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Bank Ownership and Credit Growth in Emerging Markets During and After the 2008–09 Financial Crisis—A Cross-Regional Comparison

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Abstract

This paper examines bank credit growth in emerging markets before, during, and after the 2008-09 financial crisis using bank-level data, focusing on the role of bank ownership. Credit growth by foreign banks lagged behind that of domestic banks in 2009 in Asia, and in 2010 in Latin America and emerging Europe. State-owned banks instead played a counter-cyclical role during the crisis in particular in Latin America and emerging Europe, and credit by state-owned banks also grew faster than that of private banks after the crisis in Latin America. Expansionary monetary policy on average led to higher credit growth. Banks in Latin America and Asia that relied more on retail funding had higher credit growth, in particular during the crisis. Better-capitalized banks and banks with more liquid assets also had faster credit growth. Finally, banks in countries with stronger banking regulation had higher credit growth during the crisis.

JEL Classification Numbers: G01, G21

Keywords: Credit Growth; Bank Ownership; Financial Crisis

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Contents

I.   Introduction

This paper uses bank-level data to study credit growth by deposit-taking banks before, during, and after the 2008–09 global financial crisis, with particular attention to the role of bank ownership. The ownership structure of banking sectors in developing and emerging market countries have changed substantially since late 1990s. Between 1999 and 2009, the share of bank assets held by foreign banks in developing countries rose from 26 to 46 percent, while government bank ownership declined from 28 to 19 percent (Cull and Peria, 2012).[2] During the 2008–09 crisis, while bank credit growth dropped significantly, there were differences in bank behavior depending on bank ownership, which is the focus of this study, although we also examined other factors affecting bank lending.

There is a rich literature relating bank behavior to ownership. Foreign banks are found to help diversify risks (Allen et al., 2011) and increase competition and improve efficiency (Detragiache and Gupta, 2006; Taboada, 2011; Hasan and Xie, 2012). Foreign banks often played a stabilizing role during past local emerging market crises by providing more capital and credit (de Haas and van Lelyveld, 2006, 2010; Dages et al., 2000; Crystal et al., 2001, 2002; Arena et al., 2007; Claessens and van Horen, 2013). On the other hand, foreign bank participation can expose unhedged borrowers to foreign exchange risk and the local banking system to foreign shocks (Peek and Rosengren, 1997, 2000; Avdjiev et al. 2012). During the 2008–09 financial crisis which originated from advanced economies, foreign banks might have helped transmit the crisis from parent countries to local markets through cutting credit supply (Cetorelli and Goldberg, 2011; Popov and Udell, 2012; Schnabl, 2012).

There is evidence that state-owned banks hinder financial development (La Porta et al., 2002; Barth et al., 2004). Lending by state banks are often politically motivated (Dinc, 2005; Brown and Dinc, 2005), and state banks are usually less efficient (Micco et al., 2007; Berger et al., 2009). State-owned banks can also play a positive role in some aspects. Andrianova et al. (2009) found that state banks could foster growth if they are managed with sound and transparent practice. In addition, during financial crises, state banks often played a counter-cyclical role by better maintaining credit growth (Micco and Panizza, 2006; De Haas and van Lelyveld, 2011; Bertay et al., 2012).

This paper is most closely related to Bakker et al. (2013) and Cull and Peria (2012). Bakker et al. (2013) focused on European emerging markets and found that foreign ownership was associated with higher credit growth before the crisis, but this positive effect declined since 2008. Their study did not address the role of state banks. Cull and Peria (2012) found that in European emerging markets, lending by foreign banks fell more than that of domestic private

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[2] Foreign bank participation in developing countries has been driven by multiple factors including following home country customers, profit seeking, and low entry barriers (Cull and Peria, 2010; Detragiache et al., 2008).

banks during the crisis, and government-owned banks did not act counter-cyclically, but the opposite was true in Latin America.

Compared to these studies, our paper includes Asian emerging markets[3] and we also investigated bank credit growth after the global financial crisis. In addition, we analyzed the impact of monetary policy and banking regulation on credit growth, also using bank-level data. Studies on these subjects have mostly used aggregate data and findings are inclusive. A number of studies (Aisen and Franken, 2010; Bhaumik et al., 2011) identified a link between looser monetary policy and faster credit growth, but Bloxham et al. (2011) found no such link. Banking regulation and supervision were found to be important for credit growth in earlier studies (Hilbers et al., 2005). However, Beltratti and Stulz (2012) found that banking regulation was generally uncorrelated with the performance of banks during the 2008–09 crisis.

We found that while banks in all three regions experienced a sharp decline in credit growth during the crisis, the behavior of foreign banks and state-owned banks differed, and there are also differences across regions. Lending by foreign banks in Asia fell more than that of domestic banks in 2009 (after controlling for other factors affecting credit growth), but not so in Latin America and emerging Europe. However, in Latin America and Europe, foreign banks' credit growth has lagged behind that of domestic banks in 2010. In contrast, state banks played a counter-cyclical role during the crisis in Latin America and emerging Europe (also some evidence in Asia), and credit by state banks also grew faster than that of private banks after the crisis in Latin America. We further found that foreign parent banks' characteristics affected the credit growth of their subsidiaries.

Expansionary monetary policy on average led to higher credit growth. Better-capitalized banks, and banks with more liquid assets and relied more on retail funding had faster credit growth. In addition, banks in countries with better banking regulation experienced higher credit growth during the crisis.

The rest of the paper is organized as follows. Section II describes our empirical specification. Section III discusses the data and stylized facts. Section IV presents the empirical results, and Section V provides some concluding remarks.

II.   Empirical Methodology

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[3] To conduct the analysis for countries with broadly similar banking sector structure and facing similar shocks, we separate emerging markets into three groups by geographical location: Latin America, Eastern and Central Europe, and Asia.

We conduct the analysis for the three regions separately for a cross-regional comparison. Annual individual bank credit growth over 2004–11 is modeled with the following panel specification (similar to Cull and Peria, 2012):

$$
\begin{aligned}
CG_{ijt} = &\; \alpha_0 + \alpha_1 Foreign_{ijt} + \alpha_2 State_{ijt} + \beta_1 Year2008_{ijt} + \beta_2 Year2009_{ijt} \\
&+ \beta_3 Year2010_{ijt} + \beta_4 Year2011_{ijt} + \gamma_1 Foreign_{ijt} * Year2008_{ijt} \dots \\
&+ \gamma_4 Foreign_{ijt} * Year2011_{ijt} + \rho_1 State_{ijt} * Year2008_{ijt} + \cdots \\
&+ \rho_4 State_{ijt} * Year2011_{ijt} + \pi' Z_{j\dots} + \theta' X_{ijt-1} + v_j + w_{jt} + \mu_i + u_{ijt},
\end{aligned}
$$

where CG_{ijt} is the annual credit growth, in U.S. dollars, for bank i in country j in year t. Banks lend in both local and foreign currencies. Following the common practice (e.g., Cull and Peria, 2012; Bakker, 2013), we used credit in U.S. dollars but included exchange rate depreciation (for the current period) as an explanatory variable to control for the effect of exchange rate movements.[4] Foreign and State are dummy variables take value of one for foreign and state-owned banks, respectively. Year2008–Year2011 are year dummies. $Z_{j\dots}$ is a vector of country characteristics including aggregate demand (lagged GDP growth), monetary policy rate (lagged), and banking regulation measure at the beginning of the sample period (2003). These variables only vary at the country level.

X_{ijt-1} is a vector of bank-specific characteristics commonly included in studies of credit growth. These include bank size (log of total bank assets), capitalization (equity-to-loan ratio), liquidity condition (liquid assets/total assets), profitability (return on assets), and funding stability (retail deposits/total liability). We used lagged variables to help control for endogeneity. v_j, w_{jt}, and μ_i are vectors representing country fixed effects, country-year dummies, and bank fixed effects, respectively, although they are not necessarily included in the same regression. Macro variables such as GDP growth and exchange rate will be dropped automatically when country-year fixed effects are included, since they do not have country-year variations. In some specifications we also included the characteristics of foreign parent banks including cost-to-income ratio, loan-to-deposit ratio, and equity-to-asset ratio. In addition, we included the credit default swap (CDS) of the parent bank's country.

The interactions of the foreign and state dummies with the 2008–11 year dummies are also included. The coefficients of foreign and state dummies by themselves would represent the difference in credit growth of foreign and state banks compared with that of domestic private banks prior to the crisis (2004 to 2007), after controlling for other factors that affect bank credit. The effect of being a foreign bank vs. domestic private banks in 2008, e.g., will be captured by the sum of the foreign dummy and the interaction of the foreign bank dummy and the 2008 year dummy. The difference of the lending behavior by a state bank in 2008 vs.

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[4] The main results still hold if we express loans in constant local currency, as discussed later.

before the crisis would be captured by the sum of the 2008 year dummy and the interaction of the state bank dummy and the 2008 year dummy. The interactions of the year dummies with country- and bank-specific variables are also included in some specifications to identify any specific effects of these variables during and after the crisis. Most of these additional interactions are not statistically significant and are not reported.

