

# A Loan-level Analysis of Bank Lending in Mexico

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## Abstract

A strong and stable banking system is paramount for the efficient allocation of resources in the economy and provides an important channel through which monetary policy operates. We employ loan-level data from the Mexican credit registry to study how bank-specific characteristics affect the supply of credit. Then, we explore how these characteristics influence the transmission of monetary policy and their role in building banks' resilience to external shocks. Our results highlight the importance of strong balance sheets for the provision of credit in Mexico. We find that banks that are large, well-capitalised, have lower credit risk, and with stable funding sources grant more credit. Second, we show that banks that are liquid, well-capitalised, have lower credit risk, and are more efficient are more sheltered against monetary policy shocks. Last, the characteristics that strengthen banks capacity to supply loans when faced with external shocks are: liquidity, capitalisation, and low dependence on funding from foreign sources.

JEL classification-E44, E51, E52, E58, G21

Keywords: credit registry, credit supply, bank-specific characteristics, bank lending channel

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# 1 Introduction

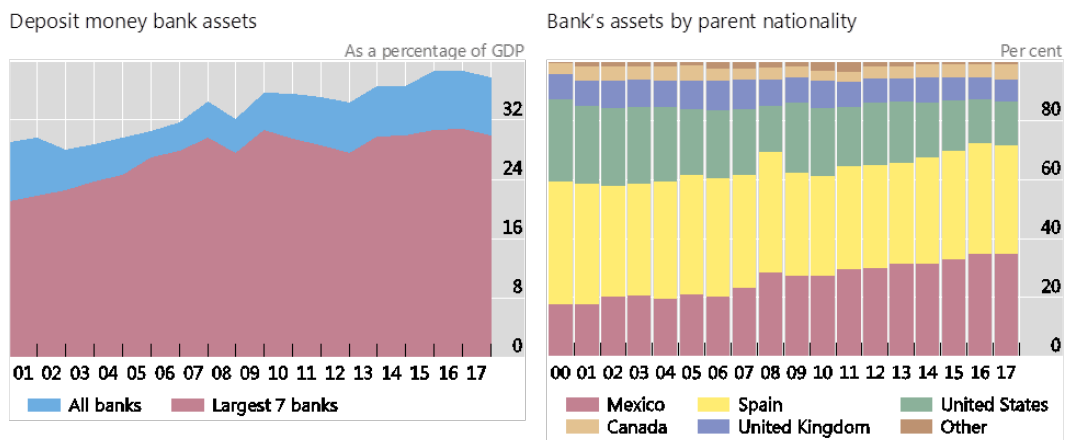
There was a substantial change in the structure of the global financial system and the interaction among its players after the great financial crisis (GFC). This change impacted how banks fund their operations, grant credit, the business line they engage into and their reaction to monetary policy shocks. There is a growing body of literature that studies whether structural breaks after the GFC have changed how bank-specific characteristics affect loan provision. This area of research is developing in Latin America by taking advantage of the granularity provided by credit registry data. This paper seeks to contribute to the literature on the role of bank-specific characteristics on the supply of credit and how these characteristics affect the relevant channels through which monetary policy operates on the financial system.<sup>1</sup> We focus on the Mexican banking system, which presents an interesting case of study given its high levels of concentration and participation of foreign affiliates of international banks. We first present an overview of the evolution of the Mexican banking system, highlighting the reforms that have shaped how the industry operates and responds to global and domestic shocks. Then, using loan-level data from the Mexican credit registry we estimate how bank-specific characteristics affect the supply of credit and influence the bank lending channel. Foremost among these characteristics are the changing role of bank capital, market funding composition, and bank risk. Finally, we analyze how global shocks affect the supply of credit and which characteristics shelter banks from these shocks.

We find that bank-specific characteristics that affect positively the supply of credit in Mexico are: size, high capital, lower share of riskier loans, a *commercial* business model<sup>2</sup> and high long-term funding. Second, we find that those banks that reduce less their credit supply when there is a tightening of monetary policy are liquid, well-capitalised, have lower credit risk, more efficient, more reliant on short-term funding and have a relatively low share of funding from foreign sources. Finally, we find that banks' characteristics that build resilience against external shocks are: high liquidity, high capital, less income diversification, high share of short-term and long-term funding, and low share of funding from foreign sources.

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<sup>1</sup>This paper was produced as part of a working group implemented by the BIS Consultative Council for the Americas (CCA) Consultative Group of Directors of Financial Stability (CGDFS) on changes in banks' business models and their impact on bank lending.

<sup>2</sup>This model will be described later, but it is characterised by a business model more oriented to credit with a low share of trading securities in their assets.



Source: CNBV.

Globalization initialised a process of internationalization of banks, which has affected financial systems in Latin America. Forty years ago the Mexican banking sector was a local industry dominated by specialized intermediaries and closed to foreign competition. It then became a state owned industry after the expropriation of banks in 1982. Nowadays, this industry is dominated by international financial corporations. The defining changes in the banking sector were catalysed by the reforms implemented after the 1995 crisis and the signing of the North American Free Trade Agreement (NAFTA). These reforms accelerated the expansion of international banking and consolidated the banking system. In the last years, the Mexican banking sector has grown at a steady pace, with the seven largest banks owning 80 percent of the system assets and with subsidiaries of international banks holding a market share of 70 percent (Graph 1).<sup>3</sup> More recently, the financial authorities have implemented a series of reforms aimed at enhancing competition and financial stability in the industry. The evaluation of the role of bank characteristics on the supply of credit is relevant for the proper implementation of policies that aim to foster a stable financial system. A strong financial system shelters banks against domestic and external shocks. The paper is structured in the following way. Section 2 presents a short literature review. Section 3 explores the evolution of the banking system and the changes in banks' business models in Mexico.

<sup>3</sup>There are no branches of foreign banks, authorities have only allowed subsidiaries to operate in the country. The 7 largest banks are: Banorte (Mexico), BBVA Bancomer (Spain), Citi Banamex (US), HSBC (UK), Inbursa (Mexico), Santander (Spain) and Scotiabank (Canada).

Section 4 and 5 present the data and econometric specification. Section 6 analyzes the results and section 7 concludes.

## 2 Literature Review

Our paper relates to studies that use credit-registry data to analyze changes in the banking system. For Latin America, a working group established by the BIS analyzed the impact of macroprudential policies on credit (Gambacorta and Murcia (2017)). Their findings are that macroprudential policies have been quite effective in stabilizing credit cycles. They also find that macroprudential tools have a greater effect on credit growth when reinforced by the use of monetary policy to push in the same direction. As part of the working group, Levin, López and López-Gallo (2017) study the impact of the implementation of loan-loss provisioning rules in Mexico. They find that this policy had a negative effect on credit and the effect was larger for credit denominated in local currency compared to foreign-currency loans. Our paper follows a similar specification but focuses on how bank specific characteristics affect the supply of credit.

We also contribute to the literature that explores the different behaviour of foreign banks in credit provision compared to domestic banks. CGFS (2018) studies the implications of regulatory changes on bank lending in Mexico and focuses on the change in behavior of foreign subsidiaries after the implementation of Basel 2.5, Basel III and the liquidity coverage ratio, using credit registry data. Their results suggest that post Basel 3, foreign subsidiaries decreased their credit growth rate by more than domestic banks. We explore the differentiated role that bank specific characteristics play if a bank is a subsidiary and how that affects their credit supply.

Finally, our paper is relevant to the literature on the transmission channels of monetary policy and external shocks in the financial system. Buch and Goldberg (2017), find that effects of prudential spillovers sometimes spill over borders through bank lending. They show that balance sheet conditions and business models drive the amplitude and direction of spillovers to lending growth rates. Levin et al (2017) assess the inward cross-border spillover effect of prudential policies and find that the increase in capital requirements in the United States had an significant impact on bank lending in Mexico. Last, Bank of Mexico (2017) analyzes the effects of unexpected monetary policy shocks

on the supply of credit using loan-level data. They find that banks with a higher level of liquidity reduce less their credit in response to an increase in the policy rate. We corroborate these results and show that banks with strong balance sheets reduce less their credit supply when faced by monetary policy or global external shocks.

