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FRANCISCO JAVIER MARTÍNEZ GARCÍA
Director de la Fundación UCEIF

ÍNDICE

INTRODUCTION

The financial crisis that began in 2007 has hit financial systems around the world, and has focused attention on the inadequacies of the contemporary model of financial regulation, both at the national and at the global level (Avgouleas, 2008). Excessive risk- taking in the financial sector has been considered to be one of the primary causes of the crisis, but the deeper question is what causes such excessive risk-taking? The general argument is that flawed regulation, excessive competition, and perverse incentives have led to excessive risk taking in financial markets and are at the root of the most significant economic crisis since the Great Depression *(*Eichengreen, 2010). These arguments underscore the current effort to reform bank governance practices, competition, and regulation —in order to shape bank risk— in most countries around the world. However, there is no clear prediction of the effect of competition and bank regulation on financial stability, nor is there evidence that any universal set of best practices is appropriate for all banks, independent of their ownership structure; in other words, there is limited evidence on whether regulations and supervision that are successful for commercial banks, for example, will be equally effective for cooperatives or saving banks, nor is there a clear evidence on the effect of competition among banks with different ownership structures on both its own and its competitors' risk taking behavior and performance as well as on systemic financial stability and social welfare. This thesis, which it is composed of four chapters, addresses these issues by further investigating the role of bank ownership structures on risk taking and financial stability.

The first characteristic of ownership structure considered in the first three chapters of the thesis, relates to the organizational design of the banks as we differentiate between *Commercial Banks* and *Stakeholder Banks* (such as cooperative and savings banks). The main distinction between stakeholder banks and commercial banks is the banks' bottom-line objectives and the extent to which profit maximization is the central focus of business models. While the main objective of commercial banks is

shareholder value (profit) maximization, stakeholder banks aim to maximize social objectives (Freeman, 1984; Evan and Freeman, 1988; Blair, 1995) and profits are a mean to this end.

Stakeholder banks were, originally, created to provide financial services to specific sectors or to improve the financial access in selected geographical areas. Their foundation used to be promoted by local authorities, religious organizations or professional associations. Later on, the transformation and innovation of the financial system increased the competitive environment and, over the past decades, many stakeholder banks have undergone a drastic transformation. Today, in terms of the range of services offered, these institutions are very similar to their commercial banks competitors, and compete with them in a wide range of banking markets under the same regulatory conditions. In fact, stakeholder banks have been criticized for not being "social", but "commercial" regarding their external growth strategies (Schmidt, 2009). Nonetheless, the stakeholder banks have maintained their key characteristic, i.e., a social objective, a regional commitment and a mandate to contribute to the 'general good' by, for instance, providing access to credit to certain categories of the population (Ayadi *et al.*, 2010).

In some countries, stakeholder banks constitute an important segment of the financial sector; the majority of European countries, for example, host a significant sector of stakeholder banks, competing against commercial banks under the same regulatory and competitive conditions. In addition, as a result of the current financial crisis the governments of countries with a banking system dominated by commercial banks, as is the case of the UK, have publicly stated their commitment to greater financial diversity and the promotion of cooperatives:

> "We want the banking system to serve business, not the other way round. We will bring forward detailed proposals to foster diversity in financial services, promote mutuals and create a more competitive banking industry." (HM Government, 2010, p. 9).

The reason for this desire for greater diversity lies in the well known fact that the variety of business models creates a corresponding diversity in

forms of corporate governance, risk appetite and management, incentive structures, policies and practices, and behavior and outcomes (see O'Hara 1981, Rasmusen 1988, and Fama and Jensen 1983). However, little is known about the effect of such diversity on financial stability. Are stakeholder banks riskier than commercial banks? Does the presence of stakeholder banks increase financial stability? Does the bank ownership structure moderate the relationship between regulation, competition and bank risk? These are the main questions addressed in chapters 1 to 3.

Chapter 1 answers these questions (among others), from a theoretical point of view, and shows that stakeholder banks are less risk-inclined than commercial banks, and that their presence makes financial systems more stable. Chapters 2 and 3 provide empirical support for these theoretical results. Furthermore, in chapter 2 we also show that the relationships between competition and bank stability on the one hand, and between regulation and bank stability on the other, depend on the bank ownership structure.

