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Abstract

This paper tests the importance of the financial structure of banks in the bank lending channel of monetary policy transmission in Colombia, using an unbalanced panel of 51 banks for the period of 1996:4-2014:8. We find that an increase in the interbank rate (proxy of the intervention rate) has a response of a drop in the growth of the total loan portfolio of banks. When we breakdown by type of policy, the bank lending channel works better in times of monetary contraction, exhibiting significant reactions from banks with low levels of solvency rather than those with high solvency. In contrast, when the policy is expansionary, the high solvency banks are the only segment exhibiting the presence of the bank lending channel. We discuss the policy implications of findings.

Keywords: Monetary Policy Transmission, Bank Lending Channel, Bank Financial Structure, Solvency, Heterogeneous Effects, Colombia.

JEL Classification: E5; E52; E59; G21.

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I. Introduction

Given its importance as a control mechanism for economies, monetary policy is an important area of many discussions and frequent investigations. In particular, the study of the transmission channels of monetary policy is one of the main research areas in the field and great concern to policymakers. Mishkin (1996) suggests the presence of three specific types of transmission mechanisms of monetary policy: i) the traditional channel of the interest rate; ii) the channels concerning the price of assets (including the "exchange rate" channel and the "equity price" channel); and iii) the transmission channels from the credit side. The latter, also grouped into the no neoclassic transmission channels according to Boivin et al. (2010), take place under the assumption of imperfections in the credit market; which is transferred to the economy through two particular ways: demand for goods and the supply of credit.

In general, the transmission mechanisms along the route of credit can be classified into two types of particular channels. The first, known as the balance sheet channel, focuses on the transfer of monetary policy by the side of the "demand". That is, the one which occurs through the borrowing of agents. Thus, a contractionary monetary policy generates deterioration in the credit health of debtors on behalf of reductions in their collaterals, and increases the value of their debts. Consequently, individuals have fewer options for loans, and face a drop in their purchasing power; which is reflected in a reduction in the levels of investment and consumption in the economy.

The second, known as the bank lending channel, focuses on the effects of monetary policy on the side of the "supply"; specifically with regard to the lending capacity of banks on the financial market. Thus, contractionary policies such as increases in the intervention interest rate end up generating greater demands on compliance with collateral for banks, which are forced to reduce the number of loans offered in the case where they do not have the necessary funds to meet new financial requirements. Therefore, for the bank lending channel to work two conditions are required: i) there must be a number of agents (firms and

individuals) that depend on bank loans; and ii) monetary policy should be able to affect the supply of bank loans (Gómez-González and Grosz, 2007).

In terms of empirical evidence (reviewed in detail in the next section), initial studies such as Fazzari et al. (1988), tested the first channel and found that smaller firms face a more rigorous liquidity restriction an element that makes them more dependent on banks. Bernanke and Blinder (1992) was one of the initial studies confirming the second channel by showing that contractionary monetary policy leads to a reduction in the amount of deposits in the market. Under this theory, the reduced availability of deposits requires banks to access other sources of funding to support their claims, a process that provides different results depending on the particular characteristics of each bank. Thus, the magnitude of changes in the supply of credit of each bank depends heavily on the financial structure of such entity; feature that breaks with the Modigliani-Miller Theorem (Van den Heuvel, 2002)[1]. In the aggregate, this means that if a country has an extremely weak (strong) financial structure, its reaction to a contractionary monetary policy will be much stronger (less reactive) (Kishan and Opiela, 2000).

In this paper, we focus on the monetary transmission in Colombia. This country is a middle-income emerging economy that shares similar features with other South American economies such as Mexico, Brazil, Peru, Uruguay and Chile. The bank lending channel is particularly important in Colombia since it is a bank-based economy where more than 60% of non-financial firms' external funds are provided by banks. The existent empirical evidence provides substantial support for the view that bank-dependent borrowers are more adversely impacted by a tightening of monetary policy than borrowers with access to financial markets. The evidence also points-out that a bank lending channel can be important in an international context, especially in countries where banks and firms have less direct access to financial markets.

It is also an interesting economy to study since it shares a number of characteristics with many emerging countries. For example, it adopted an inflation targeting regime in the early 2000s, after abandoning a currency board, and it is a commodity exporter. Finally,

[1] The Modigliani-Miller Theorem for banks suggests that, in a world of perfect capital markets, decisions made regarding the amount of loans to offer do not depend on any level of the financial structure of banks.

Colombia has implemented important financial regulation reforms which helped to prevent a contagion event during the recent Great Financial Crisis. Last but not least, we have access to a rich dataset comprised of monthly balance-sheet information for over 16 years of all Colombian commercial banks.

The analysis of the bank lending channel of monetary transmission in the Colombian case has been studied in previous works albeit with quite different empirical results. For example, Gómez-González and Grosz (2007), Reyes et al. (2014) and Torres (2012) have verified the presence of the bank lending channel in the country, analyzing the reactions of the credit supply to changes in the intervention interest rate. Moreover, Tenjo et al. (2015) find that banks with riskier loan portfolios seem to reduce more their credit supply as a response to monetary policy tightening. Thus, only a few studies have consider the bank lending channel according to the particular financial structure of each bank.

The main contribution of the paper to test the presence of the bank lending channel in Colombia with an emphasis on its effects on the supply of credit and how its magnitude varies depending on the financial structure of individual banks.[2] This issue has significant policy implications. For example, a deeper knowledge regarding the heterogeneity with which the bank lending channel operates would allow the Central Bank to better predict the magnitude of the effects of a change in monetary policy, as well as the lag effects of them, ensuring that the measures taken to smooth economic cycles are more accurate. In this way, the overreaction of monetary policy that usually happens when the economy does not respond with the required speed would be avoided. To do so, this paper studies the historical behavior of the credit supply in Colombia, contrasting it against changes in the interest rate intervention. The various reactions that may arise in the supply of credit are reviewed under both contractionary and expansionary policies and by disaggregating the financial structure of banks (in terms of solvency). For econometric estimations, we employ the models in Gomez-Gonzalez and Grosz (2007) and Reyes et al. (2014) with an unbalanced panel data ranging from 16 to 34 banks which were active at some time during our mostly sample period from 1996:4 to 2014:8.

[2] In this study, we do not include revisions regarding the transfer line through which the bank loans channel (deposits) operate.

The rest of the paper is organized as follows. In the next section, a literature review is presented. The third section discusses the methodology. The fourth section presents the results, while the final section concludes the paper with policy recommendations.

II. Literature Review

The study of the bank lending channel first appeared in the literature at the beginning of the 1990s, with a concentrated study of the overall financial system without providing some disaggregated analysis. Bernanke and Blinder (1992) were the pioneers in this process, demonstrating that the widespread presence of contractionary monetary policies in the US had a response of a drop in the total supply of credit in the country during 1961-1989. However, given the aggregate nature of these studies, their preliminary results offered a rather weak and general evidence for the presence of the bank lending channel. Hence, Kishan and Opiela (2000) further evaluated the presence of such mechanism using a panel of 13,042 commercial banks with data for the 1980-1995 period. They corroborated the results of previous literature and also found stronger evidence of the bank lending channel in the US with a differential effect on banks depending on their size and capitalization. In particular, they noted that lower funding capacity due to financial restrictions imposed by a contractionary policy caused smaller banks to reduce loans.

