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THE IMPACT OF FINANCIAL REPRESSION ON INTEREST RATE SPREADS IN VENEZUELA

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EL IMPACTO DE LA REPRESIÓN FINANCIERA SOBRE LOS DIFERENCIALES DE LA TASA DE INTERÉS EN VENEZUELA
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RESUMEN

Este trabajo examina empíricamente el efecto de la represión financiera sobre los *spreads* de la tasa de interés en Venezuela. Para obtener una medición de represión financiera, construimos un índice que captura el costo de oportunidad de las restricciones regulatorias sobre las operaciones bancarias, tales como requerimientos de reservas, programas de carteras de crédito obligatorios, y el costo de los impuestos a las transacciones financieras. Después de controlar por otros determinantes de costos y a nivel de bancos, los resultados de una regresión de panel sugieren que hay una correlación positiva y estadísticamente significativa entre el índice general de represión financiera y los *spreads* de tasas de interés.

Palabras clave: regulación bancaria, intermediación, eficiencia

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ABSTRACT

This paper empirically examines the effect of financial repression on interest rates spreads in Venezuela. In order to have a measure of financial repression, we built an index that captures the opportunity cost of regulatory restrictions on banking operations, such reserve requirements, mandatory lending programs, and the cost of financial transactions taxes. After controlling for other bank-level and systemic determinants, results of panel regressions suggest that there is a statistically significant positive correlation between the overall index of financial repression and interest rate spreads.

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Keywords: banking regulation, intermediation, efficiency

The Impact of Financial Repression on Interest Rate Spreads in Venezuela

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Abstract

This paper empirically examines the effect of financial repression on interest rates spreads in Venezuela. In order to have a measure of financial repression, we built an index that captures the opportunity cost of regulatory restrictions on banking operations, such reserve requirements, mandatory lending programs, and the cost of financial transactions taxes. After controlling for other bank-level and systemic determinants, results of panel regressions suggest that there is a statistically significant positive correlation between the overall index of financial repression and interest rate spreads.

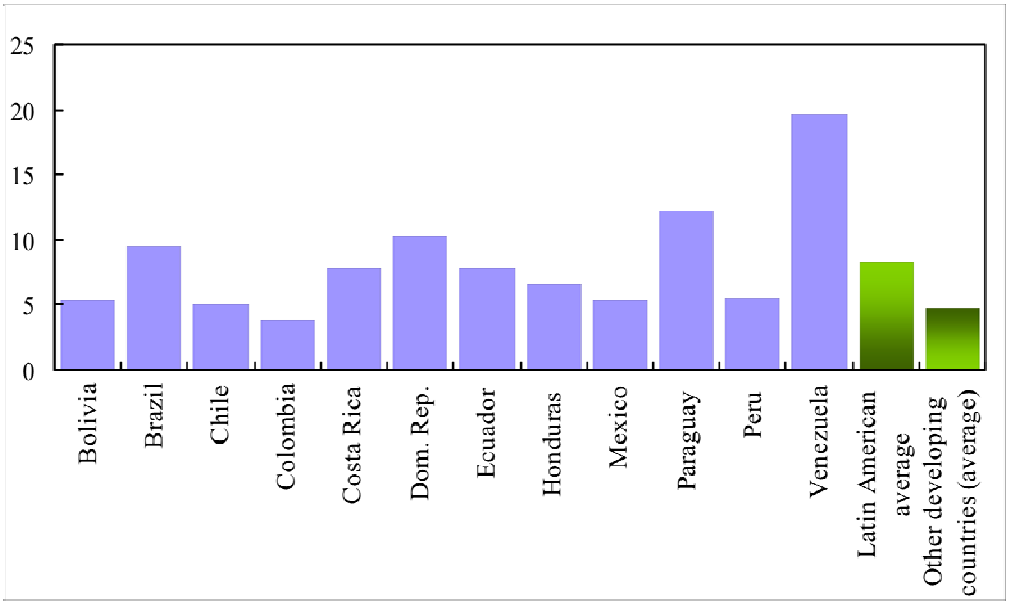
Keywords: Banking regulation, intermediation, efficiency
JEL Classification: G21, G28, O54

[1] Arreaza: Andean Development Corporation, Huskey and Zumeta: Universidad Católica Andrés Bello. This paper benefited from the valuable input and comments of Luis Zambrano, Jesús Bianco, Lenoardo Villar, Alejandro Grisanti, and the parcicipants of the EcoMod Conference in Ottawa.