III.   Data and stylized facts

The bank-level data, including bank ownership data, are from *Bankscope*, produced by Bureau Van Dijk, which contains comprehensive information on individual banks' financial statement.[5] Our study covers more than 900 banks in 24 emerging market countries in Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru), Eastern and Central Europe (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Turkey), and Asia (China, India, Indonesia, Malaysia, Philippines, Thailand, Vietnam). GDP and exchange rate data are from the IMF's *International Financial Statistics* database. Monetary policy rates are from *Haver Analytics*.

To minimize the impact from outliers, we dropped the observations of the top 3 percent credit growth (these observations are 5 times standard deviations above the mean), and winsorized all continuous variables at the 1 percent level. Various other attempts to exclude outliers yield broadly similar results. Additional data adjustments follow Thibaut and Mathias (2012), which are widely used when dealing with *Bankscope* data (e.g., controlling for the difference between fiscal year and calendar year). The final sample includes 274 banks with 1452 observations for Latin America, 251 banks with 1303 observations for Eastern and Central Europe, and 379 banks with 2068 observations for emerging Asia.

A bank is classified as foreign if 50 percent or more shares are owned by nonresidents. If a bank is owned by more than one foreign banks, its parent bank is identified as the largest foreign shareholder. Similarly, a bank is considered a state-owned bank if the government owns 50 percent or more shares. As of 2008, foreign banks in Latin America controlled one third of banking system assets, compared with more than 60 percent in Eastern and Central Europe, and about one quarter in Asia (Table 1). The corresponding shares for state-owned banks are 16 percent, 7 percent, and 24 percent, respectively.

In terms of credit growth, banks in emerging Europe were hardest hit by the crisis, where average credit growth has declined from a peak of 42 percent in 2007 to a nadir of 5 percent in 2009 (Table 2). Credit growth recovered to 12 percent in 2011, but was still well below its pre-crisis levels. The impact of the crisis was also the largest in 2009 in Latin America,

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[5] *Bankscope* may not include all banks in each country. Furthermore, some banks are only included in some years, making the panel data unbalanced.

where average credit growth declined to 13 percent from 31 percent in 2007. The revival of credit has been faster in Latin America than in Europe, where credit growth rebounded to 22–25 percent during 2010–11. Banks in emerging Asia were least affected by the crisis, with average bank credit growth declining only moderately from 24 percent in 2007 to 19 percent in 2009.

Table 1. Bank Ownership Distribution

Year	Latin America			Eastern and Central Europe			Asia		
	Foreign	State	Private	Foreign	State	Private	Foreign	State	Private
2004	33%	14%	54%	56%	8%	36%	20%	26%	55%
2008	35%	16%	49%	63%	7%	30%	23%	24%	53%
2011	35%	16%	48%	61%	8%	30%	26%	24%	50%

Table 2. Average Credit Growth by Year and Region (in percent)

Year	Latin America				Eastern and Central Europe				Asia			
	All	Foreign	State	Private	All	Foreign	State	Private	All	Foreign	State	Private
2004	18.2	3.9	13.3	28.1	27.0	27.2	13.4	29.7	21.5	17.1	18.5	24.5
2005	17.2	7.1	17.4	22.6	29.0	30.0	11.2	31.7	22.3	24.9	21.1	21.9
2006	25.7	25.7	16.4	28.3	30.9	30.7	31.0	31.2	22.2	17.0	19.3	25.0
2007	30.7	26.9	18.2	36.9	42.3	46.8	21.0	38.2	24.4	28.6	20.9	24.4
2008	25.5	27.2	34.9	19.2	24.0	24.1	14.4	26.0	20.0	16.2	20.1	21.6
2009	12.9	0.5	19.3	20.6	5.3	4.1	17.2	4.9	18.6	-2.3	20.7	27.0
2010	22.1	11.8	15.2	32.0	10.4	9.6	12.0	11.7	23.3	25.5	18.1	24.7
2011	25.0	29.3	27.3	21.1	11.7	12.5	4.3	11.9	17.3	9.4	18.0	21.1

Foreign banks across all three regions were also particularly hard hit in 2009. Foreign banks' credit growth in Latin America plummeted to a mere half percentage point, way lower than that of domestic banks (Table 2). Foreign banks' credit declined in Asia amid still healthy credit growth by domestic banks. Credit growth of foreign banks in emerging Europe also lagged behind that of domestic banks in 2009. By 2011, credit growth of foreign banks in Latin America and emerging Europe has rebounded to be higher than that of domestic banks, but not yet in Asia.

State banks played a counter-cyclical role during the crisis. In Latin America, the credit growth of state banks increased in 2008 when that of domestic private banks declined. In European emerging markets, the decline in credit growth by state banks in 2008/09 was markedly milder than that of foreign or domestic private banks. Credit growth by state banks in emerging Asia has been broadly stable during the crisis. These are only simple summary statistics, and Section IV discusses multivariate regression results.

Table 3 reports the summary statistics for loan growth by type (corporate, consumer, mortgage) and bank-level explanatory variables. *Bankscope* has less coverage on corporate, consumer, and in particular residential mortgage loan data. There are substantial variations in bank characteristics across bank types and regions. For example, state-owned banks in Latin America and emerging Asia are usually larger than non-state banks. Foreign banks in emerging Europe and Asia are on average smaller than domestic private banks. State banks in Latin America and Europe have higher liquidity ratios than non-state banks, but the opposite is true in Asia.

Table 3. Summary Statistics by Bank Type Across Regions

	LAC				ECE				ASIA			
	F	S	DP	All	F	S	DP	All	F	S	DP	All
Total loan growth rate	20.37*	23.20*	31.65	26.55	27.20	20.13	26.70	26.50	17.91*	21.31*	26.23	23.24
Corporate loan growth rate	19.60*	25.05	30.84	25.82	22.57	23.66	24.08	23.18	8.31*	18.57*	25.04	18.78
Consumer loan growth rate	33.04	28.42*	40.88	36.50	28.55	15.68	26.29	27.01	7.00*	30.83	39.58	31.99
Mortgage growth rate	11.66	27.55	18.17	18.83	35.36	-	24.61	31.12	26.90	21.50	29.73	26.89
Total Assets ($mi)	6856	16522*	5126	7447	4527*	5509	7325	5481	4904*	70173*	9961	23375
Liquid assets/total assets (%)	28.81*	31.75*	26.59	28.13	28.70	32.91*	28.54	28.98	30.48*	15.15*	21.62	21.98
Equity/total assets (%)	19.29	11.39*	17.78	17.32	12.08	16.63*	12.76	12.65	16.39*	8.22*	8.96	10.39
Equity/net loan (%)	76.69*	33.96*	54.22	58.72	28.17	39.01*	28.24	29.03	47.28*	23.72	21.69	27.72
Return on average assets (%)	0.50*	1.44*	2.59	1.71	0.85	0.91	1.09	0.93	1.32*	0.92*	1.09	1.10
Customer deposit/total liabilities (%)	45.85*	52.96	52.80	50.48	61.58*	47.21*	76.63	52.20	67.86*	69.41*	82.22	76.02
Non-performing loan/gross loan (%)	6.08	7.22	6.81	6.64	7.33	12.51*	6.86	7.67	4.83	7.10*	5.02	5.51

Note: "F" represents foreign banks, "S" represents state-owned banks, and "DP" represents domestic private banks. * indicates that comparing to domestically private owned banks, the mean of the variable is 5% significantly different.

IV.   Regression results

A. Total loans

The reporting template is the same for results for all three regions. Column (1) controls for country fixed effects. Column (2) includes country-year fixed effects, where variables such as GDP growth, exchange rate depreciation, and the year dummies will be dropped. Columns (3)–(6) control for bank fixed effects, which we view as a more robust specification. Since there is no change in state bank ownership (the state banks in the sample have always been state banks), the state bank dummy will be dropped when the bank fixed effects are included. In contrast, about 30 percent of the foreign banks have had ownership changes over the sample period. Column (4) also controls for country-year fixed effects. Finally, Columns (5) and (6) have the same specification as Columns (3) and (4), respectively, but also included the interactions of bank characteristics with year dummies. Most of these additional interaction terms are insignificant and are not reported to save space.

A.1. Latin America

Table 4a reports the regression results for bank credit growth in Latin America. The foreign bank dummy by itself is mostly insignificant, except in the specification with country-year dummies, where it is negative and significant at the 5 percent level. The interaction of the foreign bank dummy and the 2008 year dummy is positive and significant at the 1 percent level in all specifications, pointing to higher credit growth by foreign banks in 2008 (by about 15 percentage points based on Column (4)). In contrast, the credit growth of foreign banks was lower than that of domestic private banks in 2010 (by 19 percentage points according to Column (4)). This points to a possible link to the 2010 European financial crisis given the dominance of Spanish banks in Latin America, which will be discussed further below.[6] Finally, the interaction of the foreign bank dummy with the 2011 year dummy is mostly positive although only significant in Columns (1) and (2), providing some evidence of faster post-crisis credit recovery for foreign banks.

