The impact of bank ownership on lending behaviour: Evidence from the 2008-2009 financial crisis

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Abstract

This paper investigates the lending behaviour of banks with different ownership types (domestic-private, foreign, and government-owned) during normal and financial crisis periods. Using panel data for the period 2004-2013, our results indicate that the 2008-2009 crisis caused a negative shock to banking sector loan growth rates which was considerably higher during 2008 compared to 2009. Although loan supply decreased during the crisis, there were differences under different ownership types and between high and upper-middle income countries. Our findings suggest that consumer and retail loans declined significantly more in high income economies compared to upper-middle income countries. Further, in upper-middle income economies, the reduction in consumer and retail loans in 2009 was higher under foreign bank ownership in comparison to domestic-private bank ownership. Overall, the results indicate that the lending behaviour of banks with different types of ownership is significantly different in upper-middle income countries compared to high income countries.

Keywords: *bank ownership types*, *banks*, *financial crisis*, *lending*

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1. Introduction

It is well known that financial intermediaries play a vital role in economic growth by mobilizing savings and funding new technological innovations.[1] Based on this view, many countries have opened their market to foreign banks and encouraged domestic private banks participation to stimulate banking sector development. In turn, increased foreign and domestic private bank participation improved financial intermediation and stabilized aggregate loan supply (Claessens, Demirgüç-Kunt, & Huizinga, 2001; Clarke, Cull, & Peria, 2006; Crystal, Dages, & Goldberg, 2002). However, the 2008 financial crisis resulted in severe instability for banking systems and high volatility in credit markets around the world (Cull & Peria, 2013; Ivashina & Scharfstein, 2010). Consequently, the decreased levels of loan supply reduced the availability of capital to firms (Iyer, Peydró, da-Rocha-Lopes, & Schoar, 2013; Popov & Udell, 2012). As a result, credit market illiquidity and the shortage of capital led to slower economic growth in many countries.[2]

Relevant theoretical views on foreign bank lending predict that the lending behaviour of foreign banks might be influenced by parent bank health (back-up facility), economic conditions in the host country ("pull factor"), and economic climate in the home country ("push factor") (De Haas & Van Lelyveld, 2006; Stein, 1997). On the other hand, Brei and Schclarek (2015) investigated the lending behaviour of private banks and government- owned banks during the 2008 financial crisis and their theory predicts that in the event of financial crisis, private banks increase liquidity holdings and thus reduce lending whereas public banks tend to provide more loans to the real sector.

Another strand of the literature on banking and eco- nomic performance argues that government ownership of banks is associated with poor financial development (La Porta, Lopez-de-Silanes, & Shleifer, 2002; Levine, Caprio, & Barth, 1999), low bank efficiency (Bonin, Hasan, & Wachtel, 2005; Cornett, Guo, Khaksari, & Tehranian, 2010), and underperforming foreign-owned and domestic private banks (Mian, 2003; Shen & Lin, 2012). Specifically, Levine et al. (1999) emphasized that higher government ownership of assets in the banking sector results in less financial, nonfinancial, and stock market development. In addition, a part of the literature also stresses that authorities and political bureaucracy have greatly concentrated control over state-owned banks, and therefore, the lending policy of these

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[1] A considerable amount of literature has been published on the relationship between the financial sector development and economic growth. For more, see Claessens and Laeven (2005), King and Levine (1993), Pagano (1993), and Rajan and Zingales (1996).

[2] Also see the World Bank (2010) report for detailed information about the fall in GDP growth rates by regions.

banks is less responsive to the macroeconomic fluctuations in the economy (Dinç, 2005; Micco & Panizza, 2006; Sapienza, 2004).

This paper provides new empirical evidence on why banks might behave differently during normal and crisis periods, comparing bank ownership and lending activity in high income and upper-middle income economies. Additionally, the paper aims to provide fresh evidence on how the lending behaviour of banks differs according to ownership types (i.e., foreign/domestic, private/government-owned) and across loan types (i.e., total gross loans, consumer and retail loans, and corporate and commercial loans). We use a rich set of bank-level panel data from a total of 54 countries for the period 2004-2013. Our sample includes the post-crisis period thus allowing us to compare the lending behaviour of banks both before (pre-crisis period) and after the crisis (post-crisis period). In addition, we split our sample into sub-groups of high income and upper-middle income economies to achieve a greater degree of homogeneity in our panel results which also allows us to investigate for the possibility of differences in the lending behaviour of banks given different levels of economic development. Finally, from a methodological point of view, in addition to the fixed effects (FE) approach that was commonly used in many of the studies above, we also employ the powerful system Generalized Methods of Moments (GMM) methodology (Arellano & Bover, 1995; Blundell & Bond, 1998) to control for possible endogeneity in bank loan growth rates.

Overall, our results suggest that bank lending rates dropped during the 2008-2009 crisis period across all loan series and sample groups. Although the results are mostly economically significant for the 2008 crisis year, we find a higher reduction in total loans growth rates in the upper-middle income countries compared to the high income economies. Regarding different bank ownership types, we find that foreign banks in upper-middle income countries reduced consumer and retail loans faster than domestic-private banks in 2009, whereas government banks lending generally increased during both years and for all types of loans. We also find that during the crisis period, total loans rates of foreign banks were mostly similar to those from domestic-private banks. Our results are consistent across alternative estimation methods.

The rest of the paper is organized as follows. The next section (Section 2) briefly presents the relevant literature on the topic. Section 3 discusses the data and variables. Section 4 presents the econometric methodology employed and section 5 the empirical results. Finally, Section 6 concludes and provides some policy implications.

2. Literature review

The empirical literature on bank ownership and lending behaviour can be categorized into two groups: (a) research related to earlier crises that happened across countries, and (b) research related to the global financial crisis of 2008. De Haas and Van Lelyveld (2006), using panel data for the Central and Eastern European (CEE) countries, found that during periods of crisis foreign banks played a stabilizing role by keeping lending rates stable whereas domestic banks contracted their credit supply. Furthermore, other studies found evidence that during a host country-grown cri- sis, foreign banks maintained stable loan supply. For instance, Crystal, Dages, and Goldberg (2001) and Peek and Rosengren (2000) investigated foreign bank lending during the Tequila and the Brazilian crises of the 1990s and concluded that foreign banks did not pull back in response to the economic difficulties in countries such as Argentina, Brazil, and Mexico but instead used these opportunities to increase their presence in this region. Also, although earlier studies confirm the association of state-owned banks with a less efficient banking sector, more recent research has found that government-owned banks may actually play a stabilizing role in credit markets, especially during periods of crisis. For instance, Brei and Schclarek (2013) found strong evidence that government-owned banks increase their lending during a crisis period compared to a normal economic period, thus supporting the view that government-owned banks counteract the lending slowdown of private banks during economic downturns. Furthermore, Bertay, Demirgüç-Kunt, and Huizinga (2012) emphasized the valuable role of government-owned banks in stabilizing credit over the business cycle as well as during periods of financial instability.

On the other hand, studies that investigated the lending behaviour of foreign banks during the financial crisis of 2008, mainly concluded that these banks contracted their lending in host countries. Cull and Peria (2013) using bank-level data for countries located in Eastern Europe and Latin America analyzed the impact of bank owner-ship on credit growth over the period 2004-2009 and concluded that in Eastern Europe during the crisis, foreign bank total loan growth fell more than domestic private bank total loan growth. Allen, Jackowicz, Kowalewksi, and Kozlowski (2017) examined the role of ownership structure during periods of crises in the banking systems of CEE countries. They used panel data for more than 400 banks from 1994-2010 and concluded that the ownership effect on lending was conditional upon the type of cri- sis. More specifically, they found that during domestic banking crises the credit growth ratios remain constant for foreign-owned banks and declined for government-owned ones; while during the global financial crisis, the lending of government-owned banks increased (due to political programs that aim to stimulate the economy) while for private and

foreign-owned banks has been massively decreased. This result is also confirmed by Chen, Chen, Lin, and Sharma (2016) who suggest that government- owned banks (contrary to traditional beliefs) have a positive role to play during crisis, particularly for countries that enjoy low corruption.

