



Universitat Autònoma de Barcelona

# Documents de Treball

**CORPORATE GOVERNANCE IN BANKING:  
THE ROLE OF THE BOARD OF DIRECTORS**

**Pablo de Andrés  
Eleuterio Vallelado**

**Document de Treball núm. 06/4**

Departament d'Economia de l'Empresa

© Pablo de Andrés Alonso, Eleuterio Vallelado González

Coordinador / Coordinator *Documents de treball*:

David Urbano

<http://selene.uab.es/dep-economia-empresa/dt>

e-mail: [david.urbano@uab.es](mailto:david.urbano@uab.es)

Telèfon / Phone: +34 93 5814298

Fax: +34 93 5812555

Edita / Publisher:

Departament d'Economia de l'Empresa

<http://selene.uab.es/dep-economia-empresa/>

Universitat Autònoma de Barcelona

Facultat de Ciències Econòmiques i Empresariales

Edifici B

08193 Bellaterra (Cerdanyola del Vallès), Spain

Tel. 93 5811209

Fax 93 5812555

# **CORPORATE GOVERNANCE IN BANKING: THE ROLE OF THE BOARD OF DIRECTORS**

**Pablo de Andrés  
Eleuterio Vallelado**

**Document de Treball núm. 06/4**

La sèrie *Documents de treball d'economia de l'empresa* presenta els avanços i resultats d'investigacions en curs que han estat presentades i discutides en aquest departament; això no obstant, les opinions són responsabilitat dels autors. El document no pot ser reproduït total ni parcialment sense el consentiment de l'autor/a o autors/res. Dirigir els comentaris i suggerències directament a l'autor/a o autors/res, a la direcció que apareix a la pàgina següent.

A Working Paper in the *Documents de treball d'economia de l'empresa* series is intended as a mean whereby a faculty researcher's thoughts and findings may be communicated to interested readers for their comments. Nevertheless, the ideas put forwards are responsibility of the author. Accordingly a Working Paper should not be quoted nor the data referred to without the written consent of the author. Please, direct your comments and suggestions to the author, which address shows up in the next page.



# Corporate Governance in Banking: The Role of the Board of Directors\*

Pablo de Andrés\*\*  
and  
Eleuterio Vallelado

First version: June 2006  
This version: December 2007

Forthcoming in *Journal of Banking and Finance*

## ABSTRACT

We use a sample of large international commercial banks to test hypotheses on the dual role of boards of directors. We use a suitable econometric model (two step system estimator) to solve the well-known endogeneity problem in corporate governance literature, and demonstrate the empirical and theoretical superiority of system estimator over OLS and Within estimators. We find an inverted U-shaped relation between bank performance and board size, and between the proportion of non-executive directors and performance. Our results show that bank board composition and size are related to directors' ability to monitor and advise management, and that larger and not excessively independent boards might prove more efficient in monitoring and advising functions, and create more value. All of these relations hold after we control for the measure of performance, the weight of the banking industry in each country, bank ownership, and regulatory and institutional differences.

Key words: Corporate Governance, Board of Directors, Commercial Banks.  
JEL classification: G32

\* The authors are from the Department of Financial Economics and Accounting, University of Valladolid. They especially thank two anonymous referees for many useful suggestions and benefit from the useful comments of J. P. Abrahams, Y. Altumbas, J. M. Campa, M. A. García-Cestona, T. Gardener, F. Gascón, V. González, J. Lopez Gracia, P. Molyneux, J. Montoriol, J. A. Rodríguez, D. Urbano, N. Utrero, as well as participants at the Wolpertinger Conference (Cracow), at the UAB Seminars (Barcelona) and at the 5th Workshop in Finance. They also thank Sandra Sizer for editorial assistance. Financial support from UCEIF Foundation is also acknowledged. Any errors are the responsibility of the authors.

\*\* Corresponding Author: Universidad de Valladolid; Avenida Valle de Esgueva, 6; 47011 Valladolid, Spain; Ph: +34 983423334; Fax: +34 983183830; [pandres@eco.uva.es](mailto:pandres@eco.uva.es)

## 1. Introduction

The Basel Committee on Banking Supervision (BCBS) has called attention to the need to study, understand, and improve the corporate governance of financial entities. The BCBS especially advocates a governance structure composed of a board of directors and senior management (Enhancing Corporate Governance for Banking Organizations, September 1999 and February 2006). The core of the BCBS message is the conviction that good corporate governance increases monitoring efficiency. Furthermore, the Committee believes that corporate governance is necessary to guarantee a sound financial system and, consequently, a country's economic development.

To date, there are many studies on corporate governance, yet only a few papers focus on banks' corporate governance (e.g., Adams and Mehran, 2005; Caprio, Leaven and Levine, 2006; Levine, 2003; Macey and O'Hara, 2003a), even though the key aspects of corporate governance can be applied to banks. The problems of collective action faced by stakeholders who wish to ensure the efficient allocation of resources and the distribution of quasi rents, and the problems derived from different types of ownership and control, are clearly relevant to financial entities.

However, the relevance of banks in the economic system and the nature of the banking business make the problems involved in their corporate governance highly specific, as are the mechanisms available to deal with such problems. The complexity of the banking business increases the asymmetry of information and diminishes stakeholders' capacity to monitor bank managers' decisions. Banks are a key element in the payment system and play a major role in the functioning of economic systems. They are also highly leveraged firms, due mainly to the deposits taken from customers. For all these reasons, banks are subject to more intense regulation than other firms, as they are responsible for safeguarding depositors' rights, guaranteeing the stability of the payment system, and reducing systemic risk.

Regulation presents several challenges in the field of corporate governance. Even though regulation can be considered an additional mechanism of corporate governance, in most situations it reduces the effectiveness of other mechanisms in coping with corporate governance problems. This is the case when regulation imposes bank ownership restrictions, or when it reduces operations allowed to banks and applies coefficients that lessen competition in the industry, or when it designs a deposit insurance that restricts depositors' supervision. Moreover, the main aim of the regulator, which is to reduce systemic risk, might come into conflict with the main goal of shareholders, which is to increase share value. The conflicting goals introduce a new agency problem.