### 3 Evolution of the Mexican Banking System

The Mexican banking system underwent an important transformation process the last 30 years. This transformation can be described as a process of consolidation and reduction of entry barriers to foreign investors. There are three main stages in the evolution of the Mexican banking system. The first occurred after a change in banking law allowed the creation of *multibanks* in 1975, which paved the way for the emergence of universal banks (Del Ángel 2015). The second stage, characterised by a process of consolidation, was initiated by the nationalisation of banks in 1982. Prior to the nationalisation there were 60 multipurpose banks in Mexico, their number was reduced to 18 by 1990 (Graph 1, left panel). A second effect of the nationalisation was the development of the securities market in Mexico. (Del Ángel et al (2005)). The government prohibited banks from offering other financial services other than banking; contributing to the development of other financial intermediaries such as brokerage firms (Del Ángel et al (2017))). A third effect was a contraction in bank lending to the private sector as the government imposed many constraints on the banking sector. These restrictions included reserve requirements, interest rate ceilings on bank deposits and loans, and lending quotas on high priority economic sectors. The process of reprivatization of commercial banks started in 1989. Mexico also regained entry to international capital market and bank credit to the private sector increased dramatically (Graph 1, right panel). However, lack of an appropriate legal and regulatory environment created incentives for inefficient and risky lending.<sup>4</sup>

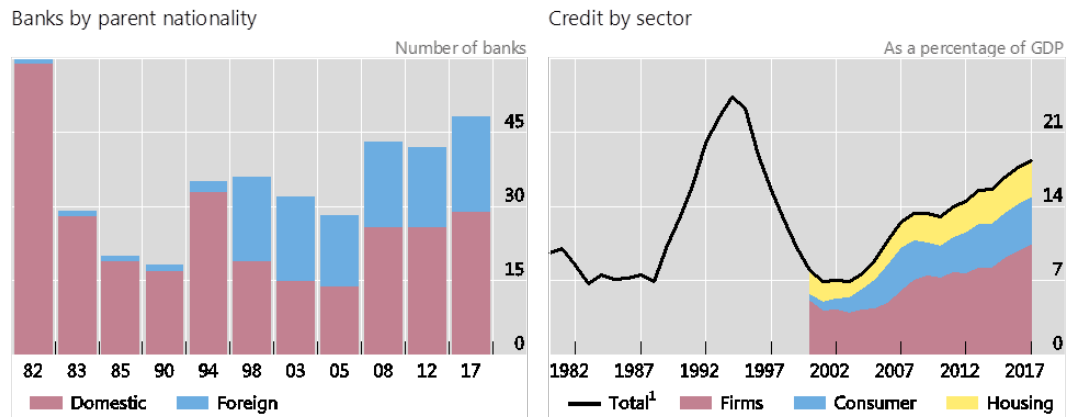
The last and most important stage in the transformation of the Mexican banking system occurred after the 1995 Mexican crisis. The Mexican government implemented several policies to prevent the collapse of the banking system. These included restrictive monetary and credit policies, measures to improve liquidity and capitalisation, debtor relief efforts, and the transfer of nonperforming loans into public debt (Herández (2007). Moreover, a change

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<sup>4</sup>Haber (2005) estimates that the ratio of non-performing loans to total loans increased from 13.5 percent in December 1991 to 52.6 percent by December 1996).

in the terms of NAFTA allowed foreigners to invest in the banking sector and by 1998 all restrictions to foreigners having interest in the Mexican banking system were lifted (Castellanos et al (2015)).<sup>5</sup>

Evolution of banks and credit in Mexico Graph 2



<sup>1</sup> CNBV starting in 2001, previous data extrapolated from BIS statistics bank credit to the private non-financial sector.

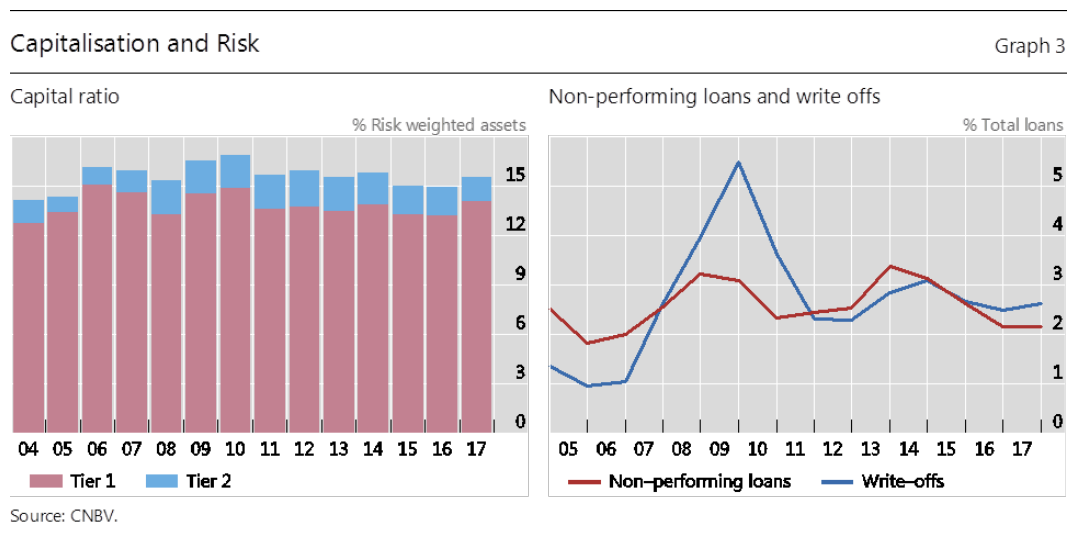
Source: Graf (1999), Hernández-Murillo (2007), CNBV and BIS Statistics

The reforms enacted after the 1995 crisis increased the financial stability of the banking sector and paved the way for the inclusion of Mexico into the global financial system. These reforms made it possible for banks to face the GFC with elevated levels of high quality capital and liquidity. After the crisis, the financial authorities in Mexico implemented all the standards and recommendations of financial regulation that the competent international organisms proposed in response to the crisis. More recently in 2013, the Mexican authorities put into effect a series of reforms aimed at ensuring bank stability, competition, and promoting financial inclusion and economic development.

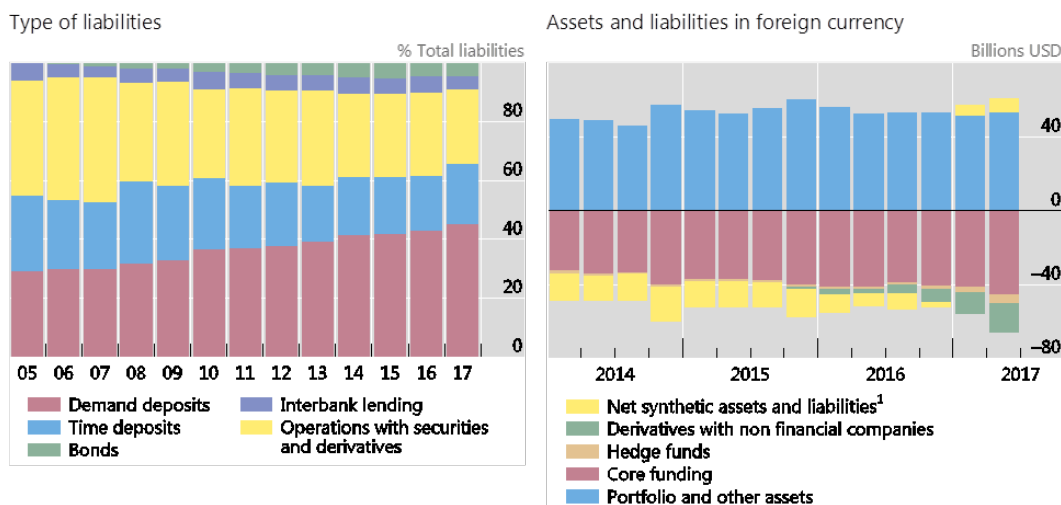
The number of banks has continued to rise in the past years, with the greatest increase in domestic banks (from 15 in 2003 to 29 in 2017 (Graph 2, left panel)). Financial deepening, measured as the ratio of credit to the non-financial sector to GDP, has also increased. Credit to firms constitutes the largest share, followed by consumer credit (Graph 2, right panel). The continued growth in credit does not pose an imminent threat to financial stability

<sup>5</sup> The number of foreign subsidiaries increased from 2 in 1994 to 17 in 1998 (Graph 2, left panel).

given the high level of capitalisation of banks and their low share of riskier loans. The capital adequacy ratio has remained above 10 percent for the past ten years (Graph 3, left panel). Furthermore, Mexican banks have a higher level of capital relative to risk weighted assets and a higher proportion of Tier 1 capital relative to total capital compared to global banks (Banco de México (2017)). Finally, the ratio of non-performing loans and write-off to gross loans has remained stable and below 3 percent (Graph 3, right panel).



Mexican banks rely heavily on demand and time deposits as their main sources of funding, which have been increasing as a percentage of total liabilities (Graph 3, left panel). After the GFC, banks proportionally reduced their operations with securities and derivatives, substituting them for bonds. Banks have reduced their market making activities while there has been a higher issuance of domestic government debt. Regarding banks' assets and liabilities in foreign currency, there are strict regulatory limits that prevent substantial mismatches (Graph 4, right panel). Given these limits, an increase in volatility of the nominal exchange rate has a limited negative impact on the financial results of banks. However, banks have been increasing their hedge of foreign currency exposure, given by the increase in the share in total liabilities of derivative contracts.



1 Net positions on foreign exchange derivatives (futures, forwards, swaps and options) whether the banks have a net asset or a liability in foreign currency.

Source: CNBV.