1. Introduction

The banking sector in Venezuela operates in a challenging environment characterized by volatile macroeconomic conditions and continuous changes of regulation, affecting the way banks do business. Since banks have a crucial role in mobilizing and allocating resources in the economy, their performance has always been part of the domestic policy debate. Interest rate spreads—the difference between the rates charged to borrowers and the rates paid to depositors—have drawn a lot of the attention in this debate, mainly because they have been quite elevated. In Figure 1 we can appreciate that banking spreads in Venezuela are the highest among Latin American countries, where spreads are already steep by international standards (Brock and Rojas-Suarez, 2000 and Gelos, 2006). Moreover, interest rate spreads have also been highly volatile in Venezuela over the past decade (Figure 2). High and volatile interest rate spreads are problematic, since that is are detrimental for domestic investment and saving.

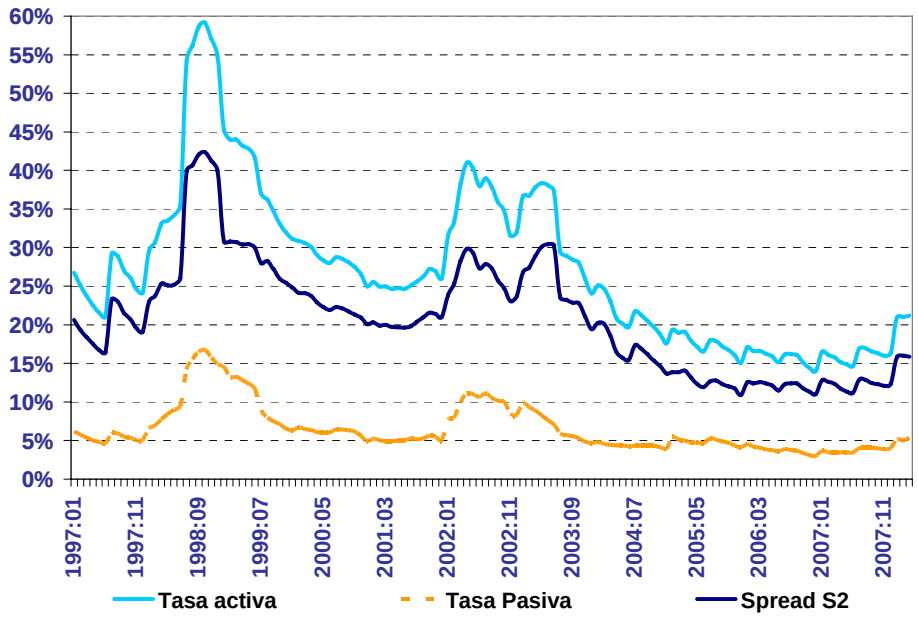
Figure 1. Net Interest Rate Margins (Averages 1999-2002)



Note: Total interest income minus total interest expense, divided by the sum of interest bearing assets. Source: Gelos (2006)

In turn, the behavior of spreads may be affected by market structure, cost efficiency, macroeconomic dynamics, institutions, and the existing regulation. A number of studies have explored the determinants of interest rate spreads in Venezuela. For instance, findings in Zambrano et al. (2001), Clemente and Puente (2001), and Arreaza et al. (2001) are not supportive of market power or concentration being relevant to explain interest rate spreads[2]. Furthermore, Zambrano (2003) presents evidence indicating competitive behavior in credit markets and monopolistic competition in overall banking intermediation (including investment services). Nonetheless, a common finding in Zambrano et al. (2001), Clemente and Puente (2001), and Arreaza et al. (2001) is that operating costs comprise a significant determinant of banking spreads. On the other hand, Arreaza et al. (2001) find that some macroeconomic variables are also relevant to explain banking spread dynamics. However, none of these studies examine the impact of financial repression or regulatory restrictions on banking spreads.