Finally, the second characteristic of ownership structure considered in the forth chapter of the thesis, relates to ownership concentration. In chapter 4 we focus on commercial banks and we analyze differences between banks with dispersed ownership and banks with controlling owners, in terms of shareholder preferences concerning risk, the ability to influence executive compensation and limits to the achievement of the desired level of shareholder risk. These are important questions, since in the search for explanations of the excessive risk taking that led to the current financial crisis, compensation schemes have received much criticism and are subject to new regulatory oversight in most countries. However, there is limited evidence of how the structure of executive compensation affects the risk choices made by bank CEOs, and of how the structure of executive compensation varies between banks with different ownership structures. In chapter 4, we address this question by analyzing the interplay between bank ownership structure, executive compensation contracts, and risk taking. We show that executive compensation is an important mechanism for shareholders to induce the preferred risk level, and that bank risk influences (and is influenced by) the incentives contained in CEO compensation contracts. In addition,

we move beyond ownership dispersion/concentration by analyzing different types of controlling shareholders (family, corporate, bank and institutional owners).

These four studies have potential implications for investors, managers and policy makers. In what follows, a summary of the research questions, theoretical background, methodology and conclusions of each chapter are presented.

SUMMARY OF THE EACH CHAPTER OF THE THESIS

Summary of Chapter 1

Chapter 1 presents a theoretical model to analyse how the ownership structure affect the strategic interaction between a profit maximizing bank (i.e., commercial bank) and a non-for profit maximizing bank (i.e., stakeholder bank). In particular we explore the following three questions: a) are the risk profile, the market share and the expected economic profits of a commercial bank different from those of a stakeholder bank? b) Does the ownership structure of a bank affect the risk-taking incentives of its competitor? And more importantly, c) does a change in the ownership structure of a bank (from a stakeholder bank to a commercial bank affect systemic financial stability and social welfare?

The economic implications of such questions are timely, in light of the financial crisis, and relevant since most countries have a significant proportion of their banking system that is not privately owned. For instance the cooperative banking sector (which is an important part of the stakeholder banking sector) is extraordinarily large; the World Council of Credit Unions has 49,000 credit unions in membership, with 177 million individual members in 96 countries. In Europe alone, there are 4,200 local cooperative banks, with around 60,000 branches and a market share of 20%. These banks serve 45 million members and 159 million customers (DeVries, 2009)[1].

The proportion of Stakeholder banks, however, varies widely across countries. While they are an important part of some of the most advanced economies such as France, Germany or Austria, at the same

1 Some of the largest banks in the world are cooperatives: The Rabobank group, for instance, is the largest agricultural cooperative bank in the world. While its origins lay in the Dutch local loan cooperatives, today, Rabobank Group has approximately 59,700 employees, who serve about 10 million customers in 44 countries. In terms of Tier I capital, Rabobank Group is among the world's 30 largest financial institutions and is consistently awarded a high rating by all rating agencies (Rabobank website, accessed on April 26, 2012).

time in a number of countries, such as Belgium[2] or UK, they are mostly inexistent or only a small fraction of them compete against commercial banks. The lack of stakeholder banks in some countries could, in part, be explained by the fact that, for decades, the growing political and liberal market consensus around the world has favored the shareholder-value model in banking. In practice, this implies the preponderance in the financial system of profit-maximizing banks, where the almost exclusive objective of managers is to maximize the shareholders' value, often, in a fairly short time horizon. In this environment, stakeholder banks have been criticized for being inefficient; and having weak corporate governance arrangements (Ayadi *et al.*, 2010).

However, this view has recently come under challenge as a result of the global financial crisis, which has hit especially hard in financial systems with a shareholder-approach to banking (DeVries, 2009, Ayadi *et al.*, 2010). In addition, stakeholder banks have done much better than their Commercial banks counterparts during the recent crisis. This seems to suggest that the relative stability of stakeholder banks may mitigate some of the instability created in the sector by commercial banks. Therefore, understanding the influence of Stakeholder banks on commercial banks' risk taking and on systemic financial stability is important because a banking system composed of a mixed array of ownership structures may be inherently more stable and less prone to crisis than one populated exclusively by commercial banks.

Chapter 1 explores this issue and, to this mean, presents a model of duopolistic competition for the retail banking market of deposits where two banks have different ownership structures: financial institutions can either be commercial banks or stakeholder banks. Our model specification allows the commercial bank to behave as a stakeholder bank and vice versa, allowing us to explore the interaction between different combinations of ownership structures (i.e., two commercial banks, two stakeholder banks, one stakeholder bank and one commercial bank).

