Effect of the Internal Banking Mechanisms of Governance on the Risk-taking by the Tunisian Banks

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ABSTRACT

This study aims to analyze the relationship between internal governance mechanisms and risk-taking by banks in Tunisia. Empirical analyzes conducted from a sample of 10 Tunisian banks during an analysis period of 8 years from 2002 to 2009, also show significant results. Indeed, the concentration of capital and the size of banks have negative impact and highly significant risk on banks. In addition, Tunisian banks are foreign owned and tend to take less risk than other banks. As for the participation of the state in the capital, it has increased the risk in Tunisian banks. In addition, the size of the board has a positive and highly significant impact on bank risks, while the proportion of institutional administrators on the board is negatively and significantly related to the risk.

Keywords: *Bank Governance, Banks, Ownership Structure, Board of Directors, Banking Risk*

1. INTRODUCTION

Governance can be seen as a set of internal and external mechanisms that are used to resolve conflicts of interest between managers on the one hand, and the shareholders and stakeholders of the firm, on the other hand. The internal and external mechanisms of governance involved to ensure the best possible cooperation between managers, shareholders and other stakeholders including party and government regulations. They reduce the asymmetry of information, promote best practices in transparency and protect shareholders against excessive power of the rulers. The financial institutions, including banks, are involved in corporate governance. In fact, the banks are characterized by distinct agency problems and accented compared to other non-regulated firms. The objective of this research is to analyze the impact of internal governance mechanisms on Tunisian banks risk taking both theoretically and empirically. Indeed, the central problem of this study is: What is the impact of internal governance namely the ownership structure and the board of directors on bank risk taking. Therefore, it was based on a sample of 10 Tunisian banks that are listed on the securities exchange of Tunis (Tunis Stock Exchange) during an analysis period of 8 years from 2002 until year 2009.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Impact of Ownership Structure on Bank Risk

2.1.1 Impact of Ownership Concentration on Bank Risk

The effect of the concentration of capital in the bank risk is theoretically ambiguous and empirically complex. In fact, many studies have found a negative effect of the concentration of capital on risk (Marco 2007). Other studies have concluded that there is a neutral effect on the concentration of capital on risk (Barry 2007). While other studies have shown that the concentration of ownership has a significant impact on bank risk (Laeven and Levine 2009). Teresa Garcia Marco et al (2007) conducted an empirical study of commercial banks in Spain during the period 1993-2000. They suggested the existence of a negative relationship between the degree of concentration of the shareholders and the level of risk taking in banks. In his study, Thierno Amadou Barry (2007) highlights the impact of ownership structure on risk taking within the European commercial banks. It measures the degree of concentration of ownership by the percentage of capital held by the three largest shareholders. Based on this measure, they show that the degree of concentration of the shareholders has a neutral effect on policy-making risk within a bank. In a different institutional framework, Caprio et al (2006) showed that ownership concentration has a positive effect on bank risk after studying 244 banks from 44 countries. Indeed, these authors found that banks internationally are generally characterized by concentrated ownership structure and the shareholder banks are either a family or the state. Sironi et al (2006) analyzed the risk-taking and ownership structure of 181 European banks for a period from 1999 until 2004. The results showed that the concentration of capital is associated with better quality of loans, low risk assets and low risk of insolvency.

From this intersection of some previous studies, we make our first research hypothesis:

H1: The concentration of capital in a positive influence on bank risk taking

2.1.2 The Impact of Institutional Investors on Bank Risk

The importance of control exercised by institutional investors as well as its impact on bank risk-

taking has been studied by more than one researcher. According to several studies, we considered institutional investors, banking institutions, financial institutions other than banks or non-financial institutions whether public or private, foreign or Tunisian. Empirically, the results of all studies in this area showed that institutional ownership may discourage the use of discretionary effects. [Cheng and Reitenga (2001), Chung et al (2002) and Grace and Koh (2005); Benkraiem (2007), Cornett et al (2006), John et al (2008)] Luc Laeven and Ross Levine (2009) studied the impact of ownership structure on bank risk in a sample of 270 banks from 48 countries over a period of analysis between 1996 and 2001. They focused on the conflict between bank branch managers and owners on risk and showed the existence of a positive relationship between institutional ownership and risk measures. In this context, Yerramilli Ellul (2010), on a sample of 74 major banks in the United States during the period 2000-2008, found a positive and statistically significant relationship between institutional investors and the decision making risk. Dolde and Knopf (2006) showed a negative correlation between institutional investors and operational risk and market risk. The negative coefficient of the variable institutional investor is explained by the fact that they are less likely to take the risk. Thus, over this variable, the higher the risk is the lower is the relationship with the banks. So, we expect a negative relationship between this variable and bank risk. Therefore, we formulate our second research hypothesis:

