is reported on several dimensions, i.e., on the country-time level and on the bank-time level. The last column of each panel shows the share of prudential changes to total observations (i.e., the share of non-zero observations). The column "Exposure-Weighted Observations" is based on the underlying data on prudential changes in foreign countries (columns under the "Base Data" heading). The reported data are based on the regression sample.

credit crunch in the wake of the Lehman Brothers collapse in 2008.[7] In more recent years, both external factors and domestic countercyclical policies including macroprudential measures led to significant slowdown in credit growth, bringing its annual growth rate to around 15 percent. The loan-to-GDP ratio accordingly increased substantially over the last ten years, namely from 40 percent in 2006 to 88 percent at the end of 2014.

Second, the capital inflows are an important source for bank lending in Turkey. The debt liabilities as a share of total assets of the banking sector are 23 percent as of late 2014. These external funds included outright bank loans (15.4 percent of total assets), syndicated loans (2.6 percent), securitization finance (1.4 percent), deposits (52.7 percent), repos (6.7 percent), and issuances (4.3 percent) as of October 2015. The diverse nature of the Turkish banking sector played certain roles in the banks' preferences for these different types of funds. The diversity ranges from state-owned banks (with a share of 31.7 percent in the banking sector in terms of asset size) to local private banks (48.6 percent), and foreign bank subsidiaries and branches (19.6 percent).[8] The main providers of the external funding to banks in Turkey are commercial banks, investment banks, and asset-management firms. Overall, the banking sector in Turkey has maintained strong balance sheets with high capital adequacy and liquidity ratios, low leverage ratios, and low NPL ratios.

Third, various macroprudential measures, together with the conventional policies, have been introduced to slow down the aggregate credit growth as well as to change the composition of credit in favor of commercial loans, as higher consumer loan growth is associated with higher external imbalance risk in the economy by widening the current account deficit.[9] There are distinctive prudential rules in Turkey, most of which were introduced in the last decade.

[7]Data on credit growth as well as other main financial developments across countries and their expert analyses can be found in annual reports of the Bank for International Settlements.

[8]Based on the Banking Regulation and Supervision Agency's classification using monthly balance sheet data from October 2015.

[9]See Basci and Kara (2011) for the changes in the policy framework of the CBRT considering the risks to financial stability in the post–global financial crisis period.

For example, households are allowed to borrow neither at flexible interest rates nor in foreign-currency-denominated loans. Likewise, small and medium-size enterprises with no foreign-currency revenues are regulated with no foreign-currency borrowings. In addition, the CBRT imposed required reserves on banks' liabilities with aims of not only placing quantity constraints on the bank funding available for loans but also achieving lower leverage ratios, longer maturity for liabilities, and higher foreign-currency reserves. The Financial Stability Committee, established in the wake of the global financial crisis, introduced several macroprudential measures, including quantity-based and price-based ones.

Fourth, there were also the episodes of tightening global financial conditions, such as the global financial crisis of 2008–09, the euro-zone sovereign debt crisis, and the 2013 taper tantrum. Turkey experienced capital outflows during these episodes and introduced countercyclical policies, including easing the macroprudential policies.

3. Empirical Method and Regression Results

3.1 Baseline Analysis of Inward Transmission of Prudential Policies

In our baseline analysis, we estimate the effect of the exposure-weighted macroprudential regulations in foreign countries, denoted by $ExpP_{b,t}$, on the quarterly growth rate of the total lending of the domestic global banks in Turkey (i.e., the host country) using the following specification:

$$\Delta Y_{b,t} = \alpha_0 + (\alpha_1 ExpP_{b,t} + \alpha_2 ExpP_{b,t-1} + \alpha_3 ExpP_{b,t-2}) + \alpha_4 X_{b,t-1} + f_b + f_t + \varepsilon_{b,t}, \quad (1)$$

where $\Delta Y_{b,t}$ denotes the logarithmic change in the total loans extended by domestic global bank b in Turkey. The foreign-exposure-weighted regulation, $ExpP_{b,t}$, is calculated as the weighted average of changes in foreign regulation where the weight of each country j is determined considering the total assets and liabilities of the bank b in the respective foreign country at time $t-1$. $X_{b,t-1}$ denotes the set of controls for Turkish banks' characteristics, such as their illiquid

assets as a ratio to their portfolio, percentage of the balance sheet financed with total deposits, percentage of their equity capital as a ratio to total assets, logarithm of total real assets, and a measure of international activity expressed as the percentage of their foreign assets relative to total assets. Finally, f_b and f_t denote the bank and time fixed effects, controlling for the unobserved time-invariant bank characteristics and the common shocks to all banks, respectively.

Using the sample of all banks, columns 1–7 of table 3 show how lending growth changes in response to variations in the MPI and six individual regulatory measures, such as capital requirements, sector-specific capital buffer, LTV ratio, local-currency reserve requirements, interbank exposure limits, and the concentration ratios. According to the results on this specification, the prudential regulations abroad do not have a significant effect on the lending growth in Turkey, as we fail to reject H_0: $\alpha_1 + \alpha_2 + \alpha_3 = 0$ in all columns of table 3 even at the 10 percent significance level.