On the other hand, De Haas, Korniyenko, Pivovarsky, and Loukoianova (2012) found that both domestic and foreign-owned banks curtailed their lending during the recent global financial crisis, while foreign banks that participated in the Vienna Initiative provided more stable loan supply. Additionally, Temesvary and Banai (2017) found that foreign banks that exhibited lower capital-to-asset rations and higher non-performing loans (NPL) ratios either at the subsidiary or at the parent level, lowered substantially their lending during the crisis, but this lower lending was less pronounced for those banks that participated in the Vienna Initiative. Bonin and Louie (2017) separate foreign-owned banks into two categories: subsidiaries of the Big 6 European multinational banks and the rest foreign-owned banks. Examining their reactions during the global financial crisis which was quickly followed by the Eurozone crisis, they found that although both types of banks were negatively impacted; the impact was different for the Big 6 group who stayed committed to the region and behaved similarly in terms of lending as the domestic banks in each country. Furthermore, Meriläinen (2016) investigated the impact of the global financial crisis and the sovereign debt crisis on bank lending in Western European countries with bank- level panel data for the 2004-2013 period and found that the two crises had a negative impact on commercial and private savings banks, whereas publicly owned and cooperative banks were unaffected.

Choi, Gutierrez, and Martinez Peria (2016) investigated the role of factors (such as host location and parent geographic origin impact) on the lending behaviour of foreign banks and provided evidence that independent of host location foreign banks reduced their lending rates during the global financial crisis. They also found that banks whose parent company is located in the United States, reduced their lending activity by less than other parent banks. Dekle and Lee (2015) also suggest that foreign-owned banks reacted differently during the post 2008 crisis period, by reducing their lending much more than that of the domestic banks. They attributed this effect to the tightening of the foreign affiliates internal capital market at its headquarters (a back-up facility response).

Finally, Hamid (2019) examined the lending cyclicality of 213 ASEAN commercial banks over the period 2001-2015 and suggests that lending by private banks is procyclical while lending by state banks is countercyclical. Additionally, lending cyclicality differs only for sub-groups of ASEAN countries and not for bank ownership structure. In terms of foreign

versus domestic banks, foreign banks show greater procyclicality while during the global financial crisis lending by non-ASEAN based foreign banks was significantly reduced even though lending by ASEAN based foreign banks was largely unaffected.

Turning our attention to individual country cases, Albertazzi and Bottero (2014) used highly disaggregated bank-firm level data for Italy and found that foreign banks reduced lending sharply compared to domestic banks.[3] Similarly, Fungácová, Herrala, and Weill (2013) investigated credit supply changes by banks in Russia before and during the recent financial crisis. Using quarterly data from the beginning of 2007 to the end of 2009, they showed that overall bank lending declined during the crisis period and that the decrease was more significant for foreign banks than state-owned banks. In addition, Coleman and Feler (2015) found that Brazilian government banks substantially increased lending after the 2008 financial crisis to offset declines in private-sector banks' lending.

Most empirical studies that compare the lending pattern of domestic and foreign-owned banks as well as private and government-owned banks have yielded mixed results. The aim of this paper is to shed new light on this relationship. We achieve this by employing an empirical approach that classifies countries into high income and upper-middle income (in order to achieve a higher degree of homogeneity) as well as disaggregating the results across different loan types (i.e., total loans, consumer and retail loans, and corporate and commercial loans) to yield more conclusive results.

3. Data and variables

We employ an unbalanced panel dataset that contains bank-level data as well as macroeconomic data. The primary source for the bank-level data is Bureau van Dijk's Bankscope database. The macroeconomic country-level data were collected from the World Development Indica- tors databank of the World Bank. Our sample includes annual data for 1,201 commercial banks from 54 countries[4] over the period 2004-2013.

Banks are classified into three ownership types: domestic private, foreign-owned, and government- owned. We follow a widely accepted method in the relevant literature in order to classify banks according to their majority-ownership type: if foreign investors own more than 50% of that bank's shares then a bank is classified as a foreign-owned bank; if the government

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[3] Furthermore, Albertazzi and Bottero (2014) also emphasized the importance of the distance between host and home country. Notably, the lending behaviour of foreign banks is strongly affected by the functional distance between them and their headquarters.

[4] Table A1 in the Appendix provides a list of all countries in our sample.

or local authorities own more than 50% of the shares then a bank is classified as a government-owned bank. We use Bankscope's information on shareholders as the primary source to identify bank ownership type but given that Bankscope provides ownership information only for the most recent years, we also use the Claessens and Van Horen (2015) data which contain full ownership information for the 1995-2013 period.[5] In doing so, we are also able to take into account changes in bank ownership and to obtain a more precise owner-type dataset. Furthermore, we use the World Bank's income group classification system and classify the countries of our sample into high income and upper-middle income countries. Finally, following the literature[6] and in order to limit the impact of mergers and acquisitions on the growth rates of loans, we exclude data observations of the dependent variables above the top 1% and below the bottom 1%. Table 1 provides the definitions and data sources for all variables used.[7]

The dependent variables we use are: (a) the total loans annual growth rate, (b) the consumer and retail loans annual growth rate, and (c) the corporate and commercial loans annual growth of rate. Panel A of Table 2 provides summary statistics (means and standard deviations) for the three dependent variables for the full sample, the two sub-samples (high income and upper-middle income) and the three different bank ownership groups (domestic, foreign, government). We observe that the average growth rate for total, corporate, and consumer loans was around 11.8% for the full sample period, whereas this value decreased to 7.5%, 9.9%, and 8% for the three types of loans respectively. A comparison between bank lending rates in upper-middle income and high income countries indicates that the former in most cases exceeded the latter for both the full sample period and the crisis period. On the other hand, the summary statistics for the crisis period also provide some interesting insights into bank lending behaviour in these groups of countries. In the upper-middle income group bank lending rates across all types of loans declined from about 16.9% to around 9.6%; while in the

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[5] Where possible we also used information from banks' websites, bank regulatory agencies, local central banks, and other information sources to identify bank ownership.

[6] It is standard practice to exclude data observations that might constitute big outliers and create biases in the dataset, and therefore to the results as well. There is no decisive threshold of 1%, 3% or 5% that clears the data from outliers. For example, Cull and Peria (2013) dropped observations in the top 5% and bottom 1% of the loan growth series, whereas Brei and Schclarek (2013) excluded observations below the bottom 1% and above 99%. In our analysis the values of loan growth rates range between -400% and 400% (see Figure A1, Panel A in the Appendix). After excluding the outliers in the top and bottom 1% of the observations, the resulting distribution ranges between -100% and 125% and seems much more normal (see Figure A1, Panel B in the Appendix).

[7] Note that all our variables are expressed either in their logarithmic first differences to reflect percentage changes or in ratios. We have tested for panel unit roots in our variables and they were all found to be panel-stationary.

high income group lending in the corporate and commercial sectors slightly increased and remained virtually unchanged in the consumer and retail sector.

[Table 1 about here]

Furthermore, the growth rates of loans categorized by bank ownership groups show that the loan supply of domestic-private was similar to that of foreign-owned banks during the full sample period. A comparison of lending growth rates by bank ownership groups shows that although during the full sample period the domestic-private lending was at a similar level to that of foreign banks (around 12%), during the crisis period the average growth rates for foreign-owned banks were lower than domestic-private banks. On the other hand, the lending rates of government-owned banks exceeded other banks' lending rates for the full sample period. Notably, com- pared to domestic-private and foreign-owned banks, the average lending rates of government-owned banks did not fall significantly during the crisis period. Specifically, across all loan types the average growth rate for government-owned banks was about 13.8% throughout the sample period, whereas it fell to around 8.8% during the crisis period.

Panel B of Table 2 provides summary statistics for bank ownership shares by sample groups showing that for the full sample on average 54% of banks are domestic-private, 40% foreign-owned, and 5% government-owned. More specifically, in the upper-middle income economies sub- sample, 44% of banks are domestic-private, 45% foreign- owned, and 10% government-owned while in the high income economies group, domestic-private banks are about 59%, foreign-owned 37%, and government-owned around 3%. The above statistics show that the percentage of government-owned banks in upper-middle income economies (10%) is greater compared to high income economies (3%) or the full sample (5%) indicating that in high income economies the government has limited stakes in the banking sector.

[Table 2 about here]

To supplement our descriptive analysis, Figures 1 and 2 present the average growth rate of total loans by sample groups and ownership sub-groups, respectively. Figure 1 shows that although total lending increased continuously in all sample groups before the crisis period, it sharply dropped in 2008 and remained at low levels afterwards. Thus, the inclusion in our analysis of the period after the crisis allows us to make more reliable inferences compared to empirical studies which have investigated bank lending only for the pre-2008 period and during the 2008 crisis period. In addition, Figure 2 shows that lending rates of banks with different ownership groups also declined significantly during the crisis period. The most noticeable

change as a result of the 2008 crisis occurred in the lending rates of government banks which increased in 2009, whereas it continued to decline in foreign-owned banks.