This new approach in the literature of the bank lending channel was employed in subsequent studies. For example, Xiong (2013) found evidence of the presence of the bank lending channel in China during the period 2000-2011 allowing for asymmetric effects based on the financial structure of individual banks. Thus, small banks, or banks with lower levels of capitalization react more strongly to contractionary monetary policies, while larger banks and/or banks with more capitalization are more responsive when the policy was expansionary. Similarly, Kishan and Opiela (2006) showed that expansive monetary policies fail to encourage banks with lower capitalization, as opposed to the case of contractionary policies whose effect is much more evident in these establishments than those with higher capitalization.

Up to this point, the bank lending channel literature theorized that deposits were the main catalysts behind the operation of this mechanism. Thus, changes in monetary policy generate reactions in the levels of deposits in the financial market, which, in turn, affect the supply of loans in the economy, giving light to the bank lending channel. However, the most recent literature has taken a new direction with respect to the theoretical framework behind the bank lending channel. Indeed, Disyatat (2011) argues that monetary policy is transmitted to the market through changes in the required rate of return[3] (RRR), instead that through the amounts of deposits. Thus, when faced with contractionary monetary policies, banks have a restriction on the side of capital. Those with a lower capital level suffer from a decline in financial health, which discourages investment and, therefore, does not allow banks to maintain credit levels that they previously had, thus reducing the supply of loans. This argument is consistent with the results in Gambacorta and Márques-Ibañez (2011) who show a deepening of the role of banks' capital as a buffer (or catalyst if the policy is expansionary) regarding the dynamics of the bank lending channel especially during periods of financial crises. Similarly, Van den Heuvel (2007) had proposed a transmission mechanism of monetary policy from the credit side of the economy, known as the bank capital channel. In this view, an expansion in the intervention interest rate would generate a fall in the level of future capital of banks (specifically on the future value of equity), which, in turn, would result in a drop in the supply of loans given by the market, thus acting as a sub-channel of the bank lending mechanism.

Other recent literature has studied the bank lending channel and its interaction with other features of the financial sector. For example, Olivero et al. (2011a, 2011 b) using data for several emerging markets, found that financial sectors with lower competition levels or higher number of consolidation processes are less responsive to monetary policy shocks via the bank lending channel. Similar results are found in Ghossoub and Reed (2015) who study the optimal size distribution of the banking sector as well as the effect of banking concentration on monetary policy transmission. Finally, Aiyar et al. (2016) analyze the interaction of monetary and bank capital-requirement policies for the determination of

[3] The required rate of return is the minimum acceptable return for an agent (person or firm) to invest his/her money in a project. It is usually used to assess equity.

credit supply in the UK. Their findings imply that while large banks react only to the capital requirement, small banks' credit supply reacts to both policies.

The bank lending channel has also been studied in relation to other monetary transmission channels. For example, Aysun and Hepp (2013) analyze the interaction between the balance-sheet and bank lending channels. Similarly, Aysun (2016) uses panel data for US banks and borrowers to show that most macroeconomic shocks are transmitted through large banks' lending and borrowers' balance sheets[4].

In addition, Altunbas et al. (2010) report the presence of a second sub-transmission mechanism related to the bank lending channel, known as the risk taking channel. These authors find a relationship between a slow economic activity (e.g. low interest rates) and the risk-taking by banks where expansionary monetary policies generate a decrease in risk aversion as a result of lower requirements stipulated for offering loans. Kishan and Opiela (2012) report that these positions trigger more marked declines in loans offered by risk takers in case of a tight monetary policy.

Perhaps the recent study most closely related is Ramos-Tallada (2015) who studies the bank lending channel and its relation with bank financial indicators in Brazil. These results imply that the external finance premium and size are key bank characteristics that determine the strength of the bank lending channel. In addition, this channel is found to be stronger for banks whose security portfolio includes public bonds with higher market risk.

Regarding studies on Colombia, Gomez-Gonzalez and Grosz (2007) study the presence of the bank lending channel for Colombia and Argentina and report evidence favorable only to the first channel, with heterogeneous effects on account of capitalization and liquidity of firms. Similar results are reported by Gomez-Gonzalez and Morales (2009) based on capitalization and size approaches. Torres (2012) confirms the presence of the credit channel in the country only for the specific case of commercial loans, while no evidence of such mechanism in consumer loans is found. Tenjo et al. (2015) find that the loan supply of banks with riskier loans is more reactive to a monetary policy tightening.

[4] Relations with the risk-taking channel and the cost channel and studied in Ozsuca and Akbostanci (2016) and Chang et al. (2014), respectively.

Finally, Reyes et al. (2014) also show the existence of the bank lending channel from the particular perspective of banks in Colombia when they allow heterogeneous effects determined by the size and capitalization of banks especially for total credit and, to a smaller extent, for commercial-consumer loans. Reyes et al. (2014) employed a disaggregated analysis following Kishan et al. (2000) using the Feasible Generalized Least Squares (FGLS) approach and a measure of long-run interest rate as the benchmark interest rate.

III. Database and Methodology

The key objective of this study is to test the presence of the bank lending channel by focusing on its specific effect on the supply of bank loans without going into detail regarding the particular catalysts that generates it (that is, deposits according to the traditional theory or RRR according to the most recent literature). In addition, within the definition of the bank lending channel the aforementioned risk taking and bank capital channels are included as a subsets of the transmission mechanism.

For the empirical analysis we use an unbalance panel data with monthly records for the period 1996:4-2014:8. We count with financial structure data for 51 banks that participated in the financial market at sometime within the specified time range. This information comes from the Financial Superintendence of Colombia (*Superintendencia Financiera de Colombia*).

Table 1 summarizes the main features[5] of banks in Colombia for the starting (1996:4) and final (2014:8) point of the time period studied, separating the information through segments according to levels of solvency. Additionally, we include data referred to the 2007:8 period as an intermediate point of analysis.

[5] Solvency is measured by the ratio of total equity of the bank to total assets; capitalization is measured by the ratio of social capital of the bank to total assets. Liquidity is the sum of Cash, Accounts Receivable/CDAT's, CDT's, Repos and Interbank loans.

Table 1 - Base Information of the Sample of Banks by Groups According to Levels of Solvency

	April 1996		August 2007		August 2014	
	Solvency Above Average	**Solvency Below Average**	**Solvency Above Average**	**Solvency Below Average**	**Solvency Above Average**	**Solvency Below Average**
Bank Composition (%)	**47,06**	**52,94**	**52,94**	**47,06**	**30,43**	**69,57**
Market Participation (%)						
Assets	2,99	2,88	7,01	4,61	2,32	5,23
Liabilities	2,83	3,02	6,86	4,78	2,16	5,33
Total Portafolio	2,88	3,00	7,22	4,38	2,25	5,27
Credit Characteristics (%)						
Total Portafolio/Assets	58,35	66,47	64,72	61,98	71,04	62,67
Commercial Portafolio/Total Portafolio	67,93	63,23	65,90	48,95	50,76	42,47
Consumer Portafolio/Total Portafolio	31,11	27,65	27,43	37,70	18,44	43,99
Financial Indicators (%)						
Capitalization	9,0	5,0	2,0	3,1	18,0	2,5
Solvency	22,0	10,0	13,5	8,2	29,0	12,0
Liquidity	83,0	62,0	32,7	80,2	27,0	50,0
Number of Banks	**34**		**17**		**23**	
Average Solvency (%)	**16,0**		**11,1**		**17,0**	
Total Market Assets ($ millions)	**27.889,77**		**150.857,32**		**415.430,00**	
Total Market Liabilities ($ millions)	**24.063,98**		**133.106,49**		**355.560,00**	
Total Market Portafolio ($ millions)	**17.576,50**		**95.672,00**		**257.270,00**	
Total Market Commercial Portafolio ($ millions)	**10.192,08**		**57.811,38**		**150.458,00**	
Total Market Consumer Portafolio ($ millions)	**5.294,83**		**28.313,80**		**75.266,10**	

Solvency is measured by the ratio of total equity of the bank to total assets; capitalization is measured by the ratio of social capital of the bank to total assets. Liquidity is the sum of Cash, Accounts Receivable/CDAT's, CDT's, Repos and Interbank loans.

