Evaluating the Impact of Macroprudential Policies in Colombia

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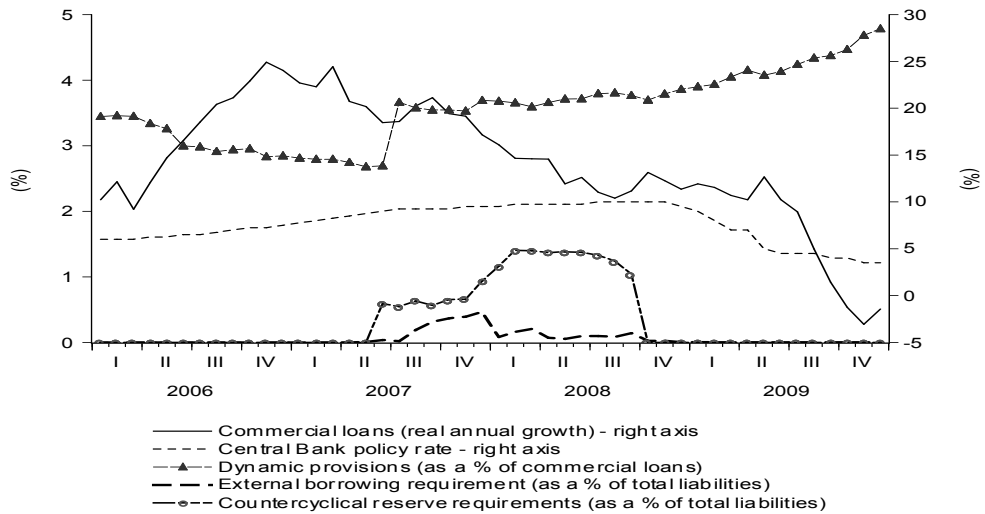
Introduction and Motivation

- During 2006-2009 Colombia's economy presented certain imbalances:
  i. Excessive capital inflows → current account deficit rose from 1.8% to 3.6% of GDP between the second half of 2006 and the first half of 2007.
  ii. High credit growth → real credit growth went from 11.8% in December 2005 to 27.3% twelve months later.
  iii. Robust housing price dynamics.
- In response the Central Bank increased the intervention rate gradually (400 bps between April 2006 and July 2008)...
- ...but transmission was sluggish and there was a limited reaction of credit dynamics.
- In this context, a marginal reserve requirement was implemented → attenuate high loan growth and leverage of private agents.
- In addition, to prevent possible arbitrages and to limit substitution from local to external borrowing, a reserve requirement for short-term external borrowing was reactivated → simultaneously, the Ministry of Finance established a deposit on FX portfolio flows and, a year later, a minimum holding period for FDI was imposed.
- Finally, the Financial Superintendency designed a new system of countercyclical provisions.

Introduction and Motivation

- The conjunction of this policies seems to have been effective...
- ...giving the Central Bank enough space for acting in a countercyclical fashion when the external shock hit in 2008.

Figure: Credit Dynamics, Macroprudential Policies and Central Bank Policy Rate



Source: Superintendencia Financiera de Colombia and Banco de la República; authors' calculations.

Introduction and Motivation

- Though this would point to the effectiveness of the MPP tools in place, it is difficult to discern between the individual impact of each as well as to isolate these from the effects of the global financial crisis.
- Bottom-line: little is known about the real impact of these tools on the supply of credit and on banks' risk-taking.
- Yet, the experience of Colombia in the 2006-2009 period is especially rich and unexplored $\rightarrow$ simultaneous use of tools for increasing resilience and containing build-up of risks.

i. Dynamic provisions

ii. Countercyclical reserve requirements

iii. External borrowing requirement

Related Literature

- There is not a wide literature about the effectiveness of macroprudential policies and their interaction with monetary policy using microdata.
  - Macroprudential policy toolkit is comprised of a variety of tools and targets various objectives, which are difficult to disentangle in practice: this analysis should take in consideration the time and cross-sectional dimensions of systemic risk.
  - Cumulative experience and information required for performing proper evaluations is not particularly rich.
- The state-of-the-art in the evaluation of the impact of macroprudential policies on diverse economic variables of interest can be differentiated depending on the information used:
  I. Aggregate information at the country level (most of the papers in the literature).
  II. Bank level data.
  III. Information at the bank-debtor relationship level or credit registry data.