H2: The presence of institutional investors is negatively correlated with the risk

2.1.3 Impact of Foreign Shareholders on Bank Risk Taking

Lensik et al (2006) found that the presence of foreigners in the ownership structure is negatively related to bank efficiency. The magnitude of this impact depends on the negative regulation in transition economies. Pedro Elosegui Pinteris and George (2002) examined the impact of privatization and foreign penetration of the choice of risk of several types of banks in Argentina during the period 1996-1999. They adopted the methodology of Shrieves and Dahl (1992) and others using a simultaneous equation model to test the behaviour of several banking institutions on the choice of capital and risk facing the change in ownership structure. Their results showed that after privatization and the entry of foreign banks and private banks newly existing increased their risk of the asset portfolio. In addition, foreign banks are exposed to a risk level. Bonin et al (2005) analyzed the impact of privatization in banks of six European countries for the period of 1994-2002. They showed that privatization alone is not enough to improve bank efficiency. Indeed, foreign-owned banks are more efficient and less risky than other banks. Megginson (2005) stated that the participation of foreign investors in the capital of their banks tends to reduce the risk to the extent that its banks operate in an international context, they will pursue more conservative

lending strategies for reputational reasons. Weill (2006) compared the technical efficiency of domestic banks to the ownership and foreign ownership in banks in Poland and the Czech Republic. He then showed that banks in foreign ownership have better technical efficiency than banks in domestic property.

Zhong et al (2007) studied the association between ownership of foreign shareholders and management of income for companies trading in New York. Their results indicated ownership of foreign shareholders which is positively associated with risk reduction. Berger et al (2005), Bonin et al (2005) and Gursoy and Aydogan (2002) stated that the entry of foreign investors in the capital of their banks is associated with a reduction of bank risk. Thus, we consider finding a negative relationship between this variable and risk. From the intersection of the previous study, we formulate our third research hypothesis:

H3: Banks with foreign ownership is less risky than other banks

2.1.4 Impact of State Participation in the Capital on Bank Risk Taking

The shareholding of the State banks is a common fact in all countries. In a study analyzing the ownership structure of banks internationally, La porta et al (2002) showed that state ownership is higher in countries with weak protection of shareholders' rights, intervention accentuated government in the economy and financial system underdeveloped. Iannotta Giuliano et al (2007) compared the performance and risk of a sample of 181 banks in 15 European countries over the period 1999 to 2004. They assess the impact of the alternative model of ownership, with the degree of ownership concentration on profitability, efficiency and risk. They showed that banks and mutual banks owned publicly have lower profitability than banks with private property. In contrast, public sector banks have a low quality loan and a higher risk of insolvency than other banks while mutual banks have better loan quality and low risk assets than private and public banks. Therefore, the public sector banks are less profitable and more risky than other types of banks. These results identify a higher concentration of ownership which is associated with better quality of loan assets below a risk and a lower risk of insolvency. In this context, Berger et al (2006) found that the effects of state ownership on bank risk-taking are positive and that banks return to the state are performing lower than banks owned privately either locally or abroad. In their study Micco and Panizza (2004) examined whether the property is correlated with bank lending policy. They found that public banks play an important role in facilitating credit policies because their loans are less sensitive to macroeconomic shocks than private banks. This differential behaviour is an explicit objective of stabilization of credit or the presence of 'lazy' directors in public banks. Thierno Amadou Barry (2007) showed that when the state retains an ownership interest in

a bank this indicates that the state seeks to control the policy of lending institutions. She directs their allocations to projects politically and socially desirable by the state, but not desirable for banks. Hence, we expect to find a positive relationship between the participation of the state capital and bank risk. It raises the following hypothesis:

H4: The participation of the state capital has a positive impact on the risk

2.2 Impact of the Board on Bank Risk

2.2.1 Impact of the Size of the Board of Directors on Bank Risk

Several empirical studies have examined the impact of the size of the board of directors on the bank risk. These studies provide, for most of them, a small board size by avoiding a large number of administrators. According to Jensen (1993), the boards composed of a large number of directors favor the domination of managers that can result in coalitions and group conflicts. Beltratti and Stulz (2010) examined the relationship between governance and bank performance during the credit crisis in an international sample of 98 banks. They argue that banks were pushed by their boards to maximize wealth and have been put at risk because of the large expense of the Board. Similarly, Lipton and Lorsch (1992) showed that boards with a small number of administrators function more effectively over large boards that have difficulties in coordinating their efforts and encourage supervision managers to pursue their own interests. A current against Blanchard and Dionne (2004) identified that the higher the number of directors increases, the more the use of sophisticated instruments to hedge against the risk increases, which justifies the excessive risk-taking by managers. Pearce and Zahra (1992) showed that a large board strengthens its capacity to monitor and improve its information sources. Thanks to its diversified structure, a council composed of a large number of directors provides better environmental links and demonstrated greater expertise. In fact, Booth et al (2002), Adams and Mehran (2005) found that the boards of directors of banks are larger (in average 16 members). In the same context, Adams and Mehran (2003) suggested that when the size of CA is high, the firms still show high levels of performance (measured by Tobin's Q) associated with higher levels of risk. They also mentioned that when a board whose size is reduced, its members can be easily manipulated and influenced by the leader. We expect that a tall board could help to better assess the risk of investment projects, thanks to the diversified structure and the best expertise that characterizes a board of large size, which would reduce the risk of banks. Therefore, we expect:

H5: The size of the board has a negative impact on the bank risk, the more it increases, the low the bank risk is.

2.2.2 Impact of Institutional Administrators on Bank Risk

Institutional investors play an active role in the governance of banks. Indeed, Jensen (1993) conducted a study on the relationship between the percentage of institutional directors on the board of directors and bank risk-taking. It was justified by the fact that they have considerable expertise. Indeed, Jensen noted that the presence of institutional directors on the boards of directors allows a better control of the executive, as these Directors have better access to information and greater expertise in the management of bank risks. According to Agrawal and Knoeber (1996), institutional investors tend to sit on the Board of Directors to exercise active control of the activities of the executive. Indeed, their presence on the board gives power to vote in important decisions relating to recruitment, remuneration and dismissal of officers and dividend policy. Also, they may have the information of the bank and ask for explanations regarding the operations of the bank. Mamoghli.C and Dhouibi.R (2009) also suggested that institutional investors have greater expertise in the area of risk-taking that could encourage managers to make a better selection of investment projects. Indeed, these authors obtained a sample of ten commercial banks quoted on the Stock Exchange Securities of Tunis (Tunis Stock Exchange) over the period 1998-2007, that the presence of institutional administrators in Tunisian banks is associated with lower risk insolvency.

Otherwise, Erkens, Hung and Matos (2010), on a sample of 296 companies from 30 countries, found that the firms with more independent boards and higher institutional ownership took more risk before the crisis led to greater shareholder losses during the crisis. Based on the study of Jensen (1993) and the results of previous empirical studies, we make the following assumption:

H6: The higher the percentage of institutional administrator's increases, bank risk decreases.

2.2.3 Impact of Foreign Directors on Bank Risk

The effect of the presence of a foreign administrator within the board of the performance and credit risk was the issue of several researchers who have adopted very different approaches to highlight the significance of this influence (and Mamoghli Dhouibi, 2009). Their results showed that the presence of foreign directors has a significant effect on the financial performance of firms. However, it is appropriate to highlight the impact of the presence of foreign directors on the performance and financial risks for banks in recent years. There has been a wave of bank privatization and acquisition by foreign banks participations in the capital of domestic banks in the WAEMU zone (Pascal Hadonnou Dannon., 2010). In this context, banks with high foreign ownership have better access to capital markets, a superior ability to diversify risk and greater opportunities to offer

some of their services to foreign clients not easily accessible to local banks. In another sense, many researchers stated that foreign directors are not able to understand the complexity of the bank and they are incompetent officers in the exercise of control and surveillance. Moreover, according to Hermalin and Weisbach (2000), foreign directors may have conflicting interests, which may create conflicts of interest between the board and the management team. It raises the following hypothesis:

H7: The risk of the bank is negatively related to the percentage of foreign directors on the board of directors. The higher the percentage of capital held by foreigners, the risk of the bank decreases.

2.2.4 Impact of Duality on Bank Risk Management

The literature on duality or plurality of positions of the CEO and Chairman of the Board of Directors has separate opinions. Some authors argue for accumulated reasons of efficiency management unit (Fogelberg and Griffith, 2000) and others denounced for abuse of power by the executive (Fama and Jensen, 1983; Pi and Timme, 1993; Pathan, 2009). When the CEO is the same person who holds the position of the Board Chairman, the capacity to influence decisions within the board will increase. This results in a weak control that could adversely affect the performance of the bank. Thus, Pi and Timme (1993) showed that for U.S commercial banks from 1988 to 1990, the presence of an officer also chairman of the board led to underperformance compared to the bank facilities when these two functions are two different people. Fogelberg and Griffith (2000) stated that there is no duality effect on the performance of banks. They explained that granting an additional title to the leader does not necessarily affect the performance of the bank. Rather, it is the level of ownership that matters. They noted that in addition to the control made by the Chairman of the Board generally has a low impact on the performance of the CEO. Shams Pathan (2009) examined the relevance of board structure on bank risk taking. Using a sample of 212 U.S "BHCs" for a period of 1997-2004, this study found that the dual management negatively affects risk taking. In this context, Vincent Aebi et al (2011) stated that the duality of management is associated with better bank performance during the financial crisis of 2007-2008. So, from these earlier studies, we make our last research hypothesis:

H8: The duality of management or the accumulation of positions has a positive impact on the risk of the bank.