Next we explore the role of the domestic affiliates of foreign banks in transmitting the effect of the macroprudential regulations taking place in the home country of the foreign global bank using equation (2):

$$\Delta Y_{b,j,t} = \alpha_0 + (\alpha_1 HomeP_{j,t} + \alpha_2 HomeP_{j,t-1} + \alpha_3 HomeP_{j,t-2}) + \alpha_4 X_{b,j,t-1} + \alpha_5 Z_{j,t} + f_b + f_t + \varepsilon_{b,j,t}, \quad (2)$$

where $\Delta Y_{b,j,t}$ is the quarterly rate of change in the lending at time t by the foreign bank b in Turkey with a parent bank located in country j, and the variable $HomeP_{j,t-1}$ is the prudential regulation at time $t-$ l conducted in home country j. Finally, $Z_{j,t}$ denotes the home-country business and financial cycles.

Column 1 of table 4 shows that the macroprudential tightening in the home country as measured with the MPI leads to higher loan growth by the domestic affiliates of foreign banks operating in Turkey. Comparing the results in column 1 of table 3 and table 4, we observe that these banks play an important role in the transmission of the cross-border effects of the macroprudential regulations implemented in the country of their parent banks. In terms of the magnitude, tightening abroad through a one-unit increase in the MPI results in a total of 4.2 percentage point higher growth rate in the lending by the domestic affiliates of the foreign banks within

Table 3. Exposure-Weighted Inward Transmission of Regulation

	Prudential Index (1)	Capital Requirements (2)	Sector-Specific Capital Buffer (3)	LTV Ratio (4)	LC Reserve Requirements (5)	Interbank Exposure Limits (6)	Concentration Ratios (7)
Foreign-Exposure-Weighted Regulation $ExpP_{sum}$	−3.925	−6.107	−3.524	−1.220	−9.549	−3.873	26.95
	(3.438)	(4.787)	(7.789)	(4.737)	(6.126)	(8.752)	(22.690)
Foreign-Exposure-Weighted Regulation $ExpP_t$	−0.160	0.091	0.528	−0.861	−3.693	−3.722	23.380
	(1.768)	(2.183)	(6.507)	(3.253)	(2.759)	(4.386)	(18.120)
Foreign-Exposure-Weighted Regulation $ExpP_{t-1}$	−2.755**	−4.071*	−3.042	0.552	−5.692**	−1.556	1.639
	(1.137)	(2.135)	(4.842)	(1.713)	(2.749)	(4.875)	(5.210)
Foreign-Exposure-Weighted Regulation $ExpP_{t-2}$	−1.011	−2.127	−1.011	−0.911	−0.164	1.405	1.928
	(1.763)	(2.524)	(3.392)	(1.326)	(2.016)	(3.653)	(2.467)
Log Total $Assets_{t-1}$	−13.262***	−13.210***	−13.196***	−13.216***	−13.197***	−13.181***	−12.688***
	(2.039)	(2.100)	(2.066)	(2.075)	(2.041)	(2.099)	(2.272)
Tier 1 $Ratio_{t-1}$	−0.401***	−0.397***	−0.403***	−0.402***	−0.401***	−0.399***	−0.388***
	(0.073)	(0.074)	(0.073)	(0.073)	(0.073)	(0.073)	(0.078)
Illiquid Assets $Ratio_{t-1}$	−0.046	−0.046	−0.047	−0.046	−0.044	−0.045	−0.051
	(0.042)	(0.043)	(0.043)	(0.043)	(0.042)	(0.042)	(0.044)
International $Activity_{t-1}$	−0.075	−0.074	−0.074	−0.076	−0.063	−0.066	−0.055
	(0.063)	(0.059)	(0.062)	(0.061)	(0.060)	(0.066)	(0.65)
Core Deposits $Ratio_{t-1}$	0.132**	0.127**	0.134**	0.135**	0.132**	0.139**	0.133**
	(0.066)	(0.064)	(0.068)	(0.065)	(0.067)	(0.065)	(0.062)
Observations	936	936	936	936	936	936	936
R^2	0.399	0.399	0.396	0.396	0.399	0.397	0.410
Adjusted R^2	0.349	0.349	0.346	0.346	0.349	0.347	0.360

Notes: This table reports the effects of changes in regulation and firm characteristics on log changes in total loans. The data are quarterly from 2006:Q1 to 2013:Q3 for a panel of forty-one domestic banks and domestic affiliates of foreign banks. ExpP is calculated as the weighted average of changes in foreign regulation where the weights are total assets and liabilities of the bank in the respective foreign country. For more details on the variables, see table 7 in the appendix. Each column gives the result for the regulatory measure specified in the column headline. All specifications include time and bank fixed effects. Standard errors are clustered by banks. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 4. Inward Transmission of Home Macropruential Policy via Affiliates

