

What Risks for the Profitability of the Banking Sector

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Abstract

This article attempts to determine the reasons of banks' failure relying heavily on the relationship between corporate governance of banks, the value of charter and risk taking. It focuses on the concept of market discipline in the banking sector. In general, the bank faces three problems: the failure of its client, increased competition and adaptation to new information and communication technologies. Our task is to show the impact of excessive risk-taking on bank profitability. It seems essential to take into account the consequences of strategic interactions of the efficiency of the banking system. The question is how we can control the level of risk-taking in the banking sector.

Our study focuses on the banking markets of seven developed countries. Our sample consists of 41 banks over the period 2000–2012. It is important to determine the disciplinary role of the shareholder in examining the effect of charter value on risk-taking by banks. Our goal is to show that the charter value can be considered as a factor of leaders' self-discipline towards risk taking. We tested the model of two simultaneous equations (3SLS) and we found that the value of charter plays a role of self-discipline only for risk capital and assets. This charter value increases the risk of insolvency. However it has no effect on the credit risk.

Keywords: charter value, risk capital and assets, credit risk, insolvency risk, internal mechanism of governance, external mechanism of governance, principal components analysis (PCA)

1. Introduction

The banking sector plays an important role in the health of the economy of a country. Inadequate assessment of the degree of risk will necessarily disrupt the smooth functioning of the banking system. In fact, many financial crises have had their birth due to the failure of the banking sector. A financial crisis will lead automatically to an economic crisis: the slightest difficulty in financial intermediaries, which are the main suppliers of funds for many customers, will have adverse effects on the entire chain of a country's economy.

In autumn 2007, banks' excessive risk-taking was the main cause of the outbreak of the "Subprime" financial crisis. Major U.S. financial institutions, such as the American International Group (AIG) and Lehman Brothers went bankrupt during the credit crisis. This financial crisis has had a negative impact on European banks, such as the "General Society", the "Royal Bank of Scotland (RBS)", "Lloyds TBS", the "Northern Rock" and "HBOS".

The excessive risk taking is primarily related to corporate governance. It may also be related to the underestimation of the risk of economic recession cycle such as the procyclicality of capital. The problem is that banks do not have sufficient capital at the outbreak of the crisis. This excessive risk-taking can also be linked to the problem of transmission of information regarding the existence of the crisis, such as the opacity of certain structured products, the existence of asset-backed securities or even the spread of collateralised debt obligations.

The quality of the borrower must be taken seriously into account in order to minimize the credit risk. The Basel Committee has proposed a new set of recommendations according to which a more relevant measure of credit risk, taking into account the quality of the borrower, including through an internal financial rating system for each establishment (referred to as "IRB" to internal Rating Based). The new solvency ratio is the McDonough ratio, named after the chairman of the Basel Committee, William J. McDonough.

The Basel II recommendations are based on three pillars:

- The capital requirement (solvency ratio of McDonough);

- The procedure of monitoring the management of capital;
- Market discipline (transparence in communication of institutions).

Thus, to increase its performance, each bank must protect itself against risks. There are several methods for managing credit risk, such as deposit insurances and prudential rules (Basel I & II). These methods aim essentially to solve asymmetric information problems. Each bank is looking for the ideal pair of profitability and risk.

Each bank may have problems with their customers' failure which is mainly due to errors in management. These problems can lead to more or less serious profitability crises. It is for this reason that the information about the customer becomes necessary to select the creditworthy customers.

The Basel III reform is an easing of liquidity rules concerning the banking regulation. It is to revise the composition of regulatory capital and apply special treatment to the systemic banks. Basel III recommendations are based on four pillars:

- Limiting the effects leverage (ratio equity / balance sheet);
- Strengthening prudential requirements for counterparty risk (risk of default of a customer);
- Improving the management of liquidity risk by the creation of two liquidity ratios;
- Increasing the level and quality of capital.

Several questions need to be developed: is the strategy of excessive risk-taking which is often linked to the existence of financial crisis? What is the impact of competition on bank profitability? Does the banking concentration stem from a well-defined strategy? Are the managers and boards of directors they main responsible for the adoption of too risky strategy? What is the impact of strategic behavior of banks on risk?

2. Literature Review

The Charter value is defined as the present value of future profits. According to Demsetz and Strahan Saidenberg (1996), the charter value is determined by two main factors: the first concerns the nature of the market structure, while the second factor concerns the sources related to the bank. Regarding the first factor, the degree of market power is obtained according to the rules established by the government: the more the number of competitors increases, the more market power decreases. The first condition on entry in the banking sector requires obtaining a Charter or right to operate more the which is given by the government. According to Milne and Whalley (1998), the value of charter depends in firstly on the number of banks authorized by the Government and secondly on the entry costs and capital levels required.

The second factor concerns the sources related to the bank that is the specific factors granted to the bank such as reputation, customer relationships and good credit. Indeed, the banking market is characterized by few suppliers and abundance of applicants, which makes it looks like the market structure of oligopoly called also market of strategy. A rivalry reign between the financial intermediaries: banks develop strategies according to the market but also the supposed competitors' strategies. The banking market is a strategic market. Its economic analysis is based on behavioral assumptions and recommended solutions are based on the type of accepted behavior.

It is interesting to expand the influence of the strategic behavior of banks on the performance and structure of the banking or financial sector. It seems essential to take into account the consequences of strategic interactions on the efficiency of the banking system. The existence of strategic interaction between banks creates a non-cooperative environment between these players. Indeed, the behavior of each bank will depend on the behavior observed or expected from other banks. Each bank seeks a strategy consistent with the hypothesis of individual rationality that yields it the maximum gain.

Hellmann et al. (2000) developed a dynamic model of the banking sector mainly where reigns an imperfect competition in the markets for deposits. The more competition increases, the more bank profits decrease and the more value of Charter becomes weaker. Faced with this latter situation, banks will take a lot of risks to increase the share of profit. Similarly, Repullo (2004) showed that intense competition reduces banks' Charter values and increases the strategy of excessive risk taking.

According to Esty (1998), it's the bank's shareholders who are primarily responsible for the adoption of excessive risk-taking strategy. Indeed, shareholders always seek the maximum gains by taking more risks. It is important to determine the relationship between the Charter value and excessive risk taking. Marcus (1984) shows that the decrease in the Charter value encourages banks to increase risk taking. Similarly, Herring and Vankudre (1987) showed that banks which take a lot of excessive risk have low Charter values.