2.3 Impact of Control Variables on The Risk

The size of the bank (LNAT) can have an effect on the target levels because of the possibility of diversification of the bank, the nature of all investment opportunities, the characteristics of the property or the access to equity as explained Godard (2001) and Fernandez and Arrondo (2005). Adams and Mehran (2005) found that bank size has

a positive and significant effect on its profitability. It raises the following hypothesis:

H9: The size of the bank has a negative effect on bank risk-taking

3. EMPIRICAL APPLICATION DEALING WITH THE RELATIONSHIP BETWEEN INTERNAL GOVERNANCE MECHANISMS AND BANK RISK-TAKING

3.1 The Methodology

The objective of this chapter is to analyze the activity of 10 Tunisian banks over a period of 8 years (2002-2009). For a better use of our database, the empirical technique we used is the technique of panel data. This technique allows us to exploit the temporal (8 years) and spatial dimension (10 banks). The basic equation to estimate is the following:

$$f_{it} = C + \sum_{k=1}^{k=k} s_K X_{it}^K + v_{it}$$

With:

it: is the measure of bank risk i at time t.

it: correspond to three risk measures namely EROE, EROA and PCRE.

C: is a constant term.

v_{it} : is the error term white noise residual.

Xit: is the group of explanatory variables, it includes the ownership structure, the board of directors and a control variable.

The equation becomes:

$$_{it} = C + {}_1CAPI + {}_2PINS + {}_3PETR + {}_4PETA + {}_5TCAD + {}_6ADIN + {}_7AIND + {}_8DUAL + {}_9LNAT +$$

$$v_{it}$$

With:
- t: 2002………………2009
- i: Bank i
- it : PCRE ; EROA ; EROE

3.2 Definitions and Measures of Variables

3.2.1. Dependent Variable (Bank Risk)

Risk is clearly identified danger associated with the occurrence of an event or series of events which are not known if they occur but we know they are likely to occur in an exhibiting situation. According to Chiappori and Yanelle (1996), the risk inherent in the banking sector is characterized by its multiplicity and its multidimensional

nature. The credit risk is expressed from three accounting measures of risk. Indeed, the overall risk measured by the standard deviation of the ratio of return on assets (EROA). In addition, the ratio of provisions over the total credit (PCRE). At the end, the standard deviation of return notes on the equity EROE.

3.2.2 Explanatory Variables

Among the governance mechanisms which could explain the level of bank risk-taking, we have retained the ownership structure, the board of directors and one control variable is the size of the bank.

3.2.2.1. Variables of Ownership Structure

Variables of ownership structure are calculated as a percentage by adding the share capital of each class of shares in the total capital of the bank.

* The Concentration of Capital (CAPI)

This variable is measured by the percentage of equity held by the largest shareholder. This measure is also used by Fernandez and Arrondo (2005), Caprio et al. (2006), Barry (2007) and Laeven and Levine (2009).

* The Presence of Institutional Investors (PINS)

According to the agency theory, institutional shareholders have privileged access to information and have therefore a more efficient control of the management of the firm. In this study, we considered institutional investors, corporations, investment companies, insurance companies and social security funds. Indeed, institutional investors are the actors who now hold the highest fraction of listed securities on financial markets. We measure this variable by the proportion of shares held by institutional investors. This variable was measured in the same way by Agrawal and Knoeber (1996), Dolde and Knopf (2006), John et al (2008) and Laeven and Levine (2009).

* The Presence of Foreign Shareholders (PETR)

We measure this variable by the percentage of capital held by foreign investors. This variable is also used by Bonin et al (2005), Lensik et al (2006) and Zhong et al (2007).

* The State Participation (PETA)

This variable is measured by the proportion of shares held by the State. This measure has been used by Berger et al (2006) and Barry et al (2009).

3.2.2.2 Variables of the Board

The Board of Directors is composed primarily of internal and external directors and independent and non-independent directors.