2 All the major financial players in Belgium are now joined-stock companies. The Belgian banking system used to have significant SBs (as the Bacob group and the Cera group), but the merger of both into larger organizations was followed by the disappearance of the stakeholder form.

We argue that the presence of stakeholder banks influences competition, welfare and stability. In particular, we are concerned with the consequences of transforming a commercial bank into a stakeholder bank on the banks' risk taking behavior and systemic financial stability. Such a transformation can induce an externality which influences the bank's risk and systemic financial stability. This externality underpins many of the conjectures made in policy discussions on the consequences of the presence of certain banks (in our case, Stakeholder banks) on the stability of other banks. The empirical literature has provided some support for the existence of such externalities. For instance, Čihák and Hesse (2007) and De Nicolò (2000) show that in systems with a high presence of non-profit maximizing banks, Commercial banks become riskier than they would otherwise be. We analyze this type of externality and its implications for systemic financial stability.

Our analysis builds on Allen and Gale (2000, Ch. 8) and Purroy and Salas (2000). The first study analyzes the trade-off between bank's risk taking behavior and competition among banks competing à-la-Cournot. They show that the optimal level of risk assumed by a bank increases as the number of deposit market competitors increases. Their model is, however, restrained to competition between symmetric banks with a homogenous financial product. The second paper analyzes the effect of different ownership structures on profits, market shares and interest rates, but does not take risk considerations into account. Moreover, their conclusions depend on the type of competition, that is, whether banks compete on quantities with homogeneous products or on prices with differentiated products.

Our setup borrows from both models, considering risk as well as different ownership structures. Furthermore, we endogenously determine the kind of competition: appealing to Singh and Vives (1984), we show that competition in the banking sector turns out to be à-la-Cournot. In sum, we introduce ownership considerations into the analysis of the relationship between competition and stability, and endogenously determining how banks compete[3].

3 In contrast, past work has focused on either:
a) the comparison between CBs and SBs (savings and cooperative banks) in terms of performance (Purroy and Salas, 2000); risk-incentives (Saunders *et al.*, 2001; Esty, 1997; Iannotta *et al.*, 2007;

Our main conclusions are that a) the presence of a stakeholder banks increases the intensity of rivalry, systemic financial stability and social welfare, b) stakeholder banks are less risk-inclined, and outperform commercial banks in market share and profits. Interestingly, our results suggest that commercial banks may also improve their own profits by adopting some stakeholder approach, c) a bank (independently of its ownership structure) is less stable and less profitable when competing against a stakeholder banks than when competing against a commercial bank.

Our results suggests that financial stability analyses should take into account the externality that certain type of banks generate on the stability of their rival. We argue that, under the presence of such an externality, the common presumption that the system as a whole will be safer when individual banks are safer may not hold. In particular, we show that the increase in the intensity of rivalry caused by the presence of stakeholder banks increases *individual* bank risk-taking (i.e., the presence of Stakeholder banks increases the risk-taking incentives of its rival) but at the same time it increases systemic financial stability. Thus, in this sense, our model helps to integrate the two main hypotheses in the literature regarding the influence of competition on bank risk: the *franchise value paradigm,* which stipulates that competition increases bank risk and reduces systemic financial stability, and the *risk-shifting hypothesis*[4], which states that competition reduces bank risk and increases systemic financial stability.

Our findings are supported by empirical evidence, yielding policy implications, which are relevant for the current debate about the conversion of Stakeholder banks into Commercial banks (Schmidt, 2009; Allen and Gale, 2007; Tirole, 2006). Specifically, our results suggest that policy makers aiming to maximize systemic financial stability may favor a stakeholder approach in the banking system.

Bøhren and Josefsen, 2007; García-Marco and Robles-Fernández, 2008); lending behavior (Delgado *et al.,* 2007); and corporate governance practices (Crespí *et al.,* 2004); or

b) the relationship between stability and competition among symmetric banks (Keely, 1990; Besanko and Thakor, 1993; Demsetz *et al.,* 1996; Matutes and Vives, 1996, 2000; Hellmann *et al.,* 2000; Salas and Saurina, 2003; Repullo, 2004; Boyd *et al.,* 2005; Jiménez *et al.,* 2007).