The state bank dummy, which is only included in columns (1) and (2), is negative and significant at the 1 percent level, suggesting that the credit growth of state banks usually lagged behind that of domestic private banks before the crisis (by about 12 percentage points). The interactions of the state bank dummy and the 2008 and 2009 year dummies are however positive and significant, indicating that state banks played a counter-cyclical role during the crisis by providing additional credit than what they would have done in a "normal" year. The evidence is particularly strong for 2008, where the coefficient is large (about 30 percentage points) and significant at the 1 percent level in all specifications. There is also evidence that state banks played an active role in providing credit in 2011.

The finding that state banks have played a countercyclical role during the crisis does not address the question of loan quality. The nonperforming-loan ratio for state banks did increase a bit from 3.6 percent in 2009 to 4.5 percent in 2010, but it is still lower than the level in 2008, and it declined in 2011.

The higher credit growth by state banks during the crisis does not seem to be the result of mergers and acquisitions by state banks over private banks. We have excluded observations with the top 3 percent credit growth, which would help exclude very large credit growth due

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[6] Foreign banks in Latin America tend to be funded locally (Jara et al., 2009), and there are usually caps on how much they can lend to their parent banks. However, there could be less restrictions in some countries on other financial support to parent banks, e.g. through purchasing assets of parent banks, which could lead to lower local credit growth due to less funds available.

Table 4a. Determinants of Total Loan Growth in Latin America

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign	-10.393	-9.798**	8.049	1.566	5.859	0.147
	[5.819]	[4.032]	[14.306]	[12.954]	[15.528]	[13.588]
State	-11.828*	-11.724***				
	[4.841]	[4.077]				
Year2008	-13.980**		-10.032**		1.039	
	[3.983]		[4.239]		[20.958]	
Year2009	-21.784		-16.969**		2.159	
	[11.464]		[6.556]		[26.340]	
Year2010	9.797**		28.405***		21.305	
	[3.672]		[7.560]		[16.059]	
Year2011	-13.913**		-2.315		9.468	
	[4.979]		[5.471]		[22.897]	
Foreign*year2008	22.065***	18.286**	19.052***	14.786**	16.305**	14.239*
	[3.963]	[7.243]	[7.103]	[6.705]	[8.019]	[7.859]
Foreign*year2009	-5.914	-7.117	-10.909	-12.04	-11.603	-10.16
	[11.498]	[8.872]	[7.340]	[7.604]	[7.142]	[7.178]
Foreign*year2010	-7.231	-8.637	-16.204**	-18.622***	-16.758**	-17.894**
	[8.355]	[5.398]	[6.649]	[7.013]	[6.876]	[7.208]
Foreign*year2011	22.678*	21.198***	3.86	1.703	0.556	-0.254
	[9.219]	[7.682]	[7.939]	[8.024]	[7.116]	[7.501]
State*year2008	34.956***	33.424***	34.162***	29.366***	33.670***	30.427***
	[6.594]	[9.070]	[6.069]	[5.871]	[6.225]	[6.205]
State*year2009	10.801***	12.290*	11.885	11.198	15.417**	13.747*
	[1.890]	[6.675]	[7.219]	[6.827]	[7.173]	[7.021]
State*year2010	-3.122	-4.425	-1.49	-4.116	-2.384	-4.345
	[2.559]	[4.935]	[5.893]	[5.600]	[5.960]	[5.448]
State*year2011	19.511***	15.674*	17.789***	12.845**	14.417***	11.443**
	[4.014]	[8.890]	[5.683]	[5.738]	[5.513]	[5.480]
GDP growth rate (%)	1.133		2.482***		3.055***	
	[0.819]		[0.695]		[0.943]	
Exchange rate depreciation (%)	0.775*		1.144***		1.155***	
	[0.381]		[0.294]		[0.328]	
Size (ln_total assets)	0.217	0.206	-12.330***	-22.112***	-11.592***	-22.663***
	[0.996]	[0.548]	[3.350]	[4.587]	[3.588]	[4.537]
Equity/loan ratio (%)	0.000	-0.004	0.168***	0.163***	0.165***	0.159***
	[0.011]	[0.019]	[0.047]	[0.047]	[0.056]	[0.058]
Liquid asets/total assets ratio (%)	-0.006	-0.005	0.239**	0.224**	0.223*	0.239*
	[0.023]	[0.056]	[0.094]	[0.102]	[0.116]	[0.125]
Return on assets (%)	0.666	0.579	0.894*	0.914*	1.058*	1.053
	[0.692]	[0.406]	[0.461]	[0.536]	[0.598]	[0.693]
Customer deposits/total liability ratio (%)	0.117*	0.116***	0.200*	0.128	0.167	0.05
	[0.046]	[0.042]	[0.109]	[0.128]	[0.114]	[0.132]
Customer deposit/total liability*year2009					0.133	0.309**
					[0.128]	[0.155]
Customer deposit/total liability*year2010					0.08	0.212*
					[0.104]	[0.112]
Country fixed effects	Y	N	N	N	N	N
Country-year fixed effects	N	Y	N	Y	N	Y
Bank fixed effects	N	N	Y	Y	Y	Y
Observations	1,452	1,452	1,452	1,452	1,452	1,452
R-squared	0.07	0.05	0.14	0.22	0.17	0.23
Number of banks	274	274	274	274	274	274

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (5) and (6) also include interactions of bank-specific variables and the 2008-11 year dummies, most of them not reported to save space.

to mergers and acquisitions. As a robustness check we also excluded observations with top 5 percent credit growth and the results (not reported) are broadly similar. The higher credit growth by state banks was also not driven by customers transferring deposits from private to state banks—the decline in deposit growth during 2008/09 for state banks is comparable to that of non-state banks.

Control variables are of expected sign. Strong GDP growth led to higher credit growth. Banks with higher capital and profitability, more liquid assets, and relying more on retail funding on average had higher credit growth. The interactions of these variables with year dummies are mostly insignificant, but the interaction of the customer deposits/total liability ratio with the 2009 and 2010 dummies are positive and significant (at the 5 and 10 percent respectively), suggesting that retail deposits were particularly important in funding credit in Latin America during and after the crisis. Finally, larger banks on average had lower credit growth.

A.2. Eastern and Central Europe

Table 4b reports the results for emerging Europe. Evidence suggests weak credit growth by foreign banks in particular in 2010, instead of 2009 as found by Bakker et al. (2013) and Cull and Peria (2012). The difference seems to result from the difference in sample countries, where Bakker et al. (2013) included countries that are typically not considered emerging markets,[7] and compared with Cull and Peria (2012) we included Baltic countries and Turkey.

Foreign banks in emerging Europe traditionally relied on cross-border wholesale funding, on which the global financial crisis had a major impact. On the other hand, reflecting banks' frustration with the "centralized" funding model since the onset of the crisis, since late 2008 they have been rebalancing their funding toward local sources (IMF, 2013). The Vienna Initiative which brought together key western parent bank groups, home and host-country authorities, and multilateral organizations also helped alleviate the impact of the crisis on foreign banks' lending.

The state bank dummy by itself is negative (specifications (1) and (2)) but insignificant. The interaction of the state bank dummy and the 2009 year dummy is positive and significant in most specifications, suggesting a countercyclical role by state banks during the crisis. The results for other control variables are in line with expectations, although some are insignificant.

A.3. Emerging Asia

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[7] Albania, Belarus, Bosnia and Herzegovina.