[Figures 1 and 2 about here]

4. Empirical methodology

To investigate the lending behaviour of banks our baseline empirical model takes the following form:

$\Delta L_{ij,t} = \alpha + \beta_1 Foreign_{ij,t} + \beta_2 Government_{ij,t} + \gamma_1 Crisis2008_t + \gamma_2 Crisis2009_t + \gamma_3 Crisis2008_t \times Foreign_{ij,t} + \gamma_4 Crisis2009_t \times Foreign_{ij,t} + \gamma_5 Crisis2008_t \times Government_{ij,t} + \gamma_6 Crisis2009_t \times Government_{ij,t} + \delta'_j X_{ij,t-1} + \theta_{1i} Crisis2008_t \times X_{ij,t-1} + \theta_{2i} Crisis2009_t \times X_{ij,t-1} + \lambda_{1i} GDPgrowth_{j,t} + \lambda_{2i} Inflation_{j,t} + \mu_{j,t} + u_{i,t}$ (1)

where ΔL is the growth rate of loans (L) that takes three different forms: (a) total loans, (b) corporate and commercial loans, and (c) consumer and retail loans, for a bank i in country j at time t. *Foreign* and *Government* are dummy variables that take the value of 1 for foreign-owned and government banks respectively, and the value of zero otherwise. Including *Foreign* and *Government* in the estimations allows us to assess the lending behaviour of these banks compared to domestic private banks for the sample period. X is a set of independent variables for bank-specific characteristics such as size (*Size*), capitalization ratio (*Capitalization*), profitability (*Profitability*), and deposit funding to total liabilities ratio (*DepFunding*). These variables will allow us to control for bank-specific characteristics that can also influence bank lending behaviour. Finally, *GDPgrowth* is the annual growth rate of real GDP to control for loan demand and *Inflation* is the annual percentage change in the GDP deflator to control for the uncertainty in the credit market.

We also include two dummy variables, *Crisis2008* and *Crisis2009* for the 2008 and 2009 crisis years, respectively; both take the value of 1 for each year respectively and zero otherwise. We use both of these dummies for two reasons. First, Figure 1 suggests that the mean GDP growth rate started to decline in 2008 and continued to decline in 2009, so both years can be considered as crisis years. Furthermore, using these dummies allows us to detect better what were the actual effects of the subprime crisis on this prolonged crisis period (Choi et al., 2016; Cull & Peria, 2013).

Additionally, we also interact the *Foreign* and *Government* dummies with the *Crisis2008* and *Crisis2009* dummies to investigate how the lending behaviour of these banks differed from domestic-private banks during the crisis period, other things being equal. For this purpose, as the base category we use the interaction term of the crisis dummies with

domestic-private banks. Moreover, in a number of our specifications, we also include the interaction term of bank-specific variables with the two crisis dummies which allow us to capture the impact of bank characteristics on lending behaviour during the crisis period. In all estimations, bank-specific variables except the bank ownership dummies and *DepFunding* are included with a one-period lag.

Regarding the estimation methods, in order to estimate Equation (1) we employ a FE approach using Driscoll and Kraay's (1998) estimator which produces autocorrelation- and heteroscedasticity-consistent standard errors that are robust to general forms of cross-sectional dependence. We initially tested the poolability assumption of our data and for all estimation equations, the respective *F*-tests rejected the null hypothesis of common slopes indicating that the FE estimation method is more appropriate compared to the pooled OLS that assumes homogeneity. Furthermore, we also performed the Hausman specification test to choose between FE and the random effects (RE) method of estimation and the results indicated that the null hypothesis is firmly rejected thus concluding that the FE model fits well with our data.

Since we are using bank-level data, endogeneity problems are a possibility and can lead to biased estimates. For example, bank loans are an integral part of total assets which are used to measure bank size in our estimations. Furthermore, the bank capitalization ratio differs according to the variability in total assets and thus plays an essential role in bank lending behaviour. Similarly, deposits are the primary source of banks to fund their lending. Consequently, bank-specific characteristics such as size (*Size*), capitalization ratio (*Capitalization*), profit- ability (*Profitability*), and the deposit funding to total liabilities ratio (*DepFunding*) may be endogenous and may be affected by the current and previous values of our dependent variable or be predetermined. Therefore, we take these bank-specific characteristics including the ownership variables and its interaction terms as pre- determined and we treat all other variables as exogenous. In addition to the FE method and to deal with possible endogeneity problems, we also employ the dynamic panel GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998), a method which is designed for situations with 'small T' time periods and 'large N' cross-sections where the independent variables are not strictly exogenous. We estimate the two-step system GMM estimator using the Windmeijer (2005) finite- sample correction method. This method corrects for the presence of heteroskedasticity and autocorrelation adjusting the covariance matrix for finite samples to minimize the downward bias in standard errors. Our dynamic model takes the following form:

$$\Delta L_{ij,t} = \alpha' + \beta'_0 \Delta L_{ij,t-1} + \beta'_1 Foreign_{ij,t} + \beta'_2 Government_{ij,t} +$$

$$\gamma'_1 Crisis2008_t + \gamma'_2 Crisis2009_t + \gamma'_3 Crisis2008_t \times Foreign_{ij,t} + \gamma'_4 Crisis2009_t \times$$

$$Foreign_{ij,t} + \gamma'_5 Crisis2008_t \times Government_{ij,t} + \gamma'_6 Crisis2009_t \times Government_{ij,t} +$$

$$\xi'_j X_{ij,t-1} + \lambda'_{1i} GDPgrowth_{j,t} + \lambda'_{2i} Inflation_{j,t} + u_{i,t} \quad (2)$$

where all variables are defined as in Equation (1) stated previously.

We use lagged values of dependent and independent variables as instruments in our estimations. The crucial assumption for the validity of our estimation is that the lagged instruments are both exogenous and relevant. Therefore, to test the relevance of instruments, we use the Hansen (1982) over-identification test where the null hypothesis is that the instruments are exogenous, and a rejection would imply that they are not valid. Further- more, we also perform the Arellano and Bond (1991) serial autocorrelation test.

5. Empirical results

Tables 3 to 5 show our regression results for foreign- owned and government-owned banks' relative to the domestic-private banks using as dependent variable the total loans growth rate (Table 3), the corporate and commercial loans growth rate (Table 4), and the consumer and retail loans growth rate (Table 5), respectively. Equations (1) and (2) are estimated using the FE panel estimator and two-step system GMM for the full sample (columns 1-2) and additionally for high income countries (columns 3-4) and upper-middle income countries (columns 5-6). All specifications include the GDP growth rate and the inflation rate as additional macroeconomic variables to control factors which might influence bank lending rates at the macro level. The Hansen (1982) and the Arellano and Bond (1991) tests provide reassuring diagnostics and confirm that the proposed dynamic specifications are adequate for valid inference. For the FE estimation we use as a measure of goodness-of-fit the R^2-within. Respectively, for the GMM estimators, since such a measure is not appropriate, we follow the De Vita and Kyaw (2017) approach and report the squared correlations of the actual and fitted values [Corr. (y, fitted y)^2] obtained after the estimation of the models.

5.1 Results for total loans

Table 3 shows the results for the total loans growth rate for the full sample (columns 1-2), high income countries (columns 3-4), and upper-middle income countries (columns 5-6), respectively. For each case, we first estimate the model shown in Equation (1) with FE, followed by the dynamic model in Equation (2) which is estimated using the system GMM method. This helps us verify our results and test the robustness of our findings to alternative specifications.

[Table 3 about here]

The crisis dummies in the FE specifications for the full sample and the upper-middle income group (reported in columns 1 and 5) are found to be statistically significant and negative for 2008 indicating that the total loan growth rates declined during that year, alternating to positive but non-significant (there is a 10% significance for the full sample results only) in 2009. Thus, during the 2008-2009 crisis the major negative impact on total loans was during the first year of the crisis. Also, the results show some differences in bank lending behaviour across the different sample groups. For instance, the magnitude of the reductions in total lending rates was considerably higher in the upper- middle income countries (-30.65) compared to the full sample group (-24.97). The *Crisis2008* dummy variable is found to be statistically significant and negative in the GMM results for all groups while the negative effect is higher for the upper-middle income group.