An important question is whether the GFC resulted in a change of banks' business models in Mexico. The structure of a bank, and what it does, is driven by factors such as market forces and regulation, but most importantly by the bank's management of its balance sheet. Hence, the bank's business model can be broadly defined by its funding and liquidity strategies, and its sensitivity to funding investment opportunities. Following a methodology similar to the one applied in the Basel Committee on Banking Supervision (BCBS)<sup>6</sup> we classify banks in Mexico into three categories: trading, universal and commercial banks.<sup>7</sup> The analysis uses thresholds based on balance sheet data to determine the categories. In broad terms, *trading banks* have a high share of trading asset securities on their balance sheet, whereas *commercial banks* have a low share of trading account securities and a substantial share of loans on their balance sheet. *Universal banks* cover the middle ground.<sup>8</sup>

<sup>6</sup>Saunt and Fub (2012)

<sup>7</sup>Another approach is to use statistical analysis to determine business models. Based on balance sheet indicators a number of studies use cluster techniques to identify groups of banks that are similar. For example Roengpitya et al (2017) distinguish between retail-funded banks, whole-sale funded banks, universal banks and trading banks. Other examples include Ayadi et al (2015) and Margaerts and Vander Venet (2016).

<sup>8</sup>Banks with a ratio of trading account securities to total assets of more than 30% are

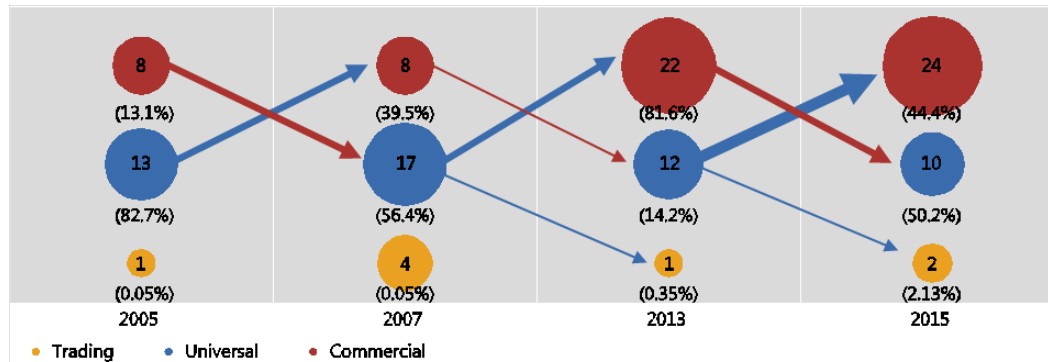


## Classification of Banks' Business Models in Mexico

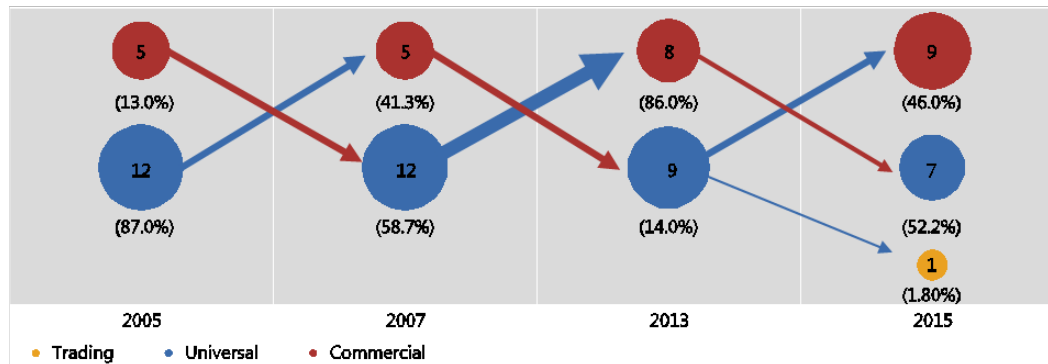
Number of banks; percent of total assets in parenthesis

Graph 5

Transition across models<sup>1</sup>



Evolution of banks<sup>2</sup>



<sup>1</sup> Percentages do not add up to 100% since there are banks without classification. <sup>2</sup> Considers only banks with all observations between 2005 and 2015.

Source: CNBV; Author's calculations.

Graph 5 presents the classification of banks in Mexico through time. The upper panel considers all banks in the system and the lower panel considers the transition of banks that were operating throughout the whole period of

classified as trading banks with less than 30% and more than 2% are classified as universal banks; and banks with less than 2% as commercial banks. There were some additional adjustments made for the classification. Banks classified as either commercial or universal with a loan to assets ratio of less than 15% were excluded from the analysis. For some banks, there was no information on trading account securities. In this case, if the securities to asset ratio was greater than 15% per cent the bank was classified as universal, otherwise it was classified as commercial

study. Before to the GFC, Mexican banks started to diversify their operations, the number of universal banks increased by four and the number of trading banks by 3. However, the GFC had an effect on the market making activities of banks in Mexico. Many global banks wound down or closed their trading desks in several locations around the world as a response to structural reforms and trading operations of global banks in emerging market economies were also negatively affected.<sup>9</sup> The number of trading banks fell to 1 and there was a substantial increase in commercial banks (to 22 ub 2013 from 8 in 2007). In the past three years, the Mexican banking system has become more sophisticated and banks have started once again to increase their market making activities, although the number of commercial banks continues to increase. The next section explores how bank-specific characteristics and banks' business models affect the supply of credit in Mexico using loan-level data.

## 4 Data

In this study we use two data sets from the *Comisión Nacional Bancaria y de Valores* (CNBV), Mexico's financial system regulatory and supervisory institution. The first one is a credit registry (R04C report) of all the commercial loans from banks to firms between September 2009 and December 2017 on a quarterly basis<sup>10</sup>. This report contains the current status of all loans given by commercial banks operating in Mexico to firms and individuals with commercial activity.<sup>11</sup> For the analysis we develop in the next section we construct a subsample that considers only firms that have multiple loans from more than one bank. We use this subsample to improve the identification of changes in the supply of loans and characterize them correctly apart from changes in the demand for loans. The complete data set has a total of 9,207,498 observations from 611,194 firms and 44 banks, while the subsample consists of 3,394,771 observations from 113,548 firms and 42 banks. Despite a negative skew in the distribution of the credit in the subsample, the distribution of variables remains similar across data sets (Graph 6, left panel). Finally, the distribution of loans granted by subsidiaries compared to domestic loans is also similar (Graph 7, left panel). In the Appendix we can observe the evolution of the

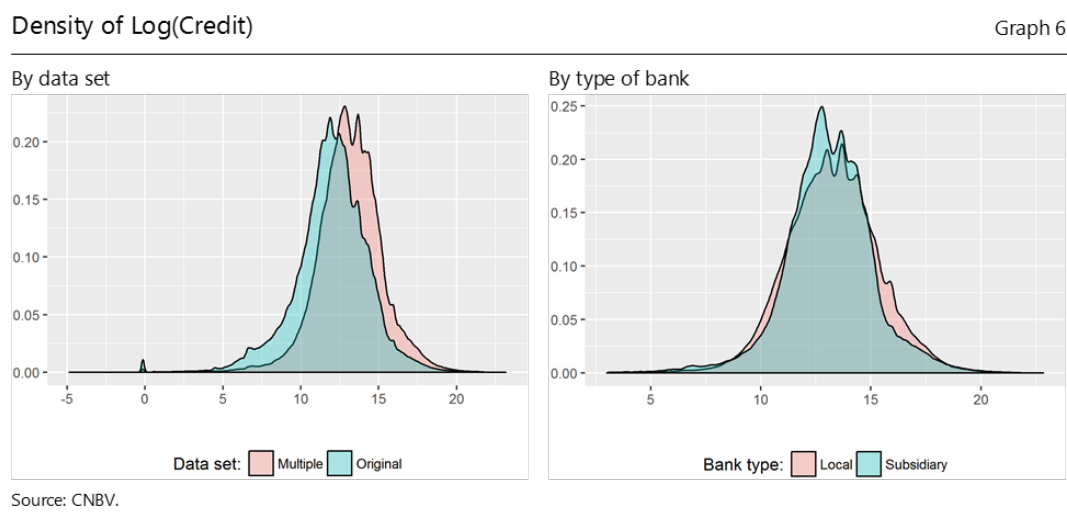
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<sup>9</sup>For example, Deutsche Bank and ING Bank closed their Mexican subsidiaries after the crisis. These two banks were very active in local debt and derivative markets. Other global banks significantly reduced their trading activities in Mexico.

<sup>10</sup>Outliers from the credit data set are trimmed at the 1% level

<sup>11</sup>The database only considers loans destined for business purposes, this means that household loans such as consumption credits and mortgages are not included.

credit across time. Larger loans have been granted in the recent times (Graph A1) and difference between local and subsidiary banks has decreased (Graph A2).