Source: Own calculations based on the Financial Superintendence of Colombia.

In April 1996, there were a total of 34 banks operating in Colombia, under an average solvency indicator of 16%. Regarding the composition according to bank solvency, 47.1% of the banks reported a higher average indicator, while the remaining 52.9% corresponded to the group with below average solvency. On the other hand, in August 2014, the Colombian banking system had 23 banks operating with an average solvency indicator of 17%. Thus, 30.4% of the sample of banks recorded a higher than average solvency, while the remaining 69.6% was below the same.

Despite the decline exhibited in the number of banks operating in the Colombian system, the market size has had a significant increase both in terms of value of assets and liabilities, as in credits offered. However, this expansion has resulted in an increased bank concentration in terms of capitalization and solvency, bringing the highest levels of

capitalization in 6 of 23 banks (in August 2014) and the highest levels of solvency on 7 banks (the aforementioned 30.4%); compared to the lowest concentration observed in April 1996 (16 of 34 banks with above average solvency and 12 with above average capitalization). This contrast between the "solvent" segment and the "non-solvent" is even deeper when the average financial indicators of each subset are compared. Indeed, while in April 1996 the distance between the segment with solvency against the non-solvent was 4 points in the capitalization indicator and 12 points in the solvency indicator; in August 2014, this gap was 16 points in the capitalization and 17 points in the solvency.

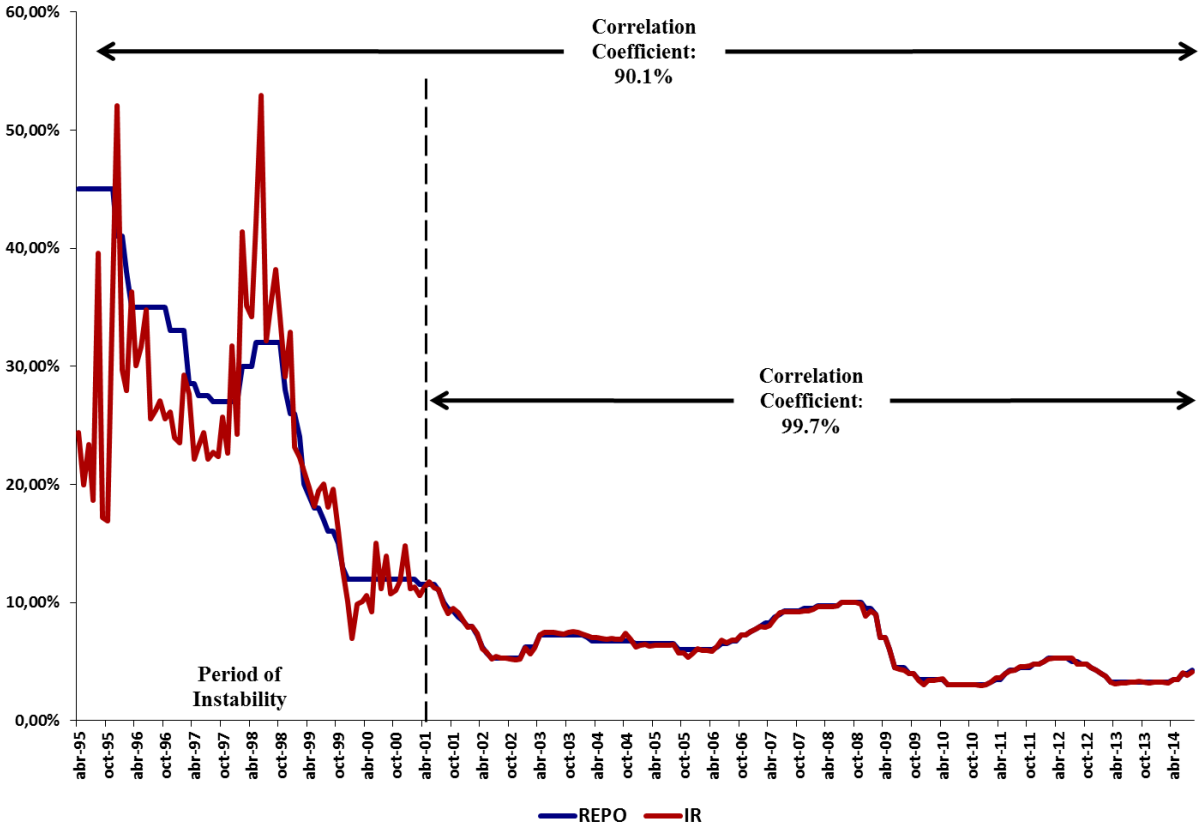
As the size distribution, on August 2014 the segment of higher solvency reported indicators of average size (e.g. total bank assets/total market assets) lower than the less solvent segment. Moreover, regarding the credit structure in April 1996 a greater share of commercial credit in total portfolio for both segments of solvency was observed. However, by August 2014 this structure seems to have changed in the less solvent segment. This shows a fair proportion of consumer credit and commercial credit, contrasting with the group of above-average solvency which has a particularly strong concentration regarding the commercial portfolio.

With regard to the figures of August 2007, the results were markedly different from the trends observed in April 1996 and August 2014. In particular, financial capitalization and liquidity indicators were higher in the less creditworthy segment, while rates of market share were higher in the group of high solvency. This could be due to the specific characteristics faced by the banking market at that time, when credit growth showed a strong acceleration and there was little concentration of solvency and capitalization among banks (the difference between segments was 5.3 points in solvency and 1.1 points in capitalization).

To study the behavior of the intervention interest rate (REPO), we use as a proxy the Colombian interbank rate (IR), which exhibits a high correlation with the REPO rate (90.1% between 1995:4-2014:8). This can be seen in Figure 1. Initially the IR exhibited a rather unstable behavior, particularly in the period 1995-2001, following the trend of the REPO but with much stronger magnitudes. However, this dynamics was corrected in 2001 with the introduction of the new monetary policy regime of inflation targeting. Under

which it was desired to bring the IR to the REPO rate, so that market liquidity coincides with the target value of the Central Bank of Colombia. Thus, differences between the IR and REPO passed from maximums of 20 percentage points (pp) in 1995-2001 to less than 1pp values in 2001-2014, reaching a correlation coefficient of 99.7% during the last period.