Table 4b. Determinants of Total Loan Growth in Eastern and Central Europe

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign	3.326	2.938	12.55	3.341	10.588	2.694
	[4.439]	[3.322]	[8.752]	[7.566]	[8.576]	[7.774]
State	-8.311	-6.567				
	[4.595]	[4.467]				
Year2008	-6.148		-2.267		44.580***	
	[4.774]		[4.293]		[15.161]	
Year2009	-20.008**		-15.171***		23.106	
	[7.303]		[4.792]		[15.824]	
Year2010	4.33		8.819		31.949**	
	[9.703]		[5.771]		[15.583]	
Year2011	-11.573		-6.229		40.285**	
	[6.765]		[5.169]		[17.004]	
Foreign*year2008	-3.913	-7.289	-4.151	-5.603	-3.697	-4.163
	[6.056]	[5.355]	[4.640]	[4.402]	[4.419]	[4.678]
Foreign*year2009	-3.987	-3.887	-6.158	-4.634	-4.83	-3.02
	[5.373]	[4.032]	[4.700]	[4.450]	[4.405]	[4.543]
Foreign*year2010	-7.228	-4.366	-12.666***	-7.644*	-8.032*	-4.301
	[6.710]	[5.272]	[4.665]	[4.503]	[4.706]	[4.875]
Foreign*year2011	-2.834	-0.847	-7.42	-5.567	-6.298	-5.538
	[5.208]	[4.679]	[5.168]	[5.092]	[5.103]	[5.242]
State*year2008	0.234	-7.334	-1.244	-9.943	-1.214	-4.847
	[6.090]	[6.458]	[7.587]	[7.609]	[7.442]	[7.566]
State*year2009	22.067**	17.116**	19.562*	11.917	20.915*	16.062
	[8.204]	[6.622]	[10.472]	[10.423]	[11.862]	[11.495]
State*year2010	7.427	8.023	3.592	4.154	9.272	10.23
	[6.890]	[5.389]	[7.915]	[7.939]	[7.670]	[7.872]
State*year2011	4.377	0.766	2.432	-2.191	0.191	-4.794
	[5.351]	[7.132]	[10.288]	[9.227]	[10.972]	[10.750]
GDP growth rate (%)	1.916***		1.818***		5.247***	
	[0.216]		[0.293]		[0.873]	
Exchange rate depreciation (%)	-0.004		0.055		0.077	
	[0.249]		[0.144]		[0.304]	
Size (ln_total assets)	-0.392	-0.702	-5.282	-21.598***	-5.993	-22.240***
	[0.849]	[0.644]	[3.557]	[4.560]	[3.636]	[4.325]
Equity/loan ratio (%)	0.044	0.042	0.220***	0.185***	0.243**	0.248**
	[0.071]	[0.078]	[0.047]	[0.049]	[0.098]	[0.107]
Liquid asets/total assets ratio (%)	0.008	-0.025	0.351***	0.510***	0.349**	0.494***
	[0.139]	[0.091]	[0.113]	[0.121]	[0.145]	[0.144]
Return on assets (%)	-0.334	-0.524	-0.646	-0.654	-0.573	-0.736
	[0.857]	[0.701]	[0.585]	[0.633]	[0.917]	[1.017]
Customer deposits/total liability ratio (%)	0.023	0.009	-0.041	-0.126	-0.058	-0.151
	[0.048]	[0.030]	[0.095]	[0.098]	[0.101]	[0.103]
Country fixed effects	Y	N	N	N	N	N
Country-year fixed effects	N	Y	N	Y	N	Y
Bank fixed effects	N	N	Y	Y	Y	Y
Observations	1,303	1,303	1,303	1,303	1,303	1,303
R-squared	0.167	0.016	0.3	0.464	0.337	0.478
Number of bank	251	251	251	251	251	251

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (5) and (6) also include interactions of bank-specific variables and the 2008-11 year dummies, not reported to save space.

Table 4c reports the results for emerging Asia. Credit growth of foreign banks on averaged was 18 percentage points lower than that of domestic private banks in 2009 (Column (4)). There is some evidence that state banks played a counter-cyclical role in 2009. The results for other control variables are mostly as expected, although return on assets, while positive, is insignificant. There is also evidence that strong bank capital and reliance on retail deposits were particularly important for Asian banks in underpinning credit growth during the crisis (2009).

B. Corporate and consumer loans

The sample size for corporate and consumer loans is markedly smaller, therefore the results (Table 5) are not strictly comparable with those for total loans. In Latin America, the growth of corporate loans for foreign banks has lagged behind that of private domestic banks both before the crisis and in 2009/10. State banks played a strong counter-cyclical role in 2008.

In Eastern and Central Europe, while there is evidence that foreign banks reduced their lending to corporate more than domestic private banks did during 2010–11, there is little evidence of state banks playing a counter-cyclical role during the crisis. In emerging Asia, the sample is reduced to only 16 percent of the sample for total loans, and the foreign bank dummy is dropped as there is no ownership change in the sample. Foreign banks actually had higher corporate credit growth in 2010, and there is no evidence of state banks playing a counter-cyclical role during the crisis.

Table 6 reports the results for consumer loans.[8] In Latin America, the decline in foreign banks' consumer credit was particularly severe in 2009, and there is some evidence of state banks playing a counter-cyclical role in 2008. In emerging Europe, the growth of consumer loans for foreign banks was not significantly different from that of domestic private banks, but state-owned banks played a counter-cyclical role in 2008. In emerging Asia, the sample is again much smaller. Foreign banks had more lending contraction compared with domestic private banks during and after the crisis, but there seemed to be no specific efforts by state banks to support consumer lending during the crisis.

In summary, the counter-cyclical role played by state banks during the crisis was mostly on corporate loans in Latin America, but seemed to be mostly on consumer loans in emerging Europe.

C. Impact of parent banks on credit growth

This section investigates whether parent banks' characteristics have any impact on the credit

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[8] Although Bankscope also contains data for mortgage loans, the sample size is quite small.

Table 4c. Determinants of Total Loan Growth in Asia

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign	0.219	-0.03	5.806	0.33	7.058	0.676
	[4.081]	[2.998]	[4.457]	[4.917]	[4.483]	[4.993]
State	-2.528	-3.475				
	[3.000]	[2.440]				
Year2008	-2.692		-1.299		11.685	
	[4.911]		[1.939]		[11.119]	
Year2009	3.86		8.921***		8.735	
	[5.941]		[2.286]		[12.002]	
Year2010	1.107		9.256***		17.511*	
	[4.021]		[2.485]		[10.530]	
Year2011	-2.822		5.143**		12.794	
	[3.704]		[2.456]		[11.327]	
Foreign*year2008	-1.214	-2.928	4.343	3.945	4.991	3.788
	[10.113]	[6.967]	[4.444]	[4.168]	[4.589]	[4.337]
Foreign*year2009	-25.396**	-23.410***	-21.628***	-17.769***	-22.514***	-16.503***
	[7.505]	[5.647]	[4.314]	[4.409]	[4.198]	[3.955]
Foreign*year2010	-0.123	0.394	2.577	4.208	-0.195	1.892
	[3.473]	[4.980]	[4.218]	[4.272]	[3.935]	[3.966]
Foreign*year2011	-9.826	-11.196**	-5.851	-5.912	-5.258	-5.793
	[8.542]	[4.987]	[3.639]	[3.654]	[3.845]	[3.839]
State*year2008	4.134	3.396	2.718	2.229	1.972	1.549
	[4.403]	[3.514]	[2.879]	[2.835]	[3.216]	[3.207]
State*year2009	1.756	6.093*	-1.768	4.286	5.179	7.651**
	[2.981]	[3.607]	[2.840]	[2.931]	[3.457]	[3.314]
State*year2010	-1.88	1.706	-4.309*	0.096	-2.263	0.133
	[3.353]	[2.638]	[2.434]	[2.922]	[3.158]	[3.641]
State*year2011	3.251	-0.397	1.433	-1.95	-2.709	-2.14
	[5.193]	[3.363]	[2.641]	[3.158]	[3.451]	[3.644]
GDP growth rate (%)	0.187		0.890***		2.001***	
	[0.578]		[0.262]		[0.401]	
Exchange rate depreciation (%)	-0.179		-0.086		0.29	
	[0.243]		[0.095]		[0.197]	
Size (ln_total assets)	-0.581	-0.613	-9.698***	-16.718***	-9.866***	-16.776***
	[0.739]	[0.470]	[2.001]	[3.632]	[2.096]	[3.657]
Equity/loan ratio (%)	-0.007	-0.008	0.138***	0.137***	0.114***	0.102***
	[0.018]	[0.020]	[0.021]	[0.021]	[0.027]	[0.028]
Liquid asets/total assets ratio (%)	-0.001	-0.018	0.305***	0.307***	0.296***	0.335***
	[0.055]	[0.052]	[0.078]	[0.090]	[0.085]	[0.107]
Return on assets (%)	0.301	0.235	0.102	0.187	0.15	0.418
	[0.332]	[0.369]	[0.505]	[0.498]	[0.701]	[0.715]
Customer deposits/total liability ratio (%)	0.090***	0.087**	0.04	-0.034	-0.007	-0.051
	[0.023]	[0.033]	[0.064]	[0.065]	[0.068]	[0.072]
Equity/net loan*year2009					0.074**	0.110***
					[0.036]	[0.037]
Customer deposit/total liability*year2009					0.150**	0.222***
					[0.072]	[0.071]
Country fixed effects	Y	N	N	N	N	N
Country-year fixed effects	N	Y	N	Y	N	Y
Bank fixed effects	N	N	Y	Y	Y	Y
Observations	2,068	2,068	2,068	2,068	2,068	2,068
R-squared	0.067	0.06	0.142	0.27	0.212	0.295
Number of bank	379	379	379	379	379	379

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (5) and (6) also include interactions of bank-specific variables and the 2008-11 year dummies, most of them not reported to save space.