	HomeP = Prudential IndexC (1)	HomeP = Capital Require-ments (2)	HomeP = Sector-Specific Capital Buffer (3)	HomeP = LTV Ratio (4)	HomeP = Reserve Require-ments: Local (5)	HomeP = Interbank Exposure Limits (6)	HomeP = Concen-tration Ratios (7)
Home-Country	4.202^{**}	3.225	-2.841	-5.800^{***}	7.875^{*}	-30.860^{**}	7.244
Regulation $\text{HomeP}_{\text{sum}}$	(1.935)	(3.769)	(7.409)	(0.589)	(4.721)	(13.290)	(4.873)
Home-Country	3.266^{***}	1.418	6.160^{***}	-0.490^{**}	4.357	1.482	12.209^{***}
Regulation HomeP_{t}	(1.046)	(1.438)	(0.923)	(0.234)	(2.895)	(3.637)	(4.183)
Home-Country	0.623	1.148	-5.562	-1.288^{***}	3.935	-28.385^{**}	-4.615^{*}
Regulation $\text{HomeP}_{\text{t}-1}$	(1.074)	(1.186)	(6.214)	(0.314)	(2.563)	(12.647)	(2.775)
Home-Country	0.314	0.659	-3.439^{**}	-4.022^{***}	-0.418	-3.959	-0.350
Regulation $\text{HomeP}_{\text{t}-2}$	(0.774)	(1.444)	(1.704)	(0.512)	(2.963)	(3.127)	(1.627)
Log Total $\text{Assets}_{\text{t}-1}$	-11.774^{***}	-12.454^{***}	-12.421^{***}	-6.096^{*}	-11.922^{***}	-17.648^{***}	-7.692
	(3.668)	(3.688)	(3.573)	(3.387)	(3.662)	(3.427)	(4.736)
Tier 1 $\text{Ratio}_{\text{t}-1}$	-0.380^{*}	-0.409^{*}	-0.399^{*}	1.107^{***}	-0.392^{*}	-0.752^{***}	-0.063
	(0.229)	(0.230)	(0.229)	(0.301)	(0.234)	(0.185)	(0.314)
Illiquid Assets $\text{Ratio}_{\text{t}-1}$	-0.164^{*}	-0.173^{*}	-0.163^{*}	-0.229	-0.163^{*}	-0.349^{***}	-0.032
	(0.099)	(0.092)	(0.096)	(0.194)	(0.093)	(0.117)	(0.118)
Core Deposits $\text{Ratio}_{\text{t}-1}$	0.096	0.093	0.076	-0.305^{***}	0.087	0.067	0.022
	(0.092)	(0.101)	(0.097)	(0.032)	(0.100)	(0.099)	(0.140)
BIS Financial Cycle	0.074^{*}	0.080	0.064	-0.030	0.077	0.641^{***}	0.095
(Home Country)	(0.043)	(0.051)	(0.044)	(0.072)	(0.049)	(0.219)	(0.117)
BIS Business Cycle	0.153	0.173	0.155	-1.052^{***}	0.176	-0.910	-1.010
(Home Country)	(0.194)	(0.194)	(0.199)	(0072)	(0.200)	(0.948)	(1.261)
Observations	393	393	393	63	393	246	264
R^2	0.406	0.393	0.396	0.893	0.394	0.529	0.516
Adjusted R^2	0.315	0.301	0.304	0.699	0.302	0.418	0.408

Notes: This table reports the effects of changes in parent-country regulation and firm characteristics on log changes in total loans. The data are quarterly from 2006:Q1 to 2013:Q3. HomeP refers to the changes in regulation in the home (i.e., parent-bank) country of foreign affiliates. For more details on the variables, see table 7 in the appendix. Each column gives the result for the regulatory measure specified in the column headline. All specifications include bank fixed effects as specified in the lower part of the table. Standard errors are clustered by banks. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively.

three quarters, where a 3.2 percentage point increase takes place within the quarter of the increase in the MPI. To put this number into perspective, this is slightly below half of the median quarterly lending growth rate in Turkey over the sample period.

In terms of the effects of the individual policies, we find that the changes in capital requirements, sector-specific capital buffers, and the concentration ratios do not have a significant cross-border spillover transmitted via domestic affiliates of foreign banks. On the other hand, we find that a decrease in interbank exposure limits abroad leads to a lower lending growth rate in Turkey, suggesting that interbank liquidity is an important channel for transmitting the cross-border spillovers of the prudential regulations. Finally, the results with equation (2) on the effects of LTV ratios and the reserve requirement ratios seem to be at odds with our expectations. In particular, we find that the tightening via lower LTV ratios and the relaxation via lower reserve requirement ratios decrease the growth rate of the loans intermediated by the domestic affiliates of foreign banks in Turkey.