The second data set, which is public, provides balance sheet information of banks used in the analysis. We classify bank-specific characteristics into five categories:

- **Main indicators:** size (log of total assets), liquidity coverage ratio and bank capital ratio (net capital to total assets).
- **Risk profile:** share of non-performing loans to total loans and share of write-offs to total loans.
- **Revenue mix:** diversification ratio (non-interest income to total income) and share of trading assets to total assets.
- **Funding composition:** share of long-term funding, share of funding from foreign sources and share of demand deposits to total funding.
- **Profitability:** efficiency (operating cost to total income).

Descriptive statistics, as seen in Table 1, are very close. The proportion of loans granted by each group of banks is relatively robust. Correlations in the subsample do not indicate problems with colinearity (Table 2). There are no

correlations bigger than 0.75 and the biggest is  $-0.71$  between  $\log(\text{Total assets})$  and long term funding. The former is one the most correlated variables, which is natural given its importance.

Table 1: Descriptive Statistics

Complete	Mean	Std. Dev.	Min.	Median	Max.	Subsample	Mean	Std. Dev.	Min.	Median	Max.
Credit loans	2317025.86	3.189e+07	0.0000	125771.23	1.154e+10	Credit loans	5424990.61	5.257e+07	0.0000	453101.58	8.312e+09
$\Delta\log(\text{Credit})$	-0.053	0.758	-5.300	-0.075	5.149	$\Delta\log(\text{Credit})$	-0.050	0.673	-5.300	-0.075	5.149
$\log(\text{Total assets})$	13.385	1.034	5.929	13.780	14.187	$\log(\text{Total assets})$	13.182	1.044	6.202	13.555	14.187
LCR	2.430	1.256	0.000	2.286	7.000	LCR	2.244	1.352	0.000	2.047	7.000
Net Capital	0.117	0.026	0.026	0.111	0.886	Net Capital	0.112	0.029	0.026	0.107	0.886
NPL Bank	0.028	0.016	0.000	0.025	0.493	NPL Bank	0.026	0.013	0.000	0.024	0.493
Write-offs	0.003	0.002	0.000	0.003	0.104	Write-offs	0.003	0.002	0.000	0.003	0.104
Div. Ratio	0.162	0.197	-10.734	0.172	1.459	Div. Ratio	0.154	0.236	-10.734	0.172	1.459
Trading assets	0.024	0.028	-0.898	0.021	0.869	Trading assets	0.023	0.031	-0.716	0.017	0.869
LT funding	0.198	0.110	0.000	0.169	0.969	LT funding	0.220	0.116	0.000	0.199	0.969
Foreign fund.	0.076	0.026	0.000	0.076	0.655	Foreign fund.	0.074	0.028	0.000	0.076	0.655
ST funding	0.368	0.085	0.000	0.386	0.941	ST funding	0.349	0.089	0.000	0.358	0.941
Efficiency	64.403	29.602	-1212.252	58.940	14904.304	Efficiency	65.066	30.645	-1212.252	60.009	14904.304

Table 2: Correlations

	$\Delta\log(\text{C.})$	Credit	$\log(\text{TA})$	LCR	Net cap.	NPL	W/offs	Div. rat.	Trading	LT fund.	FF	ST fund.
Credit	0.022											
$\log(\text{TA})$	0.017	-0.019										
LCR	0.009	-0.005	0.371									
Net cap.	-0.013	-0.004	0.097	0.068								
NPL	-0.007	-0.004	-0.089	0.285	0.196							
Write-offs	0.015	-0.008	0.459	0.420	0.001	0.048						
Div. ratio	0.010	-0.001	0.134	0.127	-0.220	0.048	0.176					
Trading assets	-0.014	0.009	-0.170	-0.071	0.340	-0.073	-0.010	-0.126				
LT fund.	-0.014	0.014	-0.712	-0.392	-0.059	0.038	-0.468	-0.037	0.016			
Foreign fund.	0.010	0.001	0.465	0.164	-0.110	-0.175	0.227	0.094	-0.097	-0.227		
ST fund.	0.007	-0.007	0.685	0.322	0.172	-0.068	0.380	0.082	-0.002	-0.521	0.591	
Efficiency	0.003	0.010	-0.165	0.222	-0.195	0.147	0.093	0.073	-0.069	0.061	-0.041	-0.047

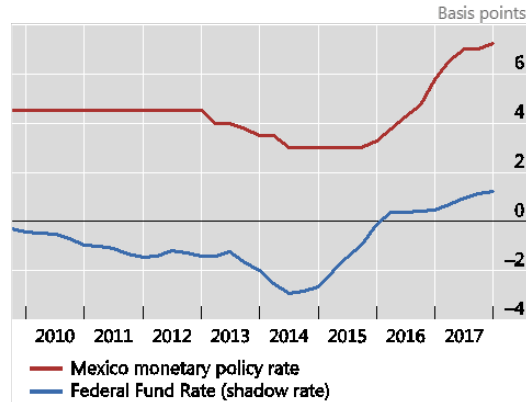
We consider five types of shocks in the analysis. First, we analyse the response of credit to the quarterly change in Mexico's monetary policy rate (Graph 8, panel 1). Our period of study includes quarters where there was a tightening and an easing in the policy rate. Second, we study four types of external shocks: global liquidity, global risk, global economic policy uncertainty, and global commodity prices. We measure global liquidity using the Federal Funds shadow rate proposed by Wu and Xia (2016) (Graph 8 panel 1). The global risk shock corresponds to a dummy variable that takes the value of one if the VIX index lies above the 75th percentile during the period of 2009-2017 (Graph 8 panel 2). We measure periods of high economic policy uncertainty as a dummy variable that has a value of one when the economic policy uncertainty index of Baker et al (2016) is above the 80th percentile (Graph 8 panel 3). Finally, we consider a dummy variable that takes the value of one

when the annual growth in commodity prices is below the 40th percentile to represent the global commodity prices shock (Graph 8 panel 4).

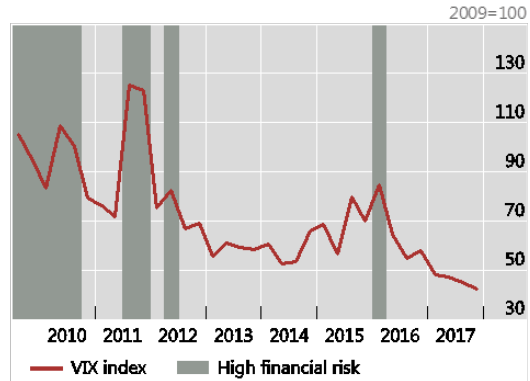
Domestic and External Shocks

Graph 7

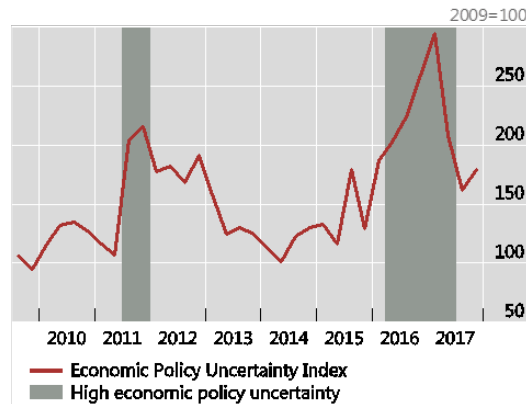
Monetary Policy in Mexico and US



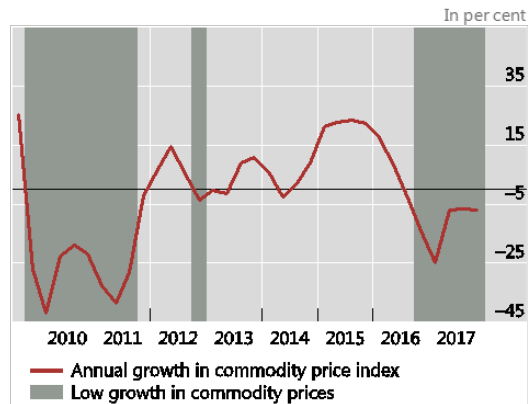
Risk Shock



Economic Policy Uncertainty Shock



Commodity Price Shock



Source: Wu and Xia (2016), Baker et al (2016), Banco de Mexico and Bloomberg.

## 5 Empirical Strategy

The empirical analysis focuses on the change in relationship between bank-specific characteristics and the growth of credit over time. The dependent variable in all specifications is the log-change in the total amount (sum of loans) owed by creditor  $i$  to bank  $b$  at time  $t$ . The explanatory variables of interest are a vector of bank specific characteristics  $X_{b,t-1}$ . We focus on firms with multiple banking relationships to enhance the identification of supply shocks, following Khwaja and Mian (2008). The panel equation we estimate is the following:<sup>12</sup>

$$\Delta \log(\text{Credit}_{i,b,t}) = \beta X_{b,t-1} + \alpha_b + \gamma_{i,t} + \varepsilon_{i,b,t} \quad (1)$$

where  $\alpha_b$  are time invariant bank fixed effects and  $\gamma_{i,t}$  are time variant firm fixed effects. We modify the main specification to explore how bank-specific characteristics play a different role if the bank is a foreign affiliate:

$$\Delta \log(\text{Credit}_{i,b,t}) = (\beta + \beta^* F_b) X_{b,t-1} + \alpha_b + \gamma_{i,t} + \varepsilon_{i,b,t} \quad (2)$$

where  $F_b = 1$  if  $b$  is a subsidiary of an international bank.