The role of boards as a mechanism for corporate governance of banks takes on special relevance in a framework of limited competition, intense regulation, and higher informational asymmetries due to the complexity of the banking business. Thus, the board becomes a key mechanism to monitor managers' behavior and to advise them on strategy identification and implementation. Bank directors' specific knowledge of the complexity of the banking business enables them to monitor and advise managers efficiently. To avoid any conflict of interest between the bank and the regulator, the board takes charge of links with the regulator. As in other firms, bank boards must also cope with legal responsibilities.

Our paper has two purposes. Firstly, it analyzes the effectiveness of the boards of directors in monitoring and advising managers in the bank industry. Our underlying idea is that several characteristics of the board of directors (size, composition or functioning) might reflect directors' motivation and their ability to effectively monitor and advise managers. We expect that banks with boards that are more effective in monitoring and advisory terms are better governed, and that better governance creates shareholder value. Secondly, the paper proposes an econometric method particularly suited to address the usual problems encountered in corporate governance empirical literature, particularly the endogeneity issue.

Our paper is inspired by the Adams and Mehran (2005) paper and we aim to advance in the analysis of bank board of directors in several ways. First, our research uses a sample of 69 large commercial banks from six developed countries for the period 1996-2005. Thus, we extend previous studies that focus on US Bank Holding Companies to an international scenario. Second, we propose and test a model that integrates the monitoring approach and the advisory approach to explain performance of bank board of directors. Thus, we observe that boards which are larger and balanced between insiders and outsiders create more value in the banks. Finally, we use a suitable econometric model (two-step system estimator) to solve unobserved heterogeneity and endogeneity problems. Moreover, we compare system estimator with OLS and Within estimators to demonstrate why only system estimator is consistent. The system estimator takes into account the unobserved heterogeneity, the endogeneity and the heteroskedasticity of the explanatory variables at the same time for panel data (dynamic dimension). This is not the case with the OLS estimators or the within estimators of the fixed effects model previously reported in empirical research on boards.

Overall, we find that there is an inverted U-shaped relation between board size and performance. Although we note that adding new directors is positively linked to a bank's performance, and indicates better manager monitoring and advising, the non-monotonic relation shows that when the number of directors reaches 19, Tobin's Q starts to diminish. Further, we find an inverted U-shaped relation between the proportion of outsiders and value which might be driving the relation between board size and performance. We show that the incorporation of outsiders improves value, in line with board size, but that when reaching a high proportion over the total board, Q starts to diminish. This result strengthens the hypothesis that the information and council of inside directors in the board are important to perform efficiently. It also challenges the dominant recommendation that advises excessive independence in boards. These results are robust to several controls, such as measures of

performance, ownership structure, the weight of the banking system, and differences in institutional and regulatory settings. These findings are consistent with the importance of the advisory role of boards we find in recent papers (Adams and Ferreira, 2007; Hellan and Sykuta, 2004).

The paper is organized as follows. Section 2 presents the banking industry's corporate governance issues and our empirical hypotheses concerning boards of directors. Section 3 describes our sample, variables, and econometric techniques. Section 4 presents our main empirical results. In Section 5 we offer some alternative specifications of the analysis. Section 6 concludes.

## **2. Bank boards and our empirical hypotheses**

We follow Zingales (1998) by defining corporate governance as a group of mechanisms used by stakeholders to ensure that directors efficiently manage corporate resources, a task that includes the manner in which quasi rents are developed and distributed. Thus, the problem of bank governance does not differ greatly from the governance problem of any organization whose business involves an exchange of goods. However, corporate governance in banks plays a special role due to the uniqueness of these organizations. Studies on bank corporate governance (e.g., Ciancanelli and Reyes, 2001; Levine, 2003; Caprio and Levine, 2002; Macey and O'Hara, 2003a; Prowse, 1997a) acknowledge the existence of difficulties, such as opacity or complexity and regulation, in the corporate governance of these institutions. Further, such difficulties interfere with the way in which the usual corporate governance mechanisms are applied to the governance of financial institutions.

Information asymmetries can be found in all sectors, yet the problems arising for financial intermediaries may be aggravated by the complexity of the bank business (Jones, 1998;

Furfine, 2001; Levine, 2003; Morgan, 2002). Bank opacity or complexity reflects the idiosyncratic nature of the banking business and the difficulties outside stakeholders face when monitoring bank transactions. Issues concerning complexity are common in banking, making it difficult for stakeholders to monitor their bank. Complexity can take the form of the quality of loans not being clearly perceived, financial engineering not being transparent, financial statements proving complicated, investment risk that can be easily modified, or perquisites that are easier for managers or insiders to obtain (Levine, 2003). Hence, complexity greatly aggravates the governance problem. The management of complexity requires a board that not only monitors managers efficiently, but also gives managers access to independent and valuable advice to run the bank.

Regulation also plays a special role for financial entities, since both the credit and payment systems and economic development depends on the bank's financial health. In the banking industry, regulators are one of the main stakeholders, yet their objectives may clash with those of the other stakeholders (Diamond, 1984). Although it is true that monitoring by regulators may represent an additional governance mechanism, their presence can also worsen governance problems. For example, regulators might discourage competition and discipline banks by imposing restrictions on ownership structures (Prowse, 1997a; Caprio and Levine, 2002; Macey and O'Hara, 2003a). Or regulators might limit the power of markets to discipline the banks (Ciancanelli and Reyes, 2001). They may even pursue their own interests as a regulator (Boot and Thakor, 1993; Santomero, 1997, 1998). Moreover, when regulators intervene directly in the shareholding of financial entities, this conflict of interest is compounded. Such a conflict casts doubts on the efficacy of supervision and modifies stakeholder incentive to control managers (La Porta, Lopez de Silanes and Shleifer, 2002).

Regulation might also be considered as an additional external governance force that acts

macroeconomically, at the banking industry level as a whole, and microeconomically, at the level of the individual banks (Ciancanelli and Reyes, 2001). As part of their efforts to supervise banks, regulators monitor the functioning of bank boards. However, regulators are constrained by the laws of their countries, while large banks have diversified geographically, setting up branches around the world in countries with many different regulatory systems. In this changing scenario we should expect bank boards to emphasize strategic decisions to cope with a highly competitive environment while ensuring that their bank complies with regulatory requirements in each of the countries in which the bank operates.