Figure 1 – Historical Evolution of the IR vs. REPO



Source: Own calculation based on the Central Bank of Colombia

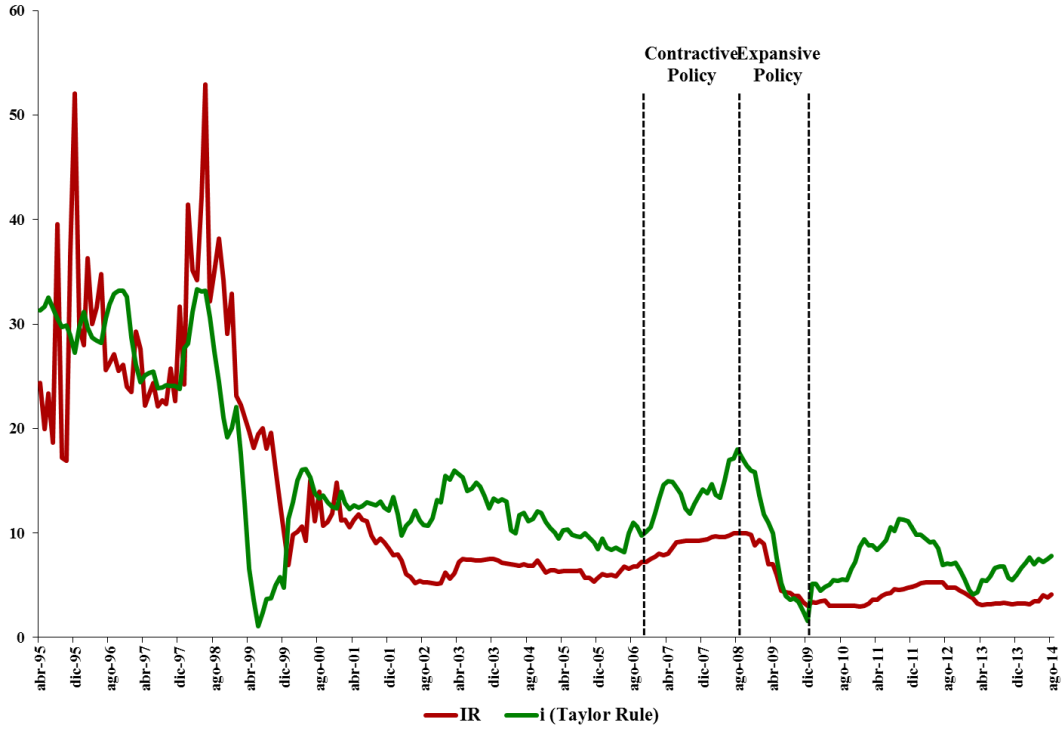
On the other hand, the selection of the periods to study the contrast of contractionary vs. expansionary monetary policy by segments of solvency was made by taking as reference the specifications patterned by the Taylor rule. Taylor (1993) found that a good monetary policy was one that generated changes in the intervention rate to variations in prices and/or income of a country. Thus, according to the formulation proposed in Taylor (1999), the Taylor rule would be:

$$Nominal\ interest\ rate = observed\ inflation + \overline{long\ term\ real\ interest\ rate}$$

$$+h * (observed\ inflation - inflation\ target) + g * product\ gap \qquad (1)$$

where *h* should be greater than 1 (i.e. 1 point shift in inflation should generate more than 1 point shift - e.g. 1.5 points - in the nominal interest rate), while *g* must have a value of about 0.5 (Roberts, 2008). Figure 2 shows the calculation of the formula for Colombia, contrasted with the monetary policy observed in the country during the same period approximated by the IR. For details regarding the calculation of the Taylor rule and the construction of the variables used go to Appendix 1 1.

Figure 2 – Taylor Rule vs. Observed Monetary Policy



Source: Own calculation based on the Central Bank of Colombia, Dane , and *Ultrabursátiles.*

The periods studied were selected taking into account two elements: i) that monetary policy was contractionary or expansionary according to the theory (Taylor rule); and ii) that this coincided with monetary policy actually applied in the country. That is, the periods in which the theoretical rate of intervention (i) and observed (IR) exhibited the same trend; upward in times of monetary contraction and downward in times of monetary expansion. Thus, the periods chosen for study were 2006:10-2008:8 for the contractive policy and 2008:8-2009:12 for the expansionary. Furthermore, the breakdown by levels of

solvency (necessary to analyze the contrast of monetary policies by segments) was performed using the median and mean as separating elements.

Regarding the empirical methodology, we take as reference the following model formulated by Kishan et al. (2000) and Reyes et al. (2014):

$$y_{i,t} = \beta \sum_{j=1}^{6} x_{t-j} + \sum_{j=1}^{6} x_{t-j}\, I_2' \odot Z_{i,t-1}\emptyset_j + R'_{i,t-1} + Z_{i,t-1} + u_{i,t} \qquad (2)$$

where $y_{i,t}$ corresponds to the real growth rate[6] of loans of the bank "i" in month "t"; $\beta \sum_{j=1}^{6} x_{t-j} + \sum_{j=1}^{6} x_{t-j}$ is the benchmark (IR) lagged to 6 periods; $R'_{i,t-1}$ is an array of bank specific variables (size[7] and solvency or capitalization) with a lag of one month; $\odot$ represents the *Hadamard*[8] product; I_2' is a matrix of ones of size 2x1 (i.e. a row of ones); $Z_{i,t-1}$ gathers the controls in the model (real exchange rate index-RERI[9] and industry production real index-IPI[10], the latter as a real monthly GDP proxy) lagged 1 month; and $u_{i,t}$ corresponds to the measurement error of the model, which is supposed i.i.d. This structure is used for both the general model as the segmented version by solvency and periods.

The evaluation of this model is carried out following the techniques used in time-series cross-section; specifically the feasible generalized least squares (FGLS). There are two main reasons why estimation of FGLS is preferred. First, T > N (T = 221 and N moves between 16 & 34), making this exercise an analysis of "time-series cross-section" (Beck, 2006). In this case, traditional methodologies such as FGLS take precedence over estimation methods such as fixed or random effects, since these are designed for panel data with N > T (Greene, 2002). Second, the base used is unbalanced; an element that discourages the use of the methodology panel corrected standard errors (PCSE). Since for

[6] The real growth of the portfolio is calculated as: ((1 + nominal growth)/(1 + annual inflation))-1
[7] Size is measured by the ratio of total assets of the bank to total assets of the market.
[8] The *Hadamard* product is a binary operation that multiplies two matrices of dimension *m x n*, to produce a matrix of *m x n* dimension, where each *ij* component of this matrix is the product between the *ij* components of the original matrices.
[9] Real exchange rate index uses total weights and the CPI as the deflator. Total weights are mobile participation of order 12 of each country in the Colombian foreign trade (imports and exports) with its 22 major partners.
[10] Actual production rate of the Colombian manufacturing industry.

unbalanced bases, this method makes the estimate only for the periods that are available in all panels of the model (Stata, 2013).

These arguments also apply to estimates of the segmented model, where T is 23 (contractive policy model) or 16 (expansive policy) and N moves between 7 and 9 (separated by median) or between 4 and 6 (separated by average). Thus, it continued compliance with T > N which confirms the use of FGLS since the main condition for these estimators are valid as long as T is at least the same size as N (Stata, 2013). In addition, Beck et al. (2002) state that for the time series cross-section there is no minimum required T (but preferably greater than 10); so the proposed models would work out despite the lower number of periods.

On the other hand, according to the Dickey-Fuller test, the control variables RERI and IPI are stationary; which validates the second central requirement of this methodology. Also, independence between panels is assumed to meet the necessary conditions for the FGLS to work in unbalanced panels. In this regard, the literature has found that FGLS estimators are consistent for unbalanced data bases; with the base model for the simplest imbalances, or ANOVA-FGLS type estimators for complex models (Ullah & Giles, 1998).

As for the sources of information, the figures regarding the financial structure of banks came from the Financial Superintendence of Colombia. While the performance of the IR as a proxy for the intervention rate (REPO) came from the Central Bank of Colombia. Meanwhile, the RERI comes from the Central Bank of Colombia, while the IPI comes from Department of Statistics of Colombia (*Dane*).

