A Loan-level Analysis of The Determinants of Credit Growth and The Bank Lending Channel in Peru

José Bustamante¹

Walter Cuba²

Julio Tambini³

Abstract

This paper uses loan-level data from the Peruvian credit registry to determine how the role of bank-specific characteristics (i.e. bank size, liquidity, capitalisation, funding, revenue, and profitability) may affect the supply of credit. Also, we analyse how these characteristics affect the banks' response to monetary policy shocks. Finally, we analyse how the link between bank specific characteristics and credit supply is affected by global financial conditions. Our results show that well-capitalized, high-liquidity, low-risk, more profitable banks tend to grant more credit. Also, we find bigger banks (in terms of assets) and higher bank liquidity weaken the monetary policy transmission channel. As a result, all together, this means that strong balance sheets lead to a lower reduction in the loan supply in Peru when there is a monetary policy tightening.

Keywords: Bank's Business Models, Credit Channel, Registry Data.

¹ jose.bustamante@bcrp.gob.pe, Banco Central de Reserva del Perú

² walter.cuba@bcrp.gob.pe, Banco Central de Reserva del Perú

³ julio.tambini@bcrp.gob.pe, Banco Central de Reserva del Perú

1. Introduction

There is a growing body of literature that studies how banks' activity has changed after the recent global financial crisis (GFC). For instance, Gambacorta et al (2011) and Roengpitya et al (2014) find that banks' business model and market funding patterns have changed after the GFC, and also theses factor affected the bank lending channel. Also, the "originate-anddistribute" model of banks was affected when the securitization market froze and the banks' activity as broker-dealer changed after adjustments in regulation. Therefore, the GFC has had an impact on banks' activity, in particular, how banks are funded and grant credit and how they react to monetary policy shocks.

However, there are still few studies that analyze emerging markets economies like Peru, because the lack of appropriate data. In this paper we focus on the Peruvian banking system and we overcome the problem of data using a unique loan-level dataset that contains the characteristics of the firms that demands loans and the characteristics of the banks who grant them.

Peru presents an interesting case of study due to its characteristics in financial intermediation and dollarization. Unlike advanced economies, the Peruvian banks' non-interest income are low and deposits remain the main source of funding to the loans. The low level of the FED interest rates observed in last years encouraged banks to increase their external financing, but this situation was temporary. In addition, financial dollarization remains high in Peru, although unconventional monetary policy was implemented to reduce it.

The empirical specification is based on Jimenez, Ongena, Peydro & Saurina (2012) and Gambacorta & Marques-Ibanez (2011). We study how changes in banks' characteristics (i.e. bank size, liquidity, capitalisation, funding, revenue, and profitability) may affect the supply of credit. Also, we analyse how these characteristics affect the banks' response to monetary policy shocks. Finally, we analyse how the link between bank specific characteristics and credit supply is affected by global financial conditions and uncertainty measures.

This paper uses loan-level data from the Peruvian credit registry to determine the role of bank-specific characteristics in changes in the supply of credit divided by domestic currency (soles) and foreign currency (dollars). The use of detailed credit register data allows the proper identification of both credit supply and demand shifts. The analysis is complemented with detailed firm and bank data, in particular data on funding of individual banks.

The remainder of this paper is organized as follows: The next section describes the evolution of the banking system in Peru. Section 3 presents the theoretical framework describing the bank lending channel. Section 4 is a description of the data. Section 5 presents the econometric model and Section 6 indicates the main results.

2. The banks' business model in Peru

The Peruvian Banking System Pre-Crisis

The Peruvian banking system had three main features before the Global Financial Crisis (GFC) of 2007-2008. The first one was the crisis suffered on late 90's. This crisis was caused by external shocks (Asian and Russian crisis) and internal shocks (*El Niño* phenomenon) which caused a slowdown in the economic activity and a lower capacity of debtors to pay. As a result, the credit risk increased significantly for the banks, which was reflected in the level of non-performing loans⁴ (NPL) ratio that reached 17,2% in December 2001 (7,9% in December 1996).

⁴ Refers to credits that have at least 30 days of late payment or have been refinanced.

The losses generated in this period were so high that some private banks had to sell their business or receive some external help to continue operating. From 23 banks that were operating in 1996, only 15 continued operating in 2001. Also, the government raised the limit of deposit insurance coverage from US\$ 4 700 in 1997 to US\$ 19 800 in 1998 to protect the depositors and prevent bank runs.

After the financial turmoil, Peruvian banks improved their risk management practices and developed new tools to monitor credit risk. These improvements occurred due to the greater availability of quality data about debtors. Before the crisis the lack of information impeded banks from developing better credit risk techniques. While the credit management practices were improving, the SBS⁵ continued adapting the regulation and supervision to the best international practices.

The second feature was the high level of financial dollarization. After the hyperinflation of the 80's and the high inflation of the 90's, the confidence of household and firms on the domestic currency fell apart. As a result, the dollarization of credit and deposits raised to 80% and 71% respectively by the end of 2001. Nevertheless, due to BCRP⁶ differentiated reserves requirements by currency, which was stricter in foreign currency (US dollars) than in domestic currency (soles), the low levels of inflation that restored the confidence on soles, and the development of the domestic debt market, the dollarization of credit and deposits diminished to 60% and 56% in 2007, respectively.

Finally, the third main feature was the continuous improvement on the Peruvian macroeconomic indicators that resulted in a better risk rating for the government bonds. The improvement of the sovereign risk was gradual and it resulted in the upgrade of Peruvian rating to an investment grade country in 2007. The better risk profile of the country enabled the Peruvian non-financial corporations to borrow money from foreign banks and to issue securities on capital markets; also some Peruvian banks started to finance their operations in the same manner obtaining a lower cost of funds than before.

From 2003 until the GFC, the Peruvian banking system expanded in a healthy economic environment where the Gross Domestic Product (GDP) was growing at high rates (6,1% annual on average) and inflation was low by international standards (2,3% annual on average). As a result of these macroeconomic conditions, the credit grew 12,6% on average. Additionally, the banks continued their improvements on credit risk management, they strengthened their equity through capitalization of net income and new capital injections. During that period, the financial system remained concentrated, because the loans granted by the four major banks represented 70% of total loans.

The banks managed to encompass the rapid growth of thousands of micro and small size enterprises (MSE), who contributed to the demand for credit. The fast growing credit to MSE was provided by the expansion of some banks and other non-banking financial institutions. Also, banks chose to expand their operations in the household market, where the banks granted loans with higher margins than in other credit market segments.

As a result of the lower cost of funds and the participation in the household credit market, Peruvian banks improved their financial margins. Also, the banks improved their operating efficiency because of the consolidation of some mergers and acquisitions between some big banks and the foreign banks that decided to exit the Peruvian market for strategic purpose of their holding companies. Hence, the profitability increased in this period. The good performance of the banking system attracted three new foreign banks that established in Peru around 2007 and 2008.

⁵ SBS is Superintendencia de Banca, Seguros y AFP, the Peruvian Financial Superintendence Agency.

⁶ BCRP is Banco Central de Reserva del Perú.

Impact of the financial crisis of 2008-2009

For Latin America, the GFC meant, mainly, a demand shock for its exports, lower price of commodities and an external financial shock that was translated into an increased risk aversion. In Peru, these shocks were translated into three factors. The first one was an increase of exchange rate volatility, which raised the preference for foreign exchange liquidity, and resulted in the growth of foreign currency loans (from 11% in 2006 to 35% in 2007). The second factor was the increase of the external cost of funds for the banks because of the risk aversion. Finally, when the domestic demand and the demand for Peruvian exports decreased along with lower world economic activity, the growth of credit slowed significantly, most of credits granted in this period were the ones that had already been contracted before the crisis.

Furthermore, during the worst period of the crisis, the NPL increased as the financial condition of firms and household was weakening. Also, credit followed the GDP growth, reaching a low annual growth in 2009.



Source: BCRP and bank's financial statements.

During the financial turmoil, the BCRP injected liquidity in the financial system through diminishing the reserves requirements and repurchase agreement operations (REPO). Also, the BCRP sold foreign currency in the FX spot market (USD 6.8 billion during September 2008-February 2009). These measures succeeded in buffering the financial system from the crisis and facilitated a sustained credit growth since the second semester of 2009 onwards.

Trends and changes in the banking system during the post-crisis period

In the year 2009, the SBS and the BCRP continued implementing the recommendations of Basel II. The minimum capital adequacy ratio (CAR) of banks was raised from 9.1% to 10%. Also, the SBS included the capital requirement for operational risk and defined the instruments that must be considered in the Tier 2 capital. Also, the SBS implemented additional capital buffers for banks to absorb potential losses from other risks, such as concentration on individual loan risk, economic cycle, too big to fail and others. The banks fulfilled these requirements widely with the Tier 1 representing the majority proportion in the CAR.

After the GFC, economic growth of large advanced economies remained low. This affected the Peruvian economic activity through the tradable sector (Peruvian exports are 30% of the GDP). The world demand for commodities diminished significantly, especially in metals that compose our mining sector (copper, zinc and silver). That shock, along with weak performance of the domestic demand, slowed down the Peruvian GDP growth. Hence, the NPL started growing at a higher pace than the credit, increasing the NPL ratio. However, that ratio remained below to its levels observed in the early 2 000's because of the improvement of the risk management of the banks.



Regulatory Capital Ratio and NPL Ratio



Source: SBS and bank's financial statements.

Also, the SBS continued adjusting the regulation to strengthen the financial system and improve the credit risk practices of the banks. In 2011, SBS implemented a new categorization in the financial statements for the credit to business, differentiating the firms on corporates, large, medium and small. This categorization resulted in a different provision requirement and criteria for classifying a loan as NPL depending on the category of the business and the days past due. Furthermore, in 2008 the pro-cyclical provision requirement was included in line with the process implementation of the recommendations from the Basel Committee. In 2014, banks are required to implement a stress testing model to assess prospectively their resilience to macroeconomic shocks.

Furthermore, the banks reduced their exposure to the credit risk from dollar loans by reducing the dollarization of credit. This reduction was due to the low demand for credit and the BCRP policy aimed at discouraging the foreign currency loans. The BCRP established dedollarization program since 2013 that consisted on banks being required to reduce their credits on foreign currency at a specific rate, if they did not accomplish this goal, they would be charged with an extra reserve requirement. This de-dollarization goals were encouraged by the design of some two special REPO to favor the diminution of credit dollarization on 2015.