Thus, we might expect boards of directors to be larger, since a larger board facilitates manager supervision and brings more human capital to advise managers. However, boards with too many members lead to problems of coordination, control, and flexibility in decision-making. Large boards also give excessive control to the CEO, harming efficiency (Yermack, 1996; Eisenberg, Sundgren and Wells, 1998; Fernandez et al, 1997). Therefore, the effect of board size on bank value is a trade-off between advantages (monitoring and advising) and disadvantages (coordination, control and decision-making problems). The hypothesis is that such a trade-off will show up as a non-linear relation between board size and bank value.

The literature also emphasizes that to safeguard the efficacy of supervision and advising it is not enough merely to appoint more directors. Additional directors, particularly non-executives, should be endowed with the knowledge, incentives, and abilities required to monitor, discipline, and advise managers, thus enabling directors to alleviate conflicts of interest between insiders and shareholders (Harris and Raviv, 2007). Corporate governance literature offers no conclusive evidence on the effect of appointing outside directors (Bhagat and Black, 2002; Hermalin and Weisbach, 1991; John and Senbet, 1998). On the one hand, an independent board of directors has fewer conflicts of interest when monitoring managers. Thus, when the monitoring function is prevalent, we expect a positive link between the

presence of outsiders and bank value. On the other hand, an excessive proportion of non-executive directors could damage the advisory role of boards since it might prevent bank executives joining the board. Inside directors add to the board information that outside directors would find difficult to gather. Besides, executive directors facilitate the transfer of information between board directors and management (Adams and Ferreira, 2007; Harris and Raviv, 2007; Coles et al. 2007). Thus a negative link between presence of outsiders and bank value could be expected. This indicates a trade off between the advantages and disadvantages in the proportion of non-executive directors<sup>1</sup>.

The analysis of the relation between value and board composition is incomplete if we do not take into account the internal functioning of the board. In fact, as other studies note, there are several factors that can affect how boards operate. One particularly important point is the frequency of board meetings (Vafeas, 1999). When we examine the activity of a board (Vafeas, 1999), we find explanations both for and against a positive relation between the frequency of meetings and performance. Meetings provide board members with the chance to come together, and to discuss and exchange ideas on how they wish to monitor managers and bank strategy. Hence, the more frequent the meetings, the closer the control over managers, the more relevant the advisory role, factors that lead to a positive impact on performance (proactive boards). Furthermore, the complexity of the banking business and the importance of information both increase the relevance of the board's advisory role. By contrast, frequent meetings might also be a result of board reaction to poor performance (reactive boards). Therefore, any hypothesis concerning the influence of board activity on firm performance is an empirical question, possibly yielding either proactive or reactive results.

---

<sup>1</sup> Although the empirical evidence regarding the presence of outsiders is not conclusive, all almost codes of good practices recommend increasing their presence. Recently, several papers (Adams and Ferreira, 2007; Coles et al., 2007) alert to the problems deriving from the high pressure to appoint almost exclusively independent directors.

Regulation distinguishes the banking industry from other industries, although since the deregulation implemented in developed countries, the driving forces in corporate governance are private monitoring and competition (Belkhir, 2004). Caprio, Laeven, and Levine's (2006) study shows the importance of the legal and institutional rather than the regulatory setting in banking governance. Moreover, empowering private monitoring of banks yields the greatest benefits in developed countries that have in place legal and institutional systems that work well (Beck, Demirgüç-Kunt and Levine, 2005). In our paper, we study a sample of large banks that operate in developed countries and that adapt to institutional and legal differences in the countries in which they operate. In such a context, it would be difficult for an external governance mechanism such as the market for corporate control to prove effective. One of the main governance mechanisms will be the board of directors, while other internal mechanisms, such as CEO compensation or ownership structure, might also prove effective mechanisms to deal with governance problems.

The reasons stated above lead us to consider that bank boards should play a major role in controlling and advising managers. Therefore, we examine the characteristics that bank boards should display if they are to perform their dual role efficiently. The size, composition, and functioning of boards might show directors' motivation and their ability to adequately supervise and advise managers' decisions.<sup>2</sup>

---

<sup>2</sup> Some of the reasons previously mentioned justify the relevance of ownership and manager compensation systems as mechanisms also able to solve corporate governance problems (See, for instance, the papers of Brickley and James, 1987, Caprio, Laeven and Levine, 2006, Crespi, Garcia-Cestona and Salas, 2004, Hubbard and Palia, 1995, or Micco et al.2004).

### **3. Sample, variables, and econometric model.**

#### *3.1. Data*

Since 1996, the Spencer Stuart executive search and consulting firm has gathered information on the characteristics of boards of directors of publicly traded financial and nonfinancial companies in several OECD countries. The Spencer Stuart Board Index summarizes this information. This publication is our main source of data on board size, composition, and functioning of commercial banks.

To assemble the panel data, we obtain the Board Index from Spencer Stuart for the 1996-2006 period. We obtain complementary information on boards for the last periods from the banks' web sites. As a result, we obtain information on the boards of directors of 69 commercial banks from six OECD countries. Of these six countries, three have a common-law legal and institutional setting (Canada, the U.S., and the UK) and the other three have a civil-law system (Spain, France, and Italy). All are developed countries with well-functioning legal and institutional environments. In the sample countries there are corporate governance codes for all quoted companies, both financial and nonfinancial. All the banks in our sample have a one-tier board structure. Among the countries in the sample, only France offers corporations the choice of one- or two-tier boards; 89% of French companies opt for one tier. In our sample, all the French banks have a one-tier board. None of the banks in the sample is under government or public institution majority control.

We use the Compustat Global Vantage database to obtain financial statements of banks from 1995 to 2005. We obtain data on the characteristics of banking systems and the legal and institutional setting from the OECD database and from studies by Barth, Caprio, and Levine (2001 and 2006); Beck, Demirgüç-Kunt and Levine (2000 and 2006); and La Porta, Lopez de Silanes, and Shleifer (1998). Financial data refer to the end of the year. Data on

bank boards are published at midyear. The financial information that matches the Spencer Stuart Board Index refers to the end of the previous year.

The sample comprises large commercial banks in each of the six countries. Although the 69 banks in the sample represent only 32.2% of the total number of quoted banks in the six countries, they represent about 80% of banking assets, 79% of equity, 86% of loans or 81% of deposits. Those countries with a relatively smaller percentage of banks in the sample (Italy, France, and the U.S.) are represented by large commercial banks that account for at least 50% of banking industry assets, equity, loans, or deposits. Thus, our sample is representative of the large commercial banks in Canada, France, Italy, Spain, the UK, and the U.S.