4 The risk shifting model was first pointed out by Boyd and De Nicolò (2005), and has been empirically supported by Boyd *et al.* (2006) and De Nicolò and Loukoianova (2007).

Summary of Chapter 2

In chapter 2 we analyze the effect of bank ownership structure, competition and regulation on bank stability. Second, we analyze whether the relationship between competition and bank stability on the one hand, and the relationship between regulation and bank stability, on the other hand, depends on the bank ownership structure. We argue that stakeholder banks, because of their features of origin, their mission, their activities, their organisational form and their legal status, are less risk-inclined than commercial banks, and that their presence affects the risk-taking incentives of their competitors.

The effect of competition and regulation on bank stability remains a widely debated and controversial issue, both among policymakers and academics worldwide.

Regarding competition, the two basic hypotheses in the literature on bank stability and competition have been the *franchise value paradigm* (competition-fragility view) and the *risk-shifting hypothesis* (competition-stability view). The competition-fragility view contends that an increase in competition will hurt bank stability by eroding the franchise value (Keeley, 1990; Allen and Gale, 2000, 2004; Carletti, 2008). The competition-stability view holds that competition leads to less fragility, because the market power of banks results in higher interest rates for customers, making it more difficult for them to repay loans (Boyd and De Nicolo, 2005).

In terms of regulation, economic theory provides conflicting predictions about the effects of bank regulation and supervisory practices on bank stability. For instance, there is no academic consensus on the effect of capital regulation, activity restrictions and deposit insurance on bank stability. On the one hand, capital regulation and activity restrictions are seen as fostering stability by reducing bank incentives to engage in riskier activities (Boyd *et al.,* 1998; Hellmann, Murdock and Stiglitz, 2000). On the other hand, they could lead to rent-seeking and could prevent banks from reaping necessary diversification and scale benefits (Claessens and Klingebiel, 2000). Finally, the role of deposit insurance

schemes has been especially controversial. While they are intended to increase bank stability by protecting the payment and credit systems from contagious bank runs, they also encourage excessive risk-taking behavior (Merton 1977; Keeley, 1990), which some believe offsets any stabilization benefits (Barth *et al.,* 2004; Demirgüç-Kunt and Detragiache, 2002).

None of the papers reviewed, however, considers possible differences in the relationship between competition, regulation and bank risk across commercial, savings and cooperative banks, as we do in this chapter. This is somewhat surprising, since standard agency theories establish that the type of ownership of an organization is likely to affect its objectives, its strategy, its risk taking incentives, and its performance (Jensen and Meckling, 1976; John, Litov, and Yeung, 2008). We suggest that, rather than assuming that banks have the same risk preferences, and react in the same way to a change in competition and regulation, it is critical to consider differences in their ownership structure when analyzing financial stability. Our analysis builds on Beck *et al.,* (2010) and Laeven and Levine (2009). Beck et al. (2010) examine how regulation, supervision and other institutional factors influence the relationship between competition and bank risk-taking incentives. However, they do not include differences in ownership structure in their analysis. Closer to our analysis, Laeven and Levine (2009) empirically show that the relation between bank risk and bank regulation depends on the bank's ownership concentration. They focus on shareholder banks (profit-maximizing banks) and define different ownership structure by the fraction of ultimate cash flow rights held by the bank's largest owner. Rather, we differentiate between banks with different objective functions (commercial and stakeholders banks), and explore whether the relationship between risk and regulation depends on the ownership structure of the bank, and on the proportion of each type within the financial system in general.

To perform our analysis, we collect individual bank data from the BankScope database provided by Bureau van Dijk. We draw data from 1993 to 2007 and consider 17,114 banks from 72 countries of which 11,710 are commercial banks, 2,309 are savings banks and 3,095 are cooperative banks. We estimate the Panzar and Rosse (1987) H statistic as a measure of competition and, following the literature (Leaven and

Levine, 2009, Beck *et al.,* 2010, Boyd and Runkle, 1993, Maechler *et al.,* 2005, Beck and Laeven, 2006, and Mercieca *et al.,* 2007), we define bank stability as the inverse of the probability of insolvency, measured by the bank Z-score. Thus, the inverse of the bank Z-score measures bank risk. The Z-score (reflecting profitability, leverage and return volatility) is a widely-used measure of bank distance to default, and is monotonically associated with the bank's probability of failure; a higher Z-score indicates that the bank is more stable (less risky). Finally, in order to analyze the extent to which the effect of bank regulation depends on bank ownership structures, we follow Laeven and Levine (2009) and select from the Barth et al (2006) database those regulatory variables that are stressed by the Basel Committee, and theory highlights affecting bank behavior. Thus, we examine deposit insurance, capital regulations, and regulatory restrictions on bank activities.