Performance and dollarization (%)

In the years after the crisis the banks maintained their financial margin stable and decreased their operating expenses, which compensated the expenses for provisions in face of the deterioration of credit quality. The reduction of operating expenses was significant due to the consolidation process of some banks that bought loan portfolios and absorb some non-bank financial institutions. Hence, the profitability reduced slightly from 2009 to 2012, remaining stable since then.

Despite the deceleration of the GDP after the GFC, the banking system continued to growth at a rate of 12% annually on average. After 2008, the banks maintained adequate levels of solvency and continued expanding their activities to the household. Also, the improvement on the credit risk models and management helped the banks to screen better their clients and to grant longer term loans than in the past, especially in the mortgage market.

The good performance of banks continued to attract foreign investors, who established subsidiaries in Peru after the GFC. On the other hand, foreign banks from United States and Europe were affected by their funding because these banks had a significant proportion of liabilities on foreign debt.





Source: Bank's financial statements.

For the post-crisis period, the composition of income for the Peruvian banks does not reveal an important change. There are four important sources of income for Peruvian banks: Interest on loans, financial services, investments and exchange rate income. The interest on loans explains 60% of total income, with largest banks showing some income diversification, and the medium and small banks have remained highly dependent on the interest of loans. Their investment portfolio is composed mainly of liquid assets such as Peruvian Treasury Bills and BCRP certificates of deposit. This composition is explained because after the banking crisis of late 90's the liquidity management of banks became very conservative.



Bank's Business Model

Liabilities Composition



01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 Source: Bank's financial statements.

It is important to mention that the banks are not involved directly in asset management, instead, this business is assigned to their subsidiaries, therefore this income is not reflected in the bank's income statement, but in the subsidiary's. There are only 5 banks involved in this business. If the investment banking was in the income statement of the banks, the participation of this business in the composition of income would be around 20%.

The liabilities composition is mainly based on domestic deposits. But its importance decreased progressively, from 80% of total liabilities in 2009 to 72% in 2017. Instead, external debt and the issue of securities increased their participation in total funding over the same period. The proportion of external funding to total liabilities increased to a maximum of 18% in 2012. This rise was because the cost of issuing instrument in international financial market reduced along with the good rating for government bonds. It is worth mentioning that because some of these bonds was subordinated, the issue of these instrument improve the capital adequacy ratio of the banks. After 2012, the external funding started to decrease due to initiatives by BCRP to issue REPO to provide liquidity to the financial institutions.

The increase of external debt was because Peru became an investment grade country in 2009, this enable banks to issue debt in international markets seeking cheaper financing. During the financial crisis of 2008, external financing was restrained, but when the US Federal Reserve injected liquidity to the US financial system and diminished its interest rate, the biggest Peruvian banks took the opportunity to raise funds in the international markets.

The securitization activity in Peru consist in the securitized mortgage and financial leasing loans to issue bonds that use these securitized loans as collateral. These credits are among low risk debtors. These bonds have diminished due to a preference for other sources of funds, it is worth to mention that they never had a significant proportion in liabilities (0,3% in December 2017).

3. Theoretical Framework

Traditionally, the credit supply analysis was centered on liquidity, the regulatory framework and interest rate policy. However, since the banking sector evolved, the funding decisions taken changed too, new debt issue appeared, client-based business were put in place, etc.

Banks are able to fund their credit operations through bonds issues and by external funding lines, which might mean that financial entities can accomplish their capital requirements despite having high-level leverage. On the other hand, inter-banking loans also are used as funding sources, although in Peru that happens in very short-terms and aiming to reserve requirements.

In addition, it is noticed that banking sector have increased its non-interest incomes (universal banking). This situation necessarily require us to reformulate the interest rate policy role since in order to estimate the monetary policy effect on credit, not only financial channel must be evaluated but the real channel (investment banking) is important, as well.

Higher financial deepening and new communication tech (NCT) have reinforced the bankfirm link and its contribution to the credit supply dynamic. As consequence, firms' balance sheets have become in relevant factors to explain the loan activity and the financial state of a bank influences the credit supply too. NCT gives banks' risk offices more info to improve their loan quality and that process affect credit supply too.

Under the current banking paradigm and its new business model, both regulatory framework and monetary policy need to be reformulated. For instance, higher financial-dollarization economies demand for the more active use of non-conventional monetary policies (reserve requirements, credit restrictions, etc.) in order to secure financial stability. In that context, the monetary policy transmission also needs to be re-estimate. On the regulatory framework, the ability of banks to access to non-deposit funding sources looks for new required financial indicators (e.g. systemic risks) and re-think the actual ones. About this, Basel III includes guidelines to cover these issues.

Bank Lending Channel

It is known that there are several channels that explain the effect of monetary policy into the real economy, some examples are the interest rate channel, the expectation channel and the credit channel (Rossini & Vega, 2007). The latter has gained importance over the past years and has been studied with different approximations in many countries (Ehrmann, Gambacorta, Martínez-Pagés, Sevestre, & Worms, 2001; Kishan & Opiela, 2000; Carrera, 2011; Juurikkala, Karas, & Solanko, 2011).

This channel is referred to the extent to which monetary policy affects the supply of credit and how this is translated to the real economy. For example, if the monetary policy results on a contraction of the supply of credit for some firms that are bank-dependent, they would not reduce their investments and eventually it will hit the economy growth (Bernanke & Blinder, Credit, Money, and Aggregate Demand, 1988; Bernanke & Blinder, 1992; Bernanke & Gertler, 1995).

The credit channel has two component. The first one is the balance sheet channel, which is related to how the monetary policy affects the profits, collaterals and worth of some non-financial firms. A firm would be affected in front of a tightening in monetary policy because the raise of interest rates would increase the financial expenses of the firms, also the valuation of their collateral would be lower because the higher discount rate. As a result, the financial health of the firms would be lower and they would have problems finding financing from banks, because they would not fulfill the bank's requirements. It has been said that this effect is also shown for the financial firms (Bernanke & Gertler, 1995).

The second component is the bank lending channel, which means that a tightening in monetary policy stance will increase the cost of funds for the banks and therefore they will reduced their supply of credit (Bernanke & Gertler, 1995; Kashyap & Stein, 1997; Bernanke & Blinder, Credit, Money, and Aggregate Demand, 1988). For example, if the central bank reduce the liquidity available for the banks, and they have an imperfectly elastic demand for their deposits, they would have to raise the interest rate paid or rely more other type of liabilities, which are more costly than deposits (Bernanke & Gertler, 1995).

It is worth mentioning that the effect of the bank lending channel and the balance sheet channel through the banks is heterogeneous depending on the characteristics of the banks. For example, when a tightening on monetary policy happens and raise the cost of available funds, the biggest and more capitalized banks would do better at raising funds, because they would be less risky than other smaller banks (Ehrmann, Gambacorta, Martínez-Pagés, Sevestre, & Worms, 2001), also if the banks are highly liquid, they would use their liquid assets to grant loans in front of a tightening of monetary policy, in other words, they have more capacity of delay the effects of the raise on costs of funding (Bernanke & Blinder, 1992). These factors (size, capital and liquidity) are relevant when evaluating the effect of monetary policy on loan supply.

Most of these papers have estimated a panel data model from a bank-level perspective controlling for demand and supply effects (Carrera, 2011; Ehrmann, Gambacorta, Martínez-Pagés, Sevestre, & Worms, 2001; Juurikkala, Karas, & Solanko, 2011; Shiva & Loo-Kung, 2003; Kashyap & Stein, 2000; Gambacorta L. , 2005), however some have use VAR models from a macro-level perspective to accomplish the task (Quispe, 2001; Bernanke & Gertler, 1995) and more recently there have been efforts towards the use of micro-level data (Jiménez G. , Ongena, Peydró, & Saurina, 2012).

There are multiple papers that have evaluated this factors for developed countries and have found similar results among them. For example, some authors, who have used a panel data approach, have shown that the size of the bank diminish the effect of monetary policy in the credit supply (Kishan & Opiela, 2000; Kashyap & Stein, 1995) likewise the level of capital (Kishan & Opiela, 2000; Jiménez G., Ongena, Peydró, & Saurina, 2012; Juurikkala, Karas, & Solanko, 2011). Furthermore, many authors find that liquidity is a major factor for explaining the heterogeneity of the effect among the banks (Ehrmann, Gambacorta, Martínez-Pagés, Sevestre, & Worms, 2001; Kashyap & Stein, 2000; Jiménez G., Ongena, Peydró, & Saurina, 2012).

One important empirical result was provided by Ehrmann, Gambacorta, Martínez-Pagés, Sevestre, & Worms (2001), whom show that these effects vary significantly among countries depending on their context and legal framework. For example, they shown that because of the networks through many bank smoothens their liquidity shocks and the regulation about deposit insurance, the bank lending channel was not strong enough.

For Latin America, the body of empirical evidence suggest that the bank lending channel works at reducing the loans supply offered by the banks. For the case of Chile, Alfaro, García, Jara, & Franken (2005) investigated how changes in monetary policy affected the total loans, consumer and commercial loans. In the three cases they find that monetary policy affects the most the loans supply of illiquid banks, also the size diminishes the effect only for the total loans while capital only for consumer loans. Similar results are find for the case of Bolivia, where Rocabado & Gutiérrez (2010) find that the effect of monetary policy diminishes for the most capitalized and liquid banks.

Furthermore, Gómez-González & Grosz (2007) study the bank lending channel for the case of Argentina and Colombia finding slightly different results. They found that in Argentina a shock in the interest rate did not affect the growth of the loans directly, but when the interest rate was multiplied by a capital and a liquidity ratio it affected the loan supply in the expected sign. For the case of Colombia, the authors found that the interest rate affected the supply of loans directly and stronger with low capitalized and illiquid banks.

In Peru there are several authors that have made research about this channel. Some authors have claimed that the bank lending channel does not affect the real economy significantly because of the greater access to foreign markets that many firms have gained the last years and the development of the capital market over the past decades (Quispe, 2001; De La Rocha, 1998), this improvement affect both the financial and non-financial firms, because they would be less bank-dependent firms, which is a requirement for the bank lending to affect the real economy (Bernanke & Gertler, 1995) and also, the banks would have the opportunity of raising fund at a lower cost than before when facing a tightening of monetary policy.

Other authors have test the effect of monetary policy into the supply of loans taking a panel data approach. Shiva & Loo-Kung (2003) look for the effect into the growth of total loans and loans in domestic currency, they found that for the case of total loans the monetary policy indicator did not have a direct effect, but it did when mixing the effect with the size and liquidity characteristic of banks, and in the case of the loans in domestic currency there was a direct effect and it was more strong for the smallest banks.