3.2 Differential Role of Banks Characteristics

Using equation (3), table 5 presents results on whether bank characteristics, such as log total assets, core deposits ratio, capital ratio, international activity, and illiquid assets ratio, play a role in the inward transmission of prudential tightening abroad:

$$\begin{aligned}\Delta Y_{b,t} = \alpha_0 &+ (\alpha_1 ExpP_{b,t} + \alpha_2 ExpP_{b,t-1} + \alpha_3 ExpP_{b,t-2}) + \alpha_4 X_{b,t-1} \\ &+ (\beta_1 ExpP_{b,t} \cdot X_{b,t-1} + \beta_2 ExpP_{b,t-1} \cdot X_{b,t-1} \\ &+ \beta_3 ExpP_{b,t-2} \cdot X_{b,t-1}) + f_b + f_t + \varepsilon_{b,t}. \qquad (3)\end{aligned}$$

In this setup, the total effect of foreign macroprudential tightening on the change in the lending growth is equal to

$$\frac{\partial \Delta Y_{b,t}}{\partial ExpP_{b,t}} = \alpha_1 + \alpha_2 + \alpha_3 + (\beta_1 + \beta_2 + \beta_3) \cdot X_{b,t-1}, \qquad (3')$$

which depends on the bank characteristics. Using the estimates presented in table 4 to evaluate the expression in equation (3′) at the median values of the bank characteristics, we find that none of the

Table 5. Exposure-Weighted Inward Transmission of Regulation—Bank Variables Interactions

	Prudential IndexC (1)	Capital Requirements (2)	Sector-Specific Capital Buffer (3)	LTV Ratio (4)	Reserve Requirements: Local (5)	Interbank Exposure Limits (6)	Concentration Ratios (7)
Foreign-Exposure-Weighted Regulation (ExpP)	103.7	6.634	109.8	77.49	-19.88	212.6	86.66
	(82.190)	(80.100)	(362.900)	(188.800)	(94.430)	(138.600)	(141.700)
Log Total Assets$_{t-1}$	−12.803***	−13.030***	−13.556***	−12.835***	−13.045***	−13.757***	−12.373***
	(2.266)	(1.532)	(2.180)	(2.014)	(1.854)	(2.371)	(2.398)
Tier 1 Ratio$_{t-1}$	−0.331***	−0.364***	−0.400***	−0.413***	−0.382***	−0.330***	−0.296***
	(0.087)	(0.084)	(0.076)	(0.072)	(0.073)	(0.090)	(0.100)
Illiquid Assets Ratio$_{t-1}$	−0.052	−0.062	−0.050	−0.047	−0.045	−0.031	−0.040
	(0.038)	(0.042)	(0.047)	(0.042)	(0.043)	(0.041)	(0.046)
International Activity$_{t-1}$	−0.064	−0.051	−0.089	−0.076	−0.063	−0.036	−0.082
	(0.052)	(0.058)	(0.062)	(0.065)	(0.068)	(0.075)	(0.062)
Core Deposits Ratio$_{t-1}$	0.146**	0.024	0.138**	0.123*	0.073	0.185***	0.120**
	(0.067)	(0.059)	(0.070)	(0.064)	(0.050)	(0.066)	(0.057)
Log Total Assets*ExpP	−5.384	−6.129*	−4.53	−1.016	8.561*	−4.33	6.889
	(4.725)	(3.170)	(18.530)	(9.341)	(4.749)	(8.048)	(9.671)
Tier 1 Ratio*ExpP	−0.832	2.002	−1.316	−0.59	−3.397***	−3.319***	−4.268*
	(0.795)	(1.265)	(1.817)	(1.669)	(1.643)	(1.220)	(2.365)
Illiquid Assets Ratio*ExpP	0.0423	0.968**	−0.541	−0.713	−1.087*	−0.768**	−1.907**
	(0.280)	(0.382)	(1.620)	(0.950)	(0.629)	(0.359)	(0.782)
International Activity*ExpP	0.483	1.497***	3.68	−0.32	−1.437*	−0.144	2.202
	(0.443)	(0.534)	(3.610)	(0.921)	(0.809)	(0.721)	(3.046)
Core Deposits Ratio*ExpP	−0.214	−0.0456	−0.0683	−0.0554	−0.177	−0.837**	−0.131
	(0.210)	(0.317)	(0.628)	(0.941)	(0.261)	(0.412)	(0.676)
Observations	936	936	936	936	936	936	936
R^2	0.417	0.450	0.403	0.409	0.430	0.426	0.427
Adjusted R^2	0.357	0.393	0.342	0.349	0.372	0.367	0.369

Notes: This table reports the effects of changes in regulation and firm characteristics and their interactions on log changes in total loans. The data are quarterly from 2006:Q1 to 2013:Q3 for a panel of forty-one domestic banks and domestic affiliates of foreign banks. Foreign-exposure-weighted regulation ExpP is calculated as the weighted average of changes in foreign regulation where the weights are total assets and liabilities of the bank in the respective foreign country. For ExpP and its interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding F-statistics for joint significance in parentheses. For more details on the variables, see table 7 in the appendix. Each column gives the result for the regulatory measure specified in the column headline. All specifications include bank and time fixed effects. Standard errors are clustered by banks. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively.

prudential instruments has a significant effect on the lending growth by the domestic banks in Turkey (see table 7 in the appendix).