We build an unbalanced panel of data with 620 bank-year observations. The bank-year observations in the sample are the only ones for which there is board information, market data, and financial statements available.

### *3.2. Variables and statistics*

We measure bank performance by using the firm market-to-book value ratio ( $Q$ ), which we calculate as the book value of total assets minus the book value of common equity plus the market value of common equity divided by the book value of total assets as the usual proxy for Tobin's  $Q$ . Many other studies use either this measure or a similar one as the dependent variable in research on board effectiveness (e.g., Hermalin and Weisbach, 1991; Yermack, 1996; Fernández et al., 1997; Bhagat and Black, 2002; Adams and Mehran, 2005; Caprio, Levaen and Levine, 2006), and in a broader sense, in research on the effectiveness of corporate governance mechanisms for both financial and non-financial firms.

We use two other measures of bank performance to test the robustness of the analysis, the return on assets (ROA) and annual market return of a bank shareholder (SMR). We

calculate ROA as the income before extraordinary items, interest expense, and taxes, divided by the average of the two most recent years of total assets. We estimate shareholder market return (SMR) from monthly share prices. For each month of the year we calculate the shareholder market return adjusted for dividend payments. Once we have the shareholder monthly return for each of the 12 months of the year, we calculate the average value and elevate the monthly return to annual return.

Table 1 shows the statistics for these variables. The average Q-ratio is higher than one, so large commercial banks create value. The return on assets is 1%, and the annual shareholder market return is around 22%. The mean and median values are quite close for each of the measures of performance, with certain homogeneity in the Q value and ROA of banks among countries.

#### INSERT TABLE 1

We measure the size, composition, and functioning of boards with the variables BOASIZE, OUTSIDERS, and MEYEAR. BOASIZE is the size of the board. As reported in Table 1, the mean and median sizes of the board are 15.78 and 16 directors, respectively, which is higher than the average board size (12) reported for non-financial firms (Yermack, 1996, Barnhart, Marr, and Rosenstein, 1994; Rosenstein and Wyatt, 1997; Klein, 1998; Vafeas, 1999; Andres, Azofra, and Lopez, 2005), but close to the 17 directors obtained by Adams and Mehran (2005) in the period 1995-1999 for banks.

We measure the composition of the board of directors by using the proportion of outside directors (OUTSIDERS), which we define as the number of non-executive directors out of the total number of directors. The information provided by Spencer Stuart does not allow any further distinction among board members (i.e., between affiliated and independent outside directors). On average, outsiders account for 79% of boards (table 1), similar to

Adams and Mehran's (2005) data. The median bank board comprises 16 directors, which indicates 13 outsiders and three insiders. In addition, the proportion of non-executives is related to the size of the board.

As our proxy for the functioning of boards of directors, we use the number of meetings held each year (MEYEAR). Table 1 reports an average number of meetings of 10.45, which is slightly higher than the 8.48 meetings reported by Adams and Mehran (2005).

We define a set of control variables to account for size, business mix, regulation, market power of banking industry, bank ownership structure, and investors' legal protection. We construct our control variable for "country" as follows: we use six dummy variables that take the value of one for each of the six countries, and zero otherwise. However, the country variable does not take into account that there are similarities among the countries in legal and institutional aspects or in investors' protection rights.

A first group of variables measures differences in bank business structure. One of these control variables is bank size (SIZE), which we measure by the average value of total bank assets at book value over the last two years. The variable LOANSTA measures differences in banking business. It is constructed as the ratio of loans to total assets at book value. LOANSTA is similar to the leverage control variable found in other studies<sup>3</sup>. See Table 1 for statistics.

Our second group of control variables accounts for differences among countries in terms of regulation and regulator power (see Appendix, Panel A). Thus, to measure the regulation and supervision features of each country we use dummy variables that distinguish between bank activity and ownership restrictiveness (BAOR), official supervisory power (OSP), prompt corrective action (PCA), and deposit insurance design (DID).

---

<sup>3</sup> Additionally, we define DEPOSTA as the ratio of deposits to assets at book value.

Our third group of variables measures the weight of the banking industry in each country (see Appendix, Panel B). The size (TDGPD) and concentration (BC5) of the banking business might influence the functioning of alternative governance mechanisms in each country and ultimately affect the composition and functioning of the board of directors. These variables do not vary across banks in the same country.

A fourth group of variables measures bank ownership structure (Appendix, Panel C). The composition of the board of directors might be the result of bank ownership structure. We construct three variables to control for ownership structure in 1996, 1999, and 2004. Data on ownership does not vary greatly from one year to the next. Further, we define a dummy variable that takes the value of one when the CEO and the Chairman of the Board are the same person, and zero otherwise. Lastly, in Appendix, Panel D, we measure the level of protection of investors' rights on a scale from one to six (ILP) according to La Porta et al. (1998).

#### INSERT TABLE 2

Table 2 shows that Canadian banks have the largest boards. All banks in the sample show a high proportion of outside directors. British banks have the lowest proportion (almost 60%) and Italian banks the highest proportion (90%). Banks in the sample show different levels of board functioning. Italian bank boards hold 16 meetings per year. French banks have the lowest meeting rate, around seven per year. Canadian and French banks are, on average, the largest. U.S. banks show the highest return on assets and Tobin's Q proxy, although French and Italian banks have the highest shareholder market returns.

### 3.3. *Econometric model*

Panel data analysis is the most efficient tool to use when the sample is a mixture of time series and cross-sectional data. The panel data structure allows us to take into account the unobservable and constant heterogeneity, that is, the specific features of each bank (management style and quality, market perception, business strategy, etc.). Further, we have the problem of simultaneity, given that some of our independent variables such as board size, composition, or functioning might be determined simultaneously with the dependent variable. Therefore, we need to use an econometric method that can deal with endogeneity and with the presence of unobservable fixed effects that are associated with each commercial bank and correlated with the rest of the explanatory variables.