Figure 2. Interest Rate Margins in Venezuela (1997-2008)



Note: Implicit loan rate: interest income from loans divided by total loans. Implicit deposit rate: interest expenses on deposits divided total deposits. The spread is the difference between these rates. Source: SUDEBAN, own calculation.

[2] Rodríguez and Pérez find a role for market power, but Zambrano et. al (2001) contested these results on the basis of measurement error.

Financial repression can be defined as a set of policies, laws, controls and regulatory restrictions on banking operations that prevent optimal resource allocation and interest rate setting, which entail costs that banks should be willing to transfer to their margins (McKinnon, 1973 and Shaw, 1973). An increase in financial repression should then be associated with wider interest rate spreads. Financial repression measures may include reserve requirements, interest rate caps, entry barriers, and mandatory credit allocation, among others. All of these are still part of the policy tool kit in Venezuela and, in fact, have been extensively used. Therefore, our task in this paper is to gauge whether financial repression has also contributed to support high spreads in Venezuela.

A number of recent studies find a statistically significant positive correlation between bank margins and banking regulation. In a cross-country study, Demirguc-Kunt, Leaven and Levine (2003) find that tighter regulation on bank entry and bank activities widens interest margins regulation and spreads. Results of panel studies focused on Latin American banking spreads also indicate that taxes and reserve requirements contribute to the prevalence of high spreads in Latin America, among other factors such as high operating costs, inflation and macroeconomic volatility (Brock and Rojas-Suarez, 2000 and Gelos, 2006).

Findings of country level studies point in the same direction. Barajas, Steiner, and Salazar (1999) report that financial taxation contributes to high spreads in Colombia, in addition to imperfect competition and operating costs, the fraction of nonperforming loans. In the same vein, Fuentes and Basch (1998) study the case of Chile and Grasso and Banzas (2006) cover the Aregentinean case, finding a role for regulation on spreads. A substantial number of studies focused on Brazil suggest that taxation, administrative costs, and loan-loss provisions are the main determinants of banking spreads (Central Bank of Brazil, 1999-2003).

Most of these studies focus on a single dimension of financial repression, namely, reserve requirements or taxation (of profits or of financial

transactions). In this study we resort to an indicator of financial repression that encompasses the opportunity cost of different regulatory restrictions such as mandated lending programs, reserve requirements, and the cost of financial transactions taxes, based upon Carrasquilla and Zárate (2002) and Villar, Salamanca and Murcia (2005). We employ this metric in panel regressions to test whether financial repression explains interest rate spreads in Venezuela using bank-level observations between 1997 and 2008. Our findings indicate that there exists a positive and significant correlation between bank margins and financial repression, after controlling for other bank-level and systemic determinants.

The paper contains four sections including the introduction. In the next section we describe the index of financial repression and its dynamics during the study period. The third section presents and analyses the econometric results and the last section contains the conclusions.

2. Measuring financial repression in Venezuela

In the aftermath of the financial crisis of the mid nineties, the banking sector underwent important changes that included a process of consolidation trough mergers and acquisitions, the entry of foreign banks, an improvement of prudential regulation and accounting practices, and technological upgrades. Nevertheless, regulatory restrictions on banking operations remained binding to a large extent. For example, since 1997 reserve requirements rates on net liabilities were set between 15% and 17%. Moreover, since July 2006 the central bank established an additional reserve requirement of 30% for net liabilities exceeding a benchmark determined by the monetary authority, i.e. the “marginal” reserve requirement.

Mandatory credit allocation progressively increased in quantity and scope throughout the period: from 12,5% of total loan portfolio destined to agriculture loans in 1997, compulsory subsidized loans reached 37% by 2007—including loans for agriculture (21%), tourism (3%), mortgage credit (10%) and micro-

credit (3%). Taxes on financial transactions were temporarily established, with a rate range between 0,5% and 1,5%.