* The size of the Board (TCAD)

We measure the size of the board by the number of directors to justify their presence by providing specific information about the company and its environment. This measure was also used by Yermack (1996), Godard (2001), Fernandez and Arrondo (2005), Adams and Mehran (2005) and Beltratti and Stulz (2010).

* Institutional Administrators (ADIN)

These directors are business relationship with the bank. The percentage of institutional administrators on the board of directors is measured by the ratio of the number of directors on the institutional total number of directors on the Board. This measure is also used by Jensen (1993), and Agrawal and Knoeber (1996).

* The Independent Directors (AIND)

An independent director has no executive function within the firm and is not a member in the direction. It is independent if no relationship of any kind whatsoever with the corporation, its group or its management. The independence of the board is measured by the ratio of the number of independent outside directors on the size of the board. This measure was also used by Fernández and Arrondo (2005) and Dannon (2010).

* Duality (DUAL)

Duality is indicative of the power structure of the Board of Directors when the manager takes the same time as Chairman of the Board of Directors. In our case, the duality is a binary variable that takes the value 1 if the position of Chief Executive Officer (CEO) and Chairman are performed by the same person, 0 otherwise. This measure has been used by Jensen (1993), Pathan (2009) and Mamoghli and Dhouibi (2009).

3.2.3. The Control Variable

The size of the bank (LNAT) is measured by the natural logarithm of the book value of total assets at the end of the accounting year. The logarithm transformation avoids the problem of scale resulting from the huge gap with measures of other variables in the models. It can have an effect on the target levels because of the possibility of diversification of the bank, the nature of the set of investment opportunities, the characteristics of the property or access to capital as the Fernandez and Arrondo (2005) explained.

$$Risque_{it} = \beta_0 + \beta_1 CAPI + \beta_2 PINS + \beta_3 PETR + \beta_4 PETA + \beta_5 TCAD + \beta_6 ADIN + \beta_7 AIND + \beta_8 DUAL + \beta_9 LNAT$$

Table 1: Variables of Internal Governance

Variable		Definition	Measure
Ownership structure	CAPI	Concentration of capital	This variable is measured by the percentage of equity held by the largest shareholder
	PINS	Percentage of capital held by institutional investors	Number of shares held by institutional investors / total number of shares.
	PETR	Percentage of capital held by foreign investors	Number of shares held by foreign investors / total number of shares.
	PETA	Percentage of capital held by the STATE	Number of shares held by the STATE / Total shares.
Board of directors	TCAD	Size of the Board	Number of directors on the Board.
	ADIN	Percentage of Independent Directors	Number of independent directors / Total directors in the board.
	AIND	Percentage of Institutional Administrators	Number of institutional administrators / total number of directors on the board.
	DUAL	Separation of CEO and Chairman of the Board	This variable takes the value 1 if the CEO himself is the chairman of the board, 0 otherwise.

3.3 Study of Stationarity: Unit Root Tests

The addition of the individual dimension to the usual temporal dimension has an important interest for the analysis of non-stationary series. The unit root tests on panel data over time are indeed more powerful than their analogues in individual small sample time-series. One way to ensure the stationary of individual data is to apply the unit root test. The test we use is the test of Phillips and Perron. Phillips-Perron (1988) proposes a nonparametric method to correct for the presence of autocorrelation, without adding lagged endogenous as in the method of increased DF. The statistic test of Phillips-Perron (PP) is a test of statistics corrected for the presence of autocorrelation by taking into account an estimate of the variance of long-term t (calculated by the spectral density of t has zero frequency), robust to the presence of autocorrelation and heteroscedasticity. The test procedure is to test the unit root hypothesis H0: = 0 in the following models:

$$*Y_t = \ Y_{t-1} + \ + \ t + \ t$$
$$*Y_t = \ Y_{t-1} + \ + \ t$$
$$*Y_t = \ Y_{t-1} + \ t$$

The estimation results are contained in the following table (see Appendix):

Variables	t-calculated	Prob
EROE	-2,558	0,1060
EROA	-2,553	0,1071
PCRE	-2,279	0,1811
CAPI	-5,049	0,0001
PINS	-5,941	0,0000
PETR	-5,153	0,0000
PETA	-4,174	0,0013
TCAD	-7,885	0,0000
ADIN	-4,924	0,0001
AIND	-6,05	0,0000
DUAL	-6,067	0,0000
LNAT	-2,799	0,0629

After the unit root tests for the entire series, we see that the probabilities of the variables are smaller than 0.05 with the exception of the variables EROE, EROA, PCRE and LNAT. This indicates that we can accept the null hypothesis of non-stationary at 95% for Series EROE, EROA, and LNAT and can reject this hypothesis for CAPI variables, PINS, PETR, PETA, TCAD, ADIN, AIND and DUAL.