When the unobserved effect is correlated with independent variables, pooled OLS estimations produces estimators that are biased and inconsistent. We can overcome this econometric challenge by using either the first differences or the fixed effects (within) estimators. However, as Hermalin and Weisbach (2003) point out, it is reasonable to consider that the board is determined endogenously. Then, if the strict exogeneity condition fails, then both first differences and fixed effects (within) are inconsistent and have different probability limits. The general approach for estimating models that do not satisfy strict exogeneity is to use a transformation to eliminate the unobserved effects and instruments to deal with endogeneity (Wooldridge, 2002). Thus, we decide to use the two-step system estimator (SE) with adjusted standard errors for potential heteroskedasticity proposed by Arellano and Bond (1998). This econometric method considers the unobserved effect transforming the variables into first differences, and uses the Generalized Method of Moments (GMM) to deal with endogeneity problems.

For our case, by using the GMM method we can build instruments for those variables (board size, composition, and functioning) that are potentially endogenous. This is a key point

because there is an increasing interest in the characteristics of boards as being endogenously determined by firm performance (Hermalin and Weisbach, 2003). Furthermore, by using the dynamic dimension of panel data we can check response processes across time and identify how the characteristics of the boards of directors affect bank performance.

To test model specification validity, we calculate the Hansen/Sargan test of overidentification of restrictions. This test examines the lack of correlation between the instruments and the error term. The  $AR_1$  and  $AR_2$  statistics measure first- and second-degree serial correlations. Given the use of first-difference transformations, we expect some degree of first-order serial correlation, although this correlation does not invalidate our results. However, the presence of second-order serial correlation does signal omitted variables.

We also calculate the F test of joint significance for all independent variables. The model we use to test our hypotheses considers the existence of a nonlinear relation. Our dependent variable is  $Q$  that is our proxy for bank performance. The independent variables are board size (BOASIZE), board composition (OUTSIDERS), meetings per year (MEYEAR), two measures of the bank business (LOANSTA and SIZE), several control variables (country, regulation, banking industry, ownership, institutional setting dummies), and time effect.

Analytically, the regression model (1) with the non-linear relation on board size is:

$$PERFORMANCE_{i,t} = \beta_0 + \beta_1 BOASIZE_{i,t} + \beta_2 BOASIZE_{i,t}^2 + \beta_3 OUTSIDERS_{i,t} + \beta_4 MEYEAR_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 LOANSTA_{i,t} + \beta_7 CONTROL\_VAR_{i,t} + \beta_8 YEAR_{i,t} + d_t + \eta_i + v_{i,t} \quad (1)$$

where  $i$  goes from bank 1 to bank 69 and  $t$  takes the values of the years from 1996 to 2005.

The  $\beta$  parameters are the estimated coefficients for the constant and each of the explanatory variables included in the model. We use lags of BOASIZE, OUTSIDERS, and MEYEAR as their instruments to cope with endogeneity. We split the error term in our estimations into three components: a time effect ( $d_t$ ) to control the effect of macroeconomic variables,

individual effects ( $\eta_i$ ) to control for unobservable heterogeneity, and stochastic disturbance ( $v_{it}$ ). We use the adjustment for small samples proposed by Windmeijer (2000). Since our sample size is not very large, the Windmeijer proposal improves the robustness of our results and avoids any potential downward bias in the estimated asymptotic standard errors.

#### 4. Results

In this section, we include OLS and Within estimators along with the system estimator because they are the most usual econometric techniques in the empirical literature on boards. Our purpose is not only to facilitate the comparability of our results with previous researches but also to show the advantages of considering the unobserved heterogeneity and, particularly, the endogeneity.

##### 4.1. OLS and Within Estimations

Table 3 shows the results of the OLS estimations. This estimator is not consistent as it does not consider the unobservable and constant heterogeneity of the banks in our sample and neither takes into account the endogeneity of our independent variables. The results show a non-linear relation between board size and Q that disagrees with our hypothesis. Thus, bank performance (Q) will decrease as the number of directors increases to a point where the relation hits a minimum from which performance will improve. This result is not only problematic econometrically but also goes against the theory. The bottom line of this result is that small boards are inefficient and large boards efficient. It is extremely hard to assume that increasingly larger boards create more value. This result challenges the empirical evidence in corporate governance literature: large boards encounter problems of coordination, control, and decision-making. There is no significant relation between the proportion of outsiders and

bank performance. Finally, the negative relation between board meetings and bank performance indicates that more meetings reduce bank performance in contemporary terms.

#### INSERT TABLE 3

The OLS results could be due to the non-consideration of the fixed effect and the presence of correlation among the explanatory variables. In previous researches, the fixed effect problem is solved using a fixed effects model (Within estimator). Table 4 shows the within estimators for our regression model. Thus, the within estimations show a U-shaped relation between board size and bank performance. The result is against the problems of oversized boards (i.e., Yermack, 1997), does not explain the advisory function of boards (i.e., as in Adams and Mehran, 2005), and does not adequately consider the advantages (monitoring and advising) and disadvantages (oversize boards) of board size as we hypothesized. The other results with the within estimators are not significant in the case of outsiders or partially significant in the case of board meetings. However, within estimators are consistent only if the independent variables are exogenous, which is not the case in the analysis of board structure and bank performance. Such unusual results could be due to the inconsistency of estimators arising from the lack of strict exogeneity of variables.

#### INSERT TABLE 4

The OLS and within estimators are neither econometrically consistent nor related with the theoretical postulates of board literature. Therefore, we need an econometric technique able to consider at the same time the individual characteristics of each bank together with the potential endogeneity of board characteristics. The two step system estimator with adjusted standard errors takes into account the unobservable heterogeneity transforming the original variables into first differences and the endogeneity of independent variables using instruments.

#### 4.2. Two step system estimations

We report the system estimator regression results in Table 5. For each regression, we indicate estimated coefficients; whether they are statistically different from zero (p-value); the first- and second-order correlation tests (*AR1* and *AR2*); the Hansen/Sargan tests of instrument validity; and the F test of model statistical significance. The statistical tests do not reject the validity of our model and do confirm both the absence of second-order serial correlation and the validity of the instruments we use to avoid the endogeneity problem.

Our results confirm a hypothesized inverted U-shaped relation between board size (*BOASIZE*) and our performance measure. As in Adams and Mehran (2005), we note that the addition of new directors is positively related to performance, although the increase in performance shows a diminishing marginal growth. Thus, the negative and significant coefficient of *BOASIZE SQ* shows that there is a point at which adding a new director reduces bank value. For the banks in the sample, this value is around 19 directors. We note that this is the value of board size that maximizes the objective function (Table 4), once we have estimated the coefficients.