Related Literature

I. Aggregate country level data

- Bakker et al. (2012): macroprudential policies can reduce the impact of a bust, diminishing the impact on the real economy.
- Bruno et al. (2015), Cerutti et al. (2015) and Akinci & Olmstead-Rumsey (2015): tightening is associated with lower bank credit growth and housing prices.
  * Bruno et al. (2015): macroprudential policies are more successful when they complement monetary policy by reinforcing monetary tightening, than when they act in opposite directions.
  * Cerutti et al. (2015): the effects appear to be smaller in more financially developed and open economies.
- Tovar et al. (2012) and Agénor & da Silva (2016): reserve requirements had transitory effects on credit growth and played a complementary role to monetary policy.
- Vargas et al. (2010): in Colombia, reserve requirements are important long-run determinants of business loan interest rates and have been effective in strengthening the pass-through from policy to deposit and lending interest rates.

Related Literature

II. Bank-level data

- Claessens et al. (2013): DTI and LTV ratios seem to be comparatively more effective than capital requirements as tools for containing credit growth. Limits on foreign currency lending are effective in reducing bank leverage during booms.
- Wang & Sun (2013): reserve requirements and housing related policies in China can be useful to reduce procyclicality, but are not enough to reduce systemic risks.
- Aiyar et al. (2014): generation of spill-over effects $\rightarrow$ banks tend to reduce lending when capital ratios increase, but non-UK regulated banks (resident foreign branches) increased lending in response to tighter capital requirements on regulated banks.

IIII. Bank-debtor relationship level data or credit registry data

- Jiménez et al. (2012): countercyclical provisions in Spain were successful in reducing the effects of a credit crunch, but they were not as successful in curbing the pre-crisis credit boom.
- López et al. (2014): countercyclical provisions in Colombia effectively helped reduce the amplitude of credit cycles.
- Dassatti & Peydró (2014): reserve requirements for foreign deposits in Uruguay reduced credit supply, more affected banks increased their exposure to riskier firms and larger banks were less affected by this regulation.

Data

- Quarterly dataset containing microdata on the loan-by-loan operations of firms in the commercial portfolio of banking institutions between 2006Q1 and 2009Q4.
  - Commercial loans averaged 61.3% of total loans in the financial system.
  - Firm's commercial loans with banks represented roughly 72% of the total commercial portfolio.
- Time horizon: the year prior to the adoption of the macroprudential policies to be evaluated as well as the year following their elimination (countercyclical reserve and external borrowing requirements) or last modification (dynamic provisions).

General characteristics of the firms-only sample

Total Observations	1,953,520
Banks	22
Debtors	152,862
Bank-debtor relations	272,306

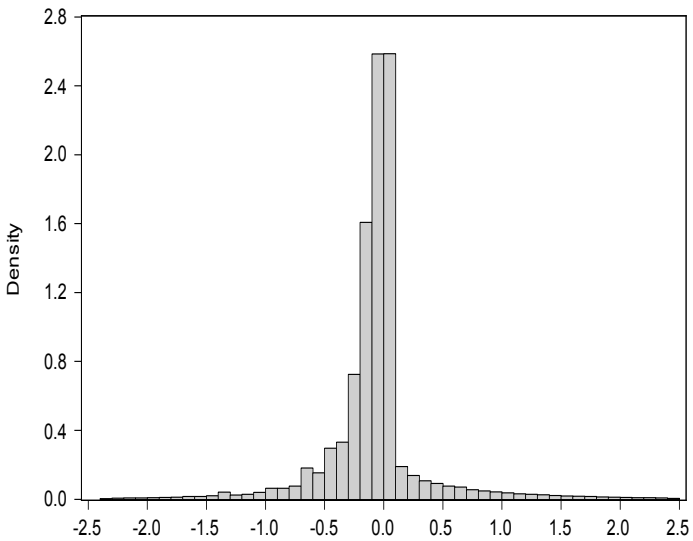
Source: Superintendencia Financiera de Colombia; authors' calculations.