Mehran et al. (2011) argue that bank governance can be particularly low due to the multiplicity of stakeholders, the complexity of bank operations. Moreover, the moral hazard created by the situation of "too big to fail" may have led to recommendations to encourage risk-taking because they knew that largely taxpayers rather than stakeholders would pay large losses. There are other reasons why corporate governance problem in banks might be more serious than in other firms—other than those created by deposit insurance (Caprio & Levine, 2002; Levine, 2004).

First, banks are very opaque to what returns the asymmetry of the information and the agency problem is particularly serious. This opacity and information asymmetry provides strong incentives for bank insiders to pursue their own interests at the expense of the interests of other stakeholders.

Secondly, the banking sector is subjected to multitude governmental regulations to protect the stability of the financial sector or to pursue other political objectives. These regulations and the governmental intervention lead diverse stakeholders of banks to turn to the government every time banks are in trouble. In this situation, it is difficult to hold the bank executives responsible for bad banking performance.

Thirdly, competition is not usually strong in the banking sector. In the context of competition in the product market discipline, behavior management can be a weakness of the banking governance: bank managers do not have strong incentives to adopt a system of good governance order to reduce their cost of capital or maintain their management control. Fourthly, the trends of the globalization, the deregulation and the financial innovation bring the highest risk on the financial institutions while risking to weaken the traditional process of governance. For all these reasons, governance remains insufficient and ineffective to check the level of risk-taking.

The main objective of banks' regulators and supervisors is to assure the safety and the solidity of the banking system. This goal is reached thanks to activities of regulations and surveillance, which refrain the banks of excessive risk-taking and minimizes the probability of bankruptcy. Because of the inefficiency and inadequacy of the system of bank governance, the task of regulators and supervisors will be easier if there are incentives of bank managers' self-discipline. Research suggests that there are deeper roots behind the above factors; one of them is the charter value of banks. We also speak about "the value of franchise" (Demetz, Saidenberg, & Strahan, 1996), the Charter value is a value which would be advanced if the bank closes.

We hold this Charter value as an influence of self-discipline on the appetite of the risk manager. On one hand, since the level of the overall risk security affects the Charter value, which affects at the same time the shareholders and the administrators if the guarantor survives. Then, the Charter value is enough brought up, the administrator takes less risk of not compromising the Charter value and hence decreasing his participation. In this way, the high Charter value induces the manager to take less risk, even if it is given less capital. On the other hand, there is incentive to be given to the administrator of the actions to reduce the appetite for the risk (because he holds a participation in the company). This view reflects the fear of losing the Charter value or license to operate the business financial capital. These two phenomena indicate that the Charter value, a key driver of the behavior of agents in financial institutions cannot be ignored in the design of models that include executive compensation. In other words, the Charter value, the risk and the incentive remuneration should be studied jointly and not separately.

Regarding the importance of the risk in the banking context, we attempt to respond to the following question: how do managers control the risk-taking of the bank in an effective way? In our study, the research questions revolve around the following: What is the impact of the mechanisms (internal and external) of governance on the banking risk-taking and the charter value? What is the role played by the Charter value in the risk taking strategy? To answer the questions mentioned above, we realized an empirical study on 41 banks of 7 developed countries from 2000 to 2012.

3. The Research Hypotheses

3.1 The Relation between the Concentration of Capital and Risk-Taking

The relation between the concentration of capital and bank' risk-taking is theoretically ambiguous and empirically complex: Although the moral hazard hypothesis of the majority of shareholders were validated at the theoretical level, the results empirical are mitigated. Indeed, Laeven and Levine (2009) notice that the concentration of capital increases the risk-taking, while Innonta et al. (2007) and Azofra and Santamaria (2011) find an inverse relation between the concentration of capital and the bank risk-taking. The banks checked by the majority of shareholders register a lower level of risk-taking. Mamiza, and Richard (2012) find a relation not linear under shape "U" between the concentration of the property and the risk-taking. We notice that the concentration of the property urges banks to take more risk.

H1: The relation between the concentration of the property and the bank risk-taking is positive.

3.2 The Relation between the Structure of the Board of Directors and the Bank Risk-Taking

According to Charreaux (2000), the Board is no longer a mechanism contributing to the creation of value, but a tool of power, domination, rent seeking and creation of social norms. Previous studies support that the optimal structure of the board of directors is based on the costs and the advantages of the surveillance and the advice, as well as the other characteristics of governance (Link et al., 2008). Studies which examine the relation between the size of the board of directors and the risk-taking of banks are very rare. Indeed, Pathan (2009) and Beltratti and Stulz (2009) find that the small size of the board increases the level of risk-taking. They concluded that the small size of the board allows the shareholders to influence managerial decisions and encourage them to adopt risky strategies. Other studies which analyze the relation between the independence and the risk-taking, find a consensus: several authors (Simpson & Gleason, 1999; Choi & Hassan, 2005; Pathan, 2009) find that the high percentage of the independent directors negatively affects the banking risk. Then, on the basis of these results, we notice that it is necessary to have a sufficient number of administrators and especially independent directors to decrease banks' risk-taking.

H2: The size of the board of directors has a negative impact on banks' risk-taking.

H3: The independence of the board of directors has a negative impact on banks' risk-taking.

3.3 The Relation between the Duality and the Bank Risk-Taking

According to the studies of Simpson and Gleason (1999) and Pathan (2009), the duality decreases the risk-taking. They found a negative relation between the duality and the risk-taking. This relation can indicate that the manager can show the risk when he is also president of council to share his human resources: he has to protect it in an internal way to engage in projects of low risk.

H4: The duality decreases the level of banks' risk-taking.

3.4 The Relation between the Compensation and the Bank Risk-Taking

The use of executive compensation to performance in the banking sector is widely suspected of having an excessive risk-taking. Therefore, it is a contributing factor to the recent financial crisis (Bebchuk & Spamann, 2009). So, Mehran and Rosenberg (2008) studied the impact of CEO compensation on the investment choice, the amount of the loan and the level of capital. They found that compensation by "stock options" leads the CEO to undertake riskier investments. Thus, Sunthiem (2010) found that the relation between executive compensation by stock options and risk-taking is positive. This result is also confirmed by Belkhir and Ghazi (2010) who have studied the link between CEO incentive and bank risk-taking using a sample of 156 banks between 1993 and 2006.

