



## OWNERSHIP STRUCTURE AND RISK AT COLOMBIAN BANKS

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# Ownership structure and Risk at Colombian banks

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## *Abstract*

*The separation between ownership and the control of capital in banks generates differences in the preferences for risk among shareholders and the manager. These differences could imply a corporate governance problem in banks with a dispersed ownership, since owners fail to exert control in the allocation of capital. In this paper we examine the relationship between the ownership structure and risk for Colombian banks. Our results suggest that a high ownership concentration leads to higher levels of risk.*

*Key words: corporate governance and banking risk*

*JEL: G21, G32, G38, L13*

## **I. Introduction**

Most of banking activities involve risk. But, more important than determining its type is establishing the sources that explain the risk taken by banks in its lending operations. Cross countries differences in banking risk are usually attributed to financial regulations represented by the deposit insurance, capital requirements and some other restrictions. But within countries are required additional criteria further than that related to financial regulations and the idiosyncratic component to address this matter.

Several empirical studies have pointed the ownership structure as the main culprit of the differences in risk among banking institutions, since it determines whether or not the capital owners are able to control the managerial decisions (Saunders, Strock and Travlos 1990, Anderson and Fraser 2000, Caprio and Levine 2002, García and Robles

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2008). However, other elements such as the market competition and banking size could also contribute in shaping risk.

The property of Banks can be in hands of few or lots of investors. As Laeven and Levine (2009) and the Corporate Governance theory suggest, the capacity of owners to guide managers' decisions concerning risk depends on the banking property distribution. The higher the ownership concentration the higher will be the risk in a banking institution, since capital owners obligate the manager to increase profits by seeking higher levels of risk. Conversely, in banks with a low property concentration, the separation between the ownership and the control of capital lead to a problem of corporate governance that consists in the mismatch of the preferences for risk among shareholders and the manager. According to Caprio and Levine (2002), small shareholders fail to exert corporate control on managerial decisions by two main reasons. The monitoring costs to control the manager are extremely high, so that, shareholders have no option than accepting his portfolio decisions. Second, the shareholders may lack of voting rights or are not properly represented in the management board, which empowers the manager with absolute control over risk. In absence of a compensation scheme additional to the salary, the manager usually adopts a risk adverse position in controlling the capital by selecting a more conservative but less profitable portfolio.

The type of banking investors could also represent an extra source of risk disparities among institutions, since banks can be private or publicly owned. According to García and Robles (2008) government owned banking institutions lead to higher levels of risks by conceding more credits to finance projects of their specific interests, and at more flexible conditions than those offered elsewhere.

Likewise, lending operations crucially depend on the size of the banking firm and the actions taken by other market competitors.

Concerning the Banking operating scale, the related literature had identified two conflicting effects on risk. The argument of a negative association between size and risk affirms that banks of large size may finance riskier credits without entering in immediate problems of liquidity. Besides, their portfolios are more diversified representing higher proceeds than those perceived by smaller institutions (Saunders, Strock and Travlos 1990, Boyd and Runkle 1993, Demsetz and Strahan 1997, and Anderson and Fraser 2000). A

positive association between banking size and risk is based on the premise “Too big to fail”, which asserts that the deposit insurance measure, used by regulators to guarantee the stability of the banking system, may have a perverse effect since large banks may have incentives to choose riskier portfolios (Chumacero and Langoni 2001, and García and Robles 2008).

In addition to the mentioned above, the type of market could affect the banking risk by affecting the interest rates (Caprio and Levine 2002, Boyd and De Nicoló 2005, Boyd, De Nicoló and Jalal 2006, and Nicoló and Loukoianova 2007). According to Boyd and De Nicoló (2005), this variable could have two opposing effects. From one side, a high market concentration (low competition) reduces the interest rates paid to deposits, which increase profits, and allows risk reductions. From the other side, a market with low competition leads to increments in the interest rates charged to credits, generating a profits reduction by the nonperforming loans growth, which obligates the manager to increase risk.

In order to determine the main sources of risk in Colombian banks we empirically test three hypotheses:

- i) A concentrated banking property leads to higher risk;
- ii) Banking size and risk are negatively associated;
- iii) An increasing market competition reduces the corporate governance problem, also implying higher levels of risk.