Regarding bank ownership, it seems that foreign banks are generally providing more loans than domestic banks, but they are also more important for the upper- middle income group since the reported positive coefficient for the high income group is insignificant. Also, during normal periods, government-owned banks do not seem to play a particular role since in all cases the reported coefficients are statistically insignificant.

However, the results for bank ownership and the cri- sis dummies interaction terms suggest some interesting differences in how banks with different ownership types behaved during the crisis period across our sample groups. For example, for the GMM estimations the inter- action term for foreign banks with the 2008 crisis dummy shows that bank lending rates exceeded domestic-private bank lending in the full sample only.

The results further suggest that government-owned banks' total lending rates are significantly different from the domestic-bank lending rates in 2008.[8] This is evident from the results obtained in columns 2 and 5, where the *Government × Crisis2008* interaction term has a positive and significant coefficient indicating that government bank lending rates exceeded domestic bank lending in the upper-middle income countries during 2008. Also, the regression results for the *Government × Crisis2009* parameter in columns 1 and 5, demonstrate that for both the full sample and for the upper-middle income group during the 2009 crisis year, government-owned banks were able to increase their lending rates compared to the domestic-private banks. Specifically, on average government banks were able to step up their lending rates by 6-9% in 2008 and by 5-8% more in 2009, compared to the domestic-private banks.

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[8] It is worth noting here that for the estimations regarding the high income countries, in all loan series, we excluded government ownership, because of limited data availability for these banks. Thus, we only compare foreign-bank lending behaviour with domestic-private banks in this group.

These findings are consistent with Choi et al. (2016) who found that government bank lending rates increased during the crisis period whereas Cull and Peria (2013) found similar results for Latin America.

Turning our attention to other variables, we notice that in most cases *Size* is negatively and significantly related with bank lending rates a result that is confirmed by both estimation methods. This counter-intuitive adverse effect of *Size* is well explained in the relevant bank lending literature. Specifically, smaller banks tend to supply relatively more lending to their clients than larger banks, because small banks that have started their activities almost from scratch have higher dynamic of lending activities com- pared to large, established banks (see Matousek & Sarantis, 2009). Therefore, our results confirm the existence of a strong lending relationship between small banks and firms in many countries as also found by Ehrmann and Worms (2004), Gambacorta (2005), and Matousek and Sarantis (2009). However, when bank *Size* interacts with the crisis dummies, our results provide some evidence that during the crisis larger banks were able to provide a more robust loan supply for all groups of countries, while interestingly for the high income group this positive effect was reported in 2008 and for the upper-middle income group in 2009, that is, with a one-year lag.

The results for bank *Capitalization* indicate that during the non-crisis period banks with a higher equity ratio provided total loans at a slower rate compared to banks with low ratios. One possible explanation for this finding can found in Gambacorta and Mistrulli (2004) who suggested that the capital-to-asset ratio may poorly approximate relevant bank capitalization which is generally used in the bank lending empirical literature.[9]

Furthermore, bank profits play a significant positive role in determining bank loan supply during the non-cri- sis period and this is supported by the results for *Profitability* for the full sample and the high income group (with the GMM coefficients being larger in magnitude). While the above might be true for the non-crisis period, our results for the interaction terms of *Profitability* with the crisis dummies (columns 1, 3 and 5) indicate that more profitable banks provided loans at slower rates during the crisis period compared to less profitable banks. For the upper-middle income economies in particular, the results indicate that profitable banks were more hesitant in providing loans during 2008 only, since the coefficient for 2009 is not statistically significant.

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[9] We have estimated our models including the variable total capital ratio as an alternative to the capitalization (proxied by the equity to asset ratio) variable. The results indicated that this variable was positive (contrary to capitalization) but insignificant. Other estimates were not significantly affected, suggesting that our results were robust.

The results for *DepFunding*, are positive in all models but significant only for the full sample (column 1). The theoretical prediction is that deposit funding is an important source for banks to support their lending behaviour. However, when interacted with the crisis dummies, the results in some cases become even negative but they are in most cases insignificant thus suggesting no major effects in general.

The results for the macro-variables show that GDP growth rate has a consistently positive relationship with loan growth rates when the FE methods employed, a finding that is consistent with the finance-growth nexus literature which suggests that well-functioning or growing economies provide better financial services (King & Levine, 1993; Pagano, 1993). Inflation is found to have a negative and significant coefficient for the full sample case, a result consistent with Boyd, Levine, and Smith (2001) indicating that a more inflationary environment discourages banks' lending through the adverse impact on credit market frictions. However, the opposite is found for the high income group where inflation has a positive effect. Finally, the one-period-lagged total loans growth rates are positive and significant in the GMM estimations (columns 2, 4 and 6) indicating the validity of the dynamic specification.

5.2 Results for corporate and commercial loans

Table 4 presents the estimation results for the growth rates of corporate and commercial loans. Regarding bank ownership, we observe that neither foreign nor government-owned banks seem to play an important role in the determination of corporate and commercial loans, since all coefficients are insignificant at any conventional level.

The results for the crisis dummies in both methods show that corporate and commercial lending growth rates declined massively during 2008 but not as much during 2009. Also, the 2008 reported decline was found to be larger in absolute terms in the upper-middle income group (-38.6 and -18.6% for FE and GMM, respectively) compared to that of high income countries (-28 and -3.7% for FE and GMM, respectively). Indeed, the summary statistics presented in Table 2 also show that the average corporate loan growth rates did not drop in high income countries; it was 8.75% for the full sample period and increased at 11.4% for the 2008-2009 crisis period. In comparison, the upper-middle income countries corporate loan growth rate declined from 15.2% to 8.1%. Thus, our estimation results also support this by indicating a high decrease in corporate growth rates in the upper-middle income group due to the 2008 financial crisis.

[Table 4 about here]

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Examining the results obtained for the interaction terms of bank ownership and crisis, we observe that foreign ownership is totally negligible for both crisis years, all specifications and all sub-groups of countries. However, regarding the differences between corporate and commercial lending rates of government-owned banks and domestic-private banks, we find positive and significant results for both the full sample and the upper- middle income countries. The results in columns 1, 5, and 6 for the interaction term of *Government × Crisis2008* indicate that the lending rates of government banks in the corporate and commercial sector exceeded by 13% more the lending rates of domestic-private banks in 2008 for the full sample and by around 24% more for the upper- middle income group. These results are consistent with previous empirical findings reported by Cull and Peria (2013) who also found that foreign banks curtailed their lending rates more compared to the domestic- private banks during 2009 in Eastern European countries, whereas government-owned banks increased their lending rates compared to domestic-private banks in 2008 in Latin American countries.

Similar to the results for total loans in Table 3, bank *Size* is strongly and negatively related to corporate and commercial lending with the results being consistent across sample groups and model specifications. Although bank *Size* is negatively associated with lending rates throughout the sample period, the results for the interaction terms of *Size* and *Crisis* provide some evidence that larger banks had a more robust loan supply during the crisis period, while this result was substantially higher in magnitude for the 2008 crisis year rather than 2009; and higher for the high income group compared to the upper- middle income group.

Regarding bank *Capitalization*, the FE results for the full sample indicate that higher capitalized banks provided loans at slower rates in the corporate and commercial sector. Similar to bank size, the capitalization ratio sign reverses when we multiply it with the crisis dummies, suggesting that banks with higher capitalization levels were able to increase their lending compared to banks with lower levels of capitalization, while this positive effect was more significant during the second crisis year of 2009.

Bank *Profitability* is consistently positive and significant but when multiplied with the 2008 and 2009 crisis dummies the sign reverses and is actually larger than the positive coefficient in absolute terms. This result leads us to conclude that during the crisis period more profitable banks in high income countries reduced their corporate and commercial lending at faster rates compared to those in upper-middle income countries.

In contrast to *Profitability*, the results for the *DepFunding* variable show that bank lending rates in the corporate and commercial sector were not related with deposit funding sources. When interacted with the crisis dummies in columns 1 and 5 for the full sample and

upper-middle income countries respectively, the results provide some evidence that in 2008 banks with higher deposit funding sources were able to grow corporate and commercial lending at faster rates.

Furthermore, both the FE and the GMM estimations demonstrate clearly that bank lending rates in the corporate and commercial sector have a positive relationship with GDP growth rates confirming again the existence of a positive relationship between finance and growth while inflation seems to be insignificant for this particular type of loans.