Since our goal in this paper is to gauge the impact of financial repression on interest rate spreads, we want to use a metric that encompasses the cost of the different regulatory restrictions on banking operations. Carrasquilla and Zarate (2002) came up with an index that measures the toll of financial repression in terms of the gap between the spreads consistent with existing regulation and the spreads that would result in the absence of regulatory restrictions. The index is defined in Equation 1 and its full derivation can be found in Carrasquilla and Zarate.

$$FRI = \frac{(r_d + a - r_e)(1-\alpha)}{(1-e-I)}e + \frac{(r_d + a - r_i)(1-\alpha)}{(1-e-I)}I + \frac{(1-\alpha)}{(1-e-I)}\lambda z + \left[r - (r_d + a)\right]\alpha \qquad (1)$$

Where r_e is the rate paid on required reserve balances, e is the reserve requirements ratio, r_i is the rate charged for mandatory loans, r_d is the rate paid on deposits, a represents operating costs related to deposits, α is the solvency ratio, I is the coefficient of mandatory loans, r is the opportunity cost of capital, λ is the tax rate on financial transactions, and z stands for deposit velocity.

The first term in (1) captures the opportunity cost of holding required reserves; the second term represents the cost of subsidized mandatory loans; the third term is the tax on financial transactions; and the fourth stands for the cost of capital adequacy requirements. In addition to the conventional reserve requirement ratio, we included the marginal reserve requirement that applies since 2006.

Villar, Salamanca and Murcia (2005) formulate a simplified version of (1) that includes just the first three terms of the index. They argue that this simplification reduces data and computational requirements while preserving

the general dynamics captured by (1):

$$FRI = \frac{(r_d + a - r_e)(1-\alpha)}{(1-e-I)} e + \frac{(r_d + a - r_i)(1-\alpha)}{(1-e-I)} I + \frac{(1-\alpha)}{(1-e-I)} \lambda z \qquad (2)$$

We resorted to the simplified version of the index in (2) in this paper. It also seems appropriate for our study, since we are more interested in assessing the cost of distortionary policies on spreads, rather than the cost of prudential regulation on capital adequacy. We employed monthly statistics and reports from the Central Bank (BCV), the Bank Regulating Agency (SUDEBAN), and Official Gazettes to compute this metric.