In this paper we study the banking risk as a function of the ownership structure, size and the market competition along with some traditional banking variables for Colombia. Our estimations for data between 1989 and 2009 for banks and CAVS (Savings and Housing Corporations) coincide with previous results in the financial literature, related to these variables as the main sources of risk.

To our knowledge, this is the first attempt to investigate the differences in Colombian banking risk using the ownership structure. Our empirical results suggest that risk is higher in ownership concentrated and large size banks; but decreases with the variable of market competition. In essence, banking risk depends on the side that controls the capital (manager or owners), but the operating scale and the actions taken by other market competitors have also relevant effects.

This paper is divided into four sections, including this introduction. Sections II and III contain the variables constructed, a general analysis on data, and the model and the estimation method conducted. The results and final remarks are presented in Section IV.

## II. Data

The Savings and Housing corporations (CAVS) began to partake in the financial market in 1972, following a government policy which purpose was to stimulate the construction sector by financing the domestic housing acquisition. In 1993 a government reform (Law 35/1993) approved that, in addition to the housing market, CAVS could also grant credits for consumption, which permitted them compete as equal with banks in the markets of credits and deposits. By the end of 90's and the beginning of 2000 some CAVS were acquired by banks, others became banks, and quite a few were liquidated due to solvency problems<sup>2</sup>. For these reasons we considered banks and CAVS similar institutions in the domestic financial market.

We used yearly data for Colombian banks and CAVS between 1989 and 2009 from the Profit and Loss Statements, Balance Sheets and the First Level Shareholders registers reported by each banking institution to Superfinanciera<sup>3</sup>.

As dependent variable, we computed an ex-post measure of credit risk (**RISK**) that is explained by the ratio of non-performing loans to total Loans. We recognize that other measures of risk based on the Market risk approach could allow the identification of the specific risk of each entity and the risk related to the market. However, that measure could be underestimating the total banking risk in Colombia since quite a few banks are trading their shares in the local Stock Exchange Market.

The Banking ownership structure is analyzed in several ways. First, we constructed a Herfindhal Hirschman index of shares concentration per bank, termed **OWNER\_HHI**. As the index moves towards unity an extreme concentration in shares emerges implying a

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<sup>2</sup> The domestic market of credits has been supplied by a variable number of banking institutions. During the 90s its total number averaged 37, but with a non-trivial increase of 4 institutions between 1994 and 1997. The changing nature in CAVS in the beginning of 2000 along with the banking mergers, acquisitions and liquidations entailed a fall in the number banks from 29 in 2002 to 18 in 2009.

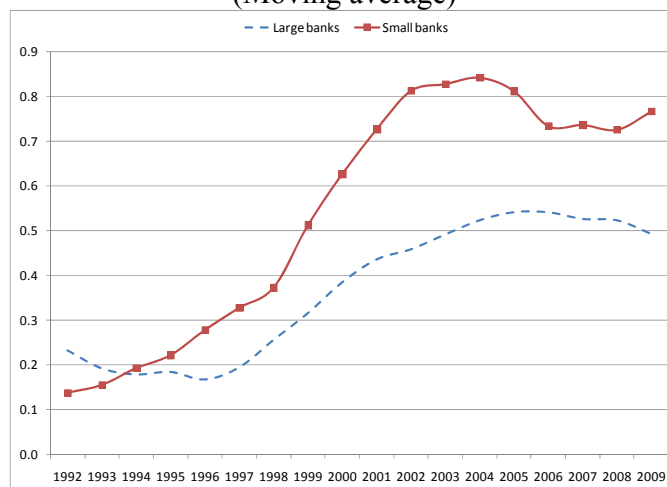
<sup>3</sup> The Financial Superintendence "Superfinanciera" is a governmental organism that exerts control, supervises and regulates banking and financial operations.

bank under the control of its owners. The higher the index of shares concentration, the stronger would be the pressure exerted by major owners over managers to increase profits, by increasing risk.

Besides the property concentration, we considered two dummy variables in terms of the type of capital invested. The **Dum\_foreign** takes the value of one for banks with more than 50% of its capital shares in hands of foreign investors and zero otherwise. In a similar way, the **Dum\_govern** captures banks with prominent government participation (higher than 50%), mainly represented by public banks, banks intervened and those that experienced liquidation processes.