INSERT TABLE 5

Boards with many directors are able to assign more people to supervise and advise on managers' decisions. Having more supervisors and advisors either reduces managers' discretionary power or at least makes it easier to detect managers' opportunistic behavior. Besides, it increases strategic capabilities to complement that of the CEO, up to a certain limit. However, boards with too many directors face considerable problems of coordination, communication, and decision-making, as well as the risk of excessive CEO control. Empirical evidence for nonfinancial firms confirms that the problems of oversized boards outweigh their advantages (Yermack, 1996; Fernandez, Gómez, Fernández, 1997; Eisenberg, Sundgren, and Wells, 1998).

We observe a positive relation between the proportion of outsiders (OUTSIDERS) and performance. This result supports the argument that adding outside directors to the board improves the supervision of management and reduces the conflict of interest among stakeholders, as predicted by theory. Besides, if a bank appoints a new outside director with advisory capabilities, strategic decisions should improve since the counseling skills of the directors complement those of the CEO. We should therefore expect to see enhanced bank performance.

We find a positive relation between the number of board meetings (MEYEAR) and bank performance. This result supports the hypothesis that bank board meetings play a role that is more proactive than reactive. Thus, an increase in the frequency of board meetings would be a response to a search for strategic decisions to improve value, rather than a response to poor results (Vafeas, 1999). However, such a positive relation lacks statistical significance.

These results point to the relevance of outside directors' experience to counsel management on strategic banking decisions. When boards are at least moderately independent, then we expect the strategic motive to dominate the monitoring role. As Adams and Ferreira (2007) show, shareholders are always better off if one-tier boards have an advisory role. We should observe an increase in value for those banks whose external directors complement and cooperate with the CEO in strategic issues. Therefore, our results confirm the view that some bank board characteristics may be associated with either effectiveness or ineffectiveness in the control, counseling, and supervision of managers. New bank board members who have non-executive duties might improve such board monitoring and advisory capabilities, since, given the complexity and idiosyncrasy of banks, there are more directors to monitor and advise management, resulting in fewer conflicts of interest. However, improvement reaches a limit as the board grows. At some point new members do

not add valuable experience or enhance coordination or communication, and indeed might cause decision-making problems.

This outcome leads us to question whether the “efficient” limit is being driven by the board composition rather than board size per se. To test this, we re-estimate the original model introducing a non-linear relation of the proportion of outsiders and replacing the board size one. If the effect of the board size on value is driven by board composition, we should obtain a point at which adding a new outside director would reduce bank value. We report the regression results in Table 6.

#### INSERT TABLE 6

Our results confirm an inverted U-shaped relation between board composition (OUTSIDERS) and bank value. Such a relation establishes an optimum point at which the proportion of non executives on the board destroys value. This result has at least three relevant implications. First, the composition of the board could be driving the inverse U shaped relation between bank performance and board size, since at the same time the non-linear relation is significant, the size of the board lacks statistical significance. Second, the non-linear relation between outsider proportion and bank performance limits the advantages of incorporating non-executives to the board. Thus, an optimum mix of executive and non-executive directors is more adequate to create value for the banks than excessively independent boards. This result is in agreement with the relevance of the board advisory function which requires the presence of executive directors whose knowledge and data concerning the bank could complement non-executive director capabilities. Besides, such a result provides empirical evidence on the theoretical proposal of a trade-off between the monitor (independence) and advisory (information) functions of the board. Finally, the third implication is that this result contradicts the well-known proposal that more independence is always better for bank performance.

Overall, these results point to the relevance of analyzing board responsibilities beyond the monitoring function. Results have shown that board size has a limit, where the problems of an oversized board (problems of control, coordination, and decision-making) outweigh the benefits (advising and monitoring). New results show that board independence, the proportion of outside directors, also has a limit. Thus, a board with a balance between executive and non-executive directors could carry out an efficient advising without overlooking the monitoring function.

#### *Alternative specifications*

Table 7 shows that our results are robust to changes in the dependent variable. The Q ratio is the most common measure of performance in corporate governance studies (Bhagat and Jefferis, 2002). However, bank leverage biases the Q ratio to one. For this reason we repeat the analyses, this time using an accounting variable, Return on Assets (ROA); and a market variable, shareholders' market return (SMR) (We note that our results do not change if we define shareholders' market returns from year-end share prices plus dividend yield). ROA measures the actual performance, but might be biased by earnings management. SMR, on the other hand, measures market performance but might be biased by market mood (Demsetz and Villalonga, 2001). For our case, the two alternative variables that measure bank performance produce no significant differences in our results. Thus, both the appointment of new directors (BOASIZE) and the percentage of outsiders show a positive relation with ROA and SMR. However, the significant and negative coefficient of BOASIZE SQ imposes an efficient limit to the appointment of too many directors, as in our original model.

## INSERT TABLE 7

We estimate the model controlling explicitly by the regulatory and institutional setting (Table 8). In general, the relations between the size and composition of boards and bank performance hold after we control for the regulatory and institutional setting. We note that although regulation distinguishes the banking industry from other industries, it is not the main factor that influences the composition and functioning of bank boards.

## INSERT TABLE 8

When we consider the weight of the banking system in each country, which we do through the bank deposits over GDP (TDGDP) or the bank concentration ratio (BC5), our results do not differ from the original model. The estimations again show a nonlinear relation between board size and value, and a positive relation between board composition (measured by the percentage of outside directors) and value. For the control variables, the significant and positive coefficients reflect better performance in banks that operate in countries with bank-based financial systems.<sup>4</sup>

We also add controls for ownership structure. We use dummy variables that take the value of one if the main shareholder holds less than 5 % of the shares for 1996, 1999, and 2004 (5OWN96, 5OWN99 and 5OWN04). Doing so allows us to determine if the link between board and performance is sensitive to different ownership structures. We then define a dummy variable that takes the value of one when there is no controlling shareholder over the whole period (5OWNALL), that is, when no shareholder holds over 5% of shares. We also estimate the model by incorporating the CH&CEO variable that measures when the Chairman of the Board is also the CEO. These controls are valuable, since the role of the

---

<sup>4</sup> For the sake of brevity, we do not report the estimated coefficients of this and the next alternative specifications, although these estimations are available on request.

board proves even more necessary in a dispersed-ownership context. The results of the estimations do not show significant differences with regard to the original model.