Table 5. Corporate Loan Growth Rate

	Latin America			Eastern and Central Europe			Asia		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Foreign	-16.248**	-27.114***	-21.513*	-6.02	-17.46	-24.85*			
	[8.216]	[9.843]	[12.833]	[12.17]	[13.27]	[14.19]			
Year2008	-11.022			3.6			4.231		
	[7.434]			[7.20]			[8.372]		
Year2009	-29.098***			-9.26			5.598		
	[9.209]			[10.07]			[7.517]		
Year2010	14.892			3.37			-0.068		
	[10.394]			[9.98]			[9.117]		
Year2011	-8.496			-7.32			-0.363		
	[8.431]			[10.35]			[8.818]		
Foreign*year2008	15.54	4.372	-1.57	-11.19	-7.44	-0.81	-3.037	3.037	-0.114
	[9.889]	[9.010]	[9.571]	[8.44]	[8.01]	[7.75]	[12.547]	[12.014]	[16.473]
Foreign*year2009	-7.104	-13.618*	-17.502**	-13.92	-9.13	-7.47	-6.692	-0.996	7.78
	[7.914]	[8.234]	[8.361]	[9.21]	[8.66]	[9.90]	[9.043]	[9.453]	[15.078]
Foreign*year2010	-13.947	-19.330*	-16.177	-20.89**	-15.61	-12.64	16.737	23.440*	29.354*
	[9.806]	[10.796]	[11.810]	[8.77]	[10.02]	[12.10]	[12.103]	[13.364]	[14.869]
Foreign*year2011	11.845	7.759	9.722	-11.16	-15.95*	-9.36	7.467	12.131	17.689
	[10.443]	[10.334]	[10.734]	[9.77]	[9.52]	[11.01]	[10.756]	[11.409]	[14.282]
State*year2008	32.540***	29.499***	29.297***	-10.97	-12.26	15.15	-6.105	-6.893	-12.586
	[11.364]	[11.312]	[11.099]	[16.79]	[16.44]	[14.37]	[10.969]	[10.471]	[14.643]
State*year2009	12.689	9.524	12.695	2.22	-4.88	10.26	1.733	3.771	12.847
	[9.822]	[9.806]	[9.836]	[13.24]	[15.09]	[15.39]	[9.202]	[8.792]	[10.687]
State*year2010	1.008	-2.272	2.437	2.75	1.26	24.54	-1.102	5.228	8.158
	[7.768]	[8.123]	[8.883]	[14.40]	[16.41]	[16.59]	[9.251]	[8.927]	[11.271]
State*year2011	37.714***	30.792***	31.339***	3.93	-9.17	10.32	-2.42	-2.345	-15.761
	[11.458]	[10.434]	[10.716]	[14.55]	[15.64]	[12.30]	[13.005]	[12.479]	[18.084]
GDP growth rate (%)	1.468			0.83			0.101		
	[1.019]			[0.56]			[1.088]		
Exchange rate depreciation (%)	0.015			-1.29***			-1.064***		
	[0.362]			[0.29]			[0.359]		
Size (ln_total assets)	-16.555***	-21.062***	-19.142***	-6.18	-26.97***	-17.69	-12.159**	-24.282**	-23.351**
	[5.451]	[6.487]	[6.930]	[7.50]	[8.68]	[9.64]	[5.974]	[9.680]	[9.648]
Equity/loan ratio (%)	0.099	0.091	0.061	0.11	0.17	0.68**	0.090*	0.169**	0.086
	[0.061]	[0.062]	[0.068]	[0.14]	[0.12]	[0.29]	[0.050]	[0.075]	[0.076]
Liquid asets/total assets ratio (%)	0.371**	0.427***	0.484**	0.50**	0.66***	0.70***	0.11	0.076	0.517**
	[0.145]	[0.150]	[0.212]	[0.23]	[0.22]	[0.26]	[0.185]	[0.193]	[0.226]
Return on average assets (%)	0.502	0.295	0.555	-0.28	-0.63	-1.02	-0.62	-0.54	-0.375
	[0.701]	[0.863]	[0.990]	[0.86]	[1.01]	[2.35]	[1.369]	[1.375]	[1.801]
Customer deposit/total liability ratio (%)	0.118	0.149	0.17	-0.22	-0.26	-0.31*	-0.004	-0.17	-0.229
	[0.189]	[0.197]	[0.192]	[0.19]	[0.18]	[0.18]	[0.174]	[0.206]	[0.277]
Country-year fixed effect	N	Y	Y	N	Y	Y	N	Y	Y
Bank fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	983	983	983	527	527	527	486	486	486
R-squared	0.19	0.247	0.268	0.41	0.59	0.64	0.14	0.256	0.317

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (3), (6), and (9) also include interactions of bank-specific variables and the 2008-11 year dummies, not reported to save space.

Table 6. Consumer Loan Growth Rate

	Latin America			Eastern and Central Europe			Asia		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Foreign	23.776	28.837	12.385	12.394	21.731	26.845			
	[37.598]	[40.024]	[31.571]	[11.279]	[20.010]	[22.339]			
Year2008	-21.961*			-22.964			-17.605		
	[11.806]			[14.847]			[23.139]		
Year2009	-39.640**			-31.308*			9.763		
	[16.629]			[17.251]			[20.644]		
Year2010	1.143			-19.737			1.305		
	[21.102]			[19.246]			[22.336]		
Year2011	-15.173			-27.369			5.444		
	[13.448]			[17.430]			[19.900]		
Foreign*year2008	7.248	-1.987	3.632	-4.815	4.485	-3.522	7.675	-48.125	-57.176
	[15.981]	[14.142]	[14.465]	[17.568]	[18.220]	[20.034]	[49.825]	[36.059]	[39.210]
Foreign*year2009	-39.618***	-33.071**	-27.540**	12.291	17.619	0.643	-40.483	-75.710***	-37.865*
	[13.386]	[13.520]	[13.272]	[16.919]	[18.726]	[23.999]	[37.595]	[23.839]	[22.387]
Foreign*year2010	4.024	3.872	1.431	0.782	3.869	-3.181	-16.681	-53.420*	-41.761*
	[12.690]	[13.302]	[13.802]	[15.589]	[18.276]	[21.803]	[41.992]	[29.540]	[23.928]
Foreign*year2011	-0.112	0.299	-3.015	5.076	7.573	5.132	-43.157	-96.976***	-87.836***
	[13.831]	[15.864]	[14.613]	[15.984]	[17.279]	[19.806]	[39.212]	[32.013]	[32.580]
State*year2008	18.452	14.847	29.182*	28.279*	50.029*	43.567*	3.829	-8.742	-41.619
	[14.187]	[15.441]	[15.862]	[15.728]	[28.738]	[24.840]	[32.302]	[33.748]	[44.964]
State*year2009	-10.868	-6.901	-4.705	-0.357	-4.95	3.953	18.967	19.827	27.644
	[13.972]	[14.391]	[14.286]	[18.548]	[22.956]	[27.179]	[25.885]	[31.159]	[34.887]
State*year2010	3.067	3.279	5.182	21.746	9.225	-22.505	23.967	15.868	23.329
	[11.869]	[11.727]	[11.144]	[19.174]	[20.316]	[25.432]	[23.841]	[29.189]	[34.786]
State*year2011	7.621	9.922	10.281	24.346	4.136	-14.188	-20.508	-35.641	-28.973
	[13.900]	[13.927]	[14.153]	[15.596]	[17.791]	[25.103]	[23.370]	[31.497]	[40.826]
GDP growth rate (%)	2.221			1.219			-0.261		
	[1.950]			[0.777]			[2.544]		
Exchange rate depreciation (%)	0.751			-0.78			-2.445***		
	[0.801]			[0.568]			[0.747]		
Size (ln_total assets)	-21.174**	-21.471	-25.365*	-22.338*	-28.331	-36.551	3.77	-15.623	-0.881
	[10.123]	[14.728]	[15.236]	[13.343]	[19.653]	[24.964]	[14.838]	[31.064]	[31.532]
Equity/loan ratio (%)	0.121	0.167	0.139	0.358**	0.380*	0.186	0.113	0.875**	-1.207
	[0.113]	[0.112]	[0.120]	[0.167]	[0.210]	[0.772]	[0.087]	[0.382]	[2.005]
Liquid asets/total assets ratio (%)	0.129	0.075	-0.049	1.102***	1.319***	1.163*	-1.837**	-2.215**	0.641
	[0.309]	[0.319]	[0.371]	[0.319]	[0.449]	[0.609]	[0.776]	[0.918]	[2.535]
Return on assets (%)	1.406*	1.046	0.835	-0.545	-1.702	-4.514	2.652	-4.443	2.909
	[0.828]	[0.949]	[1.067]	[2.099]	[2.318]	[5.856]	[6.393]	[5.243]	[23.565]
Customer deposit/total liability ratio (%)	-0.451*	-0.482*	-0.683**	-0.015	0.15	0.495	0.183	0.381	-1.202
	[0.238]	[0.276]	[0.295]	[0.471]	[0.490]	[0.488]	[0.569]	[0.579]	[1.330]
Country-year fixed effect	N	Y	Y	N	Y	Y	N	Y	Y
Bank fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	778	778	778	410	410	410	332	332	332
R-squared	0.15	0.21	0.25	0.39	0.52	0.57	0.10	0.27	0.36

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (3), (6), and (9) also include interactions of bank-specific variables and the 2008-11 year dummies, not reported to save space.

growth of their subsidiaries (or branches). Following Bakker et al. (2013), we include measures of parent banks' funding costs (cost-to-income ratio), reliance on deposit funding (loan-to-deposit ratio), and capitalization (equity-to-asset ratio). The origin of the parent bank could also be important, as the home countries (and the banks there) were affected by the global financial crisis in different degrees. Parent banks in countries more severely affected by the crisis might have reallocated more funding from their foreign subsidiaries, thus reducing available funds and credit growth in those countries. We therefore also included the CDS for the 10-year government bond of the parent bank's country.