In summary, the remuneration of leaders by variable of salaries according to the performance increases the risk-taking.

H5: The remuneration of the administrators (variable) has a positive impact on banks' risk taking.

3.5 The Relation between the State Ownership and Banks' Risk-Taking

Several studies showed that the state property of banks leads to the ineffectiveness and bad performance (La Porta et al., 2002). One of the reasons is that the management of these State banks sometimes comes under the pressure to serve particular political interests. In thorough analyses, Caprio and Martinez Peria (2000) find that a bigger area of the state property of banks is associated with a higher probability of banking crises in developing countries. Barth et al. (2004) find that public banks increase the ratio of non-performing loans, but do not find significant impact of the state property on the banking crises. By using data at the level of banks, Iannotta et al. (2007) find that the banks of the state are associated with a relatively high risk. More recently, Iannotta et al (2013), using a sample of the European banks, find that public banks have a risk higher than the private banks, which indicates the presence of a governmental protection, leading to a higher risk-taking especially in the years of elections.

H6: The public property increases the risk of the bank.

3.6 The Relation between the Prudential Regulations and the Banks' Risk-Taking

We can define the prudential regulations in all the measures, which allows to reduce or to assume better the risks managed by various components of the financial system. To assure a perfect competition and fight against the financial conglomerates, several countries put limitations on the activities. The empirical studies, studying the relation between the activity restriction and the risk-taking at the level of banks, are mixed. Beck et al. (2004)

find that an insufficiency of the activity restriction increases the competition on the market and creates incentives to take more risk. So, a high level of activity restriction decreases the competition and pushes banks to take less risk.

For the regulations on capital, the theory shows that the impact of the requirements on the risk-taking is in a different way: a high level of the regulations of the capital can decrease the competition on the market by putting barriers to entry and pushing the banks to take less risk. So, Bolt and Tieman (2004) conclude that the presence of the strict requirements of capital leads banks to decrease the risk-taking by imposing more strict criteria for the sake of granting new loans. On the contrary, Hellmann et al. (2000) and Repullo (2004) assert that the requirements of capital decrease the Charter value and encourage banks to take more risk.

In addition, several authors have studied the relation between deposit insurance and risk-taking. Most empirical studies (Hutchison & McDill, 1999; Eichengreen & Arteta, 2002; Barth et al., 2004; Hoggarth et al., 2005; Angkinand et al., 2007) indicate that the deposit insurance increases moral hazard incentives and pushes the banks to take more risk.

H7: The limitation of the activities decreases the risk-taking.

H8: The regulations of capital affect negatively the risk-taking.

H9: The protection of the depositors increases the risk-taking.

3.7 The Relation between the Competition and the Risk-Taking

Because of its effects on the financial stability, the banking competition is a subject of big concern in the literature (Beck et al., 2006; Schaeck et al., 2009; Wagner, 2010). While the competitive banking market can pull more advantages for the company in general, such as the price drop and the superior-quality financial products (Boyd & Nicoló, 2005), the influence of a competitive banking market on the financial stability is not still clear. There are two main theories brought into conflict on this question. Certain studies show that the competition becomes intensified the behavior of bank having a closed view on risk-taking because it presses to banks to operate with a minimum "buffer" of the capital (Hellman et al., 2000). However, others assert that the crises may occur less in the competitive banking environments (Beck et al., 2006; Boyd & Nicoló, 2005).

H10: A high level of the competition increases the bank risk-taking.

3.8 The Relation between the Charter Value and the Risk-Taking

The first study which examined the relation between the value of Charter and the risk-taking is Keely (1990). He observed that banks with low Charter value had a higher risk of default. Keely concludes that the increased competition caused the Charter value to decrease, which in turn leads to an increase of the risk taken by banks. This relation was confirmed by several other studies (Demsetz et al., 1996; Galloway et al., 1997; Gan, 2004; Gonzalez, 2005; Ghosh, 2009). Saunders and Wilson (2001), Jones et al. (2011), Martinez-Miera and Repullo (2010) and Niu (2012), find a non-linear relation under shape (U) between the Charter value and risk-taking.

H11: The relation between the charter value and bank risk taking is negative.

4. Econometric Analysis

This section aims at testing the effect of the banking governance on risk-taking and the Charter value simultaneously by studying the relation between the Charter value and risk-taking. At first, we shall present our sample, the explained and explanatory variables as well as the method of analysis 3SLS of two simultaneous equations. The presentation and the interpretation of the results of this study will be the object of the second section.

4.1 Sample and Data

In this analysis, we use a sample of 41 banks of seven developed countries which are France, Germany, the United Kingdom, Switzerland, Sweden, Canada and Belgium. The choice of these different countries is justified by the fact that the mechanisms of governance and governance variables have differences that allows us to capture the effect of these two types of variables on the bank risk-taking. Similarly, the sharpe ratio, largely influenced by the listing of the bank on each of the financial markets, helps identify and target its effect on risk-taking. We collect manually the data of the internal mechanisms of the banking governance, the measures of risk and financial variables and the accounting through annual reports downloaded from the appropriate sites of the banks in our sample.

So, we use the base of the data of the World Bank "World Development Indicators 2013" and the base of the data of "BRSS on 2003, BRSS on 2007 and BRSS on 2011" to collect the variables of external mechanisms of

governance and the economic indicators of the countries of our sample.

4.1.1 Measures of Bank Risk-Taking

In this study, we used three measures for the risk-taking. The studies which have examined the behavior of banks have generally adopted a one-dimensional indicator of risk, such as the share of non-performing loans, return on equity, capital ratios. However, it is doubtful that these indicators seize completely the banking risk. Besides, most of the indicators based on the given balance sheet contain errors of measurement such as the various methods of calculation the problems of balance (Zhao et al., 2009).

For all these reasons, we have created our own measure of risk-taking. We have developed a set of 18 items. After iterations based on principal component analysis (PCA) and reliability test, these 18 items were reduced to 9 items and summarized in two factors measuring risk-taking in banks: R1 capital and assets risk and R2 credit risk.