Data

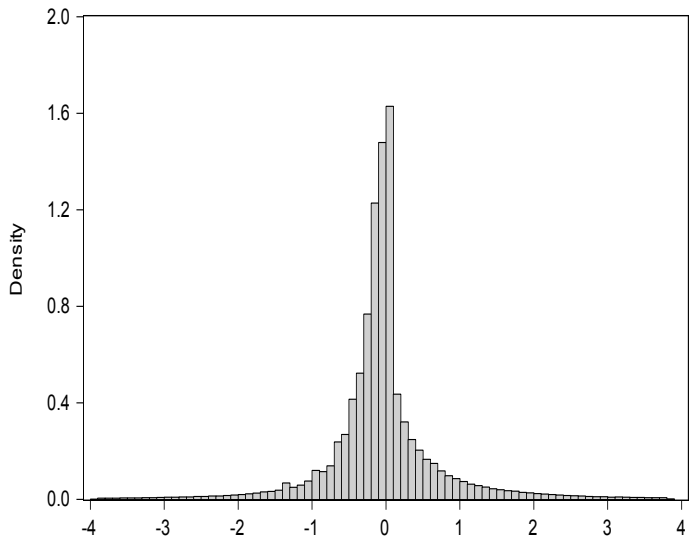
- Dataset incorporates those debtors that have loans in at least two consecutive quarters: a loan for a new bank-debtor relationship would be considered after two consecutive quarters.
- Focus on firms' commercial loans → reduce data bias: intuitively have more stable and long-lasting banking relationships than individuals.

Credit growth, by sample - 2006Q1 - 2009Q4

A. Complete sample (individuals and firms)



B. Firms



Source: Financial Superintendence; authors' calculations

Data

- Close to 44% of the outstanding debt amount corresponded to short term loans.
- Loans of a larger amount have lower levels of risk materialization and of collateralization.

	Debt amount	**# relationships**
Maturity $<$ 1 year	44.3%	33.67%
Non-Performing loans	2.11%	10.73%
Collateralized loans	27.17%	28.35%

Source: Superintendencia Financiera de Colombia; authors' calculations.

- The mean amount of loans granted in the sample reached USD197,463 with a median time-to maturity of 1.42 years and an annual interest rate of 21%.

Measure	**Debt amount (USD)**	**Loan rate (%)**	**Maturity (years)**
Central tendency	197,463.25	20.95	1.42
Dispersion	1,648,786	5.56	1.04

Source: Superintendencia Financiera de Colombia; authors' calculations.

Methodology

- To estimate the effects of the macroprudential tools on lending and bank riskiness a loan-by-loan database is employed.
- To perform the estimations distinct types of control variables are used: Macroeconomic indicators, banks financial ratios, and bank-debtor relationship characteristics.
- Different equations are estimated to check whether the macroprudential tools' effect on lending varies depending on different conditions, such as the business or financial cycle, the monetary policy stance and banks' and firms' riskiness.
- To perform the estimations a panel methodology using fixed effects is employed.