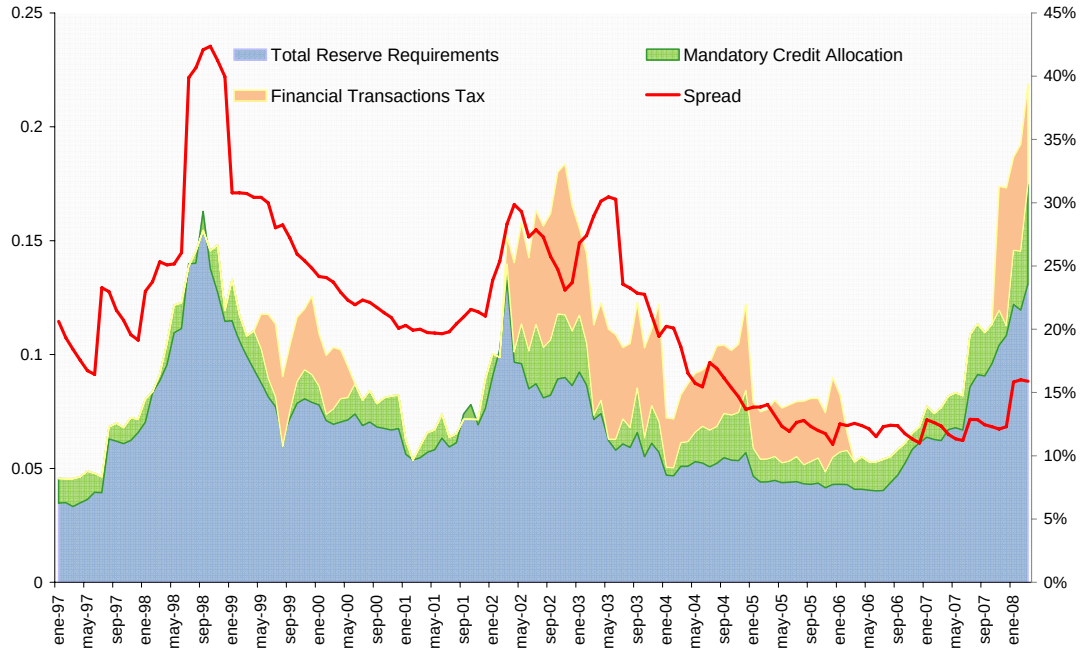
In terms of the data, for r_d we used the average deposit rate of the six largest commercial and universal banks. As a proxy for r_e we used r_d times the fraction of reserve requirements subject to the payment of interest as determined by the central bank. For e, we used the conventional reserve requirement ratio and the marginal requirement established in 2006[3]. For r_d and I we employed the corresponding ratios and rates of mandatory loans for agriculture, mortgage, tourism and micro-credit. The ratio of operating costs to average deposits is the proxy for a. Since there is no data available on monthly net withdrawals, we employed the ratio of financial transactions tax receipts to total deposits as a proxy for z[4]. Financial transactions taxes were introduced three times during our study period: between May 1999 and November 2000 with a tax rate of 0,5%; between December 2001 and February 2006 with a tax rate of 0,75%; and between November 2007 and June 2008 with a tax rate of 1,5%[5].

[3] To compute the weight of the marginal requirement we divided the total amount deposited at the central bank for this concept by total liabilities. Due to a fast paced increase in liquidity between 2006 and 2008, resources accumulated for marginal reserve requirements grew rather fast.

[4] See Finol (2006).

[5] Between 2007 and 2008, the tax was only applied to corporate financial transactions.

Figure 3. Financial Repression Index in Venezuela (1997-2008)



Source: SUDEBAN, Central Bank of Venezuela, own calculations.

The index in Equation (2) and its components are depicted in Figure 3. From the depiction of the index, it becomes evident that reserve requirements were the main driver of financial repression, although taxes on financial transactions also raised the regulatory burden for financial intermediaries while they were in place. In particular, the introduction of marginal reserve requirements since 2006 has progressively increased the cost of regulation for banks. While non-negligible, mandatory loans are not the largest source regulatory costs for banks in terms of what our measure captures.

We can also appreciate that there is a positive correlation between the financial repression index and the banking spread. In the next section we explore the relationship between spreads and financial repression more thoroughly.

3. Econometric results

In order to examine whether the overall index of financial repression is correlated with banking spreads in Venezuela, we conducted empirical exercises using monthly bank's balance sheet information for 21 banks between January 1997 and March 2008, published by SUDEBAN [6]. We controlled for other bank-specific determinants (liquidity ratio, operating costs, non-performing loans ratio, etc.) and some time-varying macroeconomic variables.

3.1 The data

The dependent variable, ***interest rate spreads***, is the difference between a broad definition of "implicit" loan and deposit rates offered by each bank in the sample, i.e., (interest plus commissions received / loans) – (interest plus commissions paid / deposits). This definition is a superior alternative to, for example, net interest margins—the ratio of interest earnings minus expenses to all interest-earning assets—since it does not take into account further charges for commissions that affect the effective cost of intermediation. In addition, when banks hold significant amounts of noninterest bearing required reserves and low-yield government bonds, the definition of net interest margins deviates from the spread definition that reflects marginal costs and revenues[7]. This is precisely the case in Venezuela. A number of empirical studies for the Venezuelan case have thus made use of this definition of spreads on the same grounds[8].

[6] Mergers and acquisitions during the period were simply treated by adding up the data of the two existing banks previous to the operation, in order to have one bank throughout the sample.

[7] See Brock and Rojas-Suarez (2000) for an extensive discussion on the merits of different definitions of banking spreads.