For the third measure of risk, we used Z-score, which measures the risk of insolvency. Z-score is the report between ROA more the ratio of total of the capital on the total of assets and the standard deviation of ROA.

4.1.2 The Charter Value

The charter value of a bank (VCH) is defined as the net present value of its future rents. Charter value can hence be thought of as being the market value of assets, minus the replacement cost of the bank (Keeley, 1990; Demsetz et al., 1996).

4.1.3 The Internal Mechanisms of Governance

The size of the board of directors (TCA): it is the total number of the members of board of directors.

Duality (DUAL): is a binary variable that measures the power of leadership. It takes the value 1 if the leader combines two functions: the general director of the bank and at the same time the President of the Board, and 0 if not.

The independence of the administrators (INDCA): it is the proportion of the independent directors' members of the board.

The number of committees of the board of directors (NCCA): it is the number of committees (committee of remuneration, appointments committee, management committee of risk) within the board of directors.

The number of board meeting (NRCA): it is the number of board meeting by the years.

Remuneration fixes (basic salary): it is the annual value of the basic pay.

Variable remuneration (variable): it is the value of profit on the actions distributed in the end of the financial year "stock option".

The ownership concentration (OC): is a binary variable that takes the value 0 if the majority shareholder holds shares of capital between [0, 10%] of the total capital of the bank, 1 if the controlling shareholder holds capital shares between [10, 25%] of the total capital of the bank and 2 the majority shareholder holds shares of capital more than 25% of the total capital of the bank.

The state property (PROPETAT): is a binary equal variable in 1 if the bank is state, and 0 if not.

4.1.4 The External Mechanisms of the Banking Governance

Restriction of activities (RESTRIC): is an index of regulatory restrictions on the activities of banks. This index measures the regulatory barriers for banks engaged in securities market activities (e.g., underwriting, brokerage, trading and all aspects of the mutual fund industry), insurance activities (for example, insurance underwriting and selling), real estate activities (e.g., real estate investment, development and management), and ownership of non-financial firms: the higher the score, the greater the restriction activity.

The stringency of the capital (CAPITAL): is an index of regulatory oversight of bank capital. It measures the regulatory approach to the assessment and verification of the degree of capital risk in a bank. A high score on this index indicates that the country has more regulatory capital.

The independence of the supervision: is an index which measures the degree of the independence of the supervision and their political influence on banks. The more the score is brought up, the more supervision is independent and powerful.

Depositor protection (PROTECT): is an index of deposit insurance regime. It identifies the level of compliance that are supposed to alleviate the problem of moral hazard. High score indicates a high degree of

protection of depositors.

Barriers to entry (ENTRYOBS): is an index which measures the conditions for granting legal licenses to the entry of foreign banks. The corresponding measure is based on all the requirements to ensure that the license application to be considered is valid. The existence of several barriers to entry increases the index score.

Lerner index (Lerner): is a measure of market power in the banking market. It compares the cost of production and marginal costs. An increase in the Lerner index indicates a deterioration of the competitive behavior of financial intermediaries.

4.1.5 The Control Variables

The size of the bank (TAIBANK): this is the natural logarithm of total assets of a bank. This variable measures the disparity in risk taking between large and small banks.

Capital ratio (equity / assets): the ratio of total equity to assets. This is a key financial ratio that measures the adequacy of a bank or financial stability fund. Generally, the higher the ratio, the more the high bank is solid.

The operating ratio (EXPLOITA): is the report between the total of expense and the total of income.

Subordinated debt (SUPORTDEBT): is the amount of subordinated liabilities recorded in the balance sheet of the bank.

Provisions for risk and charges (provisions): is the level of provisions for risks and charges.

The GDP growth (PIB): is a measure percentage that indicates the variety of the economic growth of countries in our sample.

The inflation rate (INF): is the inflation of consumer products in different countries in our sample.

The banking concentration (CONC): is the sum of the assets of three bigger commercial banks as part of the total of commercial banks' assets. The total of the asset includes the total of the productive assets, the finance and the claims on banks, seized real property, tangible assets, goodwill and other intangible assets, assets of the common taxes, the assets deferred taxes, the abandoned activities and other assets.

4.2 The Econometric Model

In order to test our hypotheses and to analyze the simultaneous effects of bank governance on risk taking and the bank Charter value, we chose to use a model with two simultaneous equations.

$$R_{i,j,t} = \beta_0 + \beta_1 * VCH_{i,j,t} + \beta_2 * X_{i,j,t} + \beta_3 * Y_{i,j,t} + \beta_4 * Z_{i,j,t} + \beta_5 * C_{i,j,t} + \epsilon_{i,j,t}$$

$$VCH_{i,j,t} = \alpha_0 + \alpha_1 * X_{i,j,t} + \alpha_2 * Y_{i,j,t} + \alpha_3 * Z_{i,j,t} + \alpha_4 * C_{i,j,t} + \mu_{i,j,t}$$

$R_{i,j,t}$ is the measurement of the risk-taking of bank i in country j and time t .

$VCH_{i,j,t}$ is the value of charter bank i in country j and time t

$X_{i,j,t}$ is the vector of variables the internal governance mechanisms of bank i in country j and time t .

$Y_{i,j,t}$ is the vector of variables the external governance mechanism of the bank i in country j and time t .

$Z_{i,j,t}$ is the vector of the control variables in banking bank i in country j and time t .

$C_{i,j,t}$ is the vector of the control variables at the country level j , bank i and time t .

$\epsilon_{i,j,t}$ is the error term of bank i , country j and time t in equation 1.

$\mu_{i,j,t}$ is the error term of bank i , country j and time t in equation 2.

β and α are the coefficients of the estimated vectors.

4.3 The Estimation Methodology

To test the model, we use the STATA 12 software. So, for all the transactions, we use a system of type 3SLS simultaneous equations, as far as the transactions determining the risk-taking of the bank are themselves affected by the characteristics of the value of Charter, the mechanisms of governance and the property of the bank. Zellner and Theil (1962) develop this method of estimation. It is considered as a method of complete information or a method of estimation of the system which takes into account a correlation between the disturbances of various equations. Furthermore, the method of least squares in three steps (3SLS) is more effective than the method of least squares in two steps (2SLS) if the system of equations is well defined (Baltagi, 2008, p. 268).