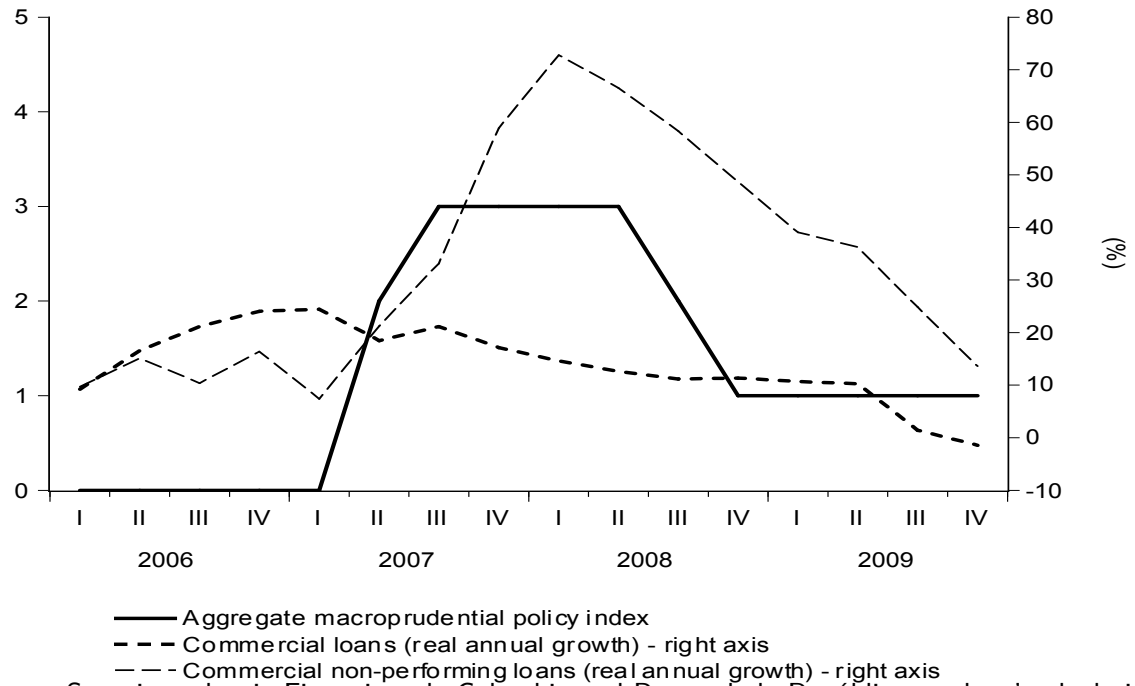
Methodology - Variables' Description

The empirical strategy is comprised of three distinct exercises, as the effect of MPP on three variables of interest is assessed.

- The dependent variables are: i) the quarterly growth of the actual value of loans ($\Delta Log\ Credit_{br,t}$); ii) the quarterly change in the loans' interest rate ($\Delta Interest\ rate_{br,t}$); and iii) the quarterly growth of the value of non-performing loans ($\Delta Log\ NPL_{br,t}$).
- The specification used for the three macroprudential policies mentioned is: i) the ratio between the total amount of dynamic provisions and total commercial loans ($DP_{br,t}$); ii) the amount of the external borrowing requirement to total liabilities ratio ($EBR_{br,t}$); and iii) the amount of the countercyclical reserve requirement to total liabilities ratio ($CRR_{br,t}$).
- As some of the macroprudential tools were active at the same time, an aggregate variable is used to estimate the joint effect of the tools ($MPP\ index_t$). This index captures the aggregate macroprudential policy stance of the country, and is defined as the sum of the three individual policies' dummy variables (dummies that take the value of 1 if the policy is in place and 0 otherwise).

Methodology - Variables' Description

Figure: Aggregate Macroprudential Policy Index, Commercial Loans and NPL Growth (2006Q1-2009Q4)



Source: Superintendencia Financiera de Colombia and Banco de la República; authors' calculations.