Our findings are as follows. First, we show that stakeholder banks are less risk-inclined than commercial banks and that they make their rivals, especially competing commercial banks, less stable. This finding holds after controlling for competition, institutional characteristics and bank regulation. Second, our results show a negative direct effect of competition on bank stability, supporting the competition-fragility view. Moreover, we show that this negative effect is contingent on the bank's ownership structure. In particular, we find that the effect of competition on stability is significantly more negative for commercial banks compared to stakeholder banks, as well as for any bank operating in systems with a higher proportion of stakeholder banks. Finally, we find that capital requirements, activity restrictions and deposit insurance have a negative effect on bank stability, but that the impact of these regulatory measures on bank risk depends on the ownership structure of the bank. Specifically, we find that stringent capital regulatory measures decrease the stability of commercial banks, but this has no effect upon the stability of stakeholder banks. In addition, we show that capital requirements increase bank stability in economies with a high proportion of stakeholder banks. The effect of activity restrictions on bank stability is negative for stakeholder banks, but positive for commercial banks. Consequently, we also find that the negative effect of activity restrictions on bank stability increases with the proportion of stakeholder banks in an economy. Finally

we show that deposit insurance has a negative impact on bank stability, and that this effect is even stronger for commercial banks.

Overall, our findings suggest that it is important to consider the bank ownership structure when analyzing bank stability. This result may have important implications for academics and policy makers, as it indicates that ignoring bank ownership structure can lead to erroneous conclusions about the effects of competition and of banking regulations on bank stability.

Summary of Chapter 3

Chapter three address the question of whether all financial systems are equally stable independently of their bank ownership structure. To address this issue we build on a rich theoretical and empirical literature exploring the relationship between banks ownership and risk-taking incentives, but we adopt a macro-perspective focusing on the effect of stakeholder banks on financial stability at the systemic level. While most previous research examines the role of banks' ownership structure on the banks' own stability, they make the implicit assumption that safer banks will make the financial system safer. We argue that this may not be the case if important externalities exist such that the safer type of banks underpins the stability of the rest of banks in the system[5]. In such a case, the overall result of an increase in stakeholder banks will depend on both the direct effect and the indirect effect.

Understanding the influence of stakeholder banks s on commercial banks' risk taking and on systemic financial stability is important for academics and policy makers alike. Theory gives conflicting predictions

5 The logic behind this argument is in line with current call to reinforce macro-prudential regulation. "Macro-prudential policy is a missing ingredient from the current policy framework. In the past few decades, there has been too great a gap between macroeconomic policy and the regulation of individual financial institutions. If macro-prudential policy had been able to increase the resilience of the system and to moderate exuberance in the supply of credit to the economy, and especially to the financial system, the crisis would have been less costly" (Bank of England, 2009). Micro-prudential regulation concerns itself with factors that affect the stability of individual institutions. Macro-prudential regulation concerns itself with factors that affect the stability of the financial system as a whole. Micro-prudential regulation is therefore a necessary, but not a sufficient condition to ensure financial stability since by making themselves safer, banks, and other highly leveraged financial intermediaries, can behave in a way that collectively undermines the system.

regarding which type of ownership is most conducive to stability. On the one hand, stakeholder banks might be less fragile than commercial banks as they have a stable deposit and customer basis, and focus on capital preservation and maximization of stakeholders' surplus rather than profits, which may make them more resistant during a crisis. Furthermore, dispersed membership and greater dominance by managers are also likely to obstruct risk-taking practices and thus reduce stakeholder banks' fragility (Ayadi *et al.* 2010, Beck *et al.* 2009). On the other hand, stakeholder banks s may be riskier than commercial bankss because of intergenerational problems, lack of corporate control mechanism, and inability to diversify and raise capital at short notice (Fonteyne, 2007, Goddard *et al.,* 2010, Rey and Tirole, 2007).