While the overall effects of the MPI and the individual prudential tools evaluated at the median value of the bank characteristics are not significant, a number of findings regarding bank-level heterogeneities may be worth mentioning. First, everything else constant, we find that larger banks face a smaller increase in the lending growth rate than smaller banks in the response to the macroprudential tightening via higher capital requirements or smaller reserve requirements abroad. Second, banks with higher illiquid assets or higher international activity are associated with higher lending growth in response to prudential tightening via higher capital requirements. In response to higher capital requirements abroad, the lending growth increases by 8 percentage points for the banks at the 75th percentile of the illiquid assets ratio distribution, and by 10.7 percentage points for the banks at the 75th percentile of the international activity distribution, compared with the median banks of the corresponding distributions. In a similar manner, having a higher level of international activity or a higher illiquid assets ratio also leads to a higher negative effect on the domestic lending growth in response to an increase in the reserve requirements abroad.

Table 6 presents the estimation results for equation (3) using the sample of domestic affiliates of foreign banks in Turkey. Evaluating equation (3′) at the median value of the bank characteristics, we find that the prudential tightening via higher sector-specific capital buffers, higher local-currency reserve requirement ratios, or lower interbank exposure limits abroad leads to lower loan growth rates. Both of these findings underlie the importance of an international liquidity channel for the cross-border spillovers. On the other hand, the effects of all other prudential regulations evaluated at the median value of the bank characteristics are not significantly different from zero.

In terms of the heterogeneous effect at the bank level, the results in table 6 show that being a large bank again has a mitigating effect for all three prudential regulations mentioned above, in that the larger banks among the domestic affiliates of foreign banks experience lower decline in lending growth in response to prudential tightening abroad via higher sector-specific capital buffers, local-currency reserve requirement ratios, or lower interbank exposure limits. We

Table 6. Inward Transmission of Home Macropruential Policy via Affiliates—Bank Variables Interactions

	HomeP = Prudential IndexC (1)	HomeP = Capital Requirements (2)	HomeP = Sector-Specific Capital Buffer (3)	HomeP = LTV Ratio (4)	HomeP = Reserve Requirements: Local (5)	HomeP = Interbank Exposure Limits (6)	HomeP = Concentration Ratios (7)
Home-Country Regulation $HomeP_{sum}$	−2.526	−41.06	−129.00***	71.71***	−72.84	−772.8	−90.45
	(46.900)	(59.940)	(40.100)	(4.436)	(31.900)	(190.900)	(60.780)
Home-Country Regulation $HomeP_t$	8.646	−14.152	−111.807**	81.221***	−48.656***	98.985	−120.594*
	(16.146)	(18.049)	(43.542)	(5.408)	(10.282)	(83.953)	(65.916)
Home-Country Regulation $HomeP_{t-1}$	11.389	−7.232	−7.565	−4.785**	−5.774	−601.737***	50.640
	(18.877)	(15.690)	(4.913)	(2.205)	(14.263)	(100.155)	(41.888)
Home-Country Regulation $HomeP_{t-2}$	−22.561	−19.677	−9.676*	−4.725***	−18.408	−270.034***	−20.501
	(24.302)	(39.228)	(4.967)	(0.337)	(23.077)	(34.542)	(27.144)
Log Total $Assets_{t-1}$	−12.619***	−13.109***	−3.883	−1.710***	−12.554***	−17.285***	−6.444
	(3.417)	(3.377)	(9.948)	(0.335)	(3.738)	(3.335)	(5.544)
Tier 1 $Ratio_{t-1}$	−0.335	−0.442**	−0.249	0.815***	−0.414*	−0.708***	0.054
	(0.233)	(0.221)	(0.262)	(0.096)	(0.238)	(0.173)	(0.300)
Illiquid Assets $Ratio_{t-1}$	−0.183	−0.180*	−0.444*	−0.228	−0.198**	−0.307**	0.018
	(0.122)	(0.103)	(0.230)	(0.144)	(0.094)	(0.127)	(0.124)
Core Deposits $Ratio_{t-1}$	0.111	0.078	0.248*	−0.335***	0.094	0.132	0.041
	(0.088)	(0.103)	(0.148)	(0.032)	(0.101)	(0.105)	(0.126)
BIS Financial Cycle (Home Country)	0.094**	0.084	0.148	−0.015	0.113**	0.622***	0.088
	(0.048)	(0.060)	(0.093)	(0.030)	(0.055)	(0.225)	(0.113)
BIS Business Cycle (Home Country)	0.180	0.233	−0.511	−0.893***	0.306	−0.715	−0.619
	(0.180)	(0.213)	(0.774)	(0.087)	(0.212)	(0.909)	(1.213)
Log Total Assets*HomeP	2.462	−0.170	7.209***	−3.618***	7.144***	60.03***	21.69***
	(1.695)	(3.184)	(2.686)	(0.818)	(0.828)	(13.03)	(8.824)
Tier 1 Ratio*HomeP	−0.714	0.550			0.612	0.549	−2.188***
	(0.536)	(0.860)			(0.867)	(0.917)	(0.893)
Illiquid Assets Ratio*HomeP	−0.145	0.774			−0.108	−3.920***	−2.925***
	(0.429)	(0.597)			(0.180)	(0.885)	(0.956)
Core Deposits Ratio*HomeP	−0.355	−0.156		−0.397***	−0.850**	−1.192***	−0.799
	(0.349)	(0.780)		(0.150)	(0.376)	(0.373)	(0.584)
Observations	393	393	393	63	393	246	264
R^2	0.431	0.421	0.280	0.881	0.405	0.599	0.578
Adjusted R^2	0.320	0.308	0.167	0.633	0.289	0.471	0.453