5.3 Results for consumer and retail loans

Table 5 presents the estimations for the growth rate of consumer and retail loans. Regarding bank ownership we observe that foreign banks provide a significantly higher rate of these type of loans for all groups based on the FE results; while government-owned banks seem to have a rather negligible role.

When it comes to the effect of the financial crisis, the results are quite similar with the other loan series suggesting that bank lending rates in this sector also declined significantly during 2008 with the decline being much larger for the high income group rather than the upper-middle income countries.

[Table 5 about here]

Regarding bank ownership and the interaction crisis dummies, we find no significant difference in bank consumer and retail lending during 2008. However, during 2009 foreign banks increased their loans in the high income countries and reduced them massively in the upper-middle income group. The results for this group of countries demonstrate that foreign banks decreased their consumer and retail lending rates faster than domestic-private banks curtailing their lending rates by about 17% to 21% faster than domestic private banks (columns 5 and 6). Regarding government-owned banks for the full sample and the upper-middle income group the results suggest that they provided more stable loan supply during the 2008 crisis year which was reversed during 2009 for the upper-middle income group only.

Regarding bank-specific characteristics, we observe that larger banks have a significant negative relationship with lending rates, whereas banks with higher profitability were able to increase their lending faster. Furthermore, the interaction term *Size × Crisis2008* is found to be positive for the high income group, while both 2008 and 2009 interaction terms are found to be negative for the upper-middle income countries. This result suggests that larger banks in the high income world were able to provide more robust consumer and retail lending during 2008. Additionally, the interaction terms of *Profitability* demonstrate again that banks with higher

profits reduced their lending rates faster than less profitable banks during the 2008-2009 crisis period.

5.4 Robustness tests

To further investigate the lending behaviour of banks with different ownership types, we break our 2004-2013 sample period to two sub-periods, namely to 2004-2009 and 2008-2013. Both of the sub-periods include the 2008-2009 crisis years and therefore this will allow us to detect any differences in bank lending behaviour by com- paring the pre-crisis period to the post-crisis period. In addition, the majority of empirical papers which have investigated bank ownership and lending within the con- text of the financial crisis used samples of mostly emerging countries and time periods covering only before and during the crisis period (Choi et al., 2016; Cull & Peria, 2013; De Haas et al., 2012). As such, our pre-crisis period estimations for the upper-middle income group countries would enable us to compare how consistent our findings are with the previous empirical literature.

Table 6 presents the results for both periods for the total loans growth rates. Comparing the 2004-2009 period with the 2008-2013 period some interesting findings about bank lending behaviour emerge. For example, the results regarding bank lending behaviour using the full sample time period indicated that total loan supply decreased by about 24% in 2008 and increased by 6.7% in 2009 (see Table 3, column 1). However, once we focus only on the 2004-2009 period (Table 6, column 1) we find that total loan growth rates in the full sample of countries actually decreased by about 11% and 8% points during the 2008 and 2009 crisis years, respectively. For the 2008-2013 time period, we see that the decrease in loans due to the crisis was only 2.5% in 2008 and slightly positive in 2009 but insignificant. Thus, the biggest effect comes from the 2004-2009 period, which suggests that after the crisis started there was considerable effort to reverse the negative effect on total loans.

[Table 6 about here]

This result about the post-crisis period is shown clearly in the high income group (both 2008 and 2009 dummies are positive and significant at 1.4% and 2.2% respectively) while this is not the case for the upper-middle income countries where we observe that total lending rates dropped by 17% and 8% for the 2008 and 2009 crisis years in both the pre- and post-crisis time periods. This result is in line with Cull and Peria (2013) who for the 2004-2009 period found that total lending dropped by 22% and 19% points in the Eastern European countries during the 2008-2009 crisis years, suggesting that our findings are consistent with earlier research in

the bank lending literature. For the upper-middle income countries we also find considerably larger coefficients in absolute terms when compared to high income countries.

Further, the results for the full sample (Table 6, column 1) and the upper-middle income countries (Table 6, column 5), suggest that foreign banks' lending rates exceeded domestic-private bank lending for the 2004- 2009 period. However, the post-crisis results indicate that in high income countries, positive lending rates are detected only for the 2008-2013 time period. Additionally, we observe that in the pre-crisis period, foreign bank total lending declined in 2009 for the full sample and upper-middle income countries. Finally, the estimated parameters for government-owned banks total lending rates present some differences between the pre-crisis and post-crisis periods while statistical significance is detected only for the full sample group of countries.

6. Conclusions

We empirically investigated the lending behaviour of banks with different ownership types for the 2004-2013 period with a special focus on the recent global financial crisis using data for 1,201 banks from 54 countries. To measure bank lending behaviour, we used (a) the total loans growth rate, (b) the corporate and commercial loans growth rate, and (c) the consumer and retail loans growth rate. We employed two frequently used methods in the relevant literature: the Driscoll and Kraay (1998) FE and the two- step dynamic GMM panel estimators. To analyze further the potential impact of bank ownership on lending behaviour according to the level of economic development of a country, we divided our sample in high income and upper-middle income economies. Finally, in order to detect any differences in bank lending behaviour during the pre- and post-crisis periods, we also provided additional estimations for the time periods before and after the crisis.

In line with earlier studies, we find robust evidence that overall banking sector lending growth rates across all types of loans and sample groups declined during the 2008-2009 crisis period with significant differences detected between loan series and sample groups. How- ever, an additional result that stems from our study is that this negative effect was substantially larger during the first year of the crisis 2008, rather than 2009. Additionally, our findings confirm that among all loan types, the higher reductions in lending growth rates during the crisis period occurred in the consumer and retail loan market. Among our sample groups, the largest drop in lending rates during the 2008-2009 crisis period occurred mostly in the upper-middle income group of countries.

Our results also indicate that government-owned banks generally increased their lending rates faster than domestic- private banks. This finding is consistent with previous empirical research which found a similar stabilizing influence during the financial crisis (Bertay et al., 2012; Brei & Schclarek, 2013; Cull & Peria, 2013). This result is more evident for upper-middle income countries, an outcome which is expected since government intervention in the banking sector is considerably higher in developing economies (Brown & Serdar Dinç, 2015).

Our results reveal that the lending behaviour of banks according to their ownership type and sampling group differs during normal and crisis periods, a finding that has significant policy implications. In particular and given that the difference in bank lending rates is statistically significant for the upper-middle income economies, we can conclude that the relevance of our findings is more important for those countries rather than the high income ones.

Furthermore, our results over different estimation sample time periods indicate that one should take into account the particular sample period when making relevant policy implications on banks' behaviour. Choi et al. (2016) recommend that diversification of the banking sector improves resilience to a variety of financial shocks and our results complement their conclusion and suggest that regulators should take into account differences in bank lending behaviour among different sampling groups and time periods. Finally, our results demonstrate that bank-specific characteristics such as bank size, profitability, and in some cases bank deposit funding, are also important factors in determining bank lending behaviour. Thus, more careful consideration of the balance sheet conditions, and the overall financial health of the banking sector has important value in attempting to prevent or mitigate adverse impacts stemming from future financial crises.

Appendix

Table A1. List of countries

High income (35)

Australia	Germany	Netherlands	Sweden
Austria	Greece	New Zealand	Switzerland
Belgium	Hong Kong	Norway	Taiwan
Canada	Hungary	Poland	United Kingdom
Chile	Ireland	Portugal	Uruguay
Croatia	Israel	Rep. Of Korea	
Czech Republic	Italy	Singapore	
Denmark	Japan	Slovakia	
Finland	Latvia	Slovenia	
France	Lithuania	Spain	

Upper-middle income (19)

Albania	Colombia	Montenegro	Sri Lanka
Argentina	Ecuador	Peru	Thailand
Bosnia and Herz.	Jordan	Romania	Turkey
Brazil	Malaysia	Serbia	Venezuela
Bulgaria	Mexico	South Africa	

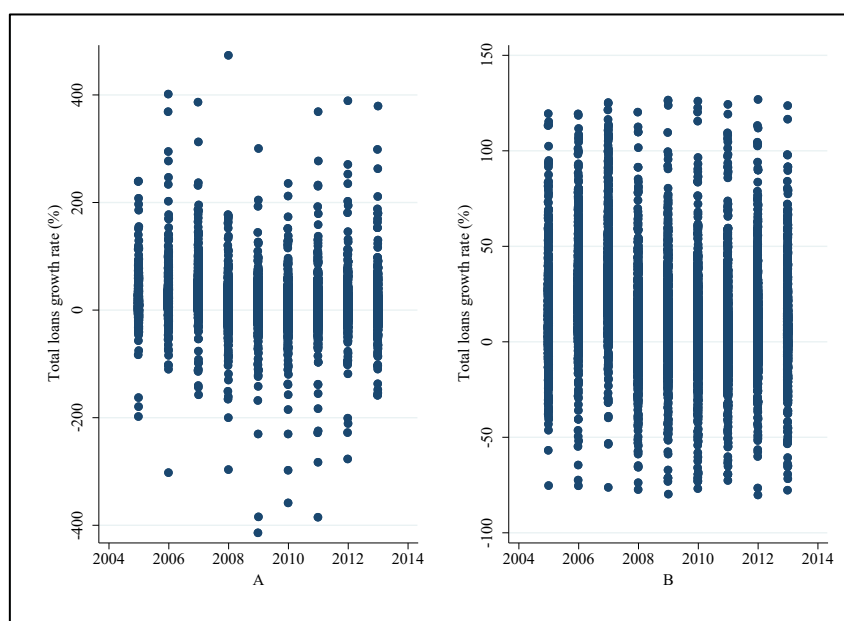Notes: The 54 countries are grouped based on the World Bank's country income group classification system.