The data CAPI, PINS, PETR, PETA, TCAD, ADIN, AIND and DUAL are stationary as can be seen in the table above. Variables are not integrated of order 1: These data are stationary in level are I (0). Generally, tests of Augmented Dickey-Fuller variables EROE, EROA, PCRE and LNAT accept the null hypothesis of non-stationary.

Table 2: Unit root test

In the second step, we proceed to test the stationary of variables in first difference.

Table 3

Variables	t-calculated	Prob
EROE	-8,7177	0,0000
EROA	-8,7181	0,0000
PCRE	-9,4187	0,0000
LNAT	-9,7479	0,0000

The ADF test leads us to reject the null hypothesis of non-stationary for the other variables EROE, EROA, PCRE and LNAT. The assumption of stationary is accepted at a 5% threshold for the first-differenced variables (variables integrated ordre1). Knowing also that these variables integrated of order 0 and 1 can present trend movements so that their linear combinations and trend components are offset to give a stationary series.

3.4 Econometric Specification

In this section, we study the impact of internal governance mechanisms on bank risk-taking by Tunisian banks using a multiple regression model relying on econometric tools. On the econometric specification tests back to determine if it is reasonable to assume that the theoretical model studied is exactly the same for all banks, or on the contrary if they are specific to each bank.

3.4.1 Test of the Specificity of the Individual Effects (Homogeneity)

To validate the model specification, two tests are therefore critical: A Fisher test to verify the existence of an individual effect and a Haussman test that identifies the nature of these effects.

It should test the hypothesis of a constant common to all banks. If this hypothesis is rejected, we get a model with individual effects. Phase specification test involves determining if the data generating process can be considered homogeneous, that is to say the same for all individuals, or whether it is completely heterogeneous, in this case, the use of technical Panel cannot be justified. Between these two extremes, it is precisely required to identify the source of heterogeneity in order to specify the model. Indeed, to test the existence of specific individual effects can be represented by an intercept specific to each individual, i is therefore sought to test the null hypothesis:

H0: 1 = 2 = ... = iN

It then uses a statistical Fisher test for the (K +1) (N-1) linear restrictions and NT-N (K +1) degrees of freedom.

The findings of this test are: If we accept the null hypothesis H0 of homogeneity, we obtain a model of Pooled completely homogeneous. If, however, we reject the null hypothesis of homogeneity, we move to the second

stage. Fisher statistics F is associated with the test of homogeneity in the model and it can be written as follows:

$$F = \frac{(SCR_c - SCR_{mc})/N - 1}{SCR_{mc}/N(T-1) - K}$$

Or SCRc is the sum of squared residuals of the restricted model (model Pooled) that is to say, without specific individual and SCRmc the sum of squared residuals of the fixed effects model.

* If Fc <Fsta so we accept Ho
* If Fc> Fsta then we reject Ho

3.4.2 Application of Different Tests in Tunisian banks

The models are built in regression variables of internal bank governance and control variables on Tunisian banks risk taking. To test the homogeneity of the Panel, we applied the test of Hsiao (1986). The F statistic of Hsiao follows a Fisher distribution with (K +1) (N-1) and NT - N (K +1) degrees of freedom and can be written in the following form:

$$F = \frac{(SCR_b - SCR_a)/(N-1)(K+1)}{SCR_a/NT - N(K+1)}$$

With:

SCRb: The sum of squared residuals without fixed effects.
SCRa: The sum of squared residuals with fixed individual effects.
N: The number of banks   N = 10
T: The number of years   T = 8
K: The number of variables and control   K = 9

If F is above the theoretical % then we reject the null hypothesis of homogeneity. If it is less than this threshold, we accept H0. Indeed, in the three equations calculated F is F statistic significantly lower than that is equal to 2.9 and P value of less than 5%. The test of Hsiao (1986) allows us to accept the Panel which is a perfectly homogeneous structure. It then adopts the method of least square ordinary or generalized.

3.5 Analysis of the Results of The Econometric Estimates

Table 4: Results of econometric estimates of the risk index based governance variables

Variables	EROE	PCRE	EROA
C	69.94585 (1.083473)	-2.556103 (-4.265473)	9.423792 (2.280047)