IV. Results

Table 2 summarizes the results of the applied model for the general period of study (1996:4-2014:8), including the calculations of the long-term effects for both the growth of total credit as of commercial credit. The figures obtained confirm the presence of the bank lending channel in the Colombian economy. Accordingly, the interbank interest rate reports a negative and significant effect on growth of the overall portfolio. Thus, an increase in the IR of 1 percentage point (pp) corresponds to a fall of 4.49pp in the growth of the total portfolio. The same is checked for growth of commercial credit, with a fall of 4.51pp.

Table 2. Results of the General Model (1996:4-2014:8) - Solvency

	Total Credit (No. Observations: 5065)		**Commercial Credit** (No. Observations: 5037)	
	Estimator	**Significance**	**Estimator**	**Significance**
Constant	21,560	***	25,513	***
	(3,782)		*(4,599)*	
Size	-0,167	n.s.	-0,371	n.s.
	(0,465)		*(0,567)*	
Solvency	-0,901	***	-0,841	***
	(0,160)		*(0,193)*	
Control Variables				
IPI	-0,022	n.s.	-0,011	n.s.
	(0,044)		*(0,053)*	
RERI	0,078	n.s.	0,072	n.s.
	(0,069)		*(0,083)*	
Long Term Variables				
TIB	-4,489	***	-4,512	***
	(0,480)		*(0,578)*	
TIB*Size	0,071	n.s.	0,077	n.s.
	(0,069)		*(0,083)*	
TIB*Solvency	0,382	***	0,376	***
	(0,023)		*(0,028)*	

Standard errors in parenthesis

***, ** & * imply significance at 1%, 5% & 10%, respectively

n.s. - Not significative

TIB: Interbank rate

IPI: Industrial Production Index (Proxy of GDP)

RERI: Real Exchange Rate Index

Size: Bank assets as a proportion of the total market assets

Solvency: Equity as a proportion of assets

Another important result shown on both estimates of the general model is the presence of heterogeneous effects on the bank lending channel according to solvency. Thus, banks with higher solvency levels have a lower sensitivity to changes in the intervention instrument. More specifically, the results imply that the more solvent is a bank; the effect of the bank lending channel on total credit growth is counteracted in 0.38pp, a figure which also applies to commercial credit.

Based on the empirical model proposed in the methodology section, we now can find that the effect of IR on total credit growth can be stated as:

$$\frac{dy}{dIR} = \beta_{IR} + \beta_{IR*solv} * Solvency + \beta_{IR*size} * Size \quad (3)$$

Assuming that the size is equal to the observed mean for the period of study (4.198) we have:

$$\frac{dy}{dIR} = (-4.489) + (0.382) * Solvency + (0) * (4.198) \quad (5)$$

Such that:

$$\frac{dy}{dIR} = (-4.489) + (0.382) * Solvency$$

$$\frac{dy}{dIR} = 0 = (-4.489) + (0.382) * Solvency$$

$$4.489 = 0.382 * Solvency$$

$$Solvency = \frac{4.489}{0.382}$$

$$Solvency = 11.743 \quad (6)$$

Therefore, according to the figures obtained for the period 1996:4-2014:8, any bank should have a solvency of 11.74% to nullify the effect of the bank lending channel on the growth of their total loans. Similarly, the indicator of solvency should be of 11.93% to offset the effect on the commercial portfolio. To give strength to these results, the overall model was estimated again, this time using the capitalization indicator as a replacement of the solvency. The coefficients obtained are shown in Table 3.

In line with the results for the model with solvency, the empirical estimation from the perspective of the capitalization yields important evidence on the existence of the bank lending channel in the country. In particular for this model, an increase of 1pp in the IR corresponds to a fall of 5pp in the growth of the total portfolio and 4.6pp in the growth of the commercial portfolio. Additionally, the presence of heterogeneous effects in monetary transmission is also evident; this time regarding capitalization and the size of the establishment. Thus, the higher capitalization of a bank, the effect of the bank lending channel is counteracted in 0.76pp for the total portfolio and 0.7pp for the commercial portfolio. As for the size, the reductions are of the order of 0.53pp and 0.49pp, respectively.

Table 3 - Results of the General Model (1996:4-2014:8) - Capitalization

	Total Credit (No. Observations: 5065)		**Commercial Credit** (No. Observations: 5037)	
	Estimator	**Significance**	**Estimator**	**Significance**
Constant	19,515	***	20,753	***
	(3,103)		*(3,999)*	
Size	-0,950	**	-0,880	n.s.
	(0,440)		*(0,567)*	
Capitalization	-1,452	***	-1,004	***
	(0,200)		*(0,251)*	
Control Variables				
IPI	0,030	n.s.	0,041	n.s.
	(0,042)		*(0,051)*	
RERI	-0,061	n.s.	-0,066	n.s.
	(0,066)		*(0,079)*	
Long Term Variables				
TIB	-4,995	***	-4,608	***
	(0,413)		*(0,511)*	
TIB*Size	0,534	***	0,491	***
	(0,069)		*(0,086)*	
TIB*Capitalization	0,763	***	0,703	***
	(0,034)		*(0,042)*	

Standard errors in parenthesis

***, ** & * imply significance at 1%, 5% & 10%, respectively

n.s. - Not significative

TIB: Interbank rate

IPI: Industrial Production Index (Proxy of GDP)

RERI: Real Exchange Rate Index

Size: Bank assets as a proportion of the total market assets

Capitalization: Social capital as a proportion of assets

On the other hand, Table 4 presents the results of the segmented model by level of solvency according to the median, reporting differences in the behavior of the bank lending channel between solvent and less solvent banks; for contractionary and expansionary policies. There, "high solvency" refers to those banks with an indicator above the median solvency of the period, while "low solvency" brings together banks with less than the median solvency of the period.

Table 4 - Disaggregated by Solvency According to Median

	Contractive Policy (2006:10-2008:8)				**Expansive Policy (2008:8-2009:12)**			
	High Solvency (No. Observations: 172)		***Low Solvency*** (No. Observations: 207)		***High Solvency*** (No. Observations: 128)		***Low Solvency*** (No. Observations: 153)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	-13,216	***	-13,403	***	-10,648	**	-3,204	n.s.
	4,672		*(3,825)*		*(5,341)*		*(5,411)*	
TIB*Size	0,077	n.s.	1,564	***	0,092	n.s.	1,327	***
	(0,089)		*(0,255)*		*(0,261)*		*(0,335)*	
TIB*Solvency	-0,045	n.s.	0,308	n.s.	0,606	**	0,225	n.s.
	(0,203)		*(0,273)*		*(0,269)*		*(0,601)*	

Standard errors in parenthesis
***, ** & * imply significance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Solvency: Equity as a proportion of assets

According to the results, the presence of the bank lending channel in the economy is more pronounced when monetary policy is contractionary, with a slightly greater effect on banks of "low solvency". There, a 1pp increase in the IR is reflected in a fall of 13.4pp in the growth of the total portfolio, while in the group of "high solvency" falls are of 13.2pp. Meanwhile, the period of expansionary policy confirms the presence of the bank lending channel in the group of "high solvency" with 10.6pp increases in the growth of the total portfolio against 1pp reductions in the IR.