Some years after, Carrera (2011) found that the interest rate affected directly to the growth of total, consumer and commercial loans. However, only the variable size from the characteristics of the banks was significant when interacting with the monetary policy variable. The variable liquidity was significant in the interaction with the policy rate only for the case of consumer loans.

It is worth mentioning that both Carrera (2011) and Shiva & Loo-Kung (2003) use banklevel data, however, as mentioned in Jiménez, Ongena, Peydró, & Saurina (2012), estimating the bank lending channel with macro or bank level data may suffer from a problem of omitted variables, because a change in the monetary policy stance affects both supply and demand for loans. Therefore an analysis using firm level data would be the best methodology to assess whether the monetary policy affects the supply of loans.

Also according to Gambacorta & Jiménez (2012) methodology, in order to estimate the credit supply determinants, the use of dynamic panel-data model is strictly recommended. As it is referred, credit loan per bank is defined as dependent variables, which sharply contrast to the conventional way to work using aggregate data.

In this paper, we follow a panel data approach with firm level data to control for the demand and supply shocks, we included some variables relating to the characteristics and financial health of the non-financial firms. For the group of bank variables, we included variable referring to the size, capital and liquidity, also we incorporate some variables referring to the risk of the financial institution and the structure of income and liabilities. In addition, the following control variables are included: macroeconomic environment (GDP, CPI), banks and firms' balance sheets, monetary policy (interest rate and non-conventional instruments).

4. Data

In this study we use three datasets from the SBS and the National Institute of Statistics and Informatics (INEI, *Instituto Nacional de Estadística e Informática*). The first one is a credit registry data (CRD) which contains information about all the commercial loans from banks to firms between June 2003 and December 2015 on a quarterly basis. This dataset is confidential and is filled by all the regulated financial institutions that grant loans, it contains the debt outstanding that a firm have in the financial system disaggregated by each bank, for example, we can identify the amount of debt outstanding that the firm ABC has in "bank A", "bank B" and "bank C". However, this dataset does not contain information regarding the firm's financial statements.

To complete the information for this paper we were able to merge this information with the national survey of firms, which is a dataset that contains the financial statements of a sample of firms (5 000 on average) on an annual basis, this information was provided by the INEI.

The third data set is the bank's balance sheet and the income statement between June 2003 and December 2015 on a monthly basis. This information is provided from each bank to the BCRP.

Regarding the credit report data⁷, we obtain information of the firms that have at least one debt in the financial system. The dependent variables is the total amount of debt that a firm has in one specific bank, this information was combined with the characteristics of the firm and the bank in which the debt is held. In the sample, we use information of 16 banks because they have information along the study period. On average, each debtor has a debt with 3 financial institutions and 12 as maximum. Likewise, the amount of debt if S/ 2 millions on average and S/ 39 million as maximum.

Regarding bank's balance sheet and the income statement⁸, we calculate several indicators for each bank. We classify the bank-specific characteristics into five categories:

1. **Bank lending channel standard indicators**: size (logarithm of total assets), liquidity ratio (current assets divided by the total assets), and bank capital ratio (equity divided by the total assets).

⁷ We obtained this data set from Peruvian's Financial System Regulatory and Supervisory Institution.

⁸ We obtained this data set from Peruvian's Financial System Regulatory and Supervisory Institution.

- 2. **Risk profile:** risk measures (non-performing loans) and indicator for a bank's securitization activity (if the bank has been involved in the business of securitization the last two years).
- 3. **Revenue mix:** diversification ratio (percentage of non-credit income respect to the total income), and trading activity ratio (percentage of the investment available for sale assets respect to the total assets).
- 4. **Funding composition:** the share of deposits over total liabilities, and funding in foreign currency (i.e., dollar funding) over total funding.
- 5. **Efficiency:** efficiency ratio (operative expenses divided by the total amount of the financial margin plus the financial services) and number of employees or branches per total assets.

Regarding the survey of the firm's balance sheet and the income statement⁹, we calculate several financial indicators for each firm that have debs in the financial system. This information was gathered of the assets, the fix assets, liabilities and the net income of the enterprises. Later, the relevant variables was calculated for the regressions. We use the logarithm of the assets, the capital ratio (equity divided by the total amount of assets), the return on assets (net income divided by the assets of the same period), liquidity ratio (current assets divided by the total assets), investment on equipment (differences between the fix assets between two consecutive years) and the number of relationships with banks. When considering this variables we are able to control the regression for the heterogeneity of the firms that request a credit. It's important to mention that the variables have annual frecuency unlike the dependent variable. When this dataset was combined with the CRD, 3 386 matches of firms was obtain on average, a minimum of 614 and maximum of 5 849 for one year of the study period.

Additionally, some macro-variables were used as control variables. We use the GDP, the terms of trade, real exchange rate, nominal exchange rate, the current account and a dummy variable the indicates the period of the international financial crisis. This information is obtained from Central Bank data base.

| Table 1: Descriptive Statistics | | | | | | | | | |
|---------------------------------|--------|-----------|--------|---------|--|--|--|--|--|
| Variables | Mean | Std. Dev. | Min | Max | | | | | |
| Main indicators | | | | | | | | | |
| Size | 10,269 | 1,024 | 5,107 | 11,694 | | | | | |
| Liquidity ratio | 31,013 | 17,418 | 1,264 | 427,430 | | | | | |
| Bank capital ratio | 7,291 | 1,923 | 4,396 | 51,913 | | | | | |
| Risk profile | | | | | | | | | |
| Non-performing loans | 3,420 | 2,623 | 0,000 | 40,689 | | | | | |
| Securitization activity | 0,596 | 0,491 | 0,000 | 1,000 | | | | | |
| Revenue mix | | | | | | | | | |
| Ratio de diversifiación | 46,806 | 8,825 | 4,278 | 86,774 | | | | | |
| Ingresos por trading | 6,384 | 4,178 | 0,000 | 87,972 | | | | | |
| Funding composition | | | | | | | | | |
| Deposits over total liabilites | 69,406 | 7,631 | 42,414 | 100,000 | | | | | |
| Funding in foreign currency | 57,847 | 7,751 | 4,725 | 98,360 | | | | | |
| Efficiency | | | | | | | | | |
| Eficciency ratio | 3,688 | 1,273 | 1,139 | 40,146 | | | | | |
| Employees per total assets | 20,657 | 10,900 | 1,206 | 419,125 | | | | | |
| Branches per total assets | 0,737 | 0,485 | 0,014 | 38,709 | | | | | |

There is a possible limitation in our estimation which is the proper identification of monetary policy over credit supply. Changes in monetary conditions may impact both loan supply and demand. For example, in the case of a monetary policy tightening, supply may contract

⁹ We obtained this data set from the National Institute of Statistics and Informatics.

because agency costs of banks may increase, but demand may also fall because firm net worth is reduced and the cost of financing is higher. This implies that an analysis based only on macro data or bank-level data may suffer from an omitted-variables problem. In order to overcome this problem, we use detailed credit register data which allows us the proper identification of credit supply and demand shifts. We use firm with multiple banking relationships (MBR) sample because it allow us to have a better control for loan demand shifts in order to properly identify credit supply movements.

5. Empirical Strategy

The empirical specification is based on Jimenez, Ongena, Peydro and Saurina (2012) and Gambacorta and Marques-Ibanez (2011). We study the relationship between bank-specific characteristics (capitalization, liquidity, size, etc) and the supply of credit using three specifications. Based in these specifications, we evaluate (i) the effect of these bank-specific characteristics on the credit supply, (ii) the role of bank-specific characteristics in strengthening or weakening the monetary policy transmission channel, and (iii) the role of these characteristics to shelter banks from a group of global external shocks.

Based in these specifications, we estimate six equations using two samples. The first one is a sample of firms with multiple banking relationships (MBR). These firms have credits in more than one bank in the Peruvian banking system. Also, this sample is matched with associated bank (b) information. The second sample is called the complete sample. It contains all firms that have credit in the banking system. It is matched with associated macroeconomic, bank (b), and firm (f) information.

Relationships between bank-specific characteristics and the growth of supply of credit

The first question to answer is how certain bank-specific characteristics affect the supply of credit. We answer this question using the following equation which is our baseline model:

$$\Delta \log \operatorname{Loan}_{fbt} = \beta X_{bt-1} + \alpha_b + firm * time + \varepsilon_{fbt} \quad (1)$$

The dependent variable $\Delta \log \text{Loan}_{fbt}$ is the change in the logarithm of outstanding loans by bank *b* to firm *f* at time *t*. X_{bt-1} is a vector of bank-specific characteristics; α_b correspond to time invariant bank fixed effects; *firm* * *time* to time variant firm fixed effects; and ε_{fbt} is an error term. We estimate this equations using a sample of firms with multiple banking relationships (MBR).

Additionally, we evaluate how results change when all loans are considered, i.e. we use the complete sample. In this case the equation would be:

$$\Delta \log \operatorname{Loan}_{fbt} = \beta X_{bt-1} + \alpha_{fb} + macro_t + firm_{ft-1} + \varepsilon_{fbt}$$
(2)

Where α_{fb} are bank-firm time-invariant fixed effects and $macro_t$ and $firm_{ft-1}$ are, respectively, time varying macroeconomic and firm controls. Also, we include seasonal dummy controls.

Bank Lending Channel

We evaluate the bank lending channel which is one of the possible transmission channels of monetary policy. Our second question to answer is how monetary shocks affect the supply of credit and to determine the role that bank-specific characteristics play in strengthening or weakening the monetary policy transmission channel. We can extend the model using the following equation: $\Delta \log \operatorname{Loan}_{fbt} = \beta X_{bt-1} + \sum_{j=0}^{1} \delta_j (\Delta i_{t-j} * X_{bt-1}) + \sum_{j=0}^{1} \delta_j (\Delta \operatorname{rr}_{t-j} * X_{bt-1}) + \alpha_b + firm * time + \varepsilon_{fbt}$ (3)

In this specification, Δi_t is the quarterly change in the monetary policy rate and Δrr_t is quarterly change in the reserve requirements rate. Also, we have included the contemporaneous effect of the monetary policy stance plus one lag.