From an empirical point of view, the literature lends supports to the idea that stakeholder banks are more stable than commercial banks. On the one hand, there are different studies showing that savings banks are less risk inclined than commercial banks in countries where savings banks are more relevant, such as Germany, Norway or Spain (García-Marco and Robles-Fernández, 2008, Bøhren and Josefsen, 2007; Beck *et al.*, 2009)[6]. In addition, the literature on the stability of cooperative banks provides evidence to the idea that cooperative banks are more stable than commercial banks (Ianotta *et al.,* 2007; Čihák and Hesse, 2007)[7].

We posit that there are different ways through which stakeholder banks may have an impact on financial stability at the systemic level. First, commercial banks may increase systemic financial stability by being inherently safer. Second, a larger presence of stakeholder banks could reduce the overall risk as there may be systemic advantage in having a heterogeneous mix of institutions with different portfolio structures. A

6 Beck *et al.* (2009) examine the stability of German banks under different ownership structures, showing that savings banks have higher Z-scores than commercial banks, almost entirely due to the lower volatility of the profits over years. Similarly García-Marco and Robles-Fernández (2008) and Bøhren and Josefsen (2007) examine whether ownership structure plays a role in the risk-taking attitude of Spanish and Norwegian financial institutions, respectively. They confirm that commercial banks are less stable than savings banks.

7 Ianotta *et al.* (2007), using a sample of large European banks, find that cooperative banks are the most stable banking group, and Čihák and Hesse (2007) find that cooperative banks are more stable than CBs for a sample of OECD countries. This is in line with earlier studies (O'Hara, 1981; Rasmusen, 1988; Saunders *et al.*, 1990; Cordell *et al.*, 1993; Gropper and Beard, 1995; Fraser and Zardkoohi, 1996; Knopf and Teall, 1996; Esty, 1997; Leonard and Biswas, 1998; Hansmann, 1996).

more diversified financial system in terms of size, ownership, and structure of businesses could be better able to weather the strains produced by the normal business cycle, and to deal with unexpected conditions such as the current crisis[8]. Third, the presence of stakeholder banks may produce an externality, positive or negative, affecting the stability of other banks[9].

Therefore, the overall impact of stakeholder banks s on financial stability will depend on the kind and magnitude of the externalities they generate. To the extent that the direct effect becomes stronger than the indirect effect, we hypothesize that the presence of stakeholder banks increases systemic financial stability. The reverse will be true if the indirect effect becomes stronger than the direct effect.

We analyze this question by considering two measures of systemic financial stability which aim to capture its main two features: absence of system-wide episodes in which the financial system fails to function (i.e., a financial crisis) and resilience of financial systems to stress (Čihák, 2006). Using panel data of 72 countries from 1993 to 2007 and logic and fixed-effects models, we find strong empirical support to the idea that the presence of stakeholder banks increases financial stability. This result puts forward that the economic arguments suggesting that organizing banking activity by means of commercial banks is definitely the best one, are not conclusive. Irrespective of the strengths and weaknesses of particular governance models, we show that there is a systemic advantage in terms of financial stability in having a mixed system of business models and a strong critical mass of stakeholder banks. This conclusion suggests that policy-makers should not take or support actions that could jeopardize the existence of those banks.

8 Allen and Gale (2000) argue that macro-economic shocks, i.e., manifestations of systemic risk, affect countries much less when the non-strictly profit-oriented banks play an important role in the financial sector (compared to when the banking sector is exclusively composed of private banks whose shares are listed and traded on a stock market).

9 The empirical literature has provided some support for the existence of such externalities. For instance, Čihák and Hesse (2007) and De Nicolò (2000) show that in systems with a high presence of non-profit maximizing banks, CBs become riskier than they would otherwise be. In addition, Barth, Caprio and Levine (1999) find that a higher degree of government ownership of banks tends to be associated with a higher fragility of financial systems. Goodhart (2004) interprets this finding as an indication that the presence of non-profit maximizing banks makes financial systems more fragile. Non-profit maximizing banks may reduce interest margins in traditional banking and push private sector banks to engage in more risky activities.

This chapter contributes to the existence literature in several ways. First, unlike previous studies, we adopt a macro-perspective in the analysis of the impact of stakeholder banks on systemic stability. Second, we use two different measures of financial stability at the systemic level in order to capture its two main features. Finally, we contribute to the literature on bank competition and stability by analyzing its relationship at the systemic level.