Notes: This table reports the effects of changes in regulation and firm characteristics and their interactions on log changes in total loans. The data are quarterly from 2006:Q1 to 2013:Q3 for foreign affiliates of domestic banks. The number of bank changes across specifications ranges from sixteen to four. HomeP refers to the changes in regulation in the home (i.e., parent-bank) country of foreign affiliates. For HomeP interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding standard errors for joint significance in parentheses. For more details on the variables, see table 7 in the appendix. Each column gives the result for the regulatory measure specified in the column headline. All specifications include time and bank fixed effects. Standard errors are clustered by banks. ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively.

find that domestic affiliates with higher illiquid asset ratios face a larger decline in lending growth rates in response to a decline in interbank exposure limits in the countries of the parent banks. In addition, we observe that smaller banks experience a higher loan growth rate in response to the lower LTV ratio abroad.

3.3 Differential Role of Business Cycles and Financial Cycles

Table A1 (in the online appendix to this paper)[10] shows whether the effect of the foreign macroprudential regulations on cross-border borrowing of banks in Turkey depend on the phases of the business cycle and financial cycle in Turkey based on the following specification:

$$\Delta Y_{b,t} = \alpha_0 + \alpha_1 ExptP_{cum,b,t} + \alpha_2 X_{b,t-1} + \alpha_3 ExpP_{cum,b,t} \cdot Z_t + f_b + f_t + \varepsilon_{b,t}, \quad (4)$$

where $ExpP_{cum,b,t-1}$ is the cumulative foreign-exposure-weighted regulation and Z_t is the vector of business cycle and financial cycle indicators, higher values of which correspond to expansionary phases of the respective cycles. In particular, we can evaluate the effect of the prudential regulation on the loan growth rate in Turkey as

$$\frac{\partial \Delta Y_{b,t}}{\partial ExpP_{b,t}} = \alpha_1 + \alpha_3 \cdot Z_t, \quad (4')$$

where $\alpha_3 \neq 0$ implies that the effect of the prudential regulations differs with respect to the phases of the business and/or the financial cycles.

We start by showing whether the value of the expression in equation (4′) evaluated at the mean values of the cycle variables is significantly different from zero or not. Using the sample of entire banks, we find that the macroprudential tightening abroad, as measured by the macroprudential policy index, leads to a higher loan growth rate in Turkey. Regarding the individual prudential regulations, prudential tightening abroad via lower LTV ratios or lower concentration ratios is associated with higher loan growth rates. In terms of the heterogeneous effects with respect to cycle, we find that business

[10]Tables A1–A4 are available at http://www.ijcb.org.

cycles in Turkey do not matter for the transmission of the foreign prudential policies to the loan growth rates. On the other hand, the expansionary effect of tightening via LTV ratios or concentration ratios is lower at the time of expansionary financial cycles, which is measured as a positive credit gap. In contrast, when the credit gap in Turkey is negative, the loan growth rate accelerates at a higher rate in response to prudential tightening abroad.

Table A2 presents the estimation results for equation (4) with the sample of domestic affiliates of foreign banks. In contrast to the analysis presented in table 5, we ask whether the effect of the prudential regulation abroad differs with respect to the business and financial cycles in the home country, i.e., the country which takes the policy action.

When we look at the effect of macroprudential tightening abroad evaluated at the median value of the business and financial cycle measures abroad, we first observe that the prudential tightening abroad measured with MPI leads to higher loan growth rates for the domestic affiliates of foreign banks at the median value of the financial and business cycle measures. For example, at the median values, prudential tightening abroad corresponding to a one-unit increase in MPI increases the lending growth rate by 1.3 percentage points, or by 18 percent of the median value of the quarterly lending growth rate over our sample period. In terms of the specific prudential tools, we find that a lower value of LTV ratio, a higher value of reserve requirement ratio, and a lower value of concentration ratios abroad lead to a higher loan growth rate, whereas a tightening via lower interbank exposure limits abroad decreases the growth rate of lending for the domestic affiliates of foreign banks. On the other hand, the changes in capital requirements or the sector-specific capital buffers do not have a significant effect. In general, these results are in line with our expectations except for the effect of the reserve requirement ratio.

In terms of the heterogeneous effects with respect to business and financial cycles in the countries of policy action, the positive effect of the macroprudential tightening abroad via a higher value of the index, a lower value of the LTV ratio, or a higher required reserve ratio is higher when the home country experiences an expansionary financial cycle as measured by a positive credit gap. On the other hand, we find that the expansionary effect of prudential

tightening via lower LTV ratios or concentration ratios is lower when the home country is in the expansionary phase of the business cycle. In other words, the prudential tightening via these policies leads to a higher loan growth rate by the domestic affiliates of foreign banks when the home countries experience a recession, which presumably corresponds to lower credit demand period in the economy.