Methodology - Estimating the effects on Credit Growth

A fixed effects panel methodology is implemented, where the two dimensions of the panel are time (t) and the bank-debtor relationship (br). Equation (1) is estimated to assess the effect of the macroprudential tools on lending dynamics.

$$\Delta Log\ Credit_{br,t} = \delta_{br} + \sum_{j=1}^{3} \beta_j Macro\ Tool^{j}_{br,t-i} + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + quarter_t + \varepsilon_{br,t} \quad (1)$$

Likewise, to confirm whether the effect of the business cycle over credit growth is altered by the stance of the macroprudential policies, equation (2) is estimated.

$$\Delta Log\ Credit_{br,t} = \delta_{br} + \sum_{j=1}^{3} \beta_j Macro\ Tool^{j}_{br,t-i} + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + \gamma \Delta MPP\ index_t * \Delta Log\ GDP_{t-i} + quarter_t + \varepsilon_{br,t} \quad (2)$$

Methodology - Estimating the effects on Credit Growth

Using equation (3) the intention is to test if a strong stance of the macroprudential policies reinforces the negative impact that increases in the monetary policy rate should have on lending dynamics (credit channel).

$$\Delta Log\ Credit_{br,t} = \delta_{br} + \sum_{j=1}^{3} \beta_j Macro\ Tool^{j}_{br,t-i} + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + \theta \Delta MPP\ index_t * \Delta MP\ rate_{t-i} + quarter_t + \varepsilon_{br,t} \quad (3)$$

Equation (4), evaluates if the macroprudential policies affect the selection of debtors depending on their risk profile (i.e. risk-taking channel), and if its effects depend on the financial health of banking institutions.

$$\Delta Log\ Credit_{br,t} = \delta_{br} + \sum_{j=1}^{3} \beta_j Macro\ Tool^{j}_{br,t-i} + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + \alpha \Delta MPP\ index_t * Bank\ Risk_{br,t} + \rho \Delta MPP\ index_t * Firm\ Risk_{br,t} + quarter_t + \varepsilon_{br,t} \quad (4)$$

Methodology - Estimating the effects on Credit Growth

To complement the previous analysis, equation (1) is re-estimated using the aggregate macroprudential index ($MPP\ index_t$) instead of the individual *Macro Tool* variables ((5)).

$$\Delta Log\ Credit_{br,t} = \delta_{br} + \beta \Delta MPP\ index_t + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i}$$
$$+ Firm\ Controls_{br,t-i} + quarter_t + \varepsilon_{br,t} \quad (5)$$

In this case β represents the marginal effects on credit growth of the macroprudential policy stance, and is expected to have a negative sign.

Methodology - Estimating the effects on Loans' Interest Rates

Another interesting analysis is to quantify the potential effect of the macroprudential tools on the cost of lending.

$$\Delta Interest\ rate_{br,t} = \delta_{br} + \sum_{j=1}^{3} \beta_j Macro\ Tool^{j}_{br,t-i} + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + quarter_t + \varepsilon_{br,t} \quad (6)$$

As the macroprudential tools that are evaluated may have different effects on banks' lending behavior, the expected signs of the β_j are non-trivial. While some of the policies may create incentives to reduce exposure to riskier clients (e.g. provisions), others may lead to higher credit costs associated with a decline in available loanable funds. The previous equation is also estimated using the $MPP\ index_t$.

$$\Delta Interest\ rate_{br,t} = \delta_{br} + \alpha \Delta MPP\ index_t + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + quarter_t + \varepsilon_{br,t} \quad (7)$$

Methodology - Estimating the effects on Non-Performing Loans

Equation (8) is estimated in order to quantify the effect of each macroprudential tool on the riskiness of the banks' loan portfolio. The expected sign for β_j should vary between policies and should be directly related to the impact of these tools on the loans' interest rates.

$$\Delta Log\ NPL_{br,t} = \delta_{br} + \sum_{j=1}^{3} \beta_j Macro\ Tool^{j}_{br,t-i} + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + quarter_t + \varepsilon_{br,t} \quad (8)$$

Additionally, equation (9) evaluates the effect of the aggregate stance of macroprudential policy on the behavior of non-performing loans.