Parent bank origin exhibits substantial heterogeneities across regions (Table 7). At the onset of the global financial crisis, Spanish banks accounted for 63 percent of foreign banks in Latin America (by assets), Western European banks accounted for 78 percent of foreign banks in emerging Europe, and banks from other Asian countries (mainly Japan and Singapore) accounted for 40 percent of foreign banks in emerging Asia. Table 8 reports the regression results for foreign banks only, controlling for country/regional origins. "Spain" and "Euro" are dummy variables for Spanish and Western European banks, and "Asia" is a dummy for banks from other Asian countries. The dummy variables are dropped in the specification with bank-fixed effects since the sample is limited to foreign banks.

Table 7. Parent Bank Origin

	Latin America		Eastern and Central Europe		Asia	
Year	Spanish	Others	Western European	Others	Asian	Others
2004	54%	46%	87%	13%	38%	62%
2008	63%	37%	78%	22%	40%	60%
2011	55%	45%	78%	22%	47%	53%

In Latin America, Spanish banks had higher credit growth than other foreign banks prior to the crisis, but had significantly lower credit growth in 2008. In emerging Europe, there was no significant difference in credit growth between Western European banks and other foreign banks, but foreign banks with higher home country CDS had lower credit growth. In Asia, there is some evidence that foreign banks from the other Asian countries had larger credit decline in 2008, and foreign banks whose parent bank had higher funding costs on average had lower credit growth.

D. Robustness checks

Table 9 reports the results using credit growth measured in constant local currency. The results are pretty close to the benchmark results. Limiting the sample to banks without any

Table 8. Parent Bank Characteristics on Credit Growth (Foreign Banks Only)

	Latin America			Eastern and Central Europe			Asia		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SPAIN	11.077**	12.093**							
	[3.743]	[4.811]							
EURO				-0.761	2.12				
				[4.898]	[4.202]				
ASIA							10.665***	7.695	
							[2.535]	[4.633]	
year2008	15.923		11.786	-13.047**		-8.083	2.054		11.61
	[9.100]		[9.875]	[5.383]		[5.585]	[8.517]		[7.048]
year2009	-12.169		-28.145**	-20.330***		-19.873**	-22.996**		-9.698
	[13.732]		[13.406]	[5.291]		[8.326]	[8.079]		[6.626]
year2010	-4.914		7.391	-3.965		-10.54	6.17		19.854**
	[16.740]		[10.589]	[8.674]		[9.070]	[10.353]		[7.623]
year2011	12.824		-4.886	-15.739**		-21.291**	-9.365		4.073
	[14.603]		[12.105]	[6.504]		[8.184]	[8.532]		[6.119]
SPAIN*year2008	-28.414***	-29.196***	-17.718*						
	[5.216]	[10.467]	[9.767]						
SPAIN*year2009	-1.166	1.417	10.988						
	[18.927]	[23.697]	[17.987]						
SPAIN*year2010	2.093	-3.558	13.282*						
	[5.116]	[6.426]	[7.259]						
SPAIN*year2011	-9.492	-4.574	7						
	[7.773]	[9.619]	[9.887]						
EURO*year2008				2.883	-3.644	2.291			
				[7.419]	[7.625]	[5.780]			
EURO*year2009				-0.209	-5.044	4.08			
				[6.065]	[5.866]	[7.546]			
EURO*year2010				-9.099	-6.476	-0.093			
				[9.514]	[8.193]	[6.691]			
EURO*year2011				-4.801	-7.349	5.978			
				[7.293]	[8.931]	[7.146]			
ASIA*year2008							-10.874**	-3.901	-10.621
							[3.293]	[4.572]	[8.635]
ASIA*year2009							-0.475	4.199	-3.175
							[3.848]	[5.155]	[7.178]
ASIA*year2010							-3.715	-8.14	1.44
							[8.605]	[7.979]	[8.329]
ASIA*year2011							-3.946	0.281	0.843
							[5.712]	[6.176]	[7.027]
Parent cost/income ratio (%)	0.023	0.048	-0.085	0.032	0.011	0.032	-0.112	-0.120*	-0.118
	[0.069]	[0.083]	[0.099]	[0.028]	[0.034]	[0.061]	[0.059]	[0.062]	[0.097]
Parent loan/customer deposit ratio (%)	0.063***	0.037	0.04	-0.011	-0.002	0.002	0.028	0.038	0.055
	[0.016]	[0.032]	[0.035]	[0.023]	[0.017]	[0.030]	[0.042]	[0.035]	[0.105]
Parent equity/total asset ratio (%)	0.077	0.026	-0.121	0.046	0.087	0.136	-0.003	0.017	-0.026
	[0.053]	[0.065]	[0.158]	[0.143]	[0.135]	[0.252]	[0.042]	[0.043]	[0.103]
Parent bank home country CDS spread	0		0	-0.010*		-0.008**	0.002		0.046
	[0.001]		[0.002]	[0.004]		[0.004]	[0.018]		[0.029]
Country fixed effect	Y	N	N	Y	N	N	Y	N	N
Country-year fixed effect	N	Y	N	N	Y	N	N	Y	N
Bank fixed effect	N	N	Y	N	N	Y	N	N	Y
Observations	494	494	494	794	794	794	448	448	448
R-squared	0.11	0.05	0.25	0.31	0.02	0.45	0.23	0.08	0.32

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Bank-specific control variables (as in Table 4a) are also included, but not reported to save space.

Table 9. Credit Growth in Local Currency

	Latin America			Eastern and Central Europe			Asia		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Foreign	3.394	-2.456	-3.476	12.842	3.528	2.79	5.804	0.057	-0.059
	[15.845]	[14.630]	[15.214]	[8.616]	[7.223]	[7.719]	[4.405]	[4.969]	[5.036]
Year2008	-11.005**			-2.397			-1.064		
	[4.774]			[4.230]			[1.935]		
Year2009	-17.587**			-15.555***			9.870***		
	[6.977]			[4.735]			[2.296]		
Year2010	26.708***			8.532			9.746***		
	[8.114]			[5.749]			[2.478]		
Year2011	-5.167			-6.75			5.570**		
	[5.957]			[5.142]			[2.448]		
Foreign*year2008	21.508***	18.070**	14.638*	-4.761	-6.353	-4.932	3.999	3.812	3.805
	[7.644]	[7.415]	[8.167]	[4.583]	[4.316]	[4.634]	[4.471]	[4.199]	[4.364]
Foreign*year2009	-9.45	-10.023	-9.569	-7.103	-5.839	-4.037	-22.127***	-17.753***	-16.172***
	[8.014]	[8.360]	[7.658]	[4.665]	[4.432]	[4.530]	[4.316]	[4.417]	[3.955]
Foreign*year2010	-14.431**	-16.909**	-16.765**	-13.690***	-8.454*	-5.006	3.109	5.06	2.909
	[6.687]	[7.061]	[7.180]	[4.697]	[4.525]	[4.904]	[4.260]	[4.341]	[4.064]
Foreign*year2011	4.747	2.389	-0.554	-7.919	-6.028	-5.973	-5.371	-5.342	-5.304
	[8.159]	[8.305]	[7.740]	[5.204]	[5.170]	[5.231]	[3.678]	[3.727]	[3.920]
State*year2008	35.601***	30.638***	31.172***	-1.268	-10.076	-4.848	2.026	1.638	1.189
	[6.111]	[6.032]	[6.225]	[7.565]	[7.589]	[7.564]	[2.861]	[2.827]	[3.203]
State*year2009	11.045	11.623*	13.331*	19.483*	11.817	16.273	-3.472	3.133	7.837**
	[7.425]	[6.903]	[7.029]	[10.462]	[10.509]	[11.498]	[2.859]	[2.938]	[3.252]
State*year2010	0.395	-2.082	-2.202	3.908	4.729	11.231	-5.454**	-0.667	0.154
	[6.008]	[5.675]	[5.573]	[7.807]	[7.936]	[7.916]	[2.432]	[2.918]	[3.630]
State*year2011	19.180***	14.324**	12.655**	3.011	-1.449	-4.069	1.251	-2.235	-1.796
	[5.805]	[5.948]	[5.639]	[10.256]	[9.340]	[10.892]	[2.786]	[3.239]	[3.733]
GDP growth rate (%)	2.634***			1.814***			0.909***		
	[0.737]			[0.302]			[0.266]		
Exchange rate depreciation (%)	1.178***			0.076			-0.06		
	[0.303]			[0.145]			[0.095]		
Size (ln_total assets)	-11.357***	-21.449***	-21.921***	-4.949	-20.964***	-21.329***	-9.974***	-16.682***	-16.579***
	[3.812]	[5.398]	[5.269]	[3.569]	[4.629]	[4.406]	[1.995]	[3.600]	[3.599]
Equity/loan ratio (%)	0.173***	0.169***	0.156***	0.178***	0.144**	0.241**	0.138***	0.138***	0.102***
	[0.046]	[0.047]	[0.057]	[0.063]	[0.069]	[0.104]	[0.021]	[0.021]	[0.029]
Liquid asets/total assets ratio (%)	0.229**	0.214**	0.240*	0.365***	0.522***	0.493***	0.296***	0.292***	0.308***
	[0.095]	[0.104]	[0.126]	[0.117]	[0.125]	[0.144]	[0.078]	[0.090]	[0.107]
Return on average assets (%)	0.850*	0.881	1.221*	-0.648	-0.639	-0.811	0.263	0.344	0.566
	[0.464]	[0.553]	[0.686]	[0.595]	[0.646]	[1.013]	[0.505]	[0.500]	[0.730]
Customer deposit/total liability ratio (%)	0.192*	0.116	0.04	-0.039	-0.125	-0.149	0.046	-0.033	-0.063
	[0.115]	[0.134]	[0.134]	[0.098]	[0.102]	[0.107]	[0.062]	[0.063]	[0.068]
Country-year fixed effect	N	Y	Y	N	Y	Y	N	Y	Y
Bank fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,452	1,452	1,452	1,303	1,303	1,303	2,068	2,068	2,068
R-squared	0.132	0.204	0.224	0.291	0.451	0.466	0.14	0.267	0.293