The figures displayed for the channel of bank loans in times of contractionary policy are repeated in estimating the segmented model according to the average, since the average (11.5%) and the median (10.4%) of solvency for this period are similar. Reason why the classifications of "high solvency" and "low solvency" were the same for both approaches (see Table 5). Moreover, the results of the period of expansionary policy continue to exhibit

the expected sign (although not significant) for the group of "high solvency"; while the segment of "low solvency" shows positive correlations (but not significant) between the IR and the portfolio growth.

Table 5 - Disaggregated by Solvency According to Mean

	Contractive Policy (2006:10-2008:8)				Expansive Policy (2008:8-2009:12)			
	High Solvency (No. Observations: 172)		***Low Solvency*** (No. Observations: 207)		***High Solvency*** (No. Observations: 43)		***Low Solvency*** (No. Observations: 238)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	-13,216	***	-13,403	***	-4,557	n.s.	3,862	n.s.
	(4,672)		*(3,825)*		*(9,956)*		*(3,329)*	
TIB*Size	0,077	n.s.	1,564	***	0,549	n.s.	0,296	*
	(0,089)		*(0,255)*		*(1,453)*		*(0,173)*	
TIB*Solvency	-0,045	n.s.	0,308	n.s.	0,192	n.s.	-0,124	n.s.
	(0,203)		*(0,273)*		*(0,413)*		*(0,310)*	

Standard errors in parenthesis
***, ** & * imply significance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Solvency: Equity as a proportion of assets

To complement these results Table 6 and 7 exhibit the estimates of the same model from the perspective of capitalization separating according to the median and mean, respectively.

Table 6 - Disaggregated by Capitalization According to Median

	Contractive Policy (2006:10-2008:8)				Expansive Policy (2008:8-2009:12)			
	High Capitalization (No. Observations: 195)		***Low Capitalization*** (No. Observations: 184)		***High Capitalization*** (No. Observations: 128)		***Low Capitalization*** (No. Observations: 153)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	-1,901	n.s.	-4,225	n.s.	-27,127	***	6,825	**
	(3,967)		*(4,029)*		*(4,410)*		*(3,136)*	
TIB*Size	-1,069	**	0,218	n.s.	6,789	***	-0,030	n.s.
	(0,517)		*(0,164)*		*(1,170)*		*(0,190)*	
TIB*Capitalization	-1,301	***	-1,821	n.s.	1,902	***	-0,193	n.s.
	(0,337)		*(2,042)*		*(0,202)*		*(2,286)*	

Standard errors in parenthesis
***, ** & * imply suignificance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Capitalization: Social capital as a proportion of assets

Thus, separating the groups according to the median capitalization, the results exhibit a particular behavior in the segment of "small capitalization" on expansionary policies. Thus, 1pp decreases in the IR correspond to reductions of 6.8pp in the growth of the total portfolio; reaction that goes against the theory of the bank lending channel. Contrary to this, the group of "high capitalization" in times of monetary expansion exhibit the presence of the bank lending channel, with 21.1pp increases in the growth of total portfolio against declines of 1pp in the IR.

Table 7 - Disaggregated by Capitalization According to Mean

	Contractive Policy (2006:10-2008:8)				**Expansive Policy (2008:8-2009:12)**			
	High Capitalization (No. Observations: 126)		***Low Capitalization*** (No. Observations: 253)		***High Capitalization*** (No. Observations: 43)		***Low Capitalization*** (No. Observations: 238)	
Long Term Variables	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
IB	0,306	n.s.	-4,296	n.s.	-24,937	***	5,971	**
	(4,966)		*(3,561)*		*(5,034)*		*(2,760)*	
IB*Size	-1,377	**	0,231	n.s.	6,963	n.s.	0,066	n.s.
	(0,683)		*(0,181)*		*(4,611)*		*(0,190)*	
IB*Capitalization	-1,656	***	-0,467	n.s.	2,871	***	-1,240	*
	(0,383)		*(0,975)*		*(0,160)*		*(0,744)*	

Standard errors in parenthesis
***, ** & * imply suignificance at 1%, 5% & 10%, respectively
n.s. - Not significative
IR: Interbank rate
Size: Bank assets as a proportion of the total market assets
Capitalization: Social capital as a proportion of assets

The estimation of the segmented model according to the mean of capitalization finds similar results. Thus, the only differences come from the period of expansionary policy, where the group of "high capitalization" no longer exhibits heterogeneous effects on the size, while the "low capitalization" holds a new effect on capitalization. Therefore, the more a bank is capitalized; reductions in the growth of the total portfolio are offset in 1.24pp.

The newly exposed results (of the segmented models) correspond to the methodology proposed in section Database, but without including individual variables of the financial indicators; because they proved to be insignificant when included in the estimates of these models. However, in Appendix 2, the results for the segmented models are reviewed including the financial variables. These results were very close to those

exhibited by Tables 4 to 7 coinciding mainly in the signs of the effects observed, albeit with slight differences in terms of the significance of them. In particular, the two methodologies agreed on two key elements: i) the presence of the bank lending channel in the group of "low solvency" during the contractionary policy period, as seen in Table A1 and A2 and ii) the presence of a peculiar behavior in banks "low capitalization" in times of monetary expansion. Thus, 1pp falls in the IR generated 8.7 pp decreases in the growth of the total portfolio of these banks (see Table A3) with heterogeneous effects depending on the level of capitalization.

Finally, in Appendix 3, the results of the segmented model applied to other periods are exhibited. This in order to complement the results obtained in the original time ranges. Thus, as determined in Figure A1, the new study dates were: 2010:9-2012:2 for the contractionary policy and 2012:2-2013:4 for the expansionary policy. However, the results of this exercise were very unstable, offering very weak evidence for the presence of the bank lending channel (only apparent in Table A7); since this period refers to a particular time when the bank lending channel failed.[11]

V. Conclusions and Policy Recommendations

In this document the presence of the bank lending channel in Colombia is studied, understood under its thickest definition without going into detail regarding the catalyst behind this mechanism (deposits or RRR); paying particular attention to the heterogeneous nature displayed in the bank loan channel according to the banks´ financial indicators. This was evaluated in the first instance, by means of a general model in the period 1996:4-2014:8, studying the behavior of growth of total and commercial loans against changes in the interbank rate of Colombia (IR). For its part, the detail of heterogeneity was analyzed through a disaggregated model according to levels of solvency (and capitalization for robustness) separating the reactions according to the type of monetary policy applied. In addition, supplementary exercises were conducted to add more robustness to the results.

[11] Despite the implementation of a contractionary monetary policy during the same period, the period 2010-2012 was one of the moments of greatest expansion of credit in Colombia. Indeed, between the first quarter of 2010 and the third quarter of 2012, microcredit grew to 60.2 %, while consumer credit made it to 36.5 %, and credit cards to 31.9 % (Superintendence of Industry and Commerce, 2013). Credit expansion was such that other entities had to help. One was the Financial Superintendence of Colombia, which introduced its own brakes through the imposition of provisions to the portfolio, (Garcia, 2012).

Given the results, this study confirms the presence of a bank lending channel in Colombia, both for total and commercial credits. Additionally, we find evidence of the existence of heterogeneous behavior in such channel depending on the financial structure of the banks surveyed. Thus, a bank with higher levels of solvency (and/or capitalization) seems to be less sensitive to changes in the IR. Similarly, larger banks react to a lesser extent to variations in the IR.