The scale of banking operations is captured by the variable **SIZE**, measured as the natural logarithm of total Assets. To account for differences in the banking size, we classified banks in small and large, with the Ward's method that we computed based in the natural logarithm of the total assets. For the computation of this clustering method we used the squared Euclidean distance, given that this alternative minimizes the loss of information that may result from the grouping procedure. Considering jointly the groups by size and the type of investors, we found that Large Banks are mostly represented by private capital (88.7%) and the Small banks are mainly foreign (63.2%). In regard to this last characteristic, we constructed an additional variable that captures the interaction between this group and the type of capital invested (**Small & foreign**).

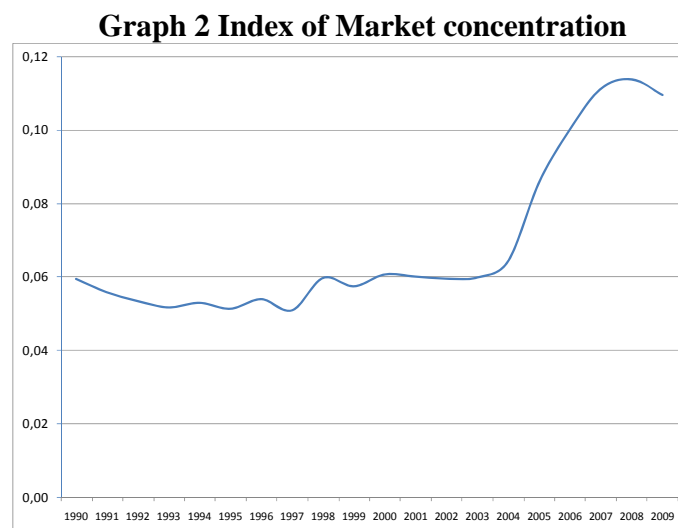
**Graph 1 Ownership concentration by banking size  
(Moving average)**



Calculations by the authors. Source of data: Superfinanciera

Since the mid of the 90's the ownership concentration have been increasing for both banking sizes, presumably by the processes of acquisitions, liquidations and mergers that turned even more pronounced between the end of 1990's and the beginning of 2000. But, the concentration in the banking property had been larger for small banks (Graph 1).

We also constructed an index of market concentration (**MARKET**) following the Herfindahl Hirschman method. This index can be computed for assets and passives, since banks compete for credits and deposits. However, we calculated this index only for the assets side, because our main interest is centred on the risk of failure. From Graph 2 is clear that market concentration has been increasing, a trend that coincides with a decline in the number of banks, which passed from 34 in 2004 to 18 in 2009.



Calculations by the authors. Source of data: Superfinanciera

Additionally, we included other variables in order to control for the most traditional banking characteristics. The **PROFITS** variable is an operating margin measure that was constructed as lagged one year value of the ratio between net Operational incomes and total Assets. The **LIQUIDITY** indicator is represented by the ratio of Bank liquid Assets and total liquid Liabilities; and the Loans growth variable (**LOAN**) is a discrete annual rate of growth in the total credits.

Notice in Table 1 that our measure of risk and the variables of ownership, Size and Market competition are strongly associated (at 1%). The correlation matrix also shows that overall risk is higher in ownership concentrated banks and in those that are of a large size. Conversely, risk is lower in small foreign owned banks.

**Table 1 Correlation matrix of variables- All banks**

	RISK	Owner_HHI	SIZE	MARKET	Dum_foreign	Dum_govern	Profits	Liquidity	Loan
Owner_HHI	0.177*** (0.000)								
SIZE	0.113*** (0.000)	0.080* (0.000)							
MARKET	-0.125*** (0.000)	0.142*** (0.000)	0.534*** (0.000)						
Dum_foreign	-0.152*** (0.000)	0.394*** (0.000)	-0.291*** (0.000)	0.002 (0.000)					
Dum_govern	0.181*** (0.000)	0.474*** (0.000)	-0.192*** (0.651)	-0.156*** (0.000)	0.237*** (0.716)				
Profits	-0.598*** (0.000)	-0.319*** (0.0006)	-0.015 (0.123)	0.019 (0.000)	-0.020 (0.276)	-0.211*** (0.847)			
Liquidity	0.260*** (0.000)	0.154*** (0.0006)	-0.047 (0.123)	-0.008 (0.000)	-0.066 (0.276)	0.182*** (0.847)	-0.487*** (0.000)		
Loan	-0.251*** (0.000)	-0.229*** (0.000)	-0.079* (0.614)	-0.101** (0.323)	-0.019 (0.060)	-0.003 (0.019)	0.206*** (0.000)	-0.011 (0.000)	
Small & foreign	-0.169*** (0.000)	0.311*** (0.000)	-0.488*** (0.000)	-0.097** (0.022)	0.737*** (0.000)	0.160*** (0.000)	0.055 (0.214)	-0.048 (0.263)	0.022 (0.602)