One important aspect is to evaluate the average monetary policy effect on lending supply. When using firm*time fixed effects, the individual term of the monetary policy shock cannot be included. For this purpose, we estimate the following equations using the complete sample, including the individual term of the monetary policy shock as follows:

$$\Delta \log \operatorname{Loan}_{fbt} = \sum_{j=0}^{3} \gamma_j \Delta i_{t-j} + \beta X_{bt-1} + \sum_{j=0}^{3} \delta_j (\Delta i_{t-j} * X_{bt-1}) + \alpha_{fb} + macro_t + firm_{ft-1} + \varepsilon_{fbt}$$
(4)

Impact of Global Factors

Finally, we evaluate the impact that external conditions (global factors) could had on the way that bank-specific characteristics interact with the supply of credit. This means that we assess how the bank-specific characteristics shield banks from a group of global factors/external shocks. The model can be written in the following way:

$$\Delta \log \operatorname{Loan}_{fbt} = \beta X_{bt-1} + \delta_i C * X_{bt-1} + \alpha_b + firm * time + \varepsilon_{fbt}$$
(5)

Where C corresponds to a global variable that characterises external conditions. In particular, we consider five possible sources of shock:

- 1. **Global financial uncertainty:** measured by the VIX index (level or dummy for high volatility period).
- 2. **Global liquidity:** measured by the Wu-Xia shadow rate for the US monetary policy (level or dummy for the ZLB period).
- 3. **Economic political uncertainty:** measured by the Baker, Bloom and Davis index (level or dummy for high level periods).
- 4. **Global commodity price:** measured by a commodity price index (level or dummy for low price periods).
- 5. **Great financial crisis**: dummy that takes the value of 1 in the period 2008:q3 and 2009:q4 and 0 elsewhere.

The figure below reports the evolution of the five global factors.



Source: Wu and Xia (2016), Baker, Bloom and Davis (2016), Bloomberg. Authors' calculations.

6. Results

Relationships between bank-specific characteristics and the growth of credit

The table 2 presents the results of estimations based in the equation 1 which is used to evaluate the effect of certain bank-specific characteristics over the supply of credit. We estimate coefficients and their standard errors for each individual block of bank-specific characteristics (column 1 to 5). Also, we show the result of a regression that includes all variables (column 6). These regressions are based in national currency variables¹⁰.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|--|-----------|---------|-----------|---------|---------|-----------|
| ΔLog (Credit) | Main | Risk | Revenue | Funding | Profit | All |
| Main indicators | | | | | | |
| Total assets Index (t-1) | -0.0002 | | | | | -0.0013 |
| | (0.977) | | | | | (0.895) |
| Capital ratio (t-1) | 0.579 *** | | | | | 0.612 *** |
| | (0.0041) | | | | | (0.006) |
| Liquidity ratio (t-1) | 0.0191 | | | | | 0.0238 * |
| | (0.110) | | | | | (0.090) |
| Risk Profile | | | | | | |
| Loan-loss provisions/total loans (t-1) | | 0.296 | | | | 0.0161 |
| | | (0.503) | | | | (0.975) |
| NPL/ total loans (t-1) | | -0.504 | | | | -0.0050 |
| | | (0.296) | | | | (0.993) |
| Doubtful loans / total loans (t-1) | | 0.204 | | | | -0.129 |
| | | (0.689) | | | | (0.818) |
| Securitization activity (t-1) | | 0.0049 | | | | 0.0069 |
| | | (0.550) | | | | (0.479) |
| Revenue Mix | | | | | | |
| Diversification ratio (t-1) | | | -0.0924 * | | | -0.0308 |
| | | | (0.062) | | | (0.641) |
| Net fees and comission income (t-1) | | | -0.177 * | | | 0.0089 |
| | | | (0.051) | | | (0.945) |
| Share of trading income (t-1) | | | -0.032 | | | -0.0753 |
| | | | (0.792) | | | (0.585) |
| Assets held for trading / total assets (t-1) | | | -0.0804 | | | -0.0858 |
| F " | | | (0.224) | | | (0.322) |
| Funding | | | | 0.0147 | | 0.0002 |
| Deposits / total habilities (t-1) | | | | 0.0147 | | 0.0092 |
| Short torm for ding (t 1) | | | | (0.841) | | (0.912) |
| Short-term funding (t-1) | | | | -0.106 | | -0.107 |
| Even din a in familian assertant ass (t. 1) | | | | (0.120) | | (0.240) |
| Funding in foreign currency (t-1) | | | | -0.0855 | | -0.0882 |
| Funding from foreign courses (t 1) | | | | (0.070) | | (0.090) |
| Funding nonnoteign sources (t-1) | | | | (0.016) | | (0.117) |
| Profitability | | | | (0.010) | | (0.117) |
| Return on equity (t-1) | | | | | -0.0646 | -0.0063 |
| Retuin on equity (i-1) | | | | | -0.00+0 | (0.918) |
| Efficiency ratio (t 1) | | | | | 0.692 | 0.235 |
| Effective (t-1) | | | | | -0.092 | (0.733) |
| Employees per total assets (t-1) | | | | | 0.0685 | -0.0114 |
| Employees per total assets (t 1) | | | | | (0.504) | (0.917) |
| Number of branches per total assets (t-1) | | | | | -1 029 | -0.747 |
| runder of of anenes per total assets ((1) | | | | | (0.490) | (0.643) |
| Number of debtors * t | 41 650 | 41 651 | 41 650 | 41 650 | 41 650 | 41 650 |
| Number of banks | 17 | 17 | 17 | 17 | 17 | 17 |
| Observations | 111 001 | 111.066 | 111.020 | 111.001 | 111.072 | 111.065 |
| Observations | 111 081 | 111 000 | 111 080 | 111 081 | 111 0/5 | 111 005 |
| \mathbf{D}^2 | 0.402 | 0.402 | 0.402 | 0.402 | 0.402 | 0.402 |

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

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

Moreover, the table 3 presents the results of our baseline models which are based on the equation 1 and 2. The column 1 presents the results using the multiple bank relationship sample and it is based on the equation 1. The column 2 presents the result using the complete sample with firms' information, macroeconomic variables and seasonal dummies. This result is based on the

¹⁰ The regression based in foreign currency (dollars) variables will be run in the next presentation.

equation 2. Both estimations include some explanatory variables that are statistically significant and/or belong at least to one block characteristics. Also, all bank-specific characteristics are in lagged terms to avoid endogeneity bias.

| ALog (Credit) | (1) | (2) |
|-------------------------------------|-----------|------------|
| Alog (Creat) | (1) | (2) |
| Main indicators | | |
| Total assets Index (t-1) | 0.0037 | 0.0023 |
| | (0.669) | (0.804) |
| Capital ratio (t-1) | 0.574 *** | 0.461 *** |
| | (0.008) | (0.000) |
| Liquidity ratio (t-1) | 0.022 * | 0.0365 *** |
| | (0.077) | (0.003) |
| Risk Profile | | |
| NPL/ total loans (t-1) | -0.292 * | 0.129 |
| | (0.094) | (0.417) |
| Securitization activity (t-1) | 0.0058 | -0.0062 |
| | (0.520) | (0.676) |
| Revenue Mix | | |
| Diversification ratio (t-1) | -0.0507 | 0.0225 |
| | (0.398) | (0.657) |
| Net fees and comission income (t-1) | 0.0085 | -0.0857 |
| | (0.943) | (0.346) |
| Share of trading income (t-1) | -0.123 | -0.133 |
| | (0.300) | (0.208) |
| Funding | | |
| Funding in foreign currency (t-1) | -0.0838 | -0.0695 |
| | (0.101) | (0.331) |
| Funding from foreign sources (t-1) | 0.171 * | 0.161 * |
| | (0.062) | (0.056) |
| Profitability | | |
| Return on equity (t-1) | 0.0055 | -0.0876 |
| | (0.923) | (0.143) |
| Employees per total assets (t-1) | -0.0642 | 0.016 |
| | (0.346) | (0.844) |
| Firm characteristics | No | Yes |
| Macro controls | No | Yes |
| Seasonal Dummy | No | Yes |
| Bank fixed effects | Yes | No |
| Firm*Time fixed effects | Yes | No |
| Bank-firm fixed effects | No | Yes |
| Sample | MRR | |
| Sumpto | MIDIN | പപ |

Most of the theoretical models would suggest that the effect of bank lending channel standard indicators such as size (total assets index), liquidity ratio (cash and securities over total assets), and bank capital ratio (equity-to-total assets) on supplied lending should be positive. So, this means that big (in terms of assets), well-capitalised, and highly-liquid banks should be grant more credit in normal times (Gambacorta and Marquez-Ibanez, 2011). Our results show that the coefficient of liquidity ratio and capital ratio are positive and statistically significant in all specifications.

Regarding measures of bank risk, the coefficient of NPL (as a share of total loans) has a negative and it is statistically significant in the equation 1. This result is consistent with the

literature on the effects of bank risk on the loan supply (Altunbas, Gambacacorta and Marques-Ibanez (2010)). However, the coefficient of securitization activity (dummy equal to 1 if the bank is active in the securitization market)¹¹ is no significant across specifications. As a result, we believe these results suggest that bank risk has a negative effect on the loan supply.

Regarding the indicators of funding composition, the coefficient of share of funding in foreign currency is negative which is consistent with the core intuition behind the bank lending operations. Also, share of funding from foreign sources is significant across specifications. Moreover, with respect to profitability indicators, the coefficient of the ROE has a positive sign (column 1) and of the number of employees per total assets is negative. However, both coefficients are no statistically significant. Overall, these results mean that more profitable and more efficient banks tend to grant more credit. Finally, the coefficients of diversification ratio (non-interest income to total income) and the share of trading income are negative, consistent with the fact that banks that are engaged in a non-traditional bank business model grant less loans. However, they are no significant.

¹¹ This activity is very small in the Peruvian Banking System.