The bank lending channel is one of the possible transmission channels of monetary policy. Tightening or loosening the monetary policy stance changes the risk free rate and banks' funding costs, which affects loan provision. The next specification explores the role of bank-specific characteristics in strengthening or weakening the monetary policy transmission channel. We extend the model in the following way:

$$\Delta \log(\text{Credit}_{i,b,t}) = (\beta + \beta^* \Delta i_{t-1}) X_{bt-1} + \alpha_b + \gamma_{i,t} + \varepsilon_{ibt} \quad (3)$$

where  $\Delta i_{t-1}$  corresponds to the quarterly change in the policy rate. To better control for loan demand shifts we can focus on firms with multiple banking relationship and saturate the model with a combination of bank, firm, time and firm\*time fixed effects. In particular, the model would be simplified, with a focus on the analysis of the interaction term between the monetary policy shock, risk shock and bank-specific characteristics.

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<sup>12</sup>The model is based on Ongena, Peydró and Saurina (2012) and Gambacorta and Marques-Ibanez (2011).

The last specification analyzes how bank-specific characteristics shield banks from external shocks.

$$\Delta \log(\text{Credit}_{i,b,t}) = (\beta + \beta^* C) X_{b,t-1} + \alpha_b + \gamma_{i,t} + \varepsilon_{ibt} \quad (4)$$

where  $C$  alternates between the four shock we are considering for the analysis. As described above, these shocks are: a global risk, global liquidity, global economic policy uncertainty and global commodity prices.

## 6 Results

Table 3 presents the results of the baseline specification. We estimate a regression for each individual block of bank-specific characteristics (columns (1)-(5)). Then, we estimate a regression that includes all variables that were statistically significant in their individual block (column (6)).<sup>13</sup> The results show that the credit supply in Mexico depends positively on the strength of a bank's balance sheet. Banks that are large and well-capitalised grant more credit, whereas banks that have a higher share of non-performing loans and write-offs grant less credit. The only counter-intuitive result is the negative sign of the liquidity coverage ratio. One reason can be that small banks faced challenges in 2015 as they complied with the phase-in requirements of the Basel III liquidity coverage ratio. These banks increased their liquidity coverage ratio while granting less loans as they turned to long-term sources of funding and adjusted the maturity of their balance sheets.

Table 4 reports the results of the interaction between the foreign affiliate dummy and bank-specific characteristics.<sup>14</sup> Subsidiaries in Mexico are formally independent legal entities, but they follow the guidelines of the parent bank. We find that subsidiaries that have more liquid balance sheets and that have a commercial business model grant more credit. The results also show that subsidiaries with a higher share of long-term funding and funding from foreign sources increase more their credit supply. We also find some counter-intuitive results: smaller, less efficient banks with a higher share of riskier loans (non-performing and write-offs) provide more credit. This last set of results may be due to the ability of subsidiaries to undertake riskier ventures given they can tap into alternative sources of funding provided by their foreign parent bank.

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<sup>13</sup>The main indicator variables (size, liquidity and capital) are always included in the last regression given their importance in the bank lending literature (Gambacorta (2005)).

<sup>14</sup>The complete results can be found in table 7 in the appendix.

Table 3: Role of Bank-Specific Characteristics on the Credit Supply in Mexico

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Funding	(5) Profit	(6) All
$\log(\text{Assets})_{(t-1)}$	0.00867* (0.00514)					0.00870* (0.00517)
$\text{LCR}_{(t-1)}$	-0.00531*** (0.000983)					-0.00362*** (0.00102)
$\text{Capital}_{(t-1)}$	0.0407 (0.0477)					0.142*** (0.0498)
$\text{NPL}_{(t-1)}$		-0.621*** (0.0720)				-0.647*** (0.0747)
$\text{Write-offs}_{(t-1)}$		-1.406*** (0.435)				-0.900** (0.446)
$\text{Div. Ratio}_{(t-1)}$			-0.00637*** (0.00220)			-0.00798*** (0.00226)
$\text{Trading assets}_{(t-1)}$			-0.0909*** (0.0228)			-0.0829*** (0.0233)
$\text{LT funding}_{(t-1)}$				0.0600*** (0.0113)		0.0463*** (0.0113)
$\text{Fund foreign}_{(t-1)}$				-0.170*** (0.0405)		-0.159*** (0.0397)
$\text{Deposits}_{(t-1)}$				-0.0126 (0.0160)		
$\text{Efficiency}_{(t-1)}$					-6.63e-06 (1.74e-05)	
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,661,018	2,663,249	2,663,249	2,663,249	2,662,027	2,661,018
R <sup>2</sup>	0.440	0.440	0.440	0.440	0.440	0.440

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

We obtain a negative relationship between the growth of credit in Mexico and the diversification of a bank's activities and sources of income. The result implies that banks with a commercial-oriented business model (lower non-interest income to total income and lower trading assets as a share of total assets) grant more credit. Finally, we find that banks with a higher share of long-term funding and lower share of funding from foreign sources grant more credit. These results point that lower maturity and currency mismatch in a bank's balance sheet support higher credit growth.



Table 4: Differentiated Effect of Subsidiaries' Bank-Specific Characteristics

$\Delta \log(\text{Credit})$	(1)	(2)	(3)	(4)	(5)	(6)
	Main	Risk	Revenue	Fund	Profit	All
<b>Subsidiary *</b>						
$\ln(\text{Assets})_{(t-1)}$	-0.0781*** (0.00840)					-0.0593*** (0.0110)
$\text{LCR}_{(t-1)}$	0.0156*** (0.00214)					0.0104*** (0.00233)
$\text{Capital}_{(t-1)}$	-0.343*** (0.108)					-0.0347 (0.123)
$\text{NPL}_{(t-1)}$		0.624*** (0.133)				0.528*** (0.149)
$\text{Write-offs}_{(t-1)}$		5.361*** (0.851)				5.031*** (0.884)
$\text{Div. Ratio}_{(t-1)}$			-0.0168 (0.0180)			-0.0732*** (0.0195)
$\text{Trading assets}_{(t-1)}$			0.234*** (0.0498)			0.00782 (0.0549)
$\text{LT funding}_{(t-1)}$				0.119*** (0.0272)		0.151*** (0.0312)
$\text{Fund foreign}_{(t-1)}$				-0.0293 (0.0696)		0.212*** (0.0813)
$\text{Deposits}_{(t-1)}$				-0.0968*** (0.0282)		-0.170*** (0.0325)
$\text{Efficiency}_{(t-1)}$					1.02e-05 (5.81e-05)	-0.000204*** (6.15e-05)
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,657,284	2,659,515	2,659,515	2,659,515	2,658,293	2,656,859
R <sup>2</sup>	0.440	0.440	0.440	0.440	0.440	0.440

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5 shows the coefficients of the interaction between bank-specific characteristics and the change in the policy rate.<sup>15</sup> The results show that strong balance sheets lead to a lower reduction in the loan supply in Mexico when there is a monetary policy shock. Higher bank liquidity and bank capital weaken the transmission channel of monetary policy. These findings are consistent with the literature of the bank lending channel (Altunbas et al (2012) and Kishan and Opiela (2000)). We find that banks with riskier loans, measured by the share of non-performing loans and write-offs, are less able to insulate their loan supply from monetary policy changes. This result is also confirmed by the literature (Altunbas et al (2010)). We find that banks with

<sup>15</sup>We report the complete results in Table 8 of the appendix.

a higher share of trading assets to total assets and higher share of funding in foreign currency are more affected by monetary policy shocks. Finally, banks with a greater share of short-term funding and more efficient banks are better insulated against changes in the policy rate. All together, these results show that characteristics that enhance the ability of a bank to raise funds from stable sources enable them to maintain a steady loan growth during a tightening of monetary policy.