[8] See Zambrano et. al (2001), Arreaza et. al (2001) and Clemente and Puente (2001).

The ***financial repression index***, our main concern in this paper, is described in Section 2. We should expect increasing spreads in response to higher levels of regulatory burden.

We further control for variations across banks and in time by incorporating other bank-level determinants. For example, we included the ***ratio of non-performing loans*** to total loans ***(NPLs)***, to account for credit risk. We should expect that more risk should be compensated for with higher earnings. Nevertheless, in the aftermath of a crisis or while regulation may be somewhat lax, a negative correlation between spread and NPLs could result, since banks may try to increase their market shares by engaging in riskier loans[9]. Spreads should also be increasing in the ***ratio of operating costs*** to assets, in order to make business profitable. Spreads should also be positively correlated to the ***capital asset ratio*** and the ***ratio of short-term liquid assets*** to deposits, as these assets bear opportunity costs since they are not used for intermediation purposes.

We also incorporated time-varying systemic variables. First, we controlled for a measure of industry concentration including a ***Hirshman-Hefindahl index*** for loans, since higher spreads could be the outcome of a concentrated system. In addition, we controlled for changes in the macroeconomic environment by including ***inflation rates*** (CPI variations yoy), a measure of financial depth (the ***ratio of M2 to GDP***)[10], a measure of ***volatility of the loan rate*** (a six-month moving average of the standard deviations of loan rates), and a ***real exchange rate*** index (nominal exchange rate times the US CPI divided by de domestic CPI). Higher inflation should be associated with wider spreads, as increasing inflation should shift the demand towards interest-earning deposits. Financial depth could go either way: a reduction of financial depth should encourage banks to raise loan rates to capture more

[9] See Brock and Rojas-Suarez (2000).

[10] We used an algorithm developed at the Central Bank to transform quarterly GDP into monthly observations, with the variations of a monthly leading indicator of economic activity (IGAEM) that is highly correlated with GDP.

deposits. At the same time, a contraction of the ratio M2 to GDP implies fewer resources to draw upon for intermediation, which should increase the price of credit. On the other hand, a volatile macroeconomic environment entails systemic risks that could be transferred to spreads. Therefore, the larger the variability of interest rates, the wider the spreads we should expect. Likewise, a large appreciation of the exchange rate may signal the presence of distortions, which may herald future corrections of the exchange rates, which should raise the FX risk premium and in consequence the spreads.

3.2 The model

We conducted FGLS panel regressions with cross-section fixed effects and individual bank time trends. Standard errors are robust to observation specific heteroskedasticity in the disturbances (White diagonal).

Results are displayed in Tables 1-3. In Table 1 we present results for the full sample and in Tables 2 and 3 we show the results for two sub-samples: January 1997-January 2003 and February 2003-March 2008. The rationale for splitting the sample rests on the fact that administrative restrictions were imposed on the foreign exchange market in February 2003, which affected banking operations. The accumulation of financial assets overseas was impaired under this regime while, at the same time, the buildup of international reserves—associated with the 2003-2008 commodity boom—implied increasing levels of liquidity that paved the road for a fast paced credit expansion. In addition, ceilings for loan rates and floors for deposit rates were also set in place at this time.

We ran regressions for each sub-sample, in order to account for possible structural changes.

Table 1

Panel Regressions
Period: January 1997 - March 2008
Dependent Variable: Interest Rate Spread

	1		2	
Variables	**Coefficient**	**P-value**	**Coefficient**	**P-value**
C	0,315	0,000	0,231	0,000
Financial Repression Index	0,159	0,000	0,070	0,099
Capital-Assets ratio	-	-	(0,099)	0,210
Non-performing loans ratio	-	-	(0,111)	0,182
Opetaring Costs to Assets Ratio	-	-	0,754	0,000
Liquidity ratio	-	-	0,007	0,555
Credit Concentration (IHH)	-	-	(0,000)	0,009
Inflation	-	-	0,001	0,002
M2/GDP	-	-	0,098	0,013
Interest rate volatility	-	-	0,549	0,000
Real exchange rate variations	-	-	0,000	0,354
AR(1)	0,883	0,000	0,848	0,000
R-squared	0,934		0,944	
Prob(F-statistic)	0,000		0,000	
Durbin-Watson stat	1,985		2,062	