Bank Lending Channel

Table 4 shows the coefficients and their standard errors of the interaction between bank-specific characteristics and the change in the policy rate. We estimate the interactions between the contemporaneous effect of the monetary policy stance plus one lag and the bank-specific characteristics. The column 1 presents the results of the estimation based on the equation 3 (which uses the sample of firm with multiple bank relationship). The column 2 presents the results from the estimation of the equation 4 (it uses the complete sample). It also includes macroeconomic and firm characteristics variables, and seasonal dummies.

| ΔLog (Credit) | | (1) | (2) |
|---|-----------------|------------|-----------|
| Total assets Index (t-1) * | $\Delta i(t)$ | 0.0197 *** | 0.0082 * |
| | | (0.008) | (0.077) |
| | $\Delta i(t-1)$ | -0.0086 | -0.0028 |
| | | (0.248) | (0.486) |
| Capital ratio (t-1) * | $\Delta i(t)$ | -0.736 | -0.691 |
| | | (0.113) | (0.108) |
| | $\Delta i(t-1)$ | -0.609 | 0.305 |
| | | (0.177) | (0.276) |
| Liquidity ratio (t-1) * | $\Delta i(t)$ | 0.0413 * | 0.053 ** |
| | | (0.067) | (0.017) |
| | $\Delta i(t-1)$ | -0.0153 | -0.0097 |
| | | (0.357) | (0.443) |
| Loan-loss provisions/total loans (t-1)* | $\Delta i(t)$ | 0.168 | -0.322 |
| • | | (0.833) | (0.577) |
| | $\Delta i(t-1)$ | 0.511 | -0.167 |
| | | (0.509) | (0.721) |
| NPL/ total loans $(t-1)^*$ | Δi(t) | 0.127 | 0.308 |
| | | (0.818) | (0.363) |
| | $\Delta i(t-1)$ | -0.239 | -0.656 |
| | () | (0.646) | (0.109) |
| Diversification ratio (t-1) * | Ai(t) | -0.223 ** | -0 193 ** |
| () | (-) | (0.037) | (0.020) |
| | $\Delta i(t-1)$ | 0.174 | -0.042 |
| | | (0.170) | (0.661) |
| Net fees and comission income (t-1) * | Ai(t) | -0.376 ** | -0 197 |
| | | (0.033) | (0.313) |
| | $\Delta i(t-1)$ | 0.223 | 0.202 * |
| | | (0.251) | (0.065) |
| Funding in foreign currency (t-1) * | Ai(t) | 0.155 | 0.135 |
| | | (0.146) | (0.205) |
| | $\Delta i(t-1)$ | -0.121 | 0.0413 |
| | | (0.258) | (0.441) |
| Funding from foreign sources (t-1) * | Ai(t) | -0.0809 | 0.0348 |
| runding nonroleigh sources (r r) | | (0.655) | (0.813) |
| | $\Delta i(t-1)$ | 0.254 | -0.25 * |
| | | (0.160) | (0.057) |
| Return on equity $(t-1)$ * | Ai(t) | 0.051 | (0.057) |
| Retuin on equity (i 1) | $\Delta I(t)$ | -0.031 | (0.242) |
| | $\Delta i(t_1)$ | 0.0621 | (0.242) |
| | $\Delta I(t-1)$ | -0.0021 | (0.222) |
| Employees pertotal assets (t_1) * | Ai(t) | (0.338) | (0.233) |
| Lipioyees per total assets (1-1) | | (0.660) | (0.162) |
| | $A_i(t, 1)$ | (0.000) | (0.102) |
| | $\Delta I(t-1)$ | -0.0432 | -0.0421 |
| | | (0.307) | (0.285) |
| Firm characteristics | | No | Yes |
| Macro controls | | No | Yes |
| Seasonal Dummy | | No | Yes |
| Bank fixed effects | | Yes | No |
| Firm*Time fixed effects | | Yes | No |
| Bank-firm fixed effects | | No | Yes |
| Sample | | MBR | ALL |

Table 4: Interaction between Bank-Specific Characteristics and MP Shocks

The results show that bigger banks (in terms of assets) and higher bank liquidity weaken the monetary policy transmission channel. These findings are consistent with the literature of the bank lending channel (Altunbas et al (2012) and Kishan and Opiela (2000)). However, the counter-intuitive result is negative sign of the coefficients related to interaction with capitalisation ratio, but these coefficients are not statistically significant. Also, we find that banks with riskier loans, measured by the share of non-performing loans, are less able to insulate their loan supply from monetary policy changes (Column 1). This results is consistent with the literature (Altunbas et al (2012)).

Additionally, we find that banks with higher share of non-interest income to total income and higher share of net fees and commission income to operating income are more affected by changes in monetary policy rate (column 1). Regarding the interaction between funding composition indicators and the change in the monetary policy rate, the results show that banks with higher funding in foreign currency over total funding and higher funding from foreign sources over total funding are better insulated against changes in policy rate. Finally, more efficient banks (lower number employees by total assets) are better insulated against changes in the policy rate. The counter-intuitive result is the negative sign of the coefficients of interaction associated to ROE.

As a results, all together, these findings show that strong balance sheets lead to a lower reduction in the loan supply in Peru when there is a monetary policy tightening (an increase in monetary policy rate).

Interaction between Bank-Specific Characteristics and Global Factors

Table 5 presents the results of the interaction between bank-specific characteristics and global factors/conditions. We evaluate whether the impact of external factors or conditions could affect the bank-specific characteristics, and then affect the supply of credit. So, our focus is to determine which characteristics shelter banks from different external shocks.

The first shock that we consider is the global risk, measured by the VIX index. This result is reported in the column (1). We find that bigger (in terms of size) and high-liquidity banks reduce lending less than other banks with similar exposure to this shock. However, the counterintuitive result is negative sign of the coefficient related to interaction with capitalisation ratio, but this coefficients is not statistically significant. Moreover, we find that banks with a higher share of non-interest income to total income and riskier banks (measured by NPL as a share of total loans) are more susceptible to global risk. These coefficients are statistically significant. We find that banks with higher share of net fees and commission income to operating income are less affected by global risk shocks.

The second shock that we consider is the global liquidity shock, measured by the Wu-Xia shadow rate for the US monetary policy (reported in the column 2). We show that there is a counter-intuitive which is the negative sign of the coefficient of interaction between shock and the capitalisation ratio. This means that well-capitalized banks are more affected by global liquidity shocks. The column 3 shows the results related to the economic policy uncertainty shocks, measured by the Baker, Bloom and Davis index. We find that banks with higher level of liquidity, well capitalized, and higher share of trading assets are less affected by this shock.

The last shock that we consider is the commodity price shock which is the most relevant for Peruvian economy. It is important because Peru is an exporter of several commodities, and this is the main driver that enhance the economic activity. The result is reported in the column 4. We find that well-capitalized banks, with higher share of trading assets, and with funding from foreign sources are less affected by this commodity prices shock. Also, we find that banks with riskier loans, measured by the share of non-performing loans, are less able to insulate their loan supply from this commodity price shock. As a results, all together, these findings show that strong balance sheets lead to a lower reduction in the loan supply in Peru when there is this shock.

| | (1) | (2) | (3) | (4) |
|--|---------------------------------|------------------|-------------------------------------|------------------------------|
| ΔLog (Credit) | Global Financial Uncertainty | Global Liquidity | Economic Poltical Uncertainty | Global Commodity price |
| Shock* | | | | |
| Total assets Index (t-1) | 0.0003 | 0.0004 | -0.0000 | -0.0001 |
| | (0.470) | (0.837) | (0.641) | (0.223) |
| Capital ratio (t-1) | -0.0101 | -0.164 ** | 0.0103 ** | 0.0095 * |
| | (0.698) | (0.015) | (0.040) | (0.058) |
| Liquidity ratio (t-1) | 0.0020 | -0.0083 | 0.0004 | 0.0003 |
| | (0.193) | (0.279) | (0.315) | (0.400) |
| Loan-loss provisions/total loans (t-1) | 0.0623 | -0.0019 | -0.011 | -0.0256 ** |
| | (0.295) | (0.991) | (0.394) | (0.024) |
| NPL/ total loans (t-1) | -0.0637 * | 0.0448 | 0.0020 | -0.0096 * |
| | (0.097) | (0.635) | (0.781) | (0.088) |
| Diversification ratio (t-1) | -0.0155 ** | 0.0275 | -0.0023 | 0.0004 |
| | (0.016) | (0.263) | (0.128) | (0.653) |
| Net fees and comission income (t-1) | 0.018 * | -0.0159 | 0.0025 | 0.0002 |
| | (0.095) | (0.636) | (0.152) | (0.876) |
| Funding in foreign currency (t-1) | 0.0136 * | -0.0289 | -0.0011 | -0.0017 |
| | (0.058) | (0.337) | (0.436) | (0.204) |
| Funding from foreign sources (t-1) | -0.0091 | -0.011 | 0.0024 | 0.0051 ** |
| | (0.343) | (0.796) | (0.333) | (0.010) |
| Share of trading income (t-1) | -0.0035 | -0.0301 | 0.0023 ** | 0.0026 ** |
| | (0.369) | (0.127) | (0.039) | (0.017) |
| Employees per total assets (t-1) | 0.0029 | -0.013 | -0.0006 | 0.0013 |
| | (0.490) | (0.443) | (0.560) | (0.188) |
| Number of banks | 18 | 17 | 18 | 18 |
| Number of debtors * t | 41 646 | 41 646 | 41 646 | 41 646 |
| Observations | 111 072 | 111 072 | 111 072 | 111 072 |
| R^2 | 0.403 | 0.402 | 0.402 | 0.403 |

| Table 5: Interaction between Bank-Specific Characteristics and Global F | Factors Shocks |
|---|-----------------------|
|---|-----------------------|

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

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

7. Conclusions

Nowadays it is well known that macroeconomic stability is not a necessary condition to ensure financial stability. The global financial crisis (GFC) in 2008-2009 has been the verification that the macroeconomic stability achieved in previous years due to reduced and stable inflation and to lower economic volatility was not sufficient to preserve financial stability. Also, there is a consensus that in order to preserve financial stability, it is necessary to ensure a stable and strong banking system. These are basic conditions to maintain operative monetary policy channel.

We evaluate the effect of these bank-specific characteristics on the credit supply, the role of bank-specific characteristics in strengthening or weakening the monetary policy transmission channel, and the role of these characteristics to shelter banks from a group of global external shocks. Our results show that well-capitalized, high-liquidity, low-risk, more profitable banks tend to grant more credit. Also, we find bigger banks (in terms of assets) and higher bank liquidity weaken the monetary policy transmission channel. Also, we find that banks with higher share of non-interest income to total income and higher share of net fees and commission income to operating income are more affected by changes in monetary policy rate. As a result, all together, this means that strong balance sheets lead to a lower reduction in the loan supply in Peru when there is a monetary policy tightening.

Finally, we study whether the impact of external factors or conditions could affect the bank-specific characteristics, and then affect the supply of credit. We find that, in general, bank characteristics that build resilience against external shocks are: high capitalisation, low risk, less diversification, low share of funding from foreign sources and a high share of long-term and short-term funding.