However, the results of the estimates of the segmented models show that this more or less sensitivity, according to the level of solvency (and/or capitalization), varies depending on the type of monetary policy that is being applied. Thus, when the policy is contractionary, banks with lower solvency levels exhibit the presence of the bank lending channel more strongly; whereas when the policy is expansive, the most solvent banks are the only ones to react under the theory put forth by the bank lending channel. Additionally, the presence of unexpected behavior in low solvency banks during times of monetary expansion was observed. There, falls in the IR corresponded to decreases in the growth of the total portfolio rather than encourages in the credit dynamics.

Thus, the bank lending channel exhibits a stronger presence in times of monetary contraction, while in times of expansion the effect is diluted. This is due to the greater freedom of action that agents have when the applied policy is expansive. Moreover, even when interest rates fall, agents do not necessarily increase their levels of demand or supply of credit. In this regard, two major cases have been documented: i) Japan, where insufficient demand for credit annulated the effect of monetary expansion that had been applied (Bernanke, 1999); and ii) New England (United States), where the difficulties to meet the minimum capital requirements did not allow banks to take advantage of lower financing costs given by monetary expansion (Van den Heuvel, 2007). In fact, according to economic literature it may even happen that credit decreases in times of monetary expansion, particularly in banks with lower levels of solvency, which tend to decrease their levels of portfolio to meet the limit capital/asset indicator defined by the regulation (Peek and Rosengren, 1992); very much in line with the results observed in this study.

The results of this paper confirm the presence of a bank lending channel in Colombia, with a highly heterogeneous character according to the financial characteristics of each

bank and the type of monetary policy that is being applied. The presence of these asymmetries in the transmission of monetary policy demonstrate the need for the Central Bank to go into greater detail when studying the behavior of the transmission mechanism of monetary policy in the economy, particularly with respect to the bank loans channel; so that they can predict more closely how the economy will perform to certain monetary incentives, and how they should be modified so that the transfer rate on the economy is more in line with the needs of the same.

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Appendix 1: The Taylor Rule in Colombia – Construction of the Variables

The calculation of the Taylor rule for Colombia was conducted according to the following formula:

$$Nominal\ interest\ rate = observed\ inflation + \overline{long\ term\ real\ interest\ rate}$$

$$+1.5 * (observed\ inflation - inflation\ target) + 0.5 * product\ gap \qquad \text{(A1)}$$

- Observed inflation corresponds to the annual CPI of Colombia.
  Source: Dane.
- The long term real interest rate is 4.8%, as expressed by Alejandro Reyes, director of economic research at *Ultrabursátiles* brokers.
  Source: Economía y Negocios., (2014, agosto 26), "Debate por tasa de interés de equilibrio en Colombia". *El Tiempo*. Recuperado de http://www.eltiempo.com/economia/sectores/emisor-y-tasa/14439216
- The inflation target corresponds to the inflation target raised by the Central Bank of Colombia. It was captured by two sources, according to the type of inflation target set (the point value or range):
  - For the period 1996-2002, the specific inflation target was used.
    Source: Central Bank of Colombia (2012, June), "Report on inflation." Recovered from http://www.banrep.gov.co/docum/Lectura_finanzas/pdf/isi_jun_2012.pdf
  - For the period 2003-2014, the central value of the inflation target range (point target) was used.
    Source: Central Bank of Colombia.
- The output gap is the subtraction between the observed real annual GDP growth and potential GDP growth. To calculate the latter the trend component of GDP growth observed is extracted using the Hodrick-Prescott filter.
  Source: Dane.

Appendix 2: Estimation of the Segmented Model, Including Financial Variables

Table A1 - Disaggregated by Solvency According to Median (Including Financial Variables)

	Contractive Policy (2006:10-2008:8)				Expansive Policy (2008:8-2009:12)			
	High Solvency (No. Observations: 172)		***Low Solvency*** (No. Observations: 207)		***High Solvency*** (No. Observations: 128)		***Low Solvency*** (No. Observations: 153)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	-11,648 *(16,199)*	n.s.	-34,324 *(12,012)*	***	23,805 *(11,359)*	**	-20,763 *(10,769)*	*
TIB*Size	0,277 *(0,480)*	n.s.	1,530 *(0,905)*	*	0,255 *(0,454)*	n.s.	2,459 *(0,680)*	***
TIB*Solvency	-0,278 *(1,107)*	n.s.	2,798 *(1,371)*	**	-1,687 *(0,636)*	***	1,449 *(1,173)*	n.s.

Standard errors in parenthesis
***, ** & * imply significance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Solvency: Equity as a proportion of assets

Table A2- Disaggregated by Solvency According to Mean (Including Financial Variables)

	Contractive Policy (2006:10-2008:8)				Expansive Policy (2008:8-2009:12)			
	High Solvency (No. Observations: 172)		***Low Solvency*** (No. Observations: 207)		***High Solvency*** (No. Observations: 43)		***Low Solvency*** (No. Observations: 238)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	-11,648 *(16,199)*	n.s.	-34,324 *(12,012)*	***	18,326 *(29,075)*	n.s.	2,367 *(6,274)*	n.s.
TIB*Size	0,277 *(0,480)*	n.s.	1,530 *(0,905)*	*	-2,568 *(3,670)*	n.s.	0,791 *(0,337)*	**
TIB*Solvency	-0,278 *(1,107)*	n.s.	2,798 *(1,371)*	**	-0,653 *(1,255)*	n.s.	-0,300 *(0,610)*	n.s.

Standard errors in parenthesis
***, ** & * imply significance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Solvency: Equity as a proportion of assets

Table A3- Disaggregated by Capitalization According to Median (Including Financial Variables)

	Contractive Policy (2006:10-2008:8)				Expansive Policy (2008:8-2009:12)			
	High Capitalization (No. Observations: 195)		***Low Capitalization*** (No. Observations: 184)		***High Capitalization*** (No. Observations: 128)		***Low Capitalization*** (No. Observations: 153)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	-4,671	n.s.	-5,832	n.s.	-5,744	n.s.	8,713	*
	(15,450)		*(7,628)*		*(16,288)*		*(4,676)*	
TIB*Size	-0,446	n.s.	0,233	n.s.	1,405	n.s.	0,640	*
	(2,562)		*(0,619)*		*(3,598)*		*(0,370)*	
TIB*Capitalization	-1,228	n.s.	-1,353	n.s.	0,804	n.s.	-14,677	***
	(1,767)		*(8,001)*		*(1,334)*		*(4,481)*	

Standard errors in parenthesis
***, ** & * imply suignificance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Capitalization: Social capital as a proportion of assets