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (3), (6), and (9) also include interactions of bank-specific variables and the 2008-11 year dummies, not reported to save space.

ownership changes also yields similar results (Table 10). Using only the balanced panel data or dropping braches (accounting for 7 percent of foreign bank observations) also yield broadly similar results (not reported to save space).

Credit growth may be path-dependent, or affected by the amount of existing nonperforming loans. Table 11 reports the results controlling for these two additional factors. Despite a smaller sample size, the results are broadly similar to the benchmark results. For banks in emerging Europe, there is some evidence of convergence in credit growth, where banks with higher credit growth in recent years had lower credit growth. Higher nonperforming ratio also led to slower credit growth for Latin America banks.

E. Impact of monetary policy and banking regulation on credit growth

We also investigate how monetary policy and banking regulation affect credit growth (Table 12). For monetary policy we use monetary policy rate (one-year lag). Expansionary monetary policy on average resulted in higher credit lending growth. For Latin American and Asian banks the impact of monetary policy rate on credit growth was larger in 2011. For Emerging European countries, the interaction of policy rate and the 2010/11 dummies are of the "wrong" sign, which is probably an indication of an endogeneity problem. The results for the foreign and state banks dummies are broadly in line with baseline results.

Finally, Table 13 reports the impact of banking regulation on credit growth. We use two dummy variable measures of banking regulation: the supervision indicator dummy and the monitoring indicator dummy. These are constructed following Kalemli-Ozcan et al. (2013) using the bank regulation and supervision database compiled by Barth et al. (2007). The supervision indicator takes a value of one if there are multiple independent supervisors for banks and zero otherwise. The monitoring index takes a value of one if (1) the top ten banks in the country are all rated by international rating agencies, (2) off-balance sheet items are disclosed to the public, (3) banks must disclose risk management procedures to the public, and (4) subordinated debt is required as part of regulatory capital. In both measures a value of one for the dummy variable suggests better banking regulation.

To avoid the potential endogeneity problem, we used the banking regulation measure for 2003, one year prior to our sample period. Latin American countries all have the same rating, and Vietnam is the only Asian country having a different rating with other Asian countries. We therefore only conducted the analysis for emerging European countries. The evidence, when the supervision indicator is used, suggests that on average banks in countries with better banking regulation prior to the crisis had higher credit growth during the crisis.

Table 10. Total Credit Growth Rate (No Changes in Foreign Bank Ownership)

	Latin America			Eastern and Central Europe			Asia		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year2008	-9.336**			-3.896			-0.915		
	[4.289]			[4.285]			[1.955]		
Year2009	-14.628**			-15.560***			8.607***		
	[6.759]			[4.876]			[2.251]		
Year2010	25.130***			8.791			9.144***		
	[7.740]			[6.044]			[2.481]		
Year2011	-2.317			-6.531			5.114**		
	[5.622]			[5.256]			[2.435]		
Foreign*year2008	21.416***	16.513**	18.196**	-0.982	-4.491	-2.73	3.955	3.928	3.701
	[7.546]	[7.310]	[8.160]	[4.716]	[4.452]	[4.975]	[4.951]	[4.680]	[4.911]
Foreign*year2009	-12.579	-15.576*	-11.224	-5.212	-4.065	-2.426	-22.797***	-21.220***	-19.520***
	[7.714]	[8.294]	[7.924]	[4.942]	[4.534]	[4.821]	[4.619]	[4.649]	[4.077]
Foreign*year2010	-15.578**	-18.228***	-16.469**	-11.198**	-6.383	-2.907	5.348	6.439	3.439
	[6.438]	[6.823]	[6.893]	[4.817]	[4.618]	[5.346]	[4.496]	[4.618]	[4.273]
Foreign*year2011	4.915	3.752	2.767	-6.362	-5.461	-5.274	-8.059**	-7.731**	-7.683*
	[8.580]	[8.645]	[8.001]	[5.386]	[5.297]	[5.611]	[3.791]	[3.852]	[4.071]
State*year2008	33.090***	28.634***	30.438***	0.216	-8.964	-2.14	2.411	1.658	0.857
	[6.112]	[5.925]	[6.285]	[7.593]	[7.671]	[7.561]	[2.885]	[2.835]	[3.253]
State*year2009	10.365	10.034	10.977	19.797*	12.402	16.55	-1.543	4.171	7.577**
	[7.392]	[6.903]	[7.230]	[10.527]	[10.442]	[11.553]	[2.829]	[2.904]	[3.252]
State*year2010	-0.88	-3.911	-4.887	3.666	5.015	11.727	-4.326*	-0.72	-1.549
	[5.810]	[5.677]	[5.442]	[8.062]	[8.064]	[7.892]	[2.452]	[2.930]	[3.710]
State*year2011	17.602***	12.617**	11.521**	2.597	-1.674	-3.999	1.49	-2.419	-3.603
	[5.656]	[5.718]	[5.497]	[10.226]	[9.053]	[10.512]	[2.650]	[3.168]	[3.729]
GDP growth rate (%)	2.223***			1.837***			0.866***		
	[0.714]			[0.324]			[0.270]		
Exchange rate depreciation (%)	1.046***			0.046			-0.069		
	[0.307]			[0.151]			[0.099]		
Size (ln_total assets)	-11.935***	-20.595***	-22.051***	-4.964	-20.469***	-20.709***	-9.693***	-17.888***	-18.019***
	[3.455]	[4.609]	[4.657]	[3.807]	[4.820]	[4.737]	[1.987]	[3.480]	[3.539]
Equity/loan ratio (%)	0.173***	0.166***	0.170**	0.241***	0.207***	0.370***	0.136***	0.136***	0.099***
	[0.051]	[0.052]	[0.069]	[0.044]	[0.048]	[0.095]	[0.021]	[0.021]	[0.029]
Liquid asets/total assets ratio (%)	0.236**	0.221**	0.207	0.337***	0.490***	0.414***	0.307***	0.315***	0.355***
	[0.096]	[0.103]	[0.128]	[0.123]	[0.128]	[0.151]	[0.081]	[0.093]	[0.113]
Return on assets (%)	0.903*	0.948	0.872	-0.411	-0.609	-0.884	0.168	0.267	0.506
	[0.501]	[0.585]	[0.778]	[0.656]	[0.684]	[1.107]	[0.507]	[0.492]	[0.732]
Customer deposit/total liability ratio (%)	0.282**	0.232*	0.135	-0.017	-0.069	-0.074	0.035	-0.051	-0.061
	[0.109]	[0.129]	[0.135]	[0.099]	[0.100]	[0.104]	[0.064]	[0.065]	[0.073]
Country-year fixed effect	N	Y	Y	N	Y	Y	N	Y	Y
Bank fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,349	1,349	1,349	1,176	1,176	1,176	1,962	1,962	1,962
R-squared	0.147	0.221	0.238	0.302	0.471	0.49	0.151	0.289	0.315

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (3), (6), and (9) also include interactions of bank-specific variables and the 2008-11 year dummies, not reported to save space.