Cross-section weighted FGLS. Fixed effects and individual time trends.
White diagonal standard errors & covariance (d.f. corrected)

Table 2

Panel Regressions
Period: January 1997 - January 2003
Dependent Variable: Interest Rate Spread

	1		2	
Variables	**Coefficient**	**P-value**	**Coefficient**	**P-value**
C	0,24754	0,00000	0,186019	0,0000
Financial Repression Index	0,41317	0,00000	0,387691	0,0000
Capital-Assets ratio	-	-	(0,072875)	0,4372
Non-performing loans ratio	-	-	(0,228223)	0,0060
Opetaring Costs to Assets Ratio	-	-	0,630937	0,0000
Liquidity ratio	-	-	0,013445	0,3573
Credit Concentration (IHH)	-	-	(0,000065)	0,0060
Inflation	-	-	(0,000676)	0,0851
M2/GDP	-	-	0,355350	0,0001
Interest rate volatility	-	-	0,587799	0,0000
Real exchange rate variations	-	-	0,000399	0,2739
AR(1)	0,83251	0,00000	0,761542	0,0000
R-squared	0,9277		0,9357	
Prob(F-statistic)	0,0000		0,0000	
Durbin-Watson stat	1,9160		1,9678	

Cross-section weighted FGLS. Fixed effects and individual time trends.
White diagonal standard errors & covariance (d.f. corrected)

Table 3

Panel Regressions
Period: February 2003 - March 2008
Dependent Variable: Interest Rate Spread

	1		2	
Variables	**Coefficient**	**P-value**	**Coefficient**	**P-value**
C	0,22306	0,00000	0,233552	0,0000
Financial Repression Index	0,07282	0,06060	0,077960	0,0229
Capital-Assets ratio	-	-	(0,114659)	0,0464
Non-performing loans ratio	-	-	0,124825	0,0953
Opetaring Costs to Assets Ratio	-	-	1,131609	0,0000
Liquidity ratio	-	-	0,023305	0,0700
Credit Concentration (IHH)	-	-	(0,000069)	0,0015
Inflation	-	-	0,000404	0,2268
M2/GDP	-	-	0,102466	0,0003
Interest rate volatility	-	-	1,250969	0,0000
Real exchange rate variations	-	-	(0,000989)	0,0004
AR(1)	0,85651	0,00000	0,677842	0,0000
R-squared	0,9593		0,9722	
Prob(F-statistic)	0,0000		0,0000	
Durbin-Watson stat	2,0028		2,0452	

Cross-section weighted FGLS. Fixed effects and individual time trends.
White diagonal standard errors & covariance (d.f. corrected)

The results indicate that the index of financial repression exhibits a statistically significant and positive correlation with banking spreads, which becomes more apparent when we split the sample in two. Opportunity costs of high reserve requirements, of mandated loans at subsidized rates, as well as the cost of financial transactions taxes are all being transferred to spreads. This is the case even after the monetary authority established caps on loan rates and minimum levels for deposit rates in 2003, which further affected the process of interest rate setting and partially curbed spreads.

Results for other determinants of banking spreads are in tune with previous findings for the Venezuelan case. Regarding bank-level variables, operating costs seem to be the most relevant and robust determinant of spreads, which is consistent with the conclusions reached in Arreaza et. al (2001), Clemente and Puente (2001) and Zambrano et. al (2001). On the other hand, macroeconomic variables also seem to be playing a significant role on spreads. Systemic risks, captured by interest rate volatility, especially seem to

be contributing to boost spreads. On the other hand, the degree of monetization of the economy relative to GDP shows a positive correlation with spreads, suggesting that when more resources become available for intermediation at a systemic level, spreads tend to be contained. As liquidity increased in the economy throughout the period, so did deposits, allowing banks to reduce deposit rates and thus widening spreads. Finally, the level of concentration of the banking system, measured by a Herfindahl-Hirschman index for loans, displays a negative correlation with spreads (although it is practically zero). This result may be the outcome of low levels of concentration in the Venezuelan banking system by all standard measures. Therefore, if market power is being exercised in the system, this may not be judged by the level of concentration. Moreover, as documented in Zambrano (2003), credit markets tend to behave competitively in Venezuela.