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CAPI	-0.234045 (-2.220154)	0.000590 (0.331404)	0.012095 (0.984907)
PINS	-0.153396 (-0.760449)	0.001646 (0.879028)	3.047509 (2.039424)
PETR	-0.199973 (-2.197709)	0.000965 (0.622772)	-0.003969 (-0.371303)
PETA	-0.111681 (-0.769758)	0.001107 (3.821606)	-0.004986 (-0.536751)
TCAD	-1.023996 (-1.054921)	0.020733 (2.300960)	0.034649 (0.557538)
ADIN	-51.03836 (-3.828917)	-0.094628 (-0.764773)	0.344336 (0.403481)
AIND	12.72056 (0.503413)	0.343575 (2.464778)	-0.840338 (-0.519439)
DUAL	1.376378 (0.244547)	0.172884 (3.309116)	-0.036064 (-0.100082)
LNAT	-4.150362 (-0.976961)	0.149477 (3.790523)	-0.642802 (-2.363361)
R2	0.460311	0.626092	0.330560
R2 ajusté	0.365208	0.569732	0.268775
Observations	80	80	80

Source: Author's estimates with the software Eviews 7
Robust statistics Student (t) are shown in brackets.

Table 5: Summary of results of regression models

Explanatory variables	Outcomes	Results Obtained	Hypotheses
CAPI	Positive	Negative	reversed
PINS	Negative	Positive	reversed
PETR	Negative	Negative	confirmed
PETA	Positive	Positive	confirmed
TCAD	Negative	Positive	reversed
ADIN	Negative	Negative	confirmed
AIND	Negative	Positive	reversed
DUAL	Positive	Positive	confirmed
LNAT	Negative	Negative	confirmed

♣   The results show that the concentration of capital (CAPI) has a negative impact statistically significant effect on risk-taking by Tunisian banks listed, the hypothesis H1 is reversed. This result corroborates the findings of Marco et al (2007) show that, in an empirical study of commercial banks in Spain during the period 1993-2000, the degree of concentration of capital is negatively associated with the level of bank risk-taking.

This is explained by the fact that when shareholders are highly concentrated, their incentives to monitor managers are larger. Thus, according to Caprio et al

(2006), the concentration of ownership is an effective governance mechanism to exercise control over the management, improve bank performance and subsequently decreases risk-taking by banks. Indeed, these authors found that banks internationally are generally characterized by concentrated ownership structure and the shareholder banks are either a family or the state and otherwise in accordance with our results, Sironi et al (2006) showed, based on the analysis of 181 European banks, the concentration of capital is associated with a better quality of loans and low risk assets.

♣   The presence of institutional investors (PINS) has a positive and statistically significant association with overall risk, the hypothesis H2 is reversed.

In our case, institutional investors are banks, financial institutions other than banks or non-financial institutions whether public or private, foreign or Tunisian. Indeed, these institutional investors can negatively influence bank risk-taking when they are involved in an active way in the government of the bank (Laeven and Levine 2009).

♣   The results showed that the presence of foreign investors (PETR) is negatively on the credit risk. The hypothesis H3 is confirmed.

This result is consistent with the studies of Bonin et al (2005). This is explained by the fact that the presence of foreign capital in the banks is desirable because it brings new management techniques, new technologies of information and communications that the banks have agreed to compete competitors.

Similarly, foreign-owned banks tend to eliminate some of the risk associated with lending to the government (political loans order). Indeed, these banks operate in an international status, so, they will pursue more conservative lending strategies for reputational reasons (eg agreements Bale 3).

♣   Participation of State (PETA) has a positive and statistically significant impact on the risk that the measures the quality of assets and the assumption H4 is confirmed. This result is consistent with the work of Berger et al (2006), Micco and Panizza (2004) and Barry (2007) showed that the state ownership is positively related to bank risk when the government retains an ownership of a bank. This indicates that the state seeks to control the policy of lending institutions. It directs their allocations to finance projects politically and socially desirable, but not desirable banking.

Sapienza (2004) studied the impact of government ownership on bank capital in its credit policy. He found that public banks charge companies to pay lower interest rates than private banks. In addition, public banks prefer to lend

mainly large companies and firms located in depressed areas. Similarly, Sapienza (2004) showed that the behaviour of bank lending is affected by public electoral results of the party affiliated with the bank. Indeed, the political party is more dominant in the region that the company borrows, the higher the rate of interest is low.

♣   The size of the board has a positive and statistically significant on risk-taking by banks in Tunisia, the hypothesis H5 is reversed. This result is consistent with the recommendations of Jensen (1993) argues that the Board operates with a reduced number of directors produces a more effective control mechanism. Indeed, a small board size allows a better alignment of interests between shareholders and managers and therefore, leads to a reduction of bank risk.

By cons, a large number of directors on the board increases the expertise and increases the potential for conflict. This has a greater potential for disagreement and lack of coordination in management decisions (Beltratti and Stulz 2010).