Table 5: Interaction between Bank-Specific Characteristics and MP Shock

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Fund	(5) Profit	(6) All
$\Delta i_{t-1}^*$						
$\ln(\text{Assets})_{(t-1)}$	-0.00514*** (0.00169)					-0.00779*** (0.00249)
$\text{LCR}_{(t-1)}$	0.0134*** (0.00171)					0.0200*** (0.00211)
$\text{Capital}_{(t-1)}$	0.0917 (0.0753)					0.286*** (0.0943)
$\text{NPL}_{(t-1)}$		-0.352*** (0.135)				-1.151*** (0.180)
$\text{Write-offs}_{(t-1)}$		-2.795*** (1.083)				-8.004*** (1.446)
$\text{Div. Ratio}_{(t-1)}$			-0.116*** (0.0222)			-0.0138 (0.0269)
$\text{Trading assets}_{(t-1)}$			-0.201*** (0.0496)			-0.188*** (0.0590)
$\text{LT funding}_{(t-1)}$				0.00244 (0.0152)		
$\text{Fund foreign}_{(t-1)}$				-0.653*** (0.0750)		-0.557*** (0.0861)
$\text{Deposits}_{(t-1)}$				0.168*** (0.0222)		0.165*** (0.0273)
$\text{Efficiency}_{(t-1)}$					0.000297*** (4.63e-05)	0.000125*** (5.45e-05)
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,661,018	2,663,249	2,663,249	2,663,249	2,662,027	2,662,027
$R^2$	0.440	0.440	0.440	0.440	0.440	0.440

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 6 presents the results of the interaction between bank-specific characteristics and global conditions.<sup>16</sup> The focus of this section is to determine which characteristics shelter banks from different external shocks. The first shock we consider is global risk, measured as a dummy variable that takes a value of 1 for high values of the VIX index (column (1)). We find that well-capitalised banks with a high level of liquidity reduce lending less than other banks with similar exposure to the risk shock. These results are well documented in the literature (Kapan and Minoui (2013)) and relate to the fact that capital and liquidity are important buffers for banks that face external shocks. We also find that banks with a higher share of non-interest income to total income are more susceptible to global risk. Finally the results show that banks with a higher share of trading assets and long-term funding reduce less their supply of credit when faced with a risk shock.

The second shock relates to global liquidity conditions (column (2)). One of the aftermaths of the GFC was an increase in permissive credit conditions in advanced economies that spilled over to emerging markets (BIS (2011)). We measure global liquidity conditions using the Federal Funds shadow rate proposed by Wu and Xia (2011). The assumption is that the relationship between the federal funds rate and cross-border bank lending is positive and mostly driven by macro fundamentals (Avdjiev and Hale (2018)). The results show that banks with higher level of liquidity and low risk grant more credit when global liquidity is high. We also find that banks with a lower share of trading assets and a higher share of short-term funding increase more their credit supply when liquidity is booming.

Column (3) shows the results associated with the economic policy uncertainty shock. We define periods of high economic uncertainty using a dummy variable that takes the value of one for high levels of the Baker, Bloom and Davis (2016) index. High economic uncertainty is associated with greater stock price volatility in international markets and reduced business investment in policy-sensitive sectors. We find that banks with high levels of capital and short-term funding are better sheltered against economic policy uncertainty shocks. On the other hand banks that are more diversified reduce more their credit supply when faced with this type of shocks. These results highlight the importance of the ability of banks to raise funds and maintain credit growth when faced with shocks that curtail investment opportunities.

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<sup>16</sup>Tables 9-12 in the appendix contain the complete results for each shock.

Table 6: Interaction between Bank-Specific Characteristics and Global Shocks

$\Delta \log(\text{Credit})$	(1) Global Risk	(2) Global Liquidity	(3) Economic Policy	(4) Commodity P
<b>Shock *</b>				
$\ln(\text{Assets})_{(t-1)}$	-0.000228 (0.00242)	-0.00139 (0.000949)	-0.00182 (0.00170)	0.00168 (0.00248)
$\text{LCR}_{(t-1)}$	0.00542*** (0.00129)	0.00432*** (0.000663)	-0.00103 (0.00109)	0.00877*** (0.00132)
$\text{Capital}_{(t-1)}$	0.249*** (0.0576)	0.0211 (0.0289)	0.227*** (0.0571)	0.0670 (0.0596)
$\text{NPL}_{(t-1)}$	-0.201 (0.152)	-0.361*** (0.0539)		-0.0589 (0.135)
$\text{Write-offs}_{(t-1)}$	-1.100 (1.005)	-1.983*** (0.361)		-4.443*** (0.976)
$\text{Div. Ratio}_{(t-1)}$	-0.0137*** (0.00481)		-0.0101** (0.00500)	-0.0232 (0.0142)
$\text{Trading assets}_{(t-1)}$	0.0998* (0.0513)	-0.0406* (0.0216)		-0.0763* (0.0449)
$\text{LT funding}_{(t-1)}$	0.0789*** (0.0193)			0.0926*** (0.0177)
$\text{Fund foreign}_{(t-1)}$	-0.386*** (0.0849)	-0.183*** (0.0284)	-0.219*** (0.0646)	-0.519*** (0.0673)
$\text{Deposits}_{(t-1)}$	0.0198 (0.0282)	0.0811*** (0.0113)	0.0928*** (0.0215)	0.112*** (0.0235)
$\text{Efficiency}_{(t-1)}$				0.000202** (8.19e-05)
Number of debtors	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42
Observations	2,640,106	2,640,106	2,640,106	2,639,682
R-squared	0.492	0.492	0.492	0.492

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The last shock we consider is a dummy variable that takes a value of one if there is a considerable drop in the annual growth commodity prices (column (4)). Commodity prices can affect bank lending through the credit supply channel driven by their effect on the nominal exchange rate and export revenues (Kohlscheen, Avalos and Schrimpf (2016) and Agarwal et al (2018)). We find that banks that transmit commodity price changes to lending less aggressively are characterised by a high level of liquidity, short-term funding, long-term funding and efficiency. On the other hand, banks with a higher share of write-offs and trading assets contract more their credit supply when

faced with a commodity price shock.

A common result in all specifications is that Mexican banks with a higher share of funding from foreign sources reduce more their loan provision when faced with external shocks. One consequence of the GFC has been a shift in the drivers of international bank lending (Avdjiev et al (2017)). International banks flows have become more responsive to the degree of commonality of financial cycles and the stance of policy in advanced economies. These effects increase the vulnerability of banks that rely on funding from foreign sources and make them more susceptible to global conditions.

## 7 Conclusions

After the GFC there has been a renewed effort to implement regulatory reforms aimed at safeguarding financial stability and strengthening banks' balance sheets. The objective is to make banks more resilient and to reduce the transmission of negative shocks to the real economy via the credit channel. This paper explores the determinants of the credit supply in Mexico taking advantage of the granularity provided by credit registry data. We find that the strength of a banks' balance sheets is fundamental for credit provision in Mexico. The bank-specific characteristics that are positively related to the growth of credit are: size, capitalisation, low share of riskier loans, less income diversification, high long-term funding and low funding from foreign sources. Then, we explore which characteristics enhance the transmission of monetary policy via the bank-lending channel. We find that the bank specific characteristics that shelter banks against a tightening of monetary policy are: liquidity, capitalisation, low share of riskier loans, low trading assets, low share of funding from foreign sources, high short term funding and efficiency. Finally we study how external shocks can affect financial intermediation and limit credit availability. We find that banks with differing characteristics are hit differently by external shocks. Our results show that bank characteristics that build resilience against external shocks are: high liquidity, high capitalisation, less diversification, low share of funding from foreign sources and a high share of long-term and short-term funding.

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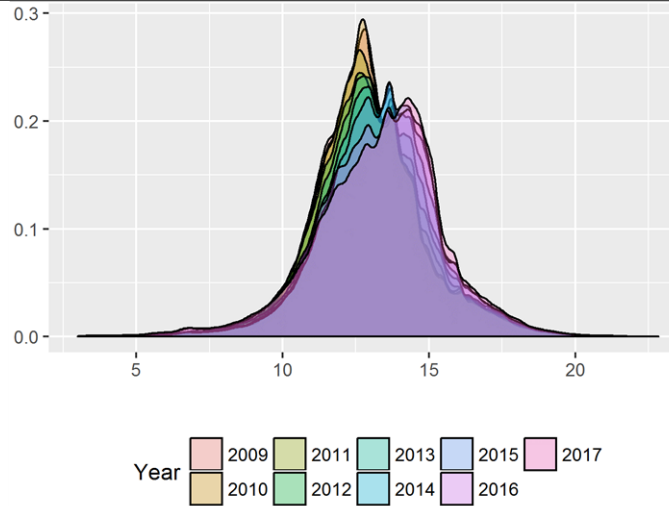
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# Appendix A Graphs and Tables

Density of Log(Credit) by year

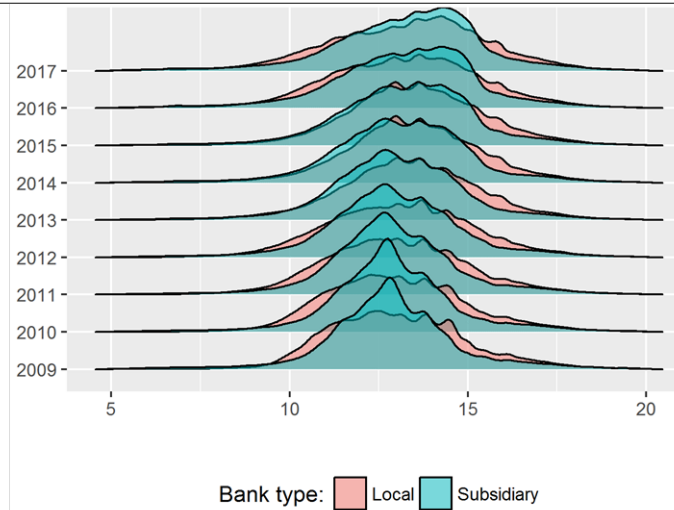
Graph A1



Source: CNBV.