Table 4

Panel Regressions
Period: January 1997 - March 2008
Dependent Variable: Interest Rate Spread

	1		2	
Variables	**Coefficient**	**P-value**	**Coefficient**	**P-value**
C	0.27878	0.00000	0.217836	0.0000
FRI-RR	0.59506	0.00000	0.319219	0.0005
Capital-Assets ratio	-	-	-0.085824	0.2695
Non-performing loans ratio	-	-	(0.117040)	0.1548
Opetaring Costs to Assets Ratio	-	-	0.742845	0.0000
Liquidity ratio	-	-	0.002296	0.7991
Credit Concentration (IHH)	-	-	(0.000046)	0.0257
Inflation	-	-	0.000862	0.0025
M2/GDP	-	-	0.034724	0.3534
Interest rate volatility	-	-	0.528032	0.0000
Real exchange rate variations	-	-	0.013817	0.0128
AR(1)	0.87249	0.00000	0.837147	0.0000
R-squared	0.9016		0.9124	
Prob(F-statistic)	0.0000		0.0000	
Durbin-Watson stat	2.0270		2.0747	

Cross-section weighted FGLS. Fixed effects and individual time trends.
White diagonal standard errors & covariance (d.f. corrected)

We further analyzed the impact of the individual components of the financial repression index on banking spreads. The index component that exhibited the largest and more significant correlation with spreads was that related to

reserve requirements. In Table 4 we present the results of regressing banking spreads on the reserve requirement component in Equation (2) for the full sample. The results we obtained from this exercise are very much in line with our previous results for the full index, in the sense that banking spreads are increasing in the opportunity costs of holding required reserves, after controlling for other bank-level and systemic determinants. We got similar results for the financial transactions tax component of the index in (2), although we did not find that the cost of mandatory loans was significant when considered by itself. We still consider that the index in (2) is still a superior measure to the concept of financial repression than each of its parts.

4. Final remarks

In this paper we assessed the role of financial repression on banking spreads in Venezuela. In order to do this, we computed a metric to capture the cost of different distortionary regulatory restrictions on banking operations, namely, the opportunity cost of holding required reserves, the cost of subsidized mandatory loans, and the tax on financial transactions. Then we ran panel regressions using monthly bank's balance sheet information, and controlled for other bank-level determinants and systemic variables.

The evidence indicates that banking spreads are increasing in financial repression and, in particular, in the cost of required reserves. The significance of the results is robust across samples. Similar results were drawn considering just the reserve requirements dimension of financial repression.
Therefore, regulation itself seems to be fueling upside pressures on spreads. Although our results are suggestive, alternative ways to account for financial repression could also be explored. For instance, the index does not measure directly the effect of interest rate caps, which may be a caveat for our results, since we may be underestimating financial repression.

On the other hand, systemic risks associated to a volatile macroeconomic environment and high operating costs are also sustaining wide spreads.

Considering the importance of costs for spreads and the macroeconomic volatility is another line of study, another natural path for research on the workings of the banking sector in Venezuela should be to explore the determinants of cost structure of banks.

Our findings are also interesting from a policy perspective. In light of these results and in the absence of strong evidence supporting the presence market power in the credit market, as documented in related literature, it is debatable whether setting caps for loan rates and minimum levels for deposit rates is the appropriate policy to deal with high and volatile banking spreads. These policies may end up creating more distortions, while the more likely culprits, such as high operating costs, systemic risks and regulatory burden remain unaddressed.

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