♣   The presence of institutional administrators (ADIN) on the board of administration is negatively correlated statistically with the overall risk of Tunisian banks listed the hypothesis H6 is confirmed. This result is consistent with the recommendations of Jensen (1993) argues that the presence of institutional directors on the board of directors with extensive expertise allows better control of the manager because they have better access to information and greater expertise in the management of banking risks.

Similarly, Mamoghli and Dhouibi (2009) suggested that institutional investors have greater expertise in the area of risk-taking that could encourage managers to make a better selection of investment projects.

♣   The percentage of foreign directors (AIND) is positively correlated and has a statistically significant association with risk-taking by banks in Tunisia. The hypothesis H7 is reversed. This result can be interpreted by the fact that these foreign directors are not able to understand the complexity of the bank and they are incompetent officers in the exercise of control and surveillance officers.

Similarly, Hermalin and Weisbach (2000) stated that foreign directors may have conflicting interests which may create conflicts of interest between the board and the management team.

♣   The duality of leadership style (DUAL) is positively and significantly related Banking risk. The hypothesis H8 is confirmed. Indeed, in the case of both roles of chairman and CEO, it would cut an alteration of the functions of control and supervision. Thus, the manager will be able to access the advice and banking firm that can cause a reduction in the effectiveness of the control of the governance structure. Thus, Jensen (1993) showed that the leader should not be the chairman because he may not be able to distinguish between its own interests with those of shareholders.

♣   Finally, the estimation results revealed that the size of the bank is correlated negatively and significantly with risk-taking by banks in Tunisia. The hypothesis H9 is confirmed. This result confirms the work of Aggrawal and Jacques (2001) on U.S banks, and Van Roy (2003) on European banks and Dannon (2010) on the banks of Africa and Middle East are also negatively influencing the level of capital and bank risk. In fact, this negative relationship between size and risk diversification is explained by the size and the existence of economies of scale in the costs of transactions.

4. CONCLUSION

The objective of our study was to investigate the relationship between internal governance mechanisms and bank risk in the Tunisian context. Particular emphasis is placed on the impact of ownership structure (ownership concentration, the presence of institutional investors, the presence of foreign shareholders and the participation of the State) and the board (the size of board of Directors, institutional directors, independent directors and the duality of leadership) on bank risk. To achieve this, we have adopted a bipartisan approach. On the one hand, through a review of theoretical and empirical literature, we formulated operational hypotheses after giving the theoretical foundations of the field of governance and banking risks. On the other hand, on a panel of 10 Tunisian banks listed on the Securities Exchange of Tunis during the period of 2002-2009, we conducted tests of specification of econometric models that we estimated using Eviews software 7.

Empirical validation of our research shows that the concentration of capital has a negative effect on risk-taking. This result is explained by the fact that when shareholders are highly concentrated, their incentives to monitor managers increase. The presence of institutional investors is positively on the overall risk of the banks because they are not involved in an active way in the government of the bank. In addition, foreign owned Tunisian banks tend to take less risk than other banks. This is explained by the fact that the presence of foreign capital brings new management techniques, new technologies of information and communications that the banks have agreed to face competitors. As for the participation of the state in the capital, it has increased the risk in Tunisian banks which could be explained by the orientation of the state to finance projects politically and socially desirable, but not desirable banking.

Regarding the Board of Directors, empirical studies showed that the size of the board has a positive impact on risk-taking in our sample. This result is explained by the fact that the board of directors of small size allows a better alignment of interests between shareholders and managers and, therefore, leads to a reduction of bank risk. For cons, the presence of institutional administrators acts negatively on risk-taking in our sample which could be explained by their high level of expertise that allows better control of the leader because they have better access to information and greater expertise in bank risk management. However, the participation of independent directors is positively correlated with risk. This result can be interpreted by the fact that these foreign directors are not able to understand the complexity of the bank and they are incompetent officers in the exercise of control and surveillance officers. Similarly, the duality has a positive impact on bank risk because both roles of Director and Chairman of the Board, there would cut an alteration of the functions of control and supervision. In addition, the size of the bank is negatively influencing bank risk-taking which is explained by the diversification in size and the existence of economies of scale in the costs of transactions. It may be interesting at this stage of the research to list a number of limitations that should be addressed and possible extensions to these analyzes.

A first limitation is the relatively small size of our sample. A second limitation is the difficulty of collecting information on the governance of Tunisian banks. This lack of information can explain the low explanatory power of our models that may affect the interpretation of results. We retain, however, the complementarities in this study between the internal mechanisms of governance and regulation constraining risk-taking by banks. However, some points need to be deepened to extend this work. Indeed, we must add the variable remuneration of directors, which is an internal discipline to managers so that it is in the interest of shareholders. In terms of extension, it would be interesting to test the model on several countries, including emerging markets.

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