Source: Author's calculations

P-values in parenthesis; significant at \*\*\*(1%), \*\*(5%), \*(10%), respectively

### III. Model and Empirical Results

We empirically estimate equation (2):

$$RISK_{it} = \alpha_i + \beta Owner\_HHI_{it} + \varphi Dum\_foreign_{it} + \lambda Dum\_govern_{it} + \delta SIZE_{it} + \theta Market\_HHI + \gamma X_{it} + u_{it} \quad (2)$$



$X_{it}$ : is a matrix that includes all banking characteristics for bank  $i$  at time  $t$ . The coefficient estimates vectors are captured by  $\beta$ ,  $\varphi$ ,  $\lambda$ ,  $\delta$ ,  $\theta$ , and  $\gamma$ . In order to control for changes in the average level of risk we estimated fixed effects models; and alternatively we estimated models of random effects. In all specifications the Hausman test signalled the random effects as the appropriate model to address the unobserved individual heterogeneity.

In Table No. 2 we present evidence of the main determinants of banking risk. Most of our results are significant at 1% level, and most of them display the expected association with the dependent variable.

**Table 2 Empirical Results- All Banks**

	Fixed Coef.	Random Coef.	Fixed Coef.	Random Coef.	Fixed Coef.	Random Coef.	Fixed Coef.	Random Coef.
Owner_hhi	0.058 (0.019)***	0.045 (0.014)***	0.041 (0.018)**	0.041 (0.014)**	0.063 (0.019)***	0.052 (0.015)***	0.044 (0.017)**	0.023 (0.012)*
Dum_foreign					-0.046 (0.014)***	-0.040 (0.011)***	-0.040 (0.012)**	-0.032 (0.009)***
Size	0.014 (0.004)***	0.014 (0.004)***	0.014 (0.004)***	0.012 (0.03)***	0.014 (0.004)***	0.013 (0.003)***	0.006 (0.004)	0.008 (0.003)***
Market	-1.157 (0.250)***	-1.207 (0.239)***	-1.202 (0.242)***	-1.237 (0.231)***	-1.231 (0.239)***	-1.224 (0.229)***	-0.844 (0.219)***	-0.910 (0.202)***
Profits							-1.078 (0.074)***	-1.091 (0.071)***
Liquidity							-0.001 (0.000)***	-0.001 (0.000)***
Loan			-0.067 (0.011)***	-0.066 (0.011)***	-0.065 (0.011)***	-0.065 (0.011)***		
Small & foreign			-0.006 (0.018)	-0.031 (0.013)**				
Constant	-0.187 (0.078)**	-0.179 (0.065)***	-0.158 (0.075)**	-0.109 (0.065)*	-0.159 (0.074)**	-0.130 (0.064)**	-0.002 (0.076)	-0.050 (0.06)
Hausman test (p- value)		0.142		0.078		0.429		0.166
Number of observations	498	498	497	497	497	497	471	471
R2	0.045	0.061	0.078	0.202	0.120	0.131	0.465	0.390

Source: Author's calculations

Standard errors on parenthesis \*\*\*(1%), \*\*(5%), \*(10%), respectively

The overall banking risk and its ownership structure are linked by a positive and significant relation. Since the index of shares concentration have been increasing for all

banks it is evident that shareholders have corporate control over the manager, exerting pressure to increase proceeds by opting for riskier portfolios. These results are consistent with previous findings of Saunders, et al (1990), Caprio and Levine (2002), and García and Robles (2008) according to which a high property concentration lessens the conflict of interests among the manager and the capital owners. Even when we controlled for bank specific characteristics, the positive association between property's concentration and risk remains unchanged and significant.

Concerning the Banking Size in our estimations we identified a positive and significant association with risk, which supports the premise "too big to fail", but at the same time contradicted our second hypothesis. In essence, this outcome suggests that shareholders of large banks can successfully exert corporate control on managerial decisions.