$$\Delta Log\ NPL_{br,t} = \delta_{br} + \sum_{i=0}^{2} \beta_j \Delta MPP\ index_{t-i} + \sum_{j=1}^{5} Macro\ Controls^{j}_{t-i} + \sum_{j=1}^{5} Bank\ Controls^{j}_{br,t-i} + Firm\ Controls_{br,t-i} + quarter_t + \varepsilon_{br,t} \quad (9)$$

Results on loan growth

Relevant Exogenous variables	Equations (1)	(2)	(3)	(4)	(5)
$DP_{br,t}$	-0.511***	-0.577***	-0.512***	-0.298***	
$EBR_{br,t}$	0.220	0.063	0.187	0.085	
$CRR_{br,t}$	-0.665**	-0.856***	-0.720***	-0.709***	
$\Delta MPP\ index_t$					-0.012***
$\Delta MPP\ index_t * \Delta^A GDP_{t-1}$		-0.188***			
$\Delta MPP\ index_t * \Delta^A MP\ rate_t$			-0.163		
$\Delta MPP\ index_t * Firm\ Risk_t$				-0.005**	
$Firm\ Risk_t$				-0.065***	
$\Delta MPP\ index_t * Zscore_t$				-0.004**	
$Zscore_t$				-0.005***	
$\Delta^A Log\ GDP_{t-1}$	0.235**	0.422***	0.295**	0.267***	0.654***
$\Delta^A MP\ rate_t$	-0.648***	-0.383***	-0.583***	-0.273**	-0.364***
Observations	1,635,741	1,635,741	1,635,741	1,412,071	1,635,741
Hausman Test p-value	0.000	0.000	0.000	0.0000	0.000
F Test p-value	0.000	0.000	0.000	0.0000	0.000

* Statistically significant at the 10% level. ** Statistically significant at the 5% level. *** Statistically significant at the 1% level.

Results on loans' interest rate

Relevant Exogenous variables	Equations (6)	(7)
$DP_{br,t}$	-37.920***	
$EBR_{br,t}$	29.036***	
$CRR_{br,t}$	73.854***	
$\Delta MPP\ index_t$		0.003
$\Delta^Q Log\ GDP_t$	61.575***	80.234***
$\Delta^Q MP\ rate_t$	28.549***	21.956***
Observations	1,459,331	1,459,331
Hausman Test p-value	0.000	0.000
F Test p-value	0.000	0.000

* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.

Results on non-performing loans

Relevant Exogenous variables	Equations (8)	(9)
$DP_{br,t-2}$	-0.682***	
$EBR_{br,t-2}$	-0.054	
$CRR_{br,t-2}$	0.452	
$\Delta MPP\ index_t$		-0.010
$\Delta MPP\ index_{t-1}$		0.009
$\Delta MPP\ index_{t-2}$		-0.008**
$CGDP\ gap_{t-1}$	1.585***	1.696***
$\Delta^Q MP\ rate_{t-1}$	0.218	-0.379
Observations	123,331	123,331
Hausman Test p-value	0.000	0.000
F Test p-value	0.000	0.000

* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.

Concluding Remarks

- Following the Global Financial Crisis of 2007-2008, considerable interest has been centered on the relevance and virtues of MPP as a complement to microprudential and monetary policy.
- Developing countries have been very active in their use $\rightarrow$ analyzing their experience can shed light on these tools' effectiveness.
- Using a micro dataset containing close to 2 million observations between 2006-2009, this paper analyzes the effect of three distinct MPP tools on credit growth and banks' risk profile.
- Results show that dynamic provisions and countercyclical reserve requirements had a negative effect on loan growth, while the effect on loan rates and the riskiness of the loan portfolio differs between the three policies.
  i. Provisions seem to be negatively related to risk-taking.
  ii. Countercyclical reserve requirements increase the cost of credit but have no statistically significant effect on non-performing loans.
  iii. No statistical evidence that the requirement on FX borrowing had an impact on credit growth or non-performing loans, though it does increment borrowing costs.
- Effects on credit growth of dynamic provisions hold when a sub-sample of firms with available balance-sheet information is used in the estimations, as do the effects of the individual policies on the interest rate $\rightarrow$ valuable robustness check on the full sample results.