We use several additional controls to examine the effect of board characteristics interacted with regulatory and institutional variables. Thus, as the result of multiplying each board variable (size, composition, and functioning) for each of the regulatory and institutional setting variables, we generate new interaction variables among board variables and the regulatory and institutional variables. In general, the inclusion of these interaction variables does not qualitatively modify our main results.

## **5. Conclusions**

The relevance of banks to the economy and the complex nature of the banking business justify specific bank regulation. Financial regulation is the answer to the idiosyncratic nature of the banking industry, yet regulation entails fresh challenges for the corporate governance of banks, challenges that are less relevant in the corporate governance of other companies or institutions. For instance, some corporate governance mechanisms become weaker, or the problems of asymmetric information are more severe, thus obstructing monitoring of managers or leading to the emergence of new conflicts of interest between regulator and stakeholders. In corporate governance, bank boards play a significant role in bank governance, either monitoring managers or advising them in the design and implementation of strategies. Our hypothesis is that certain characteristics of bank boards (size, composition, and functioning) reflect the motivation and abilities of a board in its supervisory and advisory duties.

After controlling for the problems of unobserved heterogeneity, and demonstrating the empirical and theoretical superiority of the two step system estimator over OLS and Within estimators, we draw the following conclusions for a sample of 69 boards of large commercial

banks from Canada, France, the UK, Italy, Spain, and the U.S. for the period 1996 to 2006. Our first finding challenges the widespread belief that small boards are more efficient. We find an inverted U-shaped relation between board size and bank performance. Thus, the inclusion of more directors should benefit the monitoring and advisory functions, improve governance, and raise returns. However, there is a limit beyond which the coordination, control, and decision-making problems outweigh the benefits. Our empirical survey shows that this limit is around 19 directors. The relevant finding to emerge is that board size is a trade-off between advantages (more monitoring, more advising to deal with problems) and disadvantages (control and coordination problems), and that the dominant belief defending the “one-size-fits-all” in boards, particularly the reduction in board size, is not suitable when other functions beyond the disciplinary and specificity of the banking industry are taken into account.

Second, and closely linked to board size, we obtain empirical evidence that partially concurs with a recommendation usually included in the codes of good practices: the advisability of appointing outside directors. To avoid or lessen the conflict of interest among stakeholders (in particular between regulator and shareholders) and fulfill the functions of monitoring and advising in an efficient manner, these directors should be a majority on the board. However, such a majority has a limit as shown for the inverted U-shaped relation between proportion of outsiders and performance. Thus, an optimum combination of executive and non-executive directors is more adequate to create value for the firm than excessively independent boards. Efficient boards would require the presence of executive directors, whose knowledge of the bank could complement non-executive director ability. Overall, the results regarding board size and composition support the existence of a trade-off between the monitoring (independence) and advisory (information) functions of the board.

Our findings hold after controlling for the measure of performance, ownership structure, the weight of the banking system, or differences in the regulatory and institutional setting, and go beyond the national boundaries of any one particular country or year.

In sum, banks boards efficiently assume the challenge of improving bank governance. Our results lead us to conclude that bank boards contribute to solving the weaknesses of other corporate governance mechanisms when these mechanisms are applied to financial institutions. An efficient board is valuable not only for its shareholders and stakeholders, but also for the development of an economic system. Sound governance of banks is the necessary condition to safeguard both the health of financial intermediaries and the business and economic development of a country.

## References

- Adams, R. B., 2003. What do boards do? Evidence from Board Committee and Director Compensation Data, EFA 2005 Moscow Meetings Paper, Working Paper # 397401, SSRN.
- Adams, R. B., and D. Ferreira, 2007, A theory of friendly boards, *Journal of Finance*, 62(1), 217 – 250.
- Adams, R. B., and H. Mehran, 2005, Corporate Performance, Board Structure and its determinants in the Banking Industry, Working Paper # 302593, SSRN.
- Andrés, P. de, V. Azofra, and F.J. Lopez, 2005, Corporate boards in OECD countries: Size, composition, compensation, functioning and effectiveness, *Corporate Governance: An International Review*, 13(2), 197-210
- Arellano, M., and S. Bond, 1998, Dynamic panel data estimation using DPD98 for GAUSS: A guide for users, Working Paper, Institute for Fiscal Studies.
- Barnhart, S. W., M. W. Marr, and S. Rosenstein, 1994, Firm performance and board composition. Some new evidence, *Managerial and Decision Economics* 15, 329-340.
- Barth, J.R., G. Caprio, Jr., and R. Levine, 2001, The regulation and supervision of banks around the world: A new database, in Robert E. Litan and Richard Herring, editors: *Integrating Emerging Market Countries into Global Financial System* (Brookings-Wharton Papers on Financial Services, Brookings Institutions Press).
- Barth, J.R., G. Caprio, Jr., and R. Levine, 2006, *Rethinking Bank Supervision and Regulation: Until Angels Govern*. Cambridge University Press, Cambridge (UK).
- Beck, T., A. Demirgüç-Kunt, and R. Levine, 2000, A New Database on Financial Development and Structure, *World Bank Economic Review* 14, 597-605.
- Beck, T., A. Demirgüç-Kunt, and R. Levine, 2005, Bank supervision and corruption in lending, forthcoming in *Journal of Monetary Economics*.
- Beck, T., A. Demirgüç-Kunt, and R. Levine, 2006, A New Database on Financial Development and Structure (1960-2006). New Data Updated September 2006. Working paper, The World Bank.
- Belkhir, M., 2004, Board of directors' size and performance in banking, Working Paper # 604505, SSRN.
- Bhagat, S., and B. Black, 2002, The non-correlation between Board independence and long-term firm performance, *Journal of Corporation Law*, 27, 231-274.
- Bhagat, S., and Richard H. Jefferis, Jr., 2002, *The econometrics of corporate governance studies*. MIT Press, Cambridge (MA).
- Blundell, R. and Bond, S. 1998, Initial conditions and moment restrictions in dynamic panel data models, *Journal of Econometrics*, 87, 115-143.
- Bond, S., 2002, Dynamic panel data models: A guide to micro data methods and practice, The Institute for Fiscal Studies, Working Paper 9, 1-34.
- Boot A.W., and A. Thakor, 1993, Self interested bank regulation, *American Economic Review* 83 (2), 206-12.