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| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--|-----------|---------|------------|---------|----------|-------------|------------|
| ALog (Credit) | Main | Risk | Revenue | Funding | Profit | All | Restricted |
| Main indicators | | | | | | | |
| Total assets Index (t-1) | 0.0068 | | | | | -0.0246 *** | 0.0023 |
| | (0.300) | | | | | (5.21e) | (0.804) |
| Capital ratio (t-1) | 0.577 *** | | | | | 1.027 * | 0.461 *** |
| | (0.000) | | | | | (0.056) | (0.000) |
| Liquidity ratio (t-1) | 0.0278 ** | | | | | 0.016 | 0.0365 *** |
| | (0.011) | | | | | (0.147) | (0.003) |
| Risk Profile | | | | | | | |
| Loan-loss provisions/total loans (t-1) | | 0.0515 | | | | 0.203 | |
| | | (0.934) | | | | (0.759) | 0.120 |
| NPL/ total loans (t-1) | | 0.864 * | | | | 0.444 | 0.129 |
| Developed to the second | | (0.073) | | | | (0.263) | (0.417) |
| Doubtrui ioans / total ioans (t-1) | | -0.002 | | | | -0.377 | |
| Securitization activity (t 1) | | (0.235) | | | | (0.275) | 0.0062 |
| Securitization activity (t-1) | | -0.0057 | | | | -0.0079 | -0.0002 |
| Revenue Mix | | (0.057) | | | | (0.401) | (0.070) |
| Diversification ratio (t-1) | | | 0.0314 | | | 0.108 ** | 0.0225 |
| Diversification failo (t-1) | | | (0.447) | | | (0.030) | (0.657) |
| Net fees and comission income (t-1) | | | -0.0678 | | | 0.0611 | -0.0857 |
| | | | (0.326) | | | (0.280) | (0.346) |
| Share of trading income (t-1) | | | -0.314 *** | | | -0.181 ** | -0.133 |
| () | | | (0.009) | | | (0.019) | (0.208) |
| Assets held for trading / total assets (t-1) | | | 0.17 *** | | | 0.353 *** | (01200) |
| , , , , , , , , , , , , , , , , , , , | | | (0.000) | | | (0.002) | |
| Funding | | | | | | | |
| Deposits / total liabilities (t-1) | | | | -0.0352 | | -0.132 | |
| | | | | (0.740) | | (0.215) | |
| Short-term funding (t-1) | | | | -0.0797 | | -0.31 *** | |
| | | | | (0.373) | | (0.000) | |
| Funding in foreign currency (t-1) | | | | -0.0196 | | -0.0025 | -0.0695 |
| | | | | (0.768) | | (0.976) | (0.331) |
| Funding from foreign sources (t-1) | | | | 0.0537 | | 0.141 | 0.161 * |
| | | | | (0.727) | | (0.104) | (0.056) |
| Profitability | | | | | | | |
| Return on equity (t-1) | | | | | -0.12 ** | -0.0469 | -0.0876 |
| | | | | | (0.024) | (0.618) | (0.143) |
| Efficiency ratio (t-1) | | | | | 0.746 | 0.822 | |
| | | | | | (0.433) | (0.301) | 0.016 |
| Employees per total assets (t-1) | | | | | -0.0086 | 0.0272 | 0.016 |
| Number of here the second state (second state) | | | | | (0.952) | (0.860) | (0.844) |
| Number of branches per total assets (t-1) | | | | | -0.981 | -0.757 | |
| · · · · · · · · · · · · · · · · · · · | | | | | (0.552) | (0.009) | |
| Number of observations | 170 958 | 170 946 | 170 957 | 170 958 | 170 951 | 170 945 | 170 950 |
| R-sq: Within | 0,0030 | 0,0029 | 0,0030 | 0,0030 | 0,0030 | 0,0034 | 0,0031 |
| Between | 0,0002 | 0,0003 | 0,0016 | 0,0008 | 0,0003 | 0,0024 | 0,0010 |
| Overall | 0,0002 | 0,0003 | 0,0000 | 0,0000 | 0,0003 | 0,0000 | 0,0001 |

Table 6: Role of Bank-Specific Characteristics on the Supply of Credit in Peru - Equation 2

Standard errors in parentheses. All regressions include Bank-firm fixed effects. Complete sample

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

| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--|--------------------|-----------------|---------|---------|--------------------|---------|-----------------|------------|
| ΔLog (Credit) | | Main | Risk | Revenue | Funding | Profit | All | Restricted |
| Total assets Index (t-1) * | Δi(t) | 0.0034 | | | | | 0.0366 *** | 0.0197 *** |
| | () | (0.269) | | | | | (0.000) | (0.008) |
| | $\Delta i(t-1)$ | -0.0002 | | | | | -0.0144 | -0.0086 |
| 0.51.5.615* | | (0.941) | | | | | (0.151) | (0.248) |
| Capital ratio (t-1) * | $\Delta i(t)$ | -0.0623 | | | | | -1.169 ** | -0.736 |
| | ∆i(t-1) | -0.552 ** | | | | | -0.655 | -0.609 |
| | | (0.012) | | | | | (0.198) | (0.177) |
| Liquidity ratio (t-1) * | $\Delta i(t)$ | 0.043 ** | | | | | 0.0023 | 0.0413 * |
| | 4:4 1) | (0.030) | | | | | (0.944) | (0.067) |
| | Δi(t-1) | -0.0177 (0.258) | | | | | -0.0298 (0.192) | -0.0155 |
| Loan-loss provisions/total loans (t-1) * | Δi(t) | (01200) | -0.828 | | | | -1.748 | 0.168 |
| | | | (0.256) | | | | (0.191) | (0.833) |
| | $\Delta i(t-1)$ | | 0.611 | | | | 0.944 | 0.511 |
| NPI / total loans (t 1) * | Ai(t) | | (0.321) | | | | (0.456) | (0.509) |
| NIL/ total loans (I-I) | Δi(t) | | (0.415) | | | | (0.674) | (0.818) |
| | ∆i(t-1) | | 1.351 | | | | -0.751 | -0.239 |
| | | | (0.114) | | | | (0.534) | (0.646) |
| Doubtful loans / total loans (t-1)* | $\Delta i(t)$ | | 0.826 | | | | 0.543 | |
| | Ai(t-1) | | (0.417) | | | | 0.118 | |
| | -() | | (0.072) | | | | (0.931) | |
| Securitization activity (t-1) * | $\Delta i(t)$ | | -0.0142 | | | | 0.0028 | |
| | | | (0.141) | | | | (0.871) | |
| | $\Delta i(t-1)$ | | 0.0099 | | | | -0.037 ** | |
| Diversification ratio (t-1)* | Δi(t) | | (0.510) | -0.0328 | | | -0.231 | -0.223 ** |
| | | | | (0.709) | | | (0.102) | (0.037) |
| | $\Delta i(t-1)$ | | | 0.0908 | | | 0.26 * | 0.174 |
| | | | | (0.285) | | | (0.076) | (0.170) |
| Net fees and comission income (t-1) * | $\Delta i(t)$ | | | -0.162 | | | -0.332 | -0.376 ** |
| | ∆i(t-1) | | | 0.117 | | | 0.579 ** | 0.223 |
| | | | | (0.307) | | | (0.014) | (0.251) |
| Share of trading income (t-1) * | $\Delta i(t)$ | | | -0.0789 | | | -0.539 *** | |
| | A;(t 1) | | | (0.506) | | | (0.004) | |
| | Zi(t-1) | | | (0.639) | | | (0.097) | |
| Assets held for trading / tot assets (t-1) * | [∗] ∆i(t) | | | 0.171 | | | 0.0408 | |
| | | | | (0.153) | | | (0.826) | |
| | $\Delta i(t-1)$ | | | -0.0183 | | | 0.35 * | |
| Deposits / total liabilities (t-1) * | Ai(t) | | | (0.892) | -0.353 *** | | -0.392 ** | |
| | (-) | | | | (0.001) | | (0.026) | |
| | $\Delta i(t-1)$ | | | | 0.29 ** | | 0.455 ** | |
| 01 · · · · · · · · · · · · · · · · · · · | | | | | (0.027) | | (0.013) | |
| Short-term funding (t-1) * | $\Delta i(t)$ | | | | -0.0534 (0.452) | | -0.0276 | |
| | ∆i(t-1) | | | | 0.0754 | | -0.211 | |
| | | | | | (0.311) | | (0.248) | |
| Funding in foreign currency (t-1) * | $\Delta i(t)$ | | | | -0.0782 | | 0.174 | 0.155 |
| | A;(t 1) | | | | (0.274) | | (0.152) | (0.146) |
| | Zi(t-1) | | | | (0.244) | | (0.072) | (0.258) |
| Funding from foreign sources (t-1) * | $\Delta i(t)$ | | | | -0.112 | | -0.423 | -0.0809 |
| | | | | | (0.445) | | (0.105) | (0.655) |
| | $\Delta i(t-1)$ | | | | 0.0575 | | 0.654 *** | 0.254 |
| Return on equity (t-1) * | Δi(t) | | | | (0.073) | 0.0057 | -0.0595 | -0.051 |
| | () | | | | | (0.879) | (0.480) | (0.423) |
| | $\Delta i(t-1)$ | | | | | 0.0271 | -0.0275 | -0.0621 |
| Efficiency and (1) * | 4:(4) | | | | | (0.482) | (0.788) | (0.358) |
| Efficiency ratio (t-1) * | Δ(t) | | | | | -0.545 | (0.070) | |
| | ∆i(t-1) | | | | | 0.215 | -0.248 | |
| | | | | | | (0.763) | (0.869) | |
| Employees per total assets (t-1)* | $\Delta i(t)$ | | | | | 0.0156 | -0.193 | 0.0262 |
| | Ai(t-1) | | | | | (0.855) | (0.273) | (0.660) |
| | | | | | | (0.406) | (0.790) | (0.507) |
| Number of branches per total assets | (t∆i(t) | | | | | 0.724 | 1.78 | |
| | | | | | | (0.459) | (0.311) | |
| | ∆i(t-1) | | | | | 0.0589 | 1.213 | |
| Number of debtors ** | | 41 470 | 41 470 | 41 470 | 41.470 | 41 470 | 41 470 | 41 470 |
| Number of banks | | 18 | -1 -1 0 | 18 | 18 | 18 | 18 | 18 |
| Observations | | 110 611 | 110 596 | 110 610 | 110 611 | 110 603 | 110 595 | 110 602 |
| <u>R²</u> | | 0.402 | 0.402 | 0.402 | 0.402 | 0.402 | 0.403 | 0.403 |

Table 7: Interaction between Bank-Specific Characteristics and MP Shocks - Equation 3