Concluding Remarks

- Findings support the notion that macroprudential policies have been historically used as a complement of monetary policy $\rightarrow$ increasing the stabilizing effects of changes in interest rates on credit cycles.
- In other words, said policies have been used in a countercyclical way with respect to business cycles, thereby helping to reduce the procyclicality of credit.
- MPP seem to influence risk-taking behavior:
  i. A tightening of the MPP index is shown to reduce credit access to riskier debtors, and to have a stronger adverse effect on the credit supply of less stable financial institutions.
  ii. A tighter MPP stance is also found to have a negative effect on the dynamics of non-performing loans.
- Thus, MPP seem to be an effective tool to dampen credit cycles $\rightarrow$ allowing to reduce systemic vulnerabilities and the build-up of risks.
- They also seem to be complementary to monetary policy.

Annex 1

Variables' Description

Annex 1 - Variables' Description

The control variables are divided in four groups:

- Macroeconomic controls: Real GDP growth ($\Delta Log\ GDP_t$), the change in the interbank rate as a proxy of the monetary policy stance ($\Delta MP\ rate_t$), the real growth in the exchange rate ($\Delta Log\ EX\ rate_t$), and the real growth in the current account deficit ($\Delta Log\ CA\ deficit_t$).
- Bank controls: the liquidity ratio ($Bank\ Liquidity_{br,t}$), return on assets ($Bank\ ROA_{br,t}$), bank size ($Bank\ Size_{br,t}$), the deposits to total liabilities ratio ($Bank\ Fund\ Composition_{br,t}$), and an indicator signalling whether a bank is close to the regulatory minimum capital ratio is included ($Bank\ Signalling_{br,t}$). Additionally, to measure bank riskiness, a dummy variable that takes the value of 1 if the bank's Z-score indicator is below the quarterly average of the banking system is used ($Zscore_{br,t}$). This indicator is defined as the ratio between the sum of the capital ratio and the mean of the ROA and the standard deviation of the ROA.
- Bank-debtor relationship controls: A dummy variable to distinguish if the loans have an acceptable collateral ($Collateralized\ Loans_{br,t}$) and a proxy for debtor riskiness, which is a dummy variable based on the number of days a loan has been past due ($Firm\ Risk_t$).

Annex 2

Results using a sub-sample of firms

Annex 2 - Results on loan growth using a sub-sample of firms

Relevant Exogenous variables	Equations (1)	(2)	(3)	(4)	(5)
$DP_{br,t}$	-0.523***	-0.589***	-0.534***	-0.515***	
$EBR_{br,t}$	0.031	-0.092	-0.089	0.076	
$CRR_{br,t}$	-0.112	-0.296	-0.472	-0.084	
$\Delta MPP\ index_t$					-0.015***
$\Delta MPP\ index_t * \Delta^A Log\ GDP_{t-1}$		-0.228***			
$\Delta MPP\ index_t * \Delta^A MP\ rate_t$			-1.185**		
$\Delta MPP\ index_t * Firm\ Risk_t$				-0.003	
$Firm\ Risk_t$				-0.045***	
$\Delta MPP\ index_t * Zscore_t$				0.001	
$Zscore_t$				-0.002	
$\Delta^A Log\ GDP_{t-1}$	0.322*	0.557***	0.759***	0.442**	0.697***
$\Delta^A MP\ rate_t$	-0.503*	-0.179	-0.030	-0.427	-0.156
$Firm\ Size_{br,t}$	0.054***	0.054***	0.054***	0.047***	0.053***
$Firm\ ROA_{br,t}$	0.000	0.000	0.000	0.000	0.000
$Firm\ Liquidity_{br,t}$	-0.000	-0.000	-0.000	-0.000	-0.000
$Firm\ Leverage_{br,t}$	0.000	0.000	0.000	0.000	0.000
Observations	500,255	500,255	500,255	482,250	500,255
Hausman Test p-value	0.000	0.000	0.000	0.0000	0.000
F Test p-value	0.000	0.000	0.000	0.0000	0.000

* Statistically significant at the 10% level. ** Statistically significant at the 5% level. *** Statistically significant at the 1% level.