4.4 Presentation and Interpretation of Results

Table1 presents the estimation results of our 3SLS SUR models with two simultaneous equations. For the three

models, the dependent variables are R1, R2 and Z-score and endogenous variable (VCH). From these Tables, we observe that our model explains well the risk-taking bank with a quality coefficient of adjustment (R^2) of 52.6%, 31.7% and 45.5% for R1, R2 and Z-score successively.

So, our model explains well the Charter value with a quality coefficient of adjustment of 45.5 %.

Generally, we can conclude that our models have a linear quality of acceptable adjustment.

At the end, the test of Khi-2 shows that our models are significant at the threshold of 1%.

4.4.1 The Relation between the Charter Value and Risk-Taking

Several studies have confirmed that the relation between the Charter value and the capital and asset risk is negative: Galloway et al. (1997); Gan (2004); Gonzalez (2005); Gosh (2009). An increase of a standard deviation of the Charter value would decrease the capital and asset risk of 17 %. This result is coherent with the effect disciplining some Charter value and thus supports the hypothesis. On the other hand, a positive relation exists between the Charter value and the risk of insolvency which is confirmed by the following studies: Park (1997); Hellmann et al. (2000); Saunders and Wilson (2001); Jones et al. (2011).

4.4.2 The Relation between the Internal Mechanism of Governance and Risk-Taking

The independence of the board of directors is an important factor allowing the decrease in the level of risk-taking for three types of risk: capital and asset risk, the credit risk and the risk of insolvency. Our result is coherent with the results of Pathan (2009). According to this result, the hypothesis 1 is validated and we can explain that the presence of a significant number of independent directors who strongly lead the board of directors to decrease conflicts of interests between the diverse parts of the bank.

The relation between the size of the board of directors and risk-taking is not significant in our study and consequently, our hypothesis empirically is not validated. So, for the other attributes of the board of directors, we notice that the number of Board meeting of the administration increases the capital and asset risk and the credit risk.

The impact of the duality on the risk-taking differs depending on the nature of risk: the duality increases the capital and asset risk. However, the duality increases the quality of the loans and decreases the credit risks. This relation can be explained by the aversion to the risk of the leaders as Chairman of the Board to protect human resources. This is coherent with the works of Simpson and Gleason (1999) and Pathan (2009). Our hypothesis is validated for the credit risk and is not validated for capital and asset risk.

Besides, the remuneration of leaders by variable salaries increases the capital and asset risk. Then our hypothesis is coherent and confirmed by several studies: Mahran and Rosenberg (2008), Belkhir and Ghazi (2010). They noticed that the remuneration by the stock option leads the leader to make risky investments; in particular, higher levels of allocation of "stock options" are associated to higher levels of own capital and to volatility of the asset.

The coefficient of ownership concentration is not significant for the risk of capital and assets while it is significant and negative with Zscore. This means that the concentrated ownership structure increases the risk of insolvency of the bank. We confirm our hypothesis of moral hazard shareholders at high levels of ownership concentration. In this context, the majority of shareholder can incite leaders to a policy of investment and risky credit. These results confirm the results of Haw et al. (2010), Laeven and Levine (2009) who stipulate that the risk is more important in the banks where the majority of shareholders hold important parts of the capital.

As expected, relative to the significant state ownership ratio, they are positively correlated with the risk of capital and assets, while not significant with other types of risk, but with a positive sign risk. These results show that the state-owned banks are more risky and inefficient compared to other private banks. This is confirmed by several studies such as: Caprio and Martinez-Peria (2000), Barth et al. (2004), Berger et al. (2005), and Iannotta et al. (2007) who found that state ownership leads banks to take excessive risks.

4.4.3 The Relationship between the External Mechanism and Risk-Taking

Confirming our hypothesis, the Lerner index measures the degree of competition; it has a negative and significant impact on the threshold of only 10% of the capital and asset risk: this result indicates that the increase in competition pushes managers to take more risk for the bank to compete in the financial market. Several studies have confirmed this relationship (Beck et al., 2006, Boyd and De Nicoló 2005, ...). The existence of barriers to entry reduces the credit risk which confirms the hypothesis that barriers to entry reduce competition, allowing managers to follow a no risky policy of credit.

Many countries are trying to reduce risk by restricting banks from engaging in non-lending activities. In our

study, the coefficient of activity restriction (RESTRIC) is negative between the three types of risk (capital and asset risk, credit risk and default risk), but it is statistically significant at 10% threshold with the capital and asset risk. The analysis of several authors (Matutes and Vives (2000), Beck (2008), Laeven (2004), Lepetit et al. (2008)), that found a high level of activity restrictions decreases competition and further reduces the incentives for banks to take risks.

Table 1. Results of relation between internal mechanism of governance and risk-taking