Density of Log(Credit) by year and bank type

Graph A2



Source: CNBV.

Table 7: Differentiated Response of Subsidiaries

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Fund	(5) Profit	(6) All
$\ln(\text{Assets})_{(t-1)}$	0.0296*** (0.00587)					0.00515 (0.00816)
$\text{LCR}_{(t-1)}$	-0.0178*** (0.00199)					-0.0118*** (0.00218)
$\text{Capital}_{(t-1)}$	0.00969 (0.0715)					-0.122 (0.0866)
$\text{NPL}_{(t-1)}$		-1.037*** (0.114)				-0.932*** (0.125)
$\text{Write-offs}_{(t-1)}$		-4.420*** (0.648)				-3.741*** (0.666)
$\text{Div. Ratio}_{(t-1)}$			-0.00586*** (0.00221)			-0.00767*** (0.00230)
$\text{Trading assets}_{(t-1)}$			-0.195*** (0.0308)			-0.140*** (0.0339)
$\text{LT funding}_{(t-1)}$				0.0423*** (0.0122)		-0.00104 (0.0134)
$\text{Fund foreign}_{(t-1)}$				-0.176*** (0.0581)		-0.245*** (0.0628)
$\text{Deposits}_{(t-1)}$				0.0288 (0.0236)		0.0447 (0.0274)
$\text{Efficiency}_{(t-1)}$					-1.54e-05 (5.50e-05)	0.000204*** (5.87e-05)
Sub* $\ln(\text{Assets})_{(t-1)}$	-0.0781*** (0.00840)					-0.0593*** (0.0110)
Sub* $\text{LCR}_{(t-1)}$	0.0156*** (0.00214)					0.0104*** (0.00233)
Sub* $\text{Capital}_{(t-1)}$	-0.343*** (0.108)					-0.0347 (0.123)
Sub* $\text{NPL}_{(t-1)}$		0.624*** (0.133)				0.528*** (0.149)
Sub* $\text{Write-offs}_{(t-1)}$		5.361*** (0.851)				5.031*** (0.884)
Sub* $\text{Div. Ratio}_{(t-1)}$			-0.0168 (0.0180)			-0.0732*** (0.0195)
Sub* $\text{Trading assets}_{(t-1)}$			0.234*** (0.0498)			0.00782 (0.0549)
Sub* $\text{LT funding}_{(t-1)}$				0.119*** (0.0272)		0.151*** (0.0312)
Sub* $\text{Fund foreign}_{(t-1)}$				-0.0293 (0.0696)		0.212*** (0.0813)
Sub* $\text{Deposits}_{(t-1)}$				-0.0968*** (0.0282)		-0.170*** (0.0325)
Sub* $\text{Efficiency}_{(t-1)}$					1.02e-05 (5.81e-05)	-0.000204*** (6.15e-05)
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,657,284	2,659,515	2,659,515	2,659,515	2,658,293	2,656,859
R-squared	0.440	0.440	0.440	0.440	0.440	0.440

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 8: Response of Credit to Monetary Policy Shock

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Fund	(5) Profit	(6) All
$\ln(\text{Assets})_{(t-1)}$	0.0197*** (0.00543)					0.0301*** (0.00621)
$\text{LCR}_{(t-1)}$	-0.00545*** (0.000985)					-0.00494*** (0.00107)
$\text{Capital}_{(t-1)}$	0.166*** (0.0523)					0.191*** (0.0566)
$\text{NPL}_{(t-1)}$		-0.647*** (0.0725)				-0.594*** (0.0777)
$\text{Write-offs}_{(t-1)}$		-1.435*** (0.436)				-0.465 (0.455)
$\text{Div. Ratio}_{(t-1)}$			-0.00570*** (0.00221)			-0.00500** (0.00224)
$\text{Trading assets}_{(t-1)}$			-0.0560** (0.0239)			-0.0554** (0.0252)
$\text{LT funding}_{(t-1)}$				0.0499*** (0.0114)		
$\text{Fund foreign}_{(t-1)}$				-0.0763* (0.0418)		-0.0414 (0.0432)
$\text{Deposits}_{(t-1)}$				-0.0537*** (0.0171)		0.00450 (0.0206)
$\text{Efficiency}_{(t-1)}$					-0.000268*** (4.43e-05)	-0.000101* (5.20e-05)
$\Delta i_{t-1} * \ln(\text{Assets})_{(t-1)}$	-0.00514*** (0.00169)					-0.00779*** (0.00249)
$\Delta i_{t-1} * \text{LCR}_{(t-1)}$	0.0134*** (0.00171)					0.0200*** (0.00211)
$\Delta i_{t-1} * \text{Capital}_{(t-1)}$	0.0917 (0.0753)					0.286*** (0.0943)
$\Delta i_{t-1} * \text{NPL}_{(t-1)}$		-0.352*** (0.135)				-1.151*** (0.180)
$\Delta i_{t-1} * \text{Write-offs}_{(t-1)}$		-2.795*** (1.083)				-8.004*** (1.446)
$\Delta i_{t-1} * \text{Div. Ratio}_{(t-1)}$			-0.116*** (0.0222)			-0.0138 (0.0269)
$\Delta i_{t-1} * \text{Trading assets}_{(t-1)}$			-0.201*** (0.0496)			-0.188*** (0.0590)
$\Delta i_{t-1} * \text{LT funding}_{(t-1)}$				0.00244 (0.0152)		
$\Delta i_{t-1} * \text{Fund foreign}_{(t-1)}$				-0.653*** (0.0750)		-0.557*** (0.0861)
$\Delta i_{t-1} * \text{Deposits}_{(t-1)}$				0.168*** (0.0222)		0.165*** (0.0273)
$\Delta i_{t-1} * \text{Efficiency}_{(t-1)}$					0.000297*** (4.63e-05)	0.000125** (5.45e-05)
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,661,018	2,663,249	2,663,249	2,663,249	2,662,027	2,662,027
R-squared	0.440	0.440	0.440	0.440	0.440	0.440

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table 9: Response of Credit to Risk Shock

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Fund	(5) Profit	(6) All
$\ln(\text{Assets})_{(t-1)}$	-0.0952*** (0.00742)					-0.0717*** (0.00812)
$\text{LCR}_{(t-1)}$	-0.00212* (0.00114)					-0.00240** (0.00121)
$\text{Capital}_{(t-1)}$	-0.529*** (0.0623)					-0.482*** (0.0686)
$\text{NPL}_{(t-1)}$		-0.433*** (0.0923)				-0.195** (0.0972)
$\text{Write-offs}_{(t-1)}$		0.119 (0.513)				-0.242 (0.549)
$\text{Div. Ratio}_{(t-1)}$			0.00962*** (0.00292)			0.00280 (0.00301)
$\text{Trading assets}_{(t-1)}$			-0.307*** (0.0296)			-0.253*** (0.0305)
$\text{LT funding}_{(t-1)}$				0.127*** (0.0156)		0.119*** (0.0165)
$\text{Fund foreign}_{(t-1)}$				0.0626 (0.0528)		0.0647 (0.0542)
$\text{Deposits}_{(t-1)}$				0.151*** (0.0212)		0.134*** (0.0262)
$\text{Efficiency}_{(t-1)}$					5.03e-05*** (1.93e-05)	
$\text{C1* } \ln(\text{Assets})_{(t-1)}$	-0.0102*** (0.00145)					-0.000228 (0.00242)
$\text{C1* } \text{LCR}_{(t-1)}$	0.00251*** (0.000932)					0.00542*** (0.00129)
$\text{C1* } \text{Capital}_{(t-1)}$	0.461*** (0.0447)					0.249*** (0.0576)
$\text{C1* } \text{NPL}_{(t-1)}$		0.440*** (0.122)				-0.201 (0.152)
$\text{C1* } \text{Write-offs}_{(t-1)}$		-6.388*** (0.818)				-1.100 (1.005)
$\text{C1* } \text{Div. Ratio}_{(t-1)}$			-0.0270*** (0.00448)			-0.0137*** (0.00481)
$\text{C1* } \text{Trading assets}_{(t-1)}$			0.0971** (0.0449)			0.0998* (0.0513)
$\text{C1* } \text{LT funding}_{(t-1)}$				0.0984*** (0.0137)		0.0789*** (0.0193)
$\text{C1* } \text{Fund foreign}_{(t-1)}$				-0.532*** (0.0688)		-0.386*** (0.0849)
$\text{C1* } \text{Deposits}_{(t-1)}$				0.108*** (0.0222)		0.0198 (0.0282)
$\text{C1* } \text{Efficiency}_{(t-1)}$					-7.16e-05 (6.39e-05)	
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,640,106	2,642,190	2,642,190	2,642,190	2,640,979	2,640,106
R-squared	0.492	0.492	0.492	0.492	0.492	0.492