While the chapter is mainly focused on the effect of stakeholder banks s on systemic stability, we also consider the effect of other variables, including competition, concentration and regulatory measures, thus contributing to the academic debate on whether competition enhances financial stability or not. We find that competition helps to increase systemic financial stability, thus providing support to the risk-shifting hypothesis. However, we also find that concentration increases financial stability, which provides support to the idea that competition and concentration must be considered as measuring different things (see Berger *et al.,* 2004; Beck *et al.,* 2006; Schaeck *et al.,* 2010; Jiménez *et al.,* 2007). In terms of regulation, we consider the effect of activity and entry restrictions as well as the effect of capital restrictions and the independency of the supervisory authority bank on systemic financial stability. Our results show that the probability of going into a systemic crisis is influenced by the degree of openness of the financial system. However, limitations to diversify activities and assets, capital restriction, and the independency of the supervisory banks have not a significant influence.

Summary of Chapter 4

Chapter 4 addresses the following related questions: What are the determinants of executive compensation structures and of bank risk? Which type of ownership induces more risky managerial decisions through compensation policies?

To answer these questions we combine the literature on bank ownership structures and risk-taking, with the literature on the risk- taking effect of executive compensation, to better assess the determinants of bank risk. We also consider inherent limitations, at the bank level, that may

prevent shareholders achieving their desired level of risk. To illustrate our arguments, family-controlled banks may prefer to avoid risk, due to their goal of transferring the firm to the next generation (Anderson *et al.*, 2003), or because they are unable to diversify their wealth outside of the bank. They may also have the ability to set the appropriate incentive scheme to induce the desired risk-taking behavior in their managers. However, family-controlled banks may end up being riskier due to inherent limitations, such as managerial and capital constraints. We categorize controlling shareholders into four main types: families, corporations, banks and institutional investors, and analyze whether they differ in terms of risk preferences, abilities to set the appropriate executive compensation to conform to the desired level of risk, and inherent limitations on the achievement of that level

We consider two proxies of the incentives in executive compensation contracts: the pay-performance sensitivity, delta, measuring the change in the dollar value of CEO's wealth for a one percentage point change in stock price and the pay-risk sensitivity, vega, measuring the change in the dollar value of CEO's wealth for a one percentage point change in stock price volatility. Higher deltas are thought to align shareholders and managers objectives, since managers share gains and losses with shareholders and as a result, higher delta should increase managerial efforts to identify and commit to risky and positive NPV projects. However, high-delta contracts concentrate managerial wealth in the shares of the firm, exposing managers to more risk. To the extent that managers are undiversified with respect to firm-specific wealth, they are more risk-averse than diversified shareholders. Thus, higher deltas may increase managerial preferences to undertake low-risk investments (Smith and Stulz, 1985). Option-based compensation can potentially reduce CEO preferences for low-risk decisions that arise from high deltas, by providing convex payoffs (high vegas).

Following Coles *et al.* (2006) and DeYoung *et al.* (2010), we use a three-stage least squares (3SLS) estimation approach, to test to what extent ownership structure, vega and delta, are determinants of bank risk, and to what extent different types of controlling shareholders influence the executive incentive contract to achieve the desired level of risk. This approach not

only controls for the potential endogeneity of executive compensation contracts on bank risk, but also improves the accuracy of our estimates; and allows us to test for feedback effects of risk on delta and vega and, thus, to analyze how compensation committees respond to managers' risk policy decisions by adjusting the delta and vega in compensation packages.

The data in chapter four covers the period 1997-2007 and is constructed by merging information on four different data sources as follows. First, we extract compensation data and financial variables from the SNL Financial database. This database tabulates in detail the compensation of top executives for a large sample of banks. Second, Daily stock price and Treasury bond yield data is derived from Bloomberg Thomson Financial to calculate total risk, systemic and idiosyncratic risk. This data also serves for some of the inputs to estimate Delta and Vega. Third we extract ownership data from the Thomson One Banker Ownership database. We construct a panel of all shareholdings by each shareholder of each bank over our sample period and analyze and correct any significant deviations, using the annual reports and international business media. In addition, we identify family ties between shareholders to determine the total equity stake of each family, using the banks' web sites and international business media. Finally we collect data on the economic conditions for each state using the Federal Reserve Bank of Philadelphia's state-level Coincident Index of economic conditions for each state. In addition, we exploit the FDIC's Summary of Deposits to construct our measure of Market concentration (the Herfindahl–Hirschman index) and to determine the weights to compute the economic conditions variable. Our final sample contains 446 banks and 2,554 bank-year observations.