Standard errors in parentheses. All regressions include bank and firm*time fixed effects. ***p<0.01, ** p<0.05, * p<0.1

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--|-----------|---------|------------|---------|-----------|------------|------------|
| ΔLog (Credit) | Main | Risk | Revenue | Funding | Profit | All | Restricted |
| Main indicators | | | | | | | |
| Total assets Index (t-1) | 0.0054 | | | | | -0.0175 ** | -0.0020 |
| | (0.422) | | | | | (0.015) | (0.824) |
| Capital ratio (t-1) | 0.557 *** | | | | | 0.846 *** | 0.484 *** |
| | (0.000) | | | | | (0.000) | (0.001) |
| Liquidity ratio (t-1) | 0.026 ** | | | | | 0.0259 *** | 0.0352 *** |
| | (0.011) | | | | | (5.30e) | (9.36e) |
| Risk Profile | | | | | | | |
| Loan-loss provisions/total loans (t-1) | | 0.0988 | | | | 0.326 | -0.0322 |
| | | (0.884) | | | | (0.635) | (0.956) |
| NPL/ total loans (t-1) | | 0.823 * | | | | 1.434 *** | 0.209 |
| | | (0.087) | | | | (0.004) | (0.175) |
| Doubtful loans / total loans (t-1) | | -0.639 | | | | -1.356 *** | |
| | | (0.269) | | | | (0.006) | |
| Securitization activity (t-1) | | -0.0049 | | | | 0.0023 | |
| | | (0,608) | | | | (0.818) | |
| Revenue Mix | | (, | | | | (| |
| Diversification ratio (t-1) | | | 0.0193 | | | 0.0529 | 0.0331 |
| | | | (0.604) | | | (0.401) | (0.559) |
| Net fees and comission income (t-1) | | | -0.0827 | | | 0.0578 | -0.0131 |
| | | | (0.304) | | | (0.589) | (0.883) |
| Share of trading income (t-1) | | | -0.346 *** | | | -0.378 *** | |
| | | | (0.002) | | | (0.002) | |
| Assets held for trading / tot assets (t-1) | | | 0.161 *** | | | 0.118 *** | |
| | | | (0.001) | | | (0.002) | |
| Funding | | | (, | | | (, | |
| Deposits / total liabilities (t-1) | | | | -0.0508 | | -0.147 | |
| • | | | | (0.587) | | (0.133) | |
| Short-term funding (t-1) | | | | -0.11 | | -0.309 ** | |
| | | | | (0.166) | | (0.022) | |
| Funding in foreign currency (t-1) | | | | -0.046 | | -0.119 | -0.0768 |
| | | | | (0.485) | | (0.133) | (0.285) |
| Funding from foreign sources (t-1) | | | | 0.102 | | 0.182 | 0.213 ** |
| | | | | (0.415) | | (0.189) | (0.011) |
| Profitability | | | | | | | |
| Return on equity (t-1) | | | | | -0.117 ** | -0.0114 | -0.0861 |
| | | | | | (0.029) | (0.887) | (0.237) |
| Efficiency ratio (t-1) | | | | | 0.737 | 0.468 | |
| | | | | | (0.448) | (0.557) | |
| Employees per total assets (t-1) | | | | | -0.0169 | 0.083 | 0.0263 |
| | | | | | (0.916) | (0.529) | (0.765) |
| # of branches per tot assets (t-1) | | | | | -1.181 | -2.737 * | |
| | | | | | (0.462) | (0.080) | |

| Table 8: Interaction between Bank-Specific Characteristics and MP Shocks - Equation 4 |
|---|
|---|

| AL (Cu-#4) | | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--|-----------------|--------------------|-------------------|--------------------|--------------------|--------------------|------------------------|----------------------|
| ALog (Credit) | | Main | Risk | Revenue | Funding | Profit | All | Restricted |
| Total assets Index (t-1) * | $\Delta i(t)$ | -0.0000 | | | | | 0.0296 *** | 0.0082 * |
| | ∆i(t-1) | (0.985) 0.0002 | | | | | (1.77e) 0.0001 | (0.077) -0.0028 |
| | A:(4) | (0.839) | | | | | (0.986) | (0.486) |
| Capital ratio (t-1) * | Δι(ι) | -0.138 (0.589) | | | | | (0.000) | (0.108) |
| | $\Delta i(t-1)$ | -0.205 (0.161) | | | | | 0.233 | 0.305 |
| Liquidity ratio (t-1) * | $\Delta i(t)$ | 0.0401 ** | | | | | 0.0439 | 0.053 ** |
| | ∆i(t-1) | (0.011) -0.0094 | | | | | (0.375) -0.0344 *** | (0.017) -0.0097 |
| | | (0.427) | 0.105 | | | | (0.008) | (0.443) |
| Loan-loss provisions/tot loans (t-1)* | $\Delta i(t)$ | | -0.495 (0.356) | | | | -1.655 (0.110) | -0.322 (0.577) |
| | $\Delta i(t-1)$ | | 0.303 | | | | 0.0996 | -0.167 |
| NPL/ total loans (t-1) * | $\Delta i(t)$ | | -0.928 | | | | -1.856 * | 0.308 |
| | Ai(t-1) | | (0.247) 0.825 | | | | (0.055) 0.204 | (0.363) -0.656 |
| | | | (0.346) | | | | (0.800) | (0.109) |
| Doubtful loans / total loans (t-1) * | $\Delta i(t)$ | | 0.898 (0.196) | | | | 2.64 ** (0.038) | |
| | $\Delta i(t-1)$ | | -1.136 | | | | -1.513 * | |
| Securitization activity (t-1) * | $\Delta i(t)$ | | -0.0143 | | | | -0.0319 ** | |
| | Ai(t-1) | | (0.103) | | | | (0.018) -0.0057 | |
| | <u></u> | | (0.631) | | | | (0.396) | |
| Diversification ratio (t-1) * | $\Delta i(t)$ | | | -0.0625 (0.402) | | | -0.326 *** (0.000) | -0.193 ** (0.020) |
| | $\Delta i(t-1)$ | | | 0.0007 | | | -0.0851 | -0.042 |
| Net fees and comission income (t-1) * | $\Delta i(t)$ | | | -0.0849 | | | 0.0082 | -0.197 |
| | Ai(t-1) | | | (0.631) 0.0875 | | | (0.947) 0.227 * | (0.313) 0.202 * |
| | -() | | | (0.348) | | | (0.081) | (0.065) |
| Share of trading income (t-1)* | $\Delta i(t)$ | | | -0.0236 (0.825) | | | -0.0823 (0.218) | |
| | $\Delta i(t-1)$ | | | -0.0521 | | | 0.053 | |
| Assets held for trading / tot assets (t-1) |)* ∆i(t) | | | 0.0283 | | | -0.021 | |
| | Δi(t-1) | | | (0.579) 0.148 | | | (0.890) 0.308 ** | |
| | | | | (0.131) | 0 101 | | (0.018) | |
| Deposits / total liabilities (t-1) * | Δi(t) | | | | -0.101 (0.326) | | (0.700) | |
| | $\Delta i(t-1)$ | | | | 0.19 *** | | 0.0969 | |
| Short-term funding (t-1) * | $\Delta i(t)$ | | | | -0.117 * | | -0.0326 | |
| | ∆i(t-1) | | | | (0.073) 0.059 | | (0.790) -0.078 | |
| | A:(4) | | | | (0.127) | | (0.442) | 0.125 |
| Funding in foreign currency (I-1) * | Δι(ι) | | | | (0.819) | | (0.093) | (0.205) |
| | $\Delta i(t-1)$ | | | | 0.0801 | | -0.0599 (0.218) | 0.0413 |
| Funding from foreign sources (t-1) * | $\Delta i(t)$ | | | | 0.0514 | | 0.134 | 0.0348 |
| | $\Delta i(t-1)$ | | | | (0.617) -0.0963 | | (0.448) -0.245 *** | (0.813) -0.25 * |
| Potum on aquity (t 1) * | A;(+) | | | | (0.323) | 0.0036 | (0.005) | (0.057) |
| Return on equity (t-1) * | Δ I (t) | | | | | (0.911) | (0.043) | (0.242) |
| | ∆i(t-1) | | | | | 0.019 (0.447) | 0.0661 (0.279) | 0.0397 (0.233) |
| Efficiency ratio (t-1) * | $\Delta i(t)$ | | | | | 0.173 | 2.374 *** | |
| | ∆i(t-1) | | | | | 0.321 | (0.006) 1.644 | |
| Employees per total assets (t_1)* | Ai(f) | | | | | (0.527) -0.0518 | (0.164) -0.254 ** | 0.0485 |
| inprojeco per total assets (t-1). | | | | | | (0.388) | (0.017) | (0.162) |
| | ∆i(t-1) | | | | | -0.0436 (0.432) | -0.231 * (0.087) | -0.0421 (0.283) |
| # of branches per total assets $(t-1) *$ | $\Delta i(t)$ | | | | | 1.26 ** | 1.646 | , |
| | $\Delta i(t-1)$ | | | | | -0.284 | 1.602 * | |
| Number of groups | | 10.212 | 10.210 | 10.010 | 10.210 | (0.559) | (0.057) | 10.210 |
| Number of banks | | 12 512 | 12 312 | 12 312 | 12 312 | 12 312 | 12 312 | 12 312 |
| Observations R sq Overall | | 170 714 | 170 702 | 170 713 | 170 714 | 170 707 | 170 701 | 170 706 |