Table 11. Determinants of Total Credit Growth (with Additional Contral Variables)

	Latin America		Eastern and Central Europe		Asia	
	(1)	(2)	(3)	(4)	(5)	(6)
Foreign	4.556	-10.229	35.461**	21.796	0.727	-3.866
	[16.671]	[15.067]	[14.379]	[13.768]	[5.747]	[6.302]
Year2008	-11.888*		-5.024		-3.556	
	[6.158]		[6.544]		[2.213]	
Year2009	-23.364***		-19.257***		6.623**	
	[7.781]		[7.014]		[2.616]	
Year2010	35.014***		-10.253		7.198***	
	[8.969]		[8.294]		[2.531]	
Year2011	-5.054		-20.294***		7.744***	
	[7.213]		[7.611]		[2.724]	
Foreign*year2008	22.964**	13.402	-7.703	-6.487	12.653**	8.882*
	[9.291]	[9.452]	[7.977]	[6.291]	[5.848]	[5.382]
Foreign*year2009	-14.623*	-21.995***	-16.398**	-13.407*	-17.901***	-13.170***
	[8.153]	[7.292]	[7.960]	[7.209]	[4.775]	[4.653]
Foreign*year2010	-14.817**	-18.262**	-17.807**	-10.143	-1.926	-2.334
	[6.719]	[8.050]	[8.232]	[7.411]	[4.702]	[4.420]
Foreign*year2011	4.632	6.000	-14.761*	-10.694	-5.354	-9.033**
	[7.755]	[7.756]	[8.681]	[7.513]	[4.534]	[4.330]
State*year2008	37.623***	25.474**	-11.157	3.58	3.121	0.711
	[8.279]	[12.298]	[8.483]	[7.264]	[2.831]	[3.557]
State*year2009	10.05	1.931	0.072	0.771	-0.326	6.343**
	[8.095]	[8.539]	[7.061]	[6.791]	[2.987]	[3.188]
State*year2010	2.271	-2.016	-1.853	1.493	-1.891	2.208
	[7.020]	[7.016]	[8.635]	[8.417]	[2.602]	[3.641]
State*year2011	22.705***	16.925**	-5.937	-10.821	-0.841	-4.381
	[6.966]	[7.483]	[11.680]	[8.231]	[2.696]	[3.424]
Credit growth in past 3 years (%)	-0.005	-0.009	-0.028*	-0.039	-0.005	0.014
	[0.017]	[0.023]	[0.015]	[0.027]	[0.014]	[0.022]
NPL/loan ratio (%)	-0.574**	-0.702**	-0.133	0.291	-0.165	-0.103
	[0.240]	[0.299]	[0.167]	[0.575]	[0.185]	[0.251]
GDP growth rate (%)	3.274***		0.877***		0.697**	
	[0.716]		[0.306]		[0.281]	
Exchange rate appreciation rate (%)	1.458***		0.124		-0.146	
	[0.305]		[0.175]		[0.106]	
Size (ln_total assets)	-13.158**	-24.685***	-7.997*	-21.498***	-10.000***	-19.024***
	[5.348]	[6.422]	[4.441]	[6.717]	[2.251]	[4.963]
Equity/net loan ratio (%)	0.175*	0.100	0.125	0.452***	0.134***	0.158***
	[0.105]	[0.149]	[0.141]	[0.164]	[0.028]	[0.058]
Liquid asets/total assets ratio (%)	0.233	0.342*	0.185	0.191	0.196**	0.239*
	[0.151]	[0.189]	[0.148]	[0.167]	[0.082]	[0.133]
Return on average assets (%)	1.157*	1.824**	0.05	-1.989**	0.595	0.026
	[0.608]	[0.801]	[0.776]	[0.969]	[0.505]	[1.057]
Customer deposit/total liability ratio (%)	-0.017	-0.226	0.056	0.077	0.051	-0.012
	[0.143]	[0.163]	[0.140]	[0.159]	[0.101]	[0.107]
Country-year fixed effect	N	Y	N	Y	N	Y
Bank fixed effect	Y	Y	Y	Y	Y	Y
Observations	1,391	1,391	500	500	1,382	1,382
R-squared	0.14	0.23	0.47	0.76	0.13	0.30

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Columns (2), (4) and (6) also include interactions of bank-specific variables and the 2008-11 year dummies. Not reported to save space.

Table 12. Monetary Policy and Credit Growth

	Latin America	Europe	Asia
	(1)	(2)	(3)
Foreign	6.497	10.242	6.311
	[13.429]	[8.512]	[4.577]
Monetary Policy Rate	-2.038***	-1.434***	-1.830***
	[0.675]	[0.382]	[0.463]
Year2008	-13.836***	-1.702	-2.043
	[4.738]	[6.113]	[6.317]
Year2009	-19.841***	-8.131	13.381**
	[6.784]	[6.882]	[5.188]
Year2010	27.626***	-3.22	6.781
	[8.177]	[6.057]	[5.927]
Year2011	7.263	-20.050***	13.197**
	[5.899]	[5.379]	[5.930]
Foreign*year2008	19.067***	-4.272	3.664
	[7.152]	[4.752]	[4.435]
Foreign*year2009	-10.337	-6.065	-22.239***
	[7.373]	[4.867]	[4.394]
Foreign*year2010	-16.669**	-11.340**	1.645
	[6.663]	[4.428]	[4.223]
Foreign*year2011	2.745	-6.164	-6.548*
	[7.814]	[4.967]	[3.630]
State*year2008	35.127***	-1.397	3.269
	[5.811]	[7.647]	[2.827]
State*year2009	13.300*	19.322*	-0.171
	[6.810]	[10.569]	[2.918]
State*year2010	-1.482	7.262	-3.1
	[5.709]	[8.059]	[2.473]
State*year2011	14.758***	5.465	0.128
	[5.610]	[10.337]	[2.778]
Policy*year2008	0.157	0.011	0.078
	[0.670]	[0.676]	[0.870]
Policy*year2009	0.833	-0.456	-0.839
	[0.636]	[0.687]	[0.741]
Policy*year2010	-1.317	1.884***	-0.134
	[0.927]	[0.584]	[0.817]
Policy*year2011	-2.393***	2.478***	-2.235**
	[0.762]	[0.549]	[1.029]
Country-year fixed effects	N	N	N
Bank fixed effects	Y	Y	Y
Observations	1,452	1,303	2,068
R-squared	0.162	0.319	0.157
R-Squared	0.15	0.31	0.15

Notes: Robust standard errors in brackets. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Bank-specific variables are included but not reported to save space.

Table 13. Banking Regulation and Credit Growth

	Eastern and Central Europe	
	Supervision indicator	Monitoring indicator
Foreign	12.803	12.208
	[8.653]	[8.866]
Year2008	-4.389	-6.47
	[4.581]	[10.495]
Year2009	-14.924***	-25.485**
	[5.382]	[11.743]
Year2010	11.376*	15.706
	[6.724]	[9.586]
Year2011	-7.099	-5.754
	[5.634]	[9.884]
Foreign*year2008	-5.11	-4.716
	[4.637]	[4.802]
Foreign*year2009	-7.698	-7.214
	[4.751]	[4.891]
Foreign*year2010	-12.144***	-11.895**
	[4.610]	[4.763]
Foreign*year2011	-8.897*	-7.341
	[5.313]	[5.376]
State*year2008	-4.021	-1.851
	[7.413]	[7.681]
State*year2009	15.772	17.970*
	[9.614]	[10.562]
State*year2010	4.407	5.702
	[7.874]	[8.039]
State*year2011	-0.309	3.007
	[9.997]	[10.417]
Regulation*year2008	8.953**	5.201
	[4.510]	[10.315]
Regulation*year2009	17.499***	10.584
	[6.047]	[10.940]
Regulation*year2010	-3.963	-10.532
	[5.746]	[9.081]
Regulation*year2011	9.698	-1.636
	[6.073]	[10.354]
Country-year fixed effects	N	N
Bank fixed effects	Y	Y
Observations	1,303	1,303
R-squared	0.31	0.303

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.
Bank-specific variables are included but not reported to save space.

V. Concluding remarks

This paper examines bank credit growth in emerging markets before, during, and after the 2008-09 financial crisis using bank-level data, focusing on the role of bank ownership. While credit growth declined during the crisis in all regions, there are heterogeneities across regions and across bank types. Lending by foreign banks in Asia fell by more than that of domestic private banks in 2009, while in Latin America and emerging Europe foreign banks' credit growth lagged behind that of domestic banks in 2010. In contrast, state banks played a counter-cyclical role during the crisis in Latin America and Europe (and some evidence in Asia as well), and credit by state banks also grew faster than that of private banks after the crisis in Latin America.

Expansionary monetary policy on average led to higher credit growth. Better-capitalized banks and banks that were more profitable, with more liquid assets, and relying more on retail deposits in funding also had faster credit growth. There is also evidence pointing to the particular importance of retail funding in underpinning credit growth in Latin America and Asia during the crisis. In addition, banks in emerging Europe with better banking regulation had faster credit growth during the crisis. Characteristics of the parent bank such as the cost-to-income ratio and the customer deposit-to-loan ratio also had an impact on the lending of their subsidiaries, although the effect is not consistently significant across regions. Foreign banks' country of origin also matters: Spanish banks in Latin America were particularly hard hit during the crisis, and foreign banks in emerging Europe with a higher CDS for their home country had lower credit growth.

The results suggest that a diversification of foreign bank ownership from different countries may help diversify risks by reducing the impact of idiosyncratic shocks from one particular country. In addition, maintaining a decent market share of state-owned banks in the banking system could provide a form of insurance in the downturn as witnessed by the counter-cyclical role the state-owned banks played during the global financial crisis.

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