3.4 Controlling for Domestic and Foreign Macroprudential Policies Simultaneously

Finally, we assess how cross-border borrowing varies with the foreign and domestic macroprudential regulations by using

$$\begin{aligned}\Delta Y_{b,j,t} = \alpha_0 &+ (\alpha_1 HomeP_{j,t} + \alpha_2 HomeP_{j,t-1} + \alpha_3 Home_{j,t-2}) \\ &+ \alpha_4 X_{b,t-1} + \alpha_5 Z_{j,t} + \alpha_6 Z_{host,t} + (\beta_1 HostP_t \\ &+ \beta_2 HostP_{t-1} + \beta_3 HostP_{t-2}) + f_b + \varepsilon_{b,j,t}, \end{aligned} \tag{5}$$

where $HostP_{t-1}$ is the prudential regulation in Turkey implemented at time $t-1$. In this specification $\alpha_1+\alpha_2+\alpha_3$ and $\beta_1+\beta_2+\beta_3$ denote the overall effect of the foreign and Turkish macroprudential policies on total lending, respectively. On the other hand, it is important to note that equation (5) does not control for time fixed effects, as they would be perfectly collinear with domestic macroprudential regulations. Therefore, this specification may lead to biased results with respect to causal effects of the prudential policies of home and host countries.

Column 1 of table A3 presents the results using the macroprudential policy indexes for both the foreign country (i.e., the home country) and Turkey (i.e., the host country), using the sample of domestic affiliates of foreign banks in Turkey. These results suggest that prudential tightening in both the foreign countries and Turkey is associated with higher domestic loan growth. The effect of the foreign prudential regulations can be explained along the lines of cross-border spillovers. On the other hand, the positive correlation between the macroprudential tightening in Turkey and the loan growth rate is counterintuitive. However, we believe that this result reflects the coincidence between the substantial increase in the credit growth rate in the post–global financial crisis period and the

macroprudential tightening in this period in response to the increase in global liquidity and loan growth rate.[11]

Looking at how specific policies are correlated with the loan growth rate in Turkey, we find no significant association between the outcome variable and the changes in capital requirements, LTV ratio, and the reserve requirement ratio on the local-currency liabilities. For the remaining instruments, we show in column 3 of table A3 that the macroprudential tightening via higher sector-specific capital buffers abroad is associated with a higher loan growth rate, whereas higher sector-specific capital buffers in Turkey are associated with a lower credit growth rate. The results in column 5 suggest that prudential tightening abroad via higher reserve requirement ratios on the foreign deposits dampens the loan growth rate. In contrast, higher reserve requirement ratios in a host country are associated with a faster loan growth rate, which again possibly reflects the fact that Turkey implemented prudential tightening in the 2011–13 period mostly in response to higher credit growth in Turkey induced by the quantitative easing in advanced countries in the post-2008 period.[12] Finally, in columns 7 and 8, we show that macroprudential tightening via lower interbank exposure limits or lower concentration ratios abroad is associated with faster loan growth by the domestic affiliates of foreign banks. On the other hand, it is worth noting that the results on the effects of the interbank exposure limits are counterintuitive and at odds with the results presented in tables A1 and A2. We believe that this difference can be attributed to the lack of controls for time fixed effects in specifications in table 4, the

[11]See Basci and Kara (2011) for the incorporating macroprudential tools to the monetary policy framework of the CBRT. See also the analysis by Başkaya et al. (2017a, 2017b) with the loan-level data showing the effect of global liquidity on domestic credit growth.

[12]This finding is likely to reflect the increases in the reserve options coefficients (ROC) as part of the reserve options mechanism (ROM) in Turkey that took place along with increases in reserve requirement rates on the FX-denominated deposits. In particular, the option given by the CBRT to the banks to meet their TL denominated reserve requirement liabilities with FX and gold may have induced them to increase their cross-border foreign-currency borrowing at lower global rates. See Alper, Kara, and Yörükoğlu (2013) for more discussion on the reserve options mechanism. See also Miniane et al. (2013) for the supporting evidence that higher ROC may have induced domestic banks to borrow FX-denominated funds from abroad.

inclusion of which could have controlled for the omitted common shocks, both at the country and global level, faced by the banks in our sample.

3.5 Including All Policies Simultaneously

Finally, we investigate the effects of the prudential regulations in a specification which controls for all the prudential regulations. In particular, the first and second columns of table A4 correspond to the specifications presented in equation (1), and the third column follows equation (2), except for the fact that all the policies are controlled for simultaneously.

The first column uses the sample of all banks. This specification does not control for the time fixed effects. Among the prudential regulations that we control for, we find that the LTV ratio and the interbank exposure limits have statistically significant coefficients, whereas the coefficients on the rest of the prudential instruments are insignificant. While the sign of the coefficient on the LTV is in line with our expectations, suggesting that lower LTV abroad increases the domestic lending growth in Turkey, the coefficient on the interbank exposure limits is counterintuitive. On the other hand, when we include the time fixed effects in the second column of the table, none of the individual policies seem to have a significant effect, which is consistent with the findings presented in table 3.