In relation to the market competition, our results disagree with our third hypothesis since we identified a negative association with risk. In regard to this outcome, we noticed that the effect of the market of deposits dominates, implying that the market concentration decrease the interest rates paid to deposits, which increases profits and reduces risk.

Regarding the control variables, we identified the expected results concerning banking risk. As expected, a raise in the lagged one year value of profits and the growth rate of loans lead to risk reductions. The effect of liquidity on risk though negative is extremely small.

The effects of the additional variables of ownership are as follows:

Banks with a prominent foreign participation in their property prefer lower levels of risk, suggesting that managers are the capital controllers, and that their portfolio decisions represent risk reductions. This negative association is confirmed when we considered the interaction with the group of small banks, given that most of foreign banks are small in relation to the rest of market competitors.

The relationship between the government participation in the banking ownership and risk is insignificant. A plausible explanation might be that most of Colombian government owned banks are those that experienced temporary interventions due to solvency problems. According to Laeven and Levine (2009), banks that are controlled by

the government may not reflect the conflict of interests among the manager and owners, but instead, the relation between the owner (government) and their employees (managers). For this reason, we estimated again the model presented in equation 2 excluding all government owned banks; and most of our results remain unchanged and significant (Table 3).

**Table 3 Empirical Results- Excluding government owned banks**

	Fixed Coef.	Random Coef.	Fixed Coef.	Random Coef.	Fixed Coef.	Random Coef.	Fixed Coef.	Random Coef.
Owner_hhi	0.031 (0.012)***	0.022 (0.011)**	0.034 (0.013)***	0.028 (0.012)**	0.023 (0.014)*	0.021 (0.012)*	0.024 (0.014)*	0.021 (0.012)*
Dum_foreign			-0.007 (0.011)	-0.011 (0.009)	-0.012 (0.011)	-0.010 (0.009)**	-0.018 (0.012)	-0.013 (0.009)
Size					0.016 (0.003)***	0.015 (0.002)***	0.016 (0.003)***	0.016 (0.002)***
Market	-0.535 (0.121)***	-0.498 (0.118)***	-0.529 (0.121)***	-0.492 (0.118)***	-1.014 (0.143)***	-1.011 (0.141)***	-1.094 (0.139)***	-1.083 (0.137)***
Liquidity	-0.029 (0.008)***	-0.027 (0.008)***	-0.030 (0.008)***	-0.027 (0.008)***	-0.020 (0.008)***	-0.017 (0.008)**		
Loan	-0.046 (0.007)***	-0.045 (0.007)***	-0.046 (0.007)***	-0.045 (0.007)***				
Small & foreign							0.019 (0.012)	0.005 (0.011)
Constant	0.089 (0.008)***	0.090 (0.010)***	0.089 (0.008)***	0.090 (0.010)***	-0.214 (0.048)***	-0.202 (0.043)***	-0.228 (0.049)***	-0.210 (0.044)***
Hausman test (p- value)		0.067		0.061		0.461		0.085
Number of observations	429	429	429	429	430	430	431	431
R2	0.046	0.056	0.034	0.027	0.040	0.045	0.0183	0.0636

Source: Author's calculations

Standard errors on parenthesis \*\*\*(1%) , \*\*(5%) , \*(10%), respectively

However, the previously identified preference of foreign banks for portfolios of low risk disappears, even when we considered the joint effect of size and the origin of capital investors, captured by the Small & foreign dummy variable.

### Conclusions:

Corporate governance theory asserts that the ownership structure effects on banking portfolio and therefore on risk depends upon the side that controls the capital. Under a

dispersed ownership the lack of corporate governance by owners empowers the manager with absolute control on banking capital. In absence of the pressure exerted by owners, the manager usually chooses a low risk portfolio. But, in a property concentrated bank, the owners obligate the manager to increase profits, increasing risk. In this way, a concentrated ownership structure lessens the conflict of interests among the manager and owners, but increases the risk. Our results support these arguments, but also identified that banking risk depends on other elements such as size and the market competition; even when we excluded government owned banks.

In relation to size, we found that large banks prefer higher levels of risk, a result that supports the premise “*too big to fail*”; according to which some regulatory measures could generate undesirable effects on banking portfolios. Our results impeded us to go beyond on this subject but suggest an interesting path to explore further.

Regarding the market variable, we found a negative effect on risk, suggesting that the deposit effect dominates Colombian banking activities.

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