	R1	VCH	R2	VCH	Zscore	VCH	R1	VCH	R2	VCH	Zscore	VCH
	Coef,	P>z	Coef,	P>z	Coef,	P>z	Coef,	P>z	Coef,	P>z	Coef,	P>z
VCH	0,046	0,006***	0,719	0,006***	-0,020	0,318	-0,220	0,318	-0,128	0,012**	-0,216	0,012**
INDCA	0,010	0,001***	-0,010	0,379	-0,011	0,001***	-0,006	0,624	0,027	0,001***	0,003	0,797
TCA	0,012	0,493	-0,021	0,763	0,007	0,741	-0,011	0,873	0,079	0,146	0,004	0,950
NRCA	-0,081	0,001***	-0,064	0,539	0,077	0,013**	-0,109	0,290	0,065	0,402	-0,109	0,283
NCCA	-0,028	0,636	-0,844	0,000***	-0,354	0,000***	-0,967	0,00***	-0,225	0,209	-0,917	0,000***
DUAL	-0,827	0,000***	1,045	0,107	-0,693	0,000***	0,310	0,625	0,311	0,510	0,520	0,398
fixe	0,009	0,526	-0,099	0,067*	-0,015	0,362	-0,099	0,069*	0,050	0,230	-0,083	0,129
variable	-0,020	0,036**	0,048	0,205	0,017	0,150	0,039	0,311	-0,003	0,925	0,034	0,376
OC	-0,026	0,838	1,183	0,017**	0,217	0,154	1,246	0,012**	-0,854	0,027**	0,985	0,050**
PRPETAT	-0,519	0,002**	0,342	0,607	0,047	0,814	-0,022	0,974	-0,024	0,963	-0,036	0,956
LERNER	3,373	0,063*	16,881	0,018**	0,517	0,813	19,989	0,005**	3,690	0,504	20,211	0,004***
ENTRYOB	-0,002	0,762	-0,111	0,000***	-0,020	0,031**	-0,121	0,00***	0,008	0,734	-0,112	0,000***
RESTRIC	0,005	0,088*	-0,021	0,043**	-0,002	0,467	-0,019	0,071*	0,019	0,021**	-0,014	0,187
CAPITAL	0,000	0,896	-0,028	0,032**	-0,007	0,062*	-0,031	0,020**	0,000	0,970	-0,028	0,029**
SUPER	-0,024	0,000***	0,030	0,226	0,012	0,118	0,016	0,512	0,023	0,225	0,018	0,458
protection	0,009	0,012**	0,003	0,811	-0,005	0,274	0,009	0,522	-0,018	0,094*	0,006	0,675
PIB	-0,023	0,402	-0,027	0,805	-0,062	0,063	-0,058	0,597	0,025	0,765	-0,038	0,726
INF	-0,126	0,020**	0,260	0,231	0,136	0,037	0,204	0,348	0,362	0,029*	0,249	0,252
CONCENT	-0,001	0,891	-0,025	0,198	0,002	0,712	-0,025	0,187	-0,039	0,008***	-0,034	0,082*
CAPITAUXA CTIFS	0,010	0,314	-0,008	0,833	0,008	0,474	0,001	0,986	0,017	0,575	0,002	0,949
TAIBANK	0,173	0,049**	-2,371	0,000***	-0,055	0,600	-2,325	0,000	-1,087	0,000***	-2,494	0,000***
SUPORDEBT	0,003	0,785	0,052	0,151	0,004	0,685	0,056	0,121	-0,001	0,980	0,054	0,137
EXPLOITA	-1,629	0,000***	0,783	0,494	-0,422	0,190	-0,494	0,644	-4,522	0,000***	-1,370	0,225
provision	0,036	0,000***	-0,054	0,084*	0,004	0,690	-0,028	0,352	-0,035	0,131	-0,036	0,236
_cons	0,698	0,599	30,799	0,000	3,659	0,022	33,027	0,000	11,203	0,006	33,897	0,000
Equation	R-sq	parms	chi2	P	Equation	R-sq	chi2	P	Equation	R-sq	chi2	P
R1	0.526	24.000	257,970	0,000	R2	0.317	104,920	0,000	Z-score	0.386	148,190	0,000
VCH	0.455	24.000	195,870	0,000	VCH	0.455	188,01	0,000	VCH	0.455	194,400	0,000

The index of regulatory capital (CAPITAL) is negative and significant only with credit risk, which confirms our hypothesis: a high score of capital regulation reduces impaired loans and credit risk. This result shows that regulatory capital is required to limit the risk of the bank and the probability of bank failure. Our result corroborates with the research of Hellmann et al. (2000), Matutes and Vives (2000) and Repullo (2004) and Laeven and Levine (2009).

Under the assumption that the powerful official supervisors could improve bank governance and foster competition pushes banks to take additional risks, the power index and the independence of official supervisor (SUPER) is statistically significant and positive only with risk capital and assets. This means that the supervisor is more independent and powerful and banks take risks to be competitive due to increased competition. Our results are fine-tuned with those of Levine (2003) and Agoraki et al. (2011).

Our results indicate that the index of depositor protection is statistically significant at the 1% level with capital and asset risk and 10% threshold with the risk of insolvency. It is negatively correlated with the capital and asset risk and positive with the risk of insolvency. This indicates that a high level of depositor protection reduces the capital and asset risk and increases the risk of insolvency. The latter confirms the hypothesis of moral hazard induced by the fact that the insurance deposit increases risk taking (Hutchison & McDill, 1999; Demirgüç-Kunt

& Detragiache, 2002; Barth et al., 2004).

Finally, for the variables of control, we notice that the size of the bank affects negatively the capital and asset risk and positively the risk of insolvency but is not significant with the credit risk. Our result indicates that big banks are less solvent than small banks, which confirms the hypothesis of "too big to fail". While a lower operating ratio seems to decrease the risk of capital and assets and the risk of insolvency. Thus, an increase in the amount of the provision of risks and charges decreases the risk of capital and assets. On banking concentration, our study shows a positive relation between bank concentration and the risk of insolvency. Besides, the coefficient of the economic growth (GDP) is only significant and negative with the credit risk: an increase of the economic growth rate decreases the credit risk. This result indicates that the economic growth can coincide with an increase of the financial stability. The relation between the inflation rate (INF) and three types of risk is significant: for the capital and asset risk and the credit risk, the increase of the inflation rate urges banks to take more risk. Then, for the risk of insolvency, an increase of the inflation rate decreases the risk-taking. The increase of the general level of prices allowed the banking institutions to realize substantial profits. Inflationary pressures produce an extension and an overvaluation of the banking loads, but it is the depositors and the borrowers who support such loads in the last resort. The inflation pulls more loads of investment but also the high rates of credit and thus more income of interest and profits.

4.4.4 The Effect of Internal Governance Mechanisms on the Charter Value

Variables on internal governance mechanisms have a significant effect on the relation between Charter value and the risk of capital and assets. The following variables are illustrative:

- The coefficient of the number of the committees of the board of directors (NCCA) is significant at the threshold of 1 %. It affects the Charter value negatively: an increase on the number of the committees of the board of directors decreases the Charter value of the bank and increases risk of capital and assets.
- The coefficient of the remuneration for the leaders by the fixed annual salary is significant at the threshold of 10 %. It has a negative impact on the Charter value: an increase in the fixed remuneration decreases the Charter value.
- The coefficient of ownership concentration (OC) is significant at 5% level. The relation between ownership concentration (OC) and the value of Charter is positive: the higher the concentration of ownership, the higher the value of charter is great.
- All other variables (INDCA, TCA, NRCA, VARIABLE and PROPETAT) are not significant and do not affect the Charter value for the relation with the risk of capital and assets. Thus, the Charter value positively affects the risk of insolvency, the variables internal governance mechanisms that affect the charter value are:
- The number of committee of the board of directors (NCCA) is significant at the threshold of 1 % and affects negatively the Charter value. The coefficient of the concentration of property (OC) is significant at the threshold of 5 % and affects positively the Charter value. We find an increase in a standard deviation.