The results of our study show that bank ownership structure influences both bank risk and CEO compensation contracts, and that CEO compensation contracts influence (and are influenced by) bank risk. Thus, our results suggest that executive compensation is an important mechanism for shareholders to induce the preferred risk-level. On average, banks in which CEOs receive high-vega and low-delta contracts (risk-sensitive compensation schemes) are riskier than those banks in which CEOs are less incentivized to take risks (low-vega and high-delta contracts). We also find evidence that banks controlled by undiversified shareholders, as is the

case of family-controlled banks, implement low-risk-sensitive compensation schemes (low-vega, high-delta incentive contracts) as a manifestation of their preference for lower levels of risk. However, these banks face higher limitations on achieving lower risk, compared to other banks, and as a result they end up being riskier. We also show no significant differences between the compensation schemes and risk profiles of banks controlled by undiversified shareholders and banks with dispersed ownership.

This Chapter contributes to the existing literature in several ways. As far as we know, this is one of the first studies to analyze the role of managerial incentives as an underlying mechanism through which shareholders may attain the desired level of risk. Thus, we make an attempt to open the "black box" of governance processes and practices that shareholders use to deal with the lower risk appetite of managers. We distinguish between banks with different types of controlling shareholders in terms of their risk preferences, abilities to influence the incentive scheme, and inherent limitations at the bank level, to achieve the preferred level of risk. In doing so, we integrate wealth-concentration effects and the principal–agent perspective, and enhance the theoretical model by introducing inherent limitations to managing risk. Moreover, we contribute to the literature on the link between executive compensation and financial stability (Houston and James, 1995; DeYoung *et al.* 2010; Mehran and Rosenberg, 2007; Chen *et al.* 2006) by providing evidence of the relationship between managerial compensation and risk. Finally, while most empirical studies examining the effect of executive compensation on bank risk use relatively rudimentary measures of compensation[10] (Coles, Daniel, and Naveen, 2006), we use two characteristics of executive compensation, delta and vega, that have been suggested to influence bank risk[11]. At the very best, the measures used in most previous studies are noisy measures for vega and delta (Core and Guay, 2002).

10 Such variables include the transformed, the scaled, the unscaled, and/or the untransformed measures of number of options held, the value of the options held, the number and/or value of options granted, the stock held, the stock vested, the stock grants, the sum of some of these, etc.

11 Only a few studies measure incentives with delta (Anderson *et al.,* 2000), vega (Cohen *et al.,* 2000; Knopf *et al.,* 2002), or both (Rogers, 2002; Rajgopal and Shevlin, 2002, Coles 2006, DeYoung , 2010). By estimating vega and delta for the manager's entire portfolio of stock and options, we obtain a more precise measure of the incentives provided to the manager, rather than relying on potentially noisy proxies such as the number or the value of options or stocks held. Moreover, we are able to use the full-information approach to estimate both the sensitivity of CEO wealth to stock price and the sensitivity of CEO wealth to stock volatility.

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El principal objetivo de este trabajo consiste en analizar los efectos que la estructura de propiedad bancaria tiene sobre la toma de riesgos, a nivel microeconómico y sobre el riesgo sistémico, a nivel macroeconómico. Para ello se desarrolla un modelo de competencia oligopolística y se analizan las propiedades del equilibrio de mercado en términos de beneficios, cuota de mercado y micro y macro estabilidad financiera cuando un banco comercial, maximizador de beneficios, compite contra un banco no orientado hacia los beneficios (stakeholder bank). Los resultados teóricos son validados empíricamente usando datos bancarios de 72 países durante el periodo 1997-2007. Concretamente se muestra que a) los stakeholder banks son menos arriesgados que los bancos comerciales, b) cualquier banco es más arriesgado cuando compite contra un stakeholder bank en lugar de contra un banco comercial, c) a nivel sistémico la presencia de stakeholder banks aumenta la estabilidad financiera, d) el efecto de la regulación bancaria y de la competencia en la toma de riesgos depende de la estructura de propiedad del banco, e) la concentración accionarial incrementa el riesgo bancario, f) el diseño de los incentivos gerenciales tiene un efecto muy significativo sobre la toma de riesgos bancarios.

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