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 10: Response of Credit to Liquidity Shock

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Fund	(5) Profit	(6) All
$\ln(\text{Assets})_{(t-1)}$	-0.0953*** (0.00760)					-0.0410*** (0.00871)
$\text{LCR}_{(t-1)}$	-0.00125 (0.00116)					0.00103 (0.00128)
$\text{Capital}_{(t-1)}$	-0.344*** (0.0753)					-0.293*** (0.0783)
$\text{NPL}_{(t-1)}$		-0.819*** (0.115)				-0.829*** (0.125)
$\text{Write-offs}_{(t-1)}$		-2.177*** (0.638)				-2.778*** (0.691)
$\text{Div. Ratio}_{(t-1)}$			-0.00353 (0.00429)			
$\text{Trading assets}_{(t-1)}$			-0.312*** (0.0311)			-0.293*** (0.0323)
$\text{LT funding}_{(t-1)}$				0.129*** (0.0162)		
$\text{Fund foreign}_{(t-1)}$				-0.182*** (0.0539)		-0.104* (0.0556)
$\text{Deposits}_{(t-1)}$				0.233*** (0.0213)		0.266*** (0.0264)
$\text{Efficiency}_{(t-1)}$					3.89e-05* (2.26e-05)	
$\text{C2* } \ln(\text{Assets})_{(t-1)}$	0.00172*** (0.000601)					-0.00139 (0.000949)
$\text{C2* } \text{LCR}_{(t-1)}$	1.78e-05 (0.000541)					0.00432*** (0.000663)
$\text{C2* } \text{Capital}_{(t-1)}$	0.0138 (0.0247)					0.0211 (0.0289)
$\text{C2* } \text{NPL}_{(t-1)}$		-0.258*** (0.0438)				-0.361*** (0.0539)
$\text{C2* } \text{Write-offs}_{(t-1)}$		-0.700** (0.312)				-1.983*** (0.361)
$\text{C2* } \text{Div. Ratio}_{(t-1)}$			-0.00152 (0.00278)			
$\text{C2* } \text{Trading assets}_{(t-1)}$			-0.0403** (0.0184)			-0.0406* (0.0216)
$\text{C2* } \text{LT funding}_{(t-1)}$				0.00187 (0.00560)		
$\text{C2* } \text{Fund foreign}_{(t-1)}$				-0.156*** (0.0271)		-0.183*** (0.0284)
$\text{C2* } \text{Deposits}_{(t-1)}$				0.0844*** (0.00897)		0.0811*** (0.0113)
$\text{C2* } \text{Efficiency}_{(t-1)}$					1.85e-05 (2.26e-05)	
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,640,106	2,642,190	2,642,190	2,642,190	2,640,979	2,640,106
R-squared	0.492	0.492	0.492	0.492	0.492	0.492

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 11: Response of Credit to Economic Policy Uncertainty Shock

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Fund	(5) Profit	(6) All
$\ln(\text{Assets})_{(t-1)}$	-0.0996*** (0.00735)					-0.0639*** (0.00808)
$\text{LCR}_{(t-1)}$	-0.00110 (0.00111)					-0.00412*** (0.00116)
$\text{Capital}_{(t-1)}$	-0.457*** (0.0618)					-0.559*** (0.0635)
$\text{NPL}_{(t-1)}$		-0.378*** (0.0894)				
$\text{Write-offs}_{(t-1)}$		-1.442*** (0.477)				
$\text{Div. Ratio}_{(t-1)}$			0.00751*** (0.00289)			0.00407 (0.00294)
$\text{Trading assets}_{(t-1)}$			-0.277*** (0.0298)			
$\text{LT funding}_{(t-1)}$				0.152*** (0.0153)		
$\text{Fund foreign}_{(t-1)}$				0.00734 (0.0534)		0.119** (0.0541)
$\text{Deposits}_{(t-1)}$				0.151*** (0.0219)		0.186*** (0.0258)
$\text{Efficiency}_{(t-1)}$					0.000108** (5.03e-05)	
$\text{C3* } \ln(\text{Assets})_{(t-1)}$	0.000341 (0.00134)					-0.00182 (0.00170)
$\text{C3* } \text{LCR}_{(t-1)}$	-0.00178* (0.00105)					-0.00103 (0.00109)
$\text{C3* } \text{Capital}_{(t-1)}$	0.301*** (0.0496)					0.227*** (0.0571)
$\text{C3* } \text{NPL}_{(t-1)}$		-0.0894 (0.123)				
$\text{C3* } \text{Write-offs}_{(t-1)}$		0.771 (1.031)				
$\text{C3* } \text{Div. Ratio}_{(t-1)}$			-0.0231*** (0.00446)			-0.0101** (0.00500)
$\text{C3* } \text{Trading assets}_{(t-1)}$			-0.0209 (0.0405)			
$\text{C3* } \text{LT funding}_{(t-1)}$				-0.00869 (0.0128)		
$\text{C3* } \text{Fund foreign}_{(t-1)}$				-0.280*** (0.0592)		-0.219*** (0.0646)
$\text{C3* } \text{Deposits}_{(t-1)}$				0.0995*** (0.0186)		0.0928*** (0.0215)
$\text{C3* } \text{Efficiency}_{(t-1)}$					-6.52e-05 (5.06e-05)	
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,640,106	2,642,190	2,642,190	2,642,190	2,640,979	2,640,106
R-squared	0.492	0.492	0.492	0.492	0.492	0.492

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 12: Response of Credit to Commodity Price Shock

$\Delta \log(\text{Credit})$	(1) Main	(2) Risk	(3) Revenue	(4) Fund	(5) Profit	(6) All
$\ln(\text{Assets})_{(t-1)}$	-0.0992*** (0.00738)					-0.0816*** (0.00860)
$\text{LCR}_{(t-1)}$	-0.00324*** (0.00118)					-0.00413*** (0.00126)
$\text{Capital}_{(t-1)}$	-0.453*** (0.0621)					-0.468*** (0.0732)
$\text{NPL}_{(t-1)}$		-0.470*** (0.0911)				-0.132 (0.105)
$\text{Write-offs}_{(t-1)}$		0.511 (0.546)				0.771 (0.593)
$\text{Div. Ratio}_{(t-1)}$			-0.000778 (0.00229)			-0.00753*** (0.00241)
$\text{Trading assets}_{(t-1)}$			-0.221*** (0.0334)			-0.154*** (0.0365)
$\text{LT funding}_{(t-1)}$				0.0881*** (0.0164)		0.103*** (0.0178)
$\text{Fund foreign}_{(t-1)}$				0.212*** (0.0561)		0.193*** (0.0574)
$\text{Deposits}_{(t-1)}$				0.0873*** (0.0228)		0.0656** (0.0295)
$\text{Efficiency}_{(t-1)}$					-0.000238*** (5.87e-05)	-0.000161** (8.14e-05)
$\text{C4* } \ln(\text{Assets})_{(t-1)}$	-0.0110*** (0.00126)					0.00168 (0.00248)
$\text{C4* } \text{LCR}_{(t-1)}$	0.00655*** (0.000920)					0.00877*** (0.00132)
$\text{C4* } \text{Capital}_{(t-1)}$	0.237*** (0.0448)					0.0670 (0.0596)
$\text{C4* } \text{NPL}_{(t-1)}$		0.414*** (0.111)				-0.0589 (0.135)
$\text{C4* } \text{Write-offs}_{(t-1)}$		-5.494*** (0.747)				-4.443*** (0.976)
$\text{C4* } \text{Div. Ratio}_{(t-1)}$			-0.0349*** (0.0131)			-0.0232 (0.0142)
$\text{C4* } \text{Trading assets}_{(t-1)}$			-0.123*** (0.0389)			-0.0763* (0.0449)
$\text{C4* } \text{LT funding}_{(t-1)}$				0.0909*** (0.0120)		0.0926*** (0.0177)
$\text{C4* } \text{Fund foreign}_{(t-1)}$				-0.574*** (0.0599)		-0.519*** (0.0673)
$\text{C4* } \text{Deposits}_{(t-1)}$				0.167*** (0.0186)		0.112*** (0.0235)
$\text{C4* } \text{Efficiency}_{(t-1)}$					0.000298*** (5.77e-05)	0.000202** (8.19e-05)
Number of debtors	112,905	112,905	112,905	112,905	112,905	112,905
Number of banks	42	42	42	42	42	42
Observations	2,640,106	2,642,190	2,642,190	2,642,190	2,640,979	2,639,682
R-squared	0.492	0.492	0.492	0.492	0.492	0.492

Standard errors in parentheses. All regressions include bank and firm\*time fixed effects.

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1