4.4.5 External Governance Mechanisms and the Charter Value

The coefficient on the barriers to entry (ENTRYOBS) is significant for the two models (for the risk of capital and assets and the risk of insolvency). We observe that the increase in score entry barriers reduces the charter value. In the same sense, the coefficient on the regulatory capital (CAPITAL) is significant for the two models (for risk of capital and assets and the risk of insolvency). The regulatory capital negatively affects the Charter value. An increase of one standard deviation score for the regulation of activities reduces the Charter value by 53% the risk of capital and assets and the risk of insolvency.

The coefficient of the restriction of activities (RESTIC) is significant only for the model of risk capital and assets. It has a negative impact on the Charter value. An increase of one standard deviation of the score restriction of activities reduces the Charter value by 45%.

According to our expectations, the index of the competition Lerner is significant at the threshold of 5 % for the two models of risk (risk capital and assets and the risk of insolvency). Our results show that the increase of the index of Lerner affects positively the Charter value that is a high level of the competition decreases the Charter value. We confirm the results of several searches keeley (1990), Hellmann et al. (2000) and Ghosh (2009). The economic effect of this relation is very large: an increase of a standard deviation of the index Lerner increases the Charter value of 64 % for the model of the risk capital and assets and 76 % for the risk of insolvency.

The effect of other variables external governance mechanisms is not significant for our models.

Finally, the control variables, we observe that the coefficient of the size of the bank is significant at the 1% level and negatively affects the Charter value: large banks are characterized by a low Charter value. An increase of one standard deviation of the size of the bank decreases the Charter value of 212% for risk capital and assets and 223% for the risk of insolvency.

4.4.6 The Ownership Structure and Bank Regulation

To give up predictions on the relation between the risk and the structure of property, certain theories suggest that the relation between the banking risk and the structure of property will vary according to the national regulations (for example, Shleifer & Vishny, 1986; Buser, Chen, & Kane, 1981; John, Saunders, & Senbet, 2000; John, Litov, & Yeung, 2008; Laeven & Levine, 2009). So, we attempt to know if the relation between the risk and the structure of property depends on the banking regulations. We have to re-estimate our three models add variables of interaction between the concentration of the property and the variables of the regulations.

Table 2 shows that the sign of the relationship between risk and regulatory barriers to entry depends on the capital structure of each bank. Regressions include interaction between the concentration of capital and the score of the barriers to entry; the coefficient on the variable of barriers to entry is negative and significant for R1 and R2 and is not significant for Zscore. The interaction term (OC * ENTRYOBS) is between R1 and significant way to Zscore. This shows that the stabilizing effects of the intensification of regulatory barriers to entry increase when the bank has a large owner.

The relationship between the index of the protection of depositors and the risk is positive and significant credit. The interaction term (OC * PROTECT) is between negative and significant. This shows that the regulation of the protection of depositors decreases credit risk when the bank has a large owner.

All other variables are not significant for all the types of the banking risk.

On the other hand, the Charter value, the significant index of the regulations of barriers to entry affects positively the Charter value, while the term of interaction (OC*ENTRYOBS) is significant and positive with three types of banking risk. It shows that the relation between the regulations of barriers and the Charter value depends on the concentration of the property. An increase of score of barriers to entry decreases the value of charter when the bank has a large concentration of the property.

Thus, the index of the power and independence of supervisor is significant and negative with the Charter value. However, the interaction term (OC * SUPER) is positive and significant with the Charter value. This shows that when banks have a large concentration of ownership, the effect of increased supervision score will be positive about the Charter value.

5. Conclusion

The objective of our search is to find an effective mechanism to check the level of risk-taking at the level of banks. It is a question in particular of studying the relation between the banking governance, the Charter value and the risk-taking. From a sample of 41 banks of 7 countries were developed during 2000–2012, we tried to detect the effects of governance, regulations and the banking supervision on the level of risk-taking by introducing the Charter value as a factor of self-discipline of the leaders against the risk-taking.

The empirical validation of our search shows that the Charter value has a negative effect on the risk capital and assets and a positive impact on the risk of insolvency. It shows that the Charter value plays a role of self-discipline for risk capital and assets: to decrease the risk, it is necessary to increase the Charter value of the bank. As regards the board of directors, the size of the board of directors has a positive effect on it of credit risk and a negative effect on the risk of capital and the asset and the risk of insolvency in our sample. This result is understandable by the fact that the small-sized board of directors allows a better alignment of the interests between the shareholders and the administrators and, consequently, leads to a reduction of the risk of the bank.

The independence of board of directors decreases the banking risk by confirming the previous analyses of the other authors. In addition, the duality has a positive effect on the risk of capital and assets of the bank, because both roles of managing director and President of council cut a change of the functions of control and supervision. On the other hand, the duality has a negative effect on the credit risk and the risk of insolvency. The concentration of the property has a positive impact on the banking risk. As for the participation of the State in the capital, it increased the risk in the banks of our sample which could give some explanation by the orientation of the State to finance, the desirable projects politically and socially, but not desirable for banks. The remuneration for the managers by them "stocks option" increases the risk of the bank.

Concerning the external mechanisms of the governance, the regulations of capital decrease the risk-taking by the banks of our sample. However, the supervisor's independence has a positive impact on the risk of capital and assets and the credit risk, and a negative impact on the risk of insolvency. The activities restriction has a negative impact on the risk. The protection of the depositors decreases the risk of capital and assets and the credit risk, and increased the risk of insolvency. Therefore, the regulations of barriers to entry have a positive impact on the risk of capital and assets and negative on the credit risk and the risk of insolvency. But, the competition increases the risk of capital and assets and the risk of insolvency and decreases the credit risk.

Our research examines in depth the effective way of controlling the level of risk taking by the bank. Recommendations are formulated by specifying on the role disciplinary self-discipline of the Charter value on the risk of capital and assets. To have a precaution against the risk of capital and assets, it is necessary to increase the Charter value of the bank. Our results indicate that the concentration of the high property increases the Charter value. Therefore, concerning the national regulations, it is necessary to decrease the level of barriers to entry, the regulations of the capital and the activities restrictions to increase the charter value and decrease the risk of capital and assets. The competition decreases the charter value of the bank, which confirms our hypotheses.