In the third column, we show with the sample of domestic affiliates of foreign banks that prudential regulation abroad through lower interbank limits decrease the lending growth rate. It is important to note that the negative effect of the lower interbank exposure limits on lending growth has also been observed in all specifications using the sample of domestic affiliates of foreign banks (see tables 4, 6, and A2). Similar to our findings using equation (4), we also find that lower concentration ratios abroad lead to higher loan growth by these banks. However, the rest of the individual prudential regulations do not seem to have a significant effect.

4. Conclusions

The global financial crisis has highlighted the importance of financial stability, and hence the need for prudential measures.

Particularly, during and in the aftermath of the crisis, many countries started implementing various prudential tools to deal with financial vulnerabilities and to mitigate systemic risk. While most of the recent literature has focused on the effectiveness of prudential policies within a country, a growing literature focuses also on the cross-border spillover effects of the prudential regulations and their implications for global financial stability.

This paper complements the literature on the cross-border spillover of prudential regulations by analyzing how the prudential regulations abroad affect the lending growth in Turkey. We document a number of findings: First, we provide some evidence for the existence of the cross-border spillover effects of the foreign prudential regulations on the loan growth rates in Turkey. However, the findings on the effects of some of the individual policy tools differ across the specifications. While lower LTV ratios or concentration ratios abroad in general lead to a higher domestic loan growth rate, lower interbank exposure limits or higher reserve requirements result in a smaller loan growth rate. Second, both with composite macroprudential policy indexes and with a number of specific prudential instruments, such as interbank exposure limits, concentration ratios, or loan-to-value ratios, we find that the domestic affiliates of foreign banks in Turkey play an important role for the inward transmission of the prudential regulations abroad. Third, the responses to change in macroprudential tools differ among banks depending on their balance sheet characteristics. For example, we observe that the bank size usually plays a mitigating role for the transmission of the foreign prudential regulations on domestic loan growth, whereas having a higher illiquid assets ratio or a higher level of international activity amplifies the effect of particular prudential regulations abroad on the domestic loan growth. Finally, we find some evidence that the magnitude of the cross-border spillovers of the foreign prudential regulations may differ across the phases of financial cycles, but not as much across the business cycles.

Appendix

Table 7. Net Effects

Exercise	Coefficient Sum	Prudential IndexC	Capital Requirements	Sector-Specific Capital Buffer	LTV Ratio	Reserve Requirements: Local	Interbank Exposure Limits	Concentration Ratios
Equation (3) (All Banks)	$\sum_{i=1}^{3}(\alpha_i+\beta_i\cdot\bar{X}_{b,t-1})$	2.450 (0.750)	−2.066 (0.816)	−13.000 (0.668)	7.817 (0.589)	−12.460 (0.141)	11.070 (0.232)	9.567 (0.612)
Equation (3) (Affiliates of For. Banks)	$\sum_{i=1}^{3}(\alpha_i+\beta_i\cdot\bar{X}_{b,t-1})$	−1.479 (0.786)	0.540 (0.960)	−12.380 (0.078)	1.022 (0.756)	−8.423 (0.099)	−148.400 (0.000)	−3.065 (0.563)
Equation (4) (All Banks)	$(\alpha_1+\alpha_3\cdot\bar{Z}_{j,t})$	0.728 (0.093)	2.324 (0.385)	−2.360 (0.437)	2.059 (0.022)	−0.336 (0.489)	−2.181 (0.198)	6.138 (0.010)
Equation (4) (Affiliates of For. Banks)	$(\alpha_1+\alpha_3\cdot\bar{Z}_{j,t})$	1.269 (0.004)	−0.220 (0.890)	3.527 (0.269)	2.331 (0.000)	1.928 (0.000)	−7.046 (0.064)	3.597 (0.008)

Notes: Net effects of MPP values are reported for exercises which include interaction terms, as the linear combination of instrument coefficients with interacted controls fixed at their mean levels. The numbers in parentheses in rows 1 and 2 are the p-values for the hypothesis that the value of equation (3) evaluated at the median values of bank characteristics is equal to zero. The numbers in parentheses in rows 3 and 4 are the p-values for the hypothesis that the value of equation (4) evaluated at the median values of cycle variables is equal to zero. For non-cumulative regressions, a contemporaneous/impact effect is also calculated.

Table 8. Construction of Bank Characteristics

Variable Name	Description	Data Source
Illiquid Assets Ratio	(Loans and Securities Held to Maturity)/Assets (in %)	Monthly Balance Sheet Statistics (CBRT)
Log Assets	Log (Balance Sheet Total/GDP Price Deflator)	Monthly Balance Sheet Statistics (CBRT)
Core Deposits Ratio	Total Deposits/Assets (in %)	Monthly Balance Sheet Statistics (CBRT)
Capital Ratio	Equity Capital/Assets (in %)	Monthly Balance Sheet Statistics (CBRT)
International Activity	Ratio of Foreign Assets to Total Assets (in %)	External Positions Reports (CBRT)

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