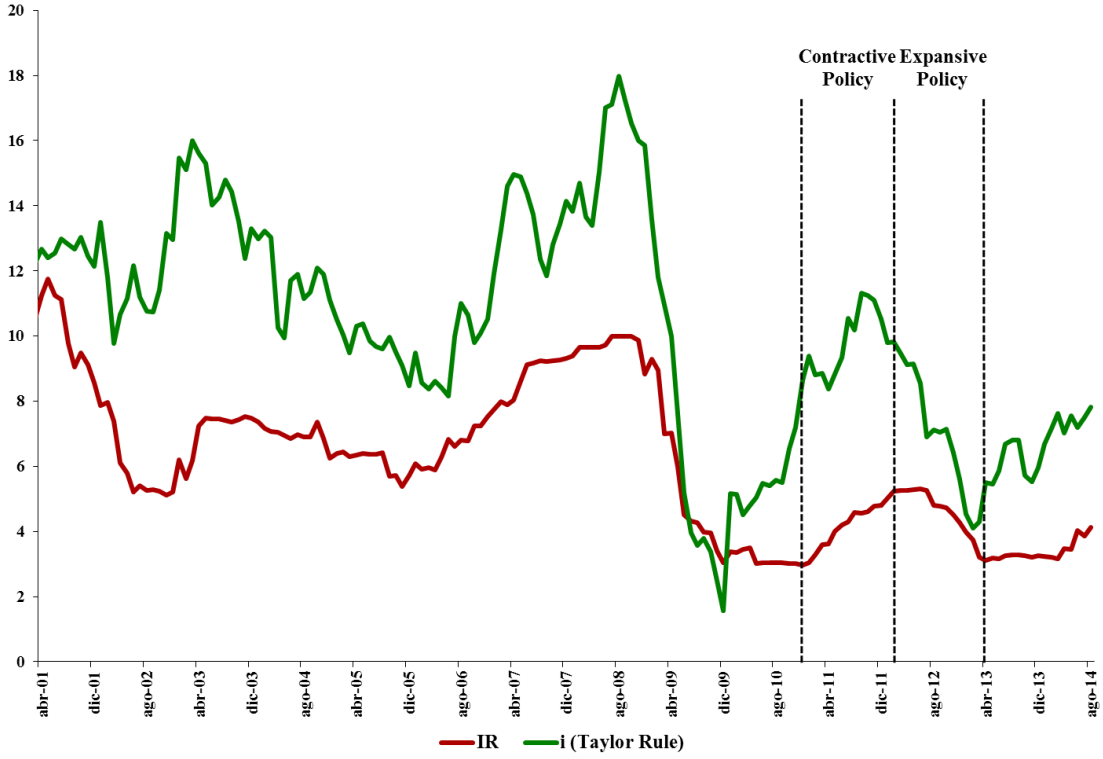
Table A4 - Disaggregated by Capitalization According to Mean (Including Financial Variables)

	Contractive Policy (2006:10-2008:8)				Expansive Policy (2008:8-2009:12)			
	High Capitalization (No. Observations: 126)		***Low Capitalization*** (No. Observations: 253)		***High Capitalization*** (No. Observations: 43)		***Low Capitalization*** (No. Observations: 238)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	16,762	n.s.	-2,407	n.s.	-26,612	n.s.	4,788	n.s.
	(19,056)		*(7,041)*		*(25,127)*		*(4,369)*	
TIB*Size	-5,338	n.s.	0,296	n.s.	1,922	n.s.	0,473	n.s.
	(3,614)		*(0,577)*		*(10,005)*		*(0,368)*	
TIB*Capitalization	-2,909	n.s.	-2,838	n.s.	3,352	n.s.	-2,407	*
	(2,081)		*(3,047)*		*(2,549)*		*(1,411)*	

Standard errors in parenthesis
***, ** & * imply suignificance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Capitalization: Social capital as a proportion of assets

Appendix 3: Estimation of the Segmented Model- Period 2001-2014

Figure A1 – Taylor Rule vs. Observed Monetary Policy (2001-2014)



Source: Own calculation based on the Central Bank of Colombia, Dane , and *Ultrabursátiles.*

Table A5 - Disaggregated by Solvency According to Median (2010-2013)

	Contractive Policy (2010:9-2012:2)				Expansive Policy (2012:2-2013:4)			
	High Solvency (No. Observations: 144)		***Low Solvency*** (No. Observations: 180)		***High Solvency*** (No. Observations: 174)		***Low Solvency*** (No. Observations: 163)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
TIB	3,565	n.s.	-3,202	n.s.	1,068	n.s.	-5,907	n.s.
	(25,000)		*(8,050)*		*(23,206)*		*8,792*	
TIB*Size	-0,528	n.s.	0,623	n.s.	-0,974	n.s.	-0,039	n.s.
	(1,044)		*(0,567)*		*(1,233)*		*(0,744)*	
TIB*Solvency	-0,279	n.s.	-0,294	n.s.	-0,684	n.s.	0,334	n.s.
	(1,085)		*(0,707)*		*(0,906)*		*(0,829)*	

Standard errors in parenthesis
***, ** & * imply significance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Solvency: Equity as a proportion of assets

Table A6 - Disaggregated by Solvency According to Mean (2010-2013)

	Política contractiva (2010:9-2012:2)				Política expansiva (2012:2-2013:4)			
	High Solvency (No. Observations: 108)		***Low Solvency*** (No. Observations: 216)		***High Solvency*** (No. Observations: 117)		***Low Solvency*** (No. Observations: 220)	
Long Term Variables	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
TIB	18,921	n.s.	9,615	n.s.	43,813	n.s.	6,929	*
	(36,477)		*(10,822)*		*(35,096)*		*(7,861)*	
TIB*Size	-0,800	n.s.	0,723	n.s.	-2,082	n.s.	0,791	*
	(1,209)		*(0,772)*		*(1,602)*		*(0,545)*	
TIB*Solvency	-0,919	n.s.	-1,603	n.s.	-0,502	n.s.	-1,405	***
	(1,494)		*(1,006)*		*(1,227)*		*(0,702)*	

Standard errors in parenthesis
***, ** & * imply significance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Solvency: Equity as a proportion of assets

Table A7 - Disaggregated by Capitalization According to Median (2010-2013)

	Política contractiva (2010:9-2012:2)				Política expansiva (2012:2-2013:4)			
	High Capitalization (No. Observations: 144)		***Low Capitalization*** (No. Observations: 180)		***High Capitalization*** (No. Observations: 157)		***Low Capitalization*** (No. Observations: 165)	
Long Term Variables	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
TIB	-65,176	**	2,690	n.s.	29,528	n.s.	-2,003	n.s.
	(27,448)		*(3,105)*		*(23,071)*		*(3,114)*	
TIB*Size	15,948	**	-0,666	***	-12,334	n.s.	-0,046	n.s.
	(7,772)		*(0,244)*		*(11,031)*		*(0,248)*	
TIB*Capitalization	2,160	**	-0,503	n.s.	-0,748	n.s.	-0,397	n.s.
	(1,090)		*(2,562)*		*(1,359)*		*(2,349)*	

Standard errors in parenthesis
***, ** & * imply suignificance at 1%, 5% & 10%, respectively
n.s. - Not significative
TIB: Interbank rate
Size: Bank assets as a proportion of the total market assets
Capitalization: Social capital as a proportion of assets

Table A8 - Disaggregated by Capitalization According to Mean (2010-2013)

	Política contractiva (2010:9-2012:2)				Política expansiva (2012:2-2013:4)			
	High Capitalization (No. Observations: 72)		***Low Capitalization*** (No. Observations: 252)		***High Capitalization*** (No. Observations: 43)		***Low Capitalization*** (No. Observations: 238)	
	Estimator	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**	**Estimator**	**Significance**
Long Term Variables								
Long Term Variables	-79,028	*	2,345	n.s.	324,187	***	-1,822	n.s.
TIB	*(44,059)*		*(3,693)*		*(52,470)*		*(4,589)*	
	23,029	n.s.	-0,663	**	-342,021	***	0,104	n.s.
TIB*Size	*(45,842)*		*(0,312)*		*(62,265)*		*(0,392)*	
	2,390	n.s.	0,267	n.s.	-11,374	***	-2,744	n.s.
TIB*Capitalization	*(1,467)*		*(1,588)*		*(2,179)*		*(2,020)*	

Standard errors in parenthesis

***, ** & * imply suignificance at 1%, 5% & 10%, respectively

n.s. - Not significative

TIB: Interbank rate

Size: Bank assets as a proportion of the total market assets

Capitalization: Social capital as a proportion of assets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