- Brickley, J., and C. M. James, 1987, The takeover market, corporate board composition, and ownership structure: the case of banking, *Journal of Law and Economics* 30, 161-180.
- Caprio, G., and R. Levine, 2002, Corporate governance of banks: Concepts and international observations, Working Paper, Global Corporate Governance Forum.
- Caprio, G., L. Laeven and R. Levine, 2006, Governance and banks valuations, Working Paper # 10158, NBER. Forthcoming in *Journal of Financial Intermediation*.
- Ciancanelli, P. and J. A. Reyes, 2001, Corporate Governance in Banking: A conceptual framework, Working paper # 253714, SSRN.
- Coles, J. L., D. D. Naveen and L. Naveen, 2007, Boards: Does one size fit all? Forthcoming in *Journal of Financial Economics*.
- Crespí, R., M. A. García-Cestona, and V. Salas, 2004, Governance Mechanisms in Spanish Financial Intermediaries, *Journal of Banking and Finance* 28(10), 2311-2330.
- Demsetz, H and B. Villalonga, 2001, Ownership Structure and Corporate Performance. *Journal of Corporate Finance* 7 (3), 209-233.
- Diamond, D. W., 1984, Financial Intermediation and Delegated Monitoring, *Review of Economic Studies* 51, 393-414.
- Eisenberg, T., S. Sundgren, and M. T. Wells, 1998, Larger board size and decreasing firm value in small firms, *Journal of Financial Economics* 48, 35-54.
- Fernandez, A.I., S. Gómez, and C. Fernandez, 1997, The effect of board size and composition on corporate performance. In M. Balling, editor: *Corporate Governance, Financial Markets and Global Convergence* (Kluwer Academic Publishers, Boston).
- Furfine, C. H., 2001, Banks as monitors of other banks: evidence from the overnight federal funds market, *Journal of Business* 74(1), 33-57.
- Harris, M., and A. Raviv, 2007, A theory of board control and size, Forthcoming in *Review of Financial Studies*.
- Helland, E. and M. Sykuta, 2004, Regulation and the Evolution of Corporate Boards: Monitoring, Advising, or Window Dressing? *Journal of Law and Economics*, XLVII, 167-193
- Hermalin, B. E., and M. S. Weisbach, 1991, The effects of board composition and direct incentives on firm performance, *Financial Management*, Winter, 101-112.
- Hermalin, B. E., and M. S. Weisbach, 2003, Board of directors as an endogenously determined institution: A survey of the economic literature, *FRBNY Economic Policy Review*, April, 7-26.
- Hubbard R.G. and D. Palia (1995): Executive pay and performance Evidence from the U.S. banking industry, *Journal of Financial Economics* 39 (1), 105-130.
- James, C. M., 1984, An analysis of the effect of state acquisition laws on managerial efficiency: the case of banking, *Journal of Political Economy* 95, 355-370
- Jensen, M. C., 1986, Agency costs and free cash flow, corporate finance and takeovers. *American Economic Review* 76, 659-665.
- John, K., and L. W. Senbet, 1998, Corporate governance and board effectiveness, *Journal of Banking and Finance* 22, 371-403.

- Jones, D., 1998, Emerging problems with the accord: Regulatory capital arbitrage and related issue, Working Paper, Federal Reserve Board of Governors.
- Klein, A., 1998, Firm performance and board committee structure, *Journal of Law and Economics* 41, 275-303.
- La Porta, R., F. López de Silanes, and A. Shleifer, 1998, Law and Finance, *Journal of Political Economy* 106, 1113-1155
- La Porta, R., F. López de Silanes, and A. Shleifer, 2002, Government ownership of commercial banks, *Journal of Finance* 57, 265-301
- Levine, R., 2003, The Corporate governance of the banks, Working Paper, Global Corporate Governance Forum.
- Macey, J. and M. O'Hara, 2003a, The corporate governance of banks, *FRBNY Economic Policy Review*, April, 91-107.
- Macey, J. R., and M. O'Hara, 2003b, Solving the corporate governance problems of banks: a proposal. *The Banking Law Journal*, 109, 326-347.
- Micco, A.; U. Panizza and M. Yañez. (2004): Bank ownership and performance, Working Paper # 518, Inter-American Development Bank, Washington DC.
- Morgan, D., 2002, Rating banks: Risk and uncertainty in an opaque industry, *American Economic Review* 92, 874-88.
- Prowse, S., 1997a, Corporate control in commercial banks, *Journal of Financial Research* 20, 509-527.
- Prowse, S., 1997b, The corporate governance system in banking: what do we know? *BNL Quarterly Review*, Special Issue, March, 11-40
- Rosenstein, S., and J.G. Wyatt, 1997, Inside directors, board effectiveness and shareholder wealth, *Journal of Financial Economics* 44, 229-250.
- Santomero, A. M., 1997, Effective Financial Intermediation, in Kim B. Staking, editor: *Policy-based finance and alternatives: East Asian lessons for Latin America and the Caribbean*, (Inter-American Development Bank).
- Santomero, A.M., 1998, The regulatory and public policy agenda for effective intermediation in post-soviet economies, in J. Doukas, V. Murinde and C. Wihlborg, eds.: *Financial Sector Reform and Privatization in Transition Economies* (7), 153-175 (Elsevier Science Publishers B.V.).
- Vafeas, N., 1999, Board meeting frequency and firm performance, *Journal of Financial Economics* 53, 113-142.
- Windmeijer, F., 2000, A Finite Sample Correction for the Variance of Linear Two-Step Gmm Estimators. WP 00/19, The Institute For Fiscal Studies.
- Wooldridge, J.M., 2002, *Econometric analysis of cross section and panel data*, The MIT press, Cambridge, Mass., USA.
- Yermack, D., 1996, Higher market valuation of companies with a small board of directors, *Journal of Financial Economics* 40, 185-211.
- Zingales, L., 1998, Corporate governance, CEPR Discussion paper no. 1806.

**Table 1**  
**Statistics**

The table shows the mean, median, standard deviation, minimum, and maximum values of the following variables: Tobin's Q proxy (Q), return on assets (ROA), shareholders' monthly market return on an annual basis (