Standard errors in parentheses. All regressions include Bank-firm fixed effects. Complete sample ***p<0.01, ** p<0.05, * p<0.1

| | (1) | (2) | (3) | (4) | (5) |
|--|------------------|------------------|-------------|------------|-----------------|
| | (-) | (-) | Economia | Clabal | (0) |
| ΔLog (Credit) | Global Financial | Clobal Liquidity | Delticel | Giobal | Great Financial |
| | Uncertainty | Giobal Liquidity | Folical | Drico | Crisis |
| | | | Uncertainty | TIKE | |
| Main indicators | | | | | |
| Total assets Index (t-1) | -0.0017 | 0.0019 | 0.0072 | 0.0037 | 0.0063 |
| | (0.855) | (0.851) | (0.412) | (0.699) | (0.526) |
| Capital ratio (t-1) | 0.52 ** | 0.291 | 0.593 ** | 0.652 *** | 0.588 ** |
| · · · · · · · · · | (0.027) | (0.244) | (0.011) | (0.004) | (0.016) |
| Liquidity ratio (t-1) | 0.0203 | 0.0096 | 0.0206 | 0.0298 ** | 0.0237 * |
| D' I D (1 | (0.113) | (0.657) | (0.103) | (0.025) | (0.067) |
| RISK Profile | 0.0001 | 0.520 | 0.255 | 0.11 | 0.26 |
| Loan-loss provisions/total loans (t-1) | 0.0001 | 0.529 | 0.255 | -0.11 | 0.26 |
| NDL / total loans (t 1) | (1.000) | (0.367) | (0.598) | (0.837) | (0.602) |
| NPL/ total loans (t-1) | -0.199 | -0.187 | -0.230 | -0.185 | -0.211 |
| Poronuo Miy | (0.232) | (0.528) | (0.154) | (0.508) | (0.229) |
| Diversification ratio (t 1) | 0.0191 | 0.0393 | 0.0499 | 0.046 | 0.0497 |
| Diversification fatto (t-1) | -0.0191 | (0.694) | -0.0499 | -0.040 | -0.0497 |
| Net fees and comission income (t 1) | 0.0104 | (0.094) | 0.0022 | (0.491) | 0.0198 |
| Net lees and comission income (t-1) | (0.034) | -0.0027 | -0.0022 | -0.0380 | -0.0198 |
| Funding | (0.954) | (0.055) | (0.987) | (0.047) | (0.874) |
| Funding in foreign currency (t-1) | -0.0884 | -0.136 | -0.0579 | -0.0733 | -0.0822 |
| r analig in totolgi cantolog (c 1) | (0.108) | (0.107) | (0.350) | (0.189) | (0.137) |
| Funding from foreign sources (t-1) | 0.185 | 0.0585 | 0.149 | 0.185 * | 0.146 |
| r andning nonmorolign sources (c r) | (0.055) | (0.657) | (0.132) | (0.069) | (0.136) |
| Profitability | () | (| | (, | () |
| Return on equity (t-1) | -0.0081 | -0.0571 | 0.014 | 0.01 | 0.0574 |
| | (0.900) | (0.358) | (0.815) | (0.879) | (0.408) |
| Employees per total assets (t-1) | -0.108 | -0.0501 | -0.0668 | -0.0636 | -0.0685 |
| | (0.137) | (0.497) | (0.341) | (0.371) | (0.364) |
| | | | | | |
| Shock* | 0.0001 | 0.0010 | 0.0000 | 0.0005 | 0.0010 |
| Total assets Index(t-1) | -0.0001 | 0.0018 | -0.0082 | 0.0037 | -0.0018 |
| | (0.991) | (0.793) | (0.293) | (0.583) | (0.882) |
| Capital ratio (t-1) | 0.569 | 1.224 *** | 0.241 | 0.652 | 0.313 |
| | (0.311) | (0.002) | (0.634) | (0.154) | (0.605) |
| Liquidity ratio (t-1) | 0.051 | 0.0211 | 0.0606 | -0.0537 ** | -0.0347 |
| | (0.144) | (0.381) | (0.144) | (0.046) | (0.435) |
| Loan-loss provisions/total loans (t-1) | 1.56 | -1.292 | -0.731 | 0.898 | -0.155 |
| | (0.188) | (0.188) | (0.626) | (0.376) | (0.920) |
| NPL/ total loans (t-1) | -0.656 | -0.335 | 0.637 | 0.113 | -0.457 |
| | (0.454) | (0.663) | (0.579) | (0.875) | (0.675) |
| Diversification ratio (t-1) | -0.202 | -0.121 | -0.0758 | -0.0307 | -0.155 |
| | (0.195) | (0.208) | (0.610) | (0.695) | (0.528) |
| Net fees and comission income (t-1) | 0.315 | 0.0986 | -0.0524 | 0.0965 | 0.357 |
| | (0.142) | (0.500) | (0.741) | (0.603) | (0.240) |
| Funding in foreign currency (t-1) | 0.0396 | 0.0434 | -0.0364 | 0.0252 | 0.0326 |
| | (0.760) | (0.653) | (0.773) | (0.831) | (0.855) |
| Funding from foreign sources (t-1) | -0.0273 | 0.176 | 0.404 * | -0.19 | 0.144 |
| | (0.909) | (0.308) | (0.064) | (0.323) | (0.547) |
| Share of trading income (t-1) | 0.0655 | 0.195 ** | 0.0714 | -0.0161 | -0.0136 |
| | (0.430) | (0.018) | (0.478) | (0.852) | (0.877) |
| Employees per total assets (t-1) | 0.0068 | 0.0119 | 0,0009 | -0.0954 | -0.0335 |
| | (0.937) | (0.887) | (0.992) | (0.213) | (0.738) |
| XY 1 6114 w | (0.001) | (0.007) | (0.572) | (0.213) | (0.750) |
| Number of debtors * t | 41 647 | 41 647 | 41 647 | 41 647 | 41 647 |
| Number of banks | 18 | 18 | 18 | 18 | 18 |
| Observations | 111 072 | 111 072 | 111 072 | 111 072 | 111 072 |
| R^2 | 0.403 | 0.403 | 0.402 | 0.402 | 0.402 |

Table 9: Interaction between Bank-Specific Characteristics and Global Factors - Dummy variables

Standard errors in parentheses. All regressions include bank and firm*time fixed effects. ***p<0.01, ** p<0.05, * p<0.1

| | (1) | (2) | (2) | (4) |
|--|--------------------|------------------|-------------|------------|
| | (1) | (2) | (3) | (4) |
| | | | Economic | Global |
| ALog (Credit) | Global Financia | Global Liquidity | Poltical | Commodity |
| | Uncertainty | Global Elquialty | Uncertainty | nrice |
| | | | Cheertunity | price |
| Main indicators | | | | |
| Total assets Index (t-1) | -0.0166 | 0.0031 | 0.0078 | 0.0226 |
| | (0.182) | (0.760) | (0.608) | (0.145) |
| Capital ratio (t-1) | 0.793 | 0.953 *** | -0.348 | -0.632 |
| | (0.129) | (0.000) | (0.515) | (0.402) |
| Liquidity ratio (t-1) | -0.0149 | 0.0127 | -0.0289 | -0.0326 |
| | (0.647) | (0.382) | (0.582) | (0.625) |
| Risk Profile | | | | |
| Loan-loss provisions/total loans (t-1) | -0.86 | -0.143 | 1.242 | 3.795 ** |
| L C C C | (0.446) | (0.807) | (0.334) | (0.014) |
| NPL/total loans (t-1) | 0.834 | -0.196 | -0.458 | 0.625 |
| | (0.188) | (0.506) | (0.462) | (0.326) |
| Revenue Mix | | · / | | · · · |
| Diversification ratio (t-1) | 0.223 | -0.0237 | 0.221 | -0.155 |
| | (0.079) | (0.753) | (0.253) | (0.406) |
| Net fees and comission income (t-1) | -0.262 | 0.0104 | -0.293 | -0.0922 |
| | (0.241) | (0.934) | (0.222) | (0.743) |
| Funding | (**= **) | (0.50.1) | (0) | (011.10) |
| Funding in foreign currency (t-1) | -0.325 | -0 117 ** | 0.0696 | 0.215 |
| r unung in fotoign cuttoney (t 1) | (0.026) | (0.035) | (0.704) | (0.361) |
| Funding from foreign sources (t-1) | 0.338 | 0.147 | -0.0979 | -0.661 ** |
| i unung nonnoleign sources (t 1) | (0,099) | (0.134) | (0.735) | (0.043) |
| Profitability | (0.077) | (0.154) | (0.755) | (0.045) |
| Peturn on equity (t 1) | 0.0860 | 0.0441 | 0.246 * | 0.363 ** |
| Retuin on equity (t-1) | (0.422) | (0.455) | -0.240 | -0.303 |
| Employance particul assots (t 1) | (0.432) | (0.455) | (0.079) | (0.033) |
| Employees per total assets (t-1) | -0.140 | -0.055 | 0.0087 | -0.247 |
| | (0.197) | (0.048) | (0.944) | (0.111) |
| Shock* | | | | |
| Total assets Index (t-1) | 0.0003 | 0.0004 | -0.0000 | -0.0001 |
| | (0.470) | (0.837) | (0.641) | (0.223) |
| Capital ratio (t-1) | -0.0101 | -0.164 ** | 0.0103 ** | 0.0095 * |
| | (0.698) | (0.015) | (0.040) | (0.058) |
| Liquidity ratio (t-1) | 0.0020 | -0.0083 | 0.0004 | 0.0003 |
| • • · · · | (0.193) | (0.279) | (0.315) | (0.400) |
| Loan-loss provisions/total loans (t-1) | 0.0623 | -0.0019 | -0.011 | -0.0256 ** |
| L Contraction of the second seco | (0.295) | (0.991) | (0.394) | (0.024) |
| NPL/ total loans (t-1) | -0.0637 * | 0.0448 | 0.0020 | -0.0096 * |
| | (0.097) | (0.635) | (0.781) | (0.088) |
| Diversification ratio (t-1) | -0.0155 ** | 0.0275 | -0.0023 | 0.0004 |
| | (0.016) | (0.263) | (0.128) | (0.653) |
| Net fees and comission income (t-1) | 0.018 * | -0.0159 | 0.0025 | 0.0002 |
| | (0.095) | (0.636) | (0.152) | (0.876) |
| Funding in foreign currency (t-1) | 0.0136 * | -0.0289 | -0.0011 | -0.0017 |
| | (0.058) | (0.337) | (0.436) | (0.204) |
| Funding from foreign sources (t-1) | -0.0091 | -0.011 | 0.0024 | 0.0051 ** |
| | (0.343) | (0.796) | (0.333) | (0.010) |
| Share of trading income (t-1) | _0 0035 | _0.0301 | 0.0023 ** | 0.0026 ** |
| | -0.0055 | (0 127) | (0 030) | (0.017) |
| Employees pertotal assets (t-1) | 0.009 | _0.013 | -0.0006 | 0.017 |
| Lampioyees per total assets (t-1) | (0.400) | -0.015 | -0.0000 | (0.188) |
| | (0.490) | (0.++3) | (0.500) | (0.100) |
| Number of banks | 18 | 17 | 18 | 18 |
| Number of debtors * t | 41 646 | 41 646 | 41 646 | 41 646 |
| Observations | 111 072 | 111 072 | 111 072 | 111 072 |
| \mathbf{p}^2 | 0.403 | 0.402 | 0.402 | 0.403 |

Table 10: Interaction between Bank-Specific Characteristics and Global Factors - Level variables

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

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