Figure A1. Total loans growth rates dispersion before (panel A) and after excluding outliers (Panel B)

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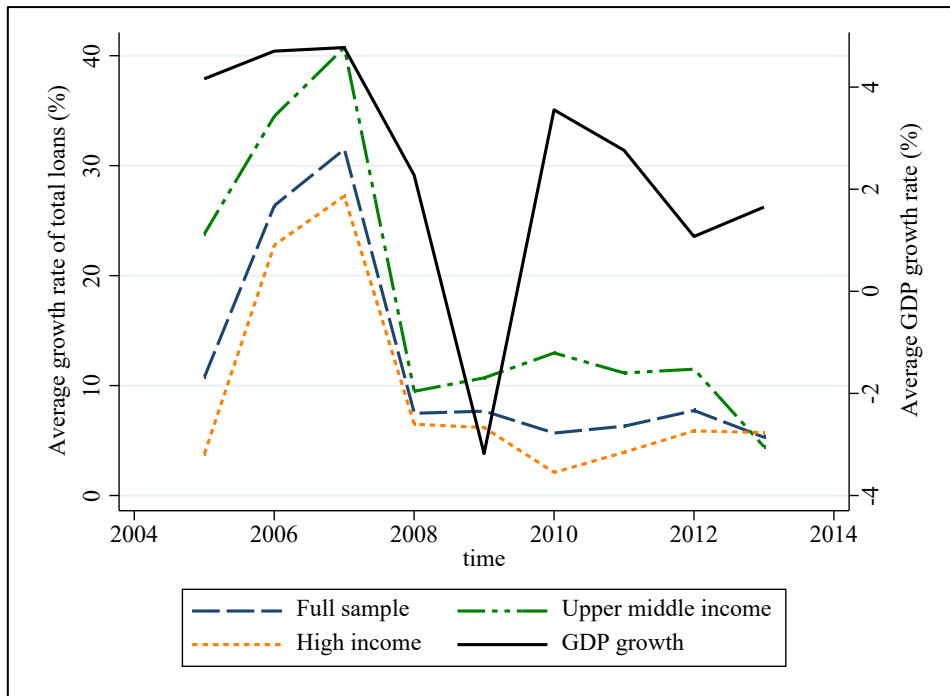
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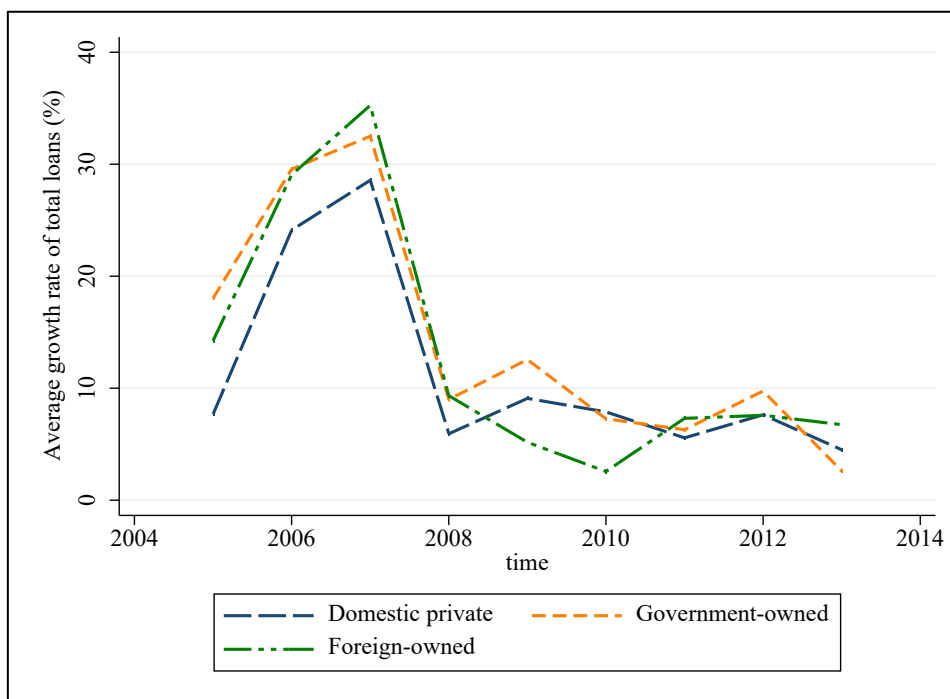**Figure 1** The growth rate of total loans by sample groups.

Figure 2 The growth rate of total loans by bank ownership groups

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Tables

Table 1 Description of variables and sources

Panel A: Bank-level data

Variable	Description	Source
Total loans growth rate	% annual change in total loans	Bankscope
Corporate loans growth rate	% annual change in corporate loans	Bankscope
Consumer loans growth rate	% annual change in consumer loans	Bankscope
Foreign	Dummy variable defined as $D = 1$ if the bank is foreign-owned	Bankscope and Claessens and Van Horen (2015)
Government	Dummy variable defined as $D = 1$ if the bank is government-owned	Bankscope and Claessens and Van Horen (2015)
Size	Log of total assets	Bankscope
Capitalization	Equity to asset ratio (%)	Bankscope
Profitability	ROAA (%)	Bankscope
DepFunding	Deposit funding to total liabilities ratio (%)	Bankscope

Panel B: Country-level data

Variable	Description	Source
GDPgrowth	GDP growth rate (annual %)	World Development Indicators
Inflation	GDP deflator (annual %)	World Development Indicators
Crisis2008	Dummy variable defined as $D = 1$ if $t = 2008$	
Crisis2009	Dummy variable defined as $D = 1$ if $t = 2009$	

Table 2 Summary statistics

Panel A

Sample	Time period	Total loans		Corporate loans		Consumer loans	
		Mean	SD	Mean	SD	Mean	SD
Full sample	Full	11.37	24.36	11.73	46.40	12.51	57.49
	Crisis	7.57	22.88	9.92	49.69	8.04	56.98
Upper-middle income countries	Full	16.25	28.42	15.24	43.94	19.39	60.76
	Crisis	10.10	27.25	8.17	36.79	10.72	54.25
High income countries	Full	8.98	21.71	8.75	48.20	5.07	52.76
	Crisis	6.32	20.27	11.46	58.79	5.13	59.78
Domestic banks	Full	10.66	21.97	12.14	46.04	11.88	50.34
	Crisis	7.54	20.60	13.89	56.42	7.18	44.25
Foreign banks	Full	12.08	27.37	10.91	45.53	12.77	66.26
	Crisis	7.18	25.89	4.32	41.60	9.68	70.48
Government banks	Full	13.14	23.45	13.48	53.84	14.96	46.82
	Crisis	10.79	20.09	11.46	30.24	4.25	41.79

Panel B

Variables	Full sample		Upper-middle		High income		Crisis period	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Domestic	0.54	0.49	0.44	0.49	0.59	0.49	0.53	0.49
Foreign	0.40	0.49	0.45	0.49	0.37	0.48	0.40	0.49
Government	0.05	0.23	0.10	0.30	0.03	0.17	0.05	0.23
Size	8.12	2.13	7.30	1.96	8.53	2.09	8.14	2.09
Capitalization	11.90	10.77	15.80	12.33	9.99	9.34	11.81	10.76
Profitability	0.86	3.10	1.41	3.04	0.59	3.09	0.70	2.31
DepFunding	84.88	16.81	82.60	18.55	85.99	15.78	83.92	17.35
GDP growth	2.26	3.52	3.81	3.48	1.50	3.28	-0.52	4.12
Inflation	4.04	5.55	8.64	7.11	1.77	2.34	4.29	5.65

Notes: The full time period refers to 2004-2013 whereas the crisis period to 2008-2009.