Results using a sub-sample of firms

Effect on loan growth also estimated using a sub-sample of firms with balance-sheet information

- Only dynamic provisions had a (-) impact on loan growth $\rightarrow$ MPP index mirrors this result.
- GDP growth has the expected (+) sign $\rightarrow$ procyclicality of credit.
- Policy rate plays its stabilizing role.
- Interactions between macro controls and the MPP index yield the expected signs:
  i. Effect of GDP is diluted when MPP is tightened.
  ii. Effect of monetary policy is reinforced by MPP.
- Results on bank risk-taking do not hold in this sample.
- Regarding firm-specific characteristics, only size seems to be a significant determinant of loan growth.

Annex 2 - Results on loans' interest rate using a sub-sample of firms

Relevant Exogenous variables	Equations (6)	(7)
$DP_{br,t}$	-36.098***	
$EBR_{br,t}$	10.387***	
$CRR_{br,t}$	71.492***	
$\Delta MPP\ index_t$		-0.096***
$\Delta^Q Log\ GDP_t$	61.693***	75.434***
$\Delta^Q MP\ rate_t$	9.023***	10.701***
$Firm\ Size_{br,t}$	-0.020	0.024
$Firm\ ROA_{br,t}$	0.000	0.000
$Firm\ Liquidity_{br,t}$	0.000	0.000
$Firm\ Leverage_{br,t}$	0.000	0.001
Observations	449,111	449,111
Hausman Test p-value	0.000	0.000
F Test p-value	0.000	0.000

* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 1% level.

Annex 2 - Results on non-performing loans using a sub-sample of firms

Relevant Exogenous variables	Equations (8)	(9)
$DP_{br,t-2}$	0.797	
$EBR_{br,t-2}$	-1.080	
$CRR_{br,t-2}$	0.401	
$\Delta MPP\ index_t$		-0.002
$\Delta MPP\ index_{t-1}$		0.005
$\Delta MPP\ index_{t-2}$		-0.022
$CGDP\ gap_{t-1}$	3.105**	3.004*
$\Delta^Q MP\ rate_{t-1}$	-0.608	-0.686
$Firm\ Size_{br,t}$	-0.038	-0.036
$Firm\ ROA_{br,t}$	0.001	0.001
$Firm\ Liquidity_{br,t}$	-0.001	-0.001
$Firm\ Leverage_{br,t}$	-0.001	-0.002
Observations	11,072	11,072
Hausman Test p-value	0.000	0.000
F Test p-value	0.000	0.000

* Statistically significant at the 10% level.

Results using a sub-sample of firms

The effect on interest rates was also estimated using the sub-sample of firms

- Yield basically the same results as those found in the entire sample, except for the significance of the MPP index → tighter policy stance leads to lower interest rates possibly as a result of lower risk-taking incentives for banks.
- No idiosyncratic characteristics of the firms provide a significant effect on loan rates.

As was the effect on non-performing loans

- No individual tool (or the aggregate index) yield a statistically significant result → policies have a negative effect on loan growth and the cost of credit which does not affect the repayment capacity of the largest firms in the sample.
- Only the stance of the financial cycle seems to be a determinant of the observed materialization of credit risk.
- This is a result in itself → non-existent effect on non-performing loans or the risk-taking channel may be associated with the particular sample used:
  * Firms supervised by Supersociedades have been chosen for said purpose → bias towards large firms (not a random sample of the corporate sector).
  * Thus, tend to be large, better-behaved firms → high quality debtors