So, we found that the relation between the national regulations and the risk-taking depends on the concentration of the property. Our result shows that the stabilizing effects of the intensification of the regulations of barriers to entry on the risk of insolvency increase when the bank has a large owner. Also the protection of the depositors is more effective to decrease the credit risk when the bank has a large owner. For the charter value, a high score of barriers in the enter decreases the charter value when the bank has a large shareholder. But, the effect of the independence of the official supervisors on the Charter value is positive when the bank has a big shareholder.

The banks need to better manage their risk-taking to avoid the difficulties reflected in the financial markets (the decrease of the stock exchange) using mainly two mechanisms which are: the good governance and the control through the sharpe ratio. The good governance requires a more active role for the board of directors and a greater dilution of capital shareholders.

Table 2. Results of relation between regulatory barriers and risk-taking

	Coef,	P>z	Coef,	P>z	Coef,	P>z	Coef,	P>z	Coef,	P>z	Coef,	P>z
VCH	0,066	0,000***			-0,004	0,842			-0,049	0,382		
INDCA	0,010	0,000***	-0,015	0,139	-0,012	0,000***	-0,007	0,491	0,027	0,001***	-0,005	0,647
TCA	0,015	0,405	-0,081	0,213	0,017	0,423	-0,072	0,276	0,084	0,126	-0,066	0,315
NRCA	-0,084	0,001***	0,074	0,442	0,067	0,029**	0,004	0,969	0,060	0,453	0,005	0,957
NCCA	-0,062	0,324	-0,336	0,143	-0,392	0,000***	-0,429	0,077*	-0,286	0,141	-0,432	0,061*
DUAL	-0,877	0,000***	1,388	0,020**	-0,704	0,000***	0,635	0,279	0,154	0,747	0,672	0,237
fixe	0,007	0,599	-0,091	0,062*	-0,009	0,561	-0,091	0,066*	0,047	0,258	-0,087	0,080*
variable	-0,024	0,015**	0,091	0,010***	0,011	0,339	0,075	0,034**	-0,014	0,633	0,073	0,038**
OC	-4,862	0,006***	34,185	0,000***	0,449	0,832	31,789	0,000***	-11,289	0,038**	30,884	0,000***
PRPETAT	-0,544	0,001***	0,862	0,164	0,057	0,777	0,415	0,497	-0,133	0,796	0,402	0,511
LERNER	2,519	0,192	11,876	0,090*	1,267	0,583	14,971	0,033**	2,126	0,720	15,019	0,032**
ENTRYOB	-0,070	0,011**	0,422	0,000***	-0,055	0,095*	0,381	0,000***	-0,135	0,109	0,373	0,000***
CAPITAL	0,005	0,661	-0,042	0,269	-0,004	0,737	-0,041	0,290	0,005	0,879	-0,040	0,298
SUPER	-0,028	0,138	-0,188	0,005***	0,028	0,217	-0,224	0,001***	0,039	0,499	-0,221	0,001***
protection	0,011	0,475	-0,018	0,753	0,038	0,046	-0,007	0,901	-0,015	0,759	-0,010	0,866
ENTRYOC	0,057	0,017**	-0,461	0,000***	0,040	0,157	-0,435	0,000***	0,123	0,092*	-0,426	0,000***
RESTOC	0,003	0,172	-0,011	0,164	-0,002	0,430	-0,009	0,258	0,011	0,104	-0,008	0,309
CAPITALOC	-0,003	0,706	0,006	0,853	-0,003	0,756	0,003	0,923	-0,002	0,943	0,003	0,923
SUPEROC	-0,002	0,857	0,185	0,000***	-0,007	0,650	0,194	0,000***	-0,022	0,563	0,192	0,000***
PROTECTOC	-0,004	0,783	0,024	0,668	-0,040	0,026**	0,020	0,727	-0,006	0,896	0,021	0,709
PIB	-0,022	0,419	0,013	0,892	-0,061	0,057*	-0,008	0,932	0,045	0,586	-0,003	0,977
INF	-0,129	0,016**	0,239	0,225	0,140	0,029*	0,140	0,480	0,339	0,040**	0,157	0,427
CONCENT	0,000	0,934	-0,036	0,038**	0,004	0,473	-0,038	0,032**	-0,035	0,021**	-0,040	0,023**
CAPITAUX ACTIFS	0,010	0,296	-0,010	0,777	0,008	0,471	-0,001	0,980	0,018	0,539	0,000	1,000
TAIBANK	0,165	0,062*	-1,855	0,000***	-0,064	0,546	-1,818	0,000***	-1,051	0,000***	-1,882	0,000***

SUPORDEBT	0,005	0,591	0,004	0,897	0,006	0,570	0,010	0,780	0,004	0,904	0,010	0,781
EXPLOITA	-1,537	0,000***	0,329	0,754	-0,262	0,417	-1,080	0,273	-4,233	0,000***	-1,360	0,190
provision	0,034	0,000***	-0,034	0,239	0,003	0,725	-0,004	0,890	-0,037	0,106	-0,007	0,814
_cons	7,131	0,009***	-12,453	0,213	2,063	0,525	-6,545	0,510	23,866	0,004***	-4,949	0,625
Equation	Obs	R-sq	chi2	P	Equation	R-sq	chi2	P	Equation	R-sq	chi2	P
R1	224,000	0,535	274,360	0,000	R2	0,344	117,360	0,000	Z-score	0,426	158,290	0,000
VCH	224,000	0,551	291,840	0,000	VCH	0,551	274,560	0,000	VCH	0,551	204,210	0,000

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Appendix A

The result of Principal Component Analysis

Table A1. Part of inertia reconstituted by the first two factors

	Eigen value	percentage of inertia	cumulative variance
R1	4.202	46.686	46.686
R2	1.792	19.916	66.602

Table A2. The correlation coefficients between the items and factors

Items	R1	R2
impaired loan / capital	0.034	0.899
Impaired loan / assets	0.315	0.875
ROA	0.831	-0.217
ROE	0.831	-0.301
Volatility of earnings	0.831	-0.160
Loans/ assets	-0.645	0.004
Loan / deposits	-0.645	-0.201
Ratio capital	0.799	0.117
Capital tier 1	0.799	-0.005

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