Table 3 Determinants of the total loans

Variables	Full sample FE (1)	GMM (2)	High income FE (3)	GMM (4)	Upper-middle income FE (5)	GMM (6)
Foreign	7.706**	-3.279	9.314	-0.611	10.334*	1.086
	(3.258)	(2.896)	(6.781)	(3.905)	(5.307)	(5.884)
Government	-8.420	-0.500			23.506	14.040
	(4.684)	(5.803)			(13.536)	(11.366)
Size t-1	-21.433***	-4.666	-19.095***	-10.911**	-23.924***	-22.780***
	(3.301)	(3.921)	(3.863)	(4.694)	(3.304)	(8.092)
Capitalization t-1	-0.217**	-1.108	-0.176*	-1.828**	-0.373**	-2.486***
	(0.082)	(0.813)	(0.092)	(0.761)	(0.141)	(0.947)
Profitability t-1	0.774**	4.582***	0.670**	9.024**	1.152*	3.117
	(0.246)	(1.523)	(0.267)	(3.829)	(0.608)	(2.267)
DepFunding	0.070***	-0.297	0.026	0.008	0.106	-0.262
	(0.017)	(0.214)	(0.043)	(0.253)	(0.079)	(0.386)
Crisis2008	-24.97**	-13.34***	-18.49	-17.59***	-30.65***	-20.78***
	(7.637)	(2.363)	(10.798)	(3.335)	(3.662)	(5.943)
Crisis2009	6.775*	-4.678	10.566	-0.369	6.252	2.711
	(3.542)	(3.460)	(7.364)	(5.820)	(5.823)	(5.316)
Foreign × Crisis2008	1.203	8.021**	1.576	-2.925	4.172	4.663
	(1.920)	(3.314)	(1.746)	(3.363)	(2.865)	(7.334)
Foreign × Crisis2009	-1.602	1.792	-0.971	-5.125	-1.647	-10.102
	(1.485)	(2.809)	(1.281)	(3.628)	(2.768)	(7.106)
Government × Crisis2008	0.759	9.090*			6.254**	14.738
	(1.389)	(5.252)			(2.601)	(9.605)
Government × Crisis2009	5.586***	8.825			8.905**	4.868
	(0.940)	(6.928)			(3.361)	(11.905)
Sizet-1 × Crisis2008	1.929***		1.931***		0.114	
	(0.285)		(0.432)		(0.193)	
Sizet-1 × Crisis2009	0.262**		-0.461		0.742**	
	(0.093)		(0.332)		(0.240)	
Capitalizationt-1 × Crisis2008	0.096		0.023		0.263***	
	(0.071)		(0.124)		(0.051)	
Capitalizationt-1 × Crisis2009	-0.022		-0.040		0.094	
	(0.050)		(0.088)		(0.064)	
Profitabilityt-1 × Crisis2008	-2.350***		-1.628**		-2.253***	
	(0.344)		(0.522)		(0.414)	
Profitabilityt-1 × Crisis2009	-0.707***		-1.528***		-0.533	
	(0.141)		(0.184)		(0.630)	
DepFunding × Crisis2008	0.066		-0.003		0.178***	
	(0.047)		(0.073)		(0.033)	
DepFunding × Crisis2009	-0.001		0.010		-0.075	
	(0.059)		(0.081)		(0.054)	
GDPgrowth	1.976***	0.247	1.332*	-0.026	2.467***	0.630
	(0.449)	(0.428)	(0.651)	(0.957)	(0.388)	(0.639)
Inflation	0.258	-0.838**	1.252***	1.785	-0.030	-0.405
	(0.333)	(0.352)	(0.289)	(1.436)	(0.542)	(0.740)
Total loans growth rate t-1		0.220**		0.477***		0.340*
		(0.105)		(0.174)		(0.178)
Constant	172.843***	84.910**	163.068***	108.406**	169.435***	231.567***
	(27.200)	(35.756)	(33.504)	(47.636)	(32.786)	(79.726)
Observations	6,769	6,769	4,554	4,554	2,215	2,215
Number of Banks	1,129	1,129	746	746	383	383
R-squared within	0.238		0.199		0.322	
Corr(y, fitted y)2		0.1809		0.2491		0.2078
AR(2) p-value		0.187		0.203		0.877
Hansen p-value		0.875		0.873		0.863

Note: FE denotes results obtained using fixed effects (models 1, 3 and 5), whereas GMM denotes results obtained using the two-step system GMM estimator (models 2, 4 and 6). × denotes an interaction term. Driscoll and Kraay's (1998) robust standard errors are given in parentheses for the fixed effects specifications while Windmeijer-corrected standard errors are reported in parentheses for the GMM specifications. Due to limited data availability, the government ownership variable and its interactions with the crisis dummies are excluded in models for the high-income countries group. ***, **, and * indicate the 1, 5, and 10% levels of significance, respectively.

Table 4 Determinants of the corporate and commercial loans

Variables	Full sample		High income		Upper-middle income	
	FE (1)	GMM (2)	FE (3)	GMM (4)	FE (5)	GMM (6)
Foreign	3.200	-3.990	1.382	-5.643	9.933	0.247
	(10.516)	(6.749)	(8.589)	(4.562)	(20.602)	(4.549)
Government	-4.876	-4.578			0.000	-7.273
	(5.672)	(12.595)			(0.000)	(10.084)
Size t-1	-21.741***	-10.074**	-26.055***	-3.249	-20.682***	-10.335**
	(4.324)	(4.919)	(6.003)	(2.129)	(4.745)	(4.626)
Capitalization t-1	-0.289**	-1.099	-0.419	-0.366	-0.440	-0.473
	(0.108)	(0.903)	(0.273)	(0.709)	(0.272)	(0.735)
Profitability t-1	0.753**	1.072**	0.608***	0.417*	2.752***	2.240
	(0.241)	(0.451)	(0.137)	(0.250)	(0.627)	(1.959)
DepFunding	-0.032	-0.517	-0.068	-0.388	0.048	0.001
	(0.036)	(0.386)	(0.048)	(0.276)	(0.080)	(0.358)
Crisis2008	-43.435***	-11.805**	-28.084***	-3.721	-38.695***	-18.683***
	(7.037)	(4.925)	(6.811)	(4.321)	(8.251)	(6.988)
Crisis2009	-12.162	3.481	0.699	11.004	-18.152	10.273
	(7.573)	(4.664)	(5.350)	(6.936)	(11.811)	(6.345)
Foreign × Crisis2008	1.428	-0.539	-0.755	4.768	3.235	0.169
	(3.222)	(5.608)	(2.106)	(5.830)	(4.586)	(6.778)
Foreign × Crisis2009	-3.744	-3.127	-2.130	4.556	-4.488	-7.319
	(2.872)	(5.649)	(1.795)	(5.052)	(4.601)	(7.416)
Government × Crisis2008	13.113***	7.035			22.832***	25.940*
	(2.385)	(8.298)			(3.982)	(13.669)
Government × Crisis2009	-1.467	1.458			-2.195	4.614
	(2.522)	(9.168)			(5.332)	(13.292)
Size$t$-1 × Crisis2008	2.016***		2.592***		0.043	
	(0.206)		(0.311)		(0.444)	
Size$t$-1 × Crisis2009	0.469**		-0.744**		1.013**	
	(0.182)		(0.276)		(0.420)	
Capitalization$t$-1 × Crisis2008	0.118		0.786***		-0.000	
	(0.129)		(0.100)		(0.155)	
Capitalization$t$-1 × Crisis2009	0.431***		0.522***		0.570***	
	(0.087)		(0.078)		(0.082)	
Profitability$t$-1 × Crisis2008	-1.736**		-3.839**		-2.559***	
	(0.575)		(1.593)		(0.568)	
Profitability$t$-1 × Crisis2009	-0.423		-5.578***		-0.291	
	(0.238)		(0.254)		(0.493)	
DepFunding × Crisis2008	0.259***		0.051		0.314***	
	(0.052)		(0.039)		(0.071)	
DepFunding × Crisis2009	0.118		0.117*		0.077	
	(0.081)		(0.052)		(0.132)	
GDPgrowth	1.884***	1.448**	1.061***	3.043***	2.156***	2.495***
	(0.256)	(0.633)	(0.285)	(0.943)	(0.364)	(0.959)
Inflation	0.073	1.063	0.988*	0.084	-0.196	0.311
	(0.284)	(1.049)	(0.502)	(1.026)	(0.348)	(0.865)
Corp loans growth rate t-1		0.129**		0.161***		0.207**
		(0.059)		(0.055)		(0.103)
Constant	185.55***	139.300**	234.85***	66.14*	159.61***	80.608
	(36.409)	(66.933)	(52.542)	(34.760)	(44.602)	(56.001)
Observations	2,944	2,944	1,548	1,548	1,396	1,396
Number of Banks	636	636	362	362	274	274
R-squared within	0.238		0.199		0.322	
Corr(y, fitted y)2		0.235		0.248		0.276
AR(2) p-value		0.264		0.282		0.382
Hansen p-value		0.087		0.341		0.156

Note: Please see Table 3.

Table 5 Determinants of consumer and retail loans

Variables	Full sample		High income		Upper-middle income	
	FE (1)	GMM (2)	FE (3)	GMM (4)	FE (5)	GMM (6)
Foreign	42.618**	0.121	51.219**	0.834	37.345**	5.551
	(13.396)	(4.209)	(19.881)	(6.166)	(15.793)	(6.568)
Government	0.000	-2.724			0.000	12.425
	(0.000)	(6.337)			(0.000)	(14.181)
Size t-1	-30.055***	-8.779**	-22.249***	-8.488**	-37.100***	-14.649***
	(5.183)	(3.695)	(4.688)	(3.868)	(4.829)	(3.737)
Capitalization t-1	-1.138**	0.031	-1.775***	-1.064	-1.205***	-0.849
	(0.344)	(0.653)	(0.417)	(0.722)	(0.273)	(1.381)
Profitability t-1	1.964**	1.468	3.073*	2.187*	1.114	3.520*
	(0.567)	(0.969)	(1.381)	(1.226)	(0.601)	(1.849)
DepFunding	-0.033	-0.186	0.006	0.476	-0.290	-0.008
	(0.167)	(0.279)	(0.158)	(0.385)	(0.181)	(0.259)
Crisis2008	-12.52	-16.16***	-77.79***	-6.893	25.905	-17.26**
	(12.517)	(4.852)	(14.016)	(5.636)	(15.408)	(7.757)
Crisis2009	19.741	5.395	-4.430	4.238	58.127***	7.003
	(14.765)	(4.731)	(13.983)	(5.731)	(15.650)	(9.361)
Foreign × Crisis2008	5.196	5.702	1.017	1.267	5.054	1.125
	(3.495)	(7.806)	(1.185)	(10.518)	(6.041)	(9.402)
Foreign × Crisis2009	-4.187	-0.386	9.681***	4.261	-17.422***	-20.799**
	(2.827)	(6.419)	(1.383)	(5.847)	(3.624)	(8.171)
Government × Crisis2008	9.843***	14.849			5.932**	10.164
	(1.683)	(10.016)			(1.857)	(13.955)
Government × Crisis2009	-0.579	-6.400			-11.386**	-14.763
	(2.556)	(8.149)			(4.171)	(12.826)
Sizet-1 × Crisis2008	-0.635		2.384**		-4.068***	
	(0.654)		(0.685)		(0.805)	
Sizet-1 × Crisis2009	0.317		1.121		-2.580*	
	(0.826)		(0.985)		(1.195)	
Capitalizationt-1 × Crisis2008	0.177		0.404		0.207	
	(0.301)		(0.468)		(0.318)	
Capitalizationt-1 × Crisis2009	0.239		0.308		0.130	
	(0.287)		(0.239)		(0.324)	
Profitabilityt-1 × Crisis2008	-4.993***		-6.704**		-4.125***	
	(0.700)		(1.955)		(0.406)	
Profitabilityt-1 × Crisis2009	-0.890		-8.520***		1.225	
	(0.497)		(1.874)		(0.648)	
DepFunding × Crisis2008	0.137*		0.668***		-0.122	
	(0.059)		(0.187)		(0.088)	
DepFunding × Crisis2009	-0.292***		-0.088		-0.501***	
	(0.045)		(0.160)		(0.071)	
GDPgrowth	1.526***	1.486***	0.744	1.857***	1.707**	1.987**
	(0.169)	(0.480)	(0.490)	(0.659)	(0.655)	(1.000)
Inflation	-0.491	-0.141	0.608**	-0.168	-0.594	-2.211**
	(0.260)	(0.474)	(0.216)	(0.472)	(0.716)	(0.962)
Cons loans growth rate t-1		0.112**		0.017		0.274**
		(0.044)		(0.056)		(0.117)
Constant	255.711***	93.825**	196.945***	49.743	323.441***	139.878***
	(31.047)	(37.400)	(32.500)	(44.538)	(24.471)	(49.599)
Observations	2,252	2,252	1,055	1,055	1,197	1,197
Number of Banks	514	514	255	255	259	259
R-squared within	0.131		0.0891		0.196	
Corr(y, fitted y)2		0.1356		0.1453		0.1785
AR(2) p-value		0.553		0.636		0.260
Hansen p-value		0.504		0.349		0.265

Note: Please see Table 3

Table 6 Differences in total loans growth rates during pre- and post-crisis periods

	Full sample		High income		Upper-middle	
	2004-2009	**2008-2013**	**2004-2009**	**2008-2013**	**2004-2009**	**2008-2013**
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Foreign	14.607**	10.161	4.782	20.771***	30.107**	-6.065
	(3.669)	(5.194)	(4.808)	(3.982)	(7.469)	(6.412)
Government	-18.661	3.960			20.956*	11.786
	(8.592)	(7.137)			(7.711)	(19.812)
Crisis2008	-11.757**	-2.571**	-10.899**	1.402***	-17.171**	-17.107***
	(3.142)	(0.818)	(2.820)	(0.290)	(5.036)	(2.347)
Crisis2009	-8.829*	0.088	-8.872**	2.244***	-9.718	-8.365**
	(3.083)	(0.715)	(2.613)	(0.181)	(5.126)	(2.293)
Foreign × Crisis2008	-0.976	4.718**	-1.541	2.310**	2.693	14.513***
	(1.128)	(1.209)	(2.069)	(0.799)	(1.360)	(2.621)
Foreign × Crisis2009	-6.530**	-1.052	-4.507	-1.171	-9.212***	1.928
	(1.325)	(1.193)	(2.307)	(0.972)	(1.426)	(2.513)
Government × Crisis2008	-2.271**	0.650			1.184	8.307*
	(0.423)	(1.064)			(1.887)	(3.388)
Government × Crisis2009	-1.246	2.682*			-2.144	5.238
	(0.593)	(1.180)			(2.478)	(3.760)
Size t-1	-26.351*	-14.434***	-23.211*	-9.885***	-26.577	-27.525***
	(10.531)	(3.184)	(9.595)	(2.237)	(12.206)	(3.683)
Capitalization t-1	0.154	-0.053	0.197	0.109	0.112	-0.384***
	(0.377)	(0.091)	(0.401)	(0.108)	(0.418)	(0.082)
Profitability t-1	-0.482**	0.288**	0.768	0.260***	-0.789***	0.791
	(0.140)	(0.088)	(0.609)	(0.057)	(0.132)	(0.508)
DepFunding	0.134*	0.067*	-0.130	0.047	0.445***	0.075
	(0.055)	(0.026)	(0.090)	(0.026)	(0.028)	(0.056)
Constant	216.140*	115.510***	222.889*	76.297***	163.876	216.080***
	(82.308)	(27.145)	(76.378)	(18.739)	(94.719)	(31.284)
Observations	2,990	5,432	2,021	3,656	969	1,776
Number of Banks	879	1,141	584	763	295	378
R-squared within	0.333	0.036	0.308	0.032	0.391	0.078

Notes: The dependent variable is the total loans growth rate. × denotes an interaction term. Driscoll and Kraay's (1998) robust standard errors are given in parentheses. Due to limited data availability, the government ownership variable and its interactions with the crisis dummies are excluded in models for the high-income countries group. ***, **, and * indicate the 1, 5, and 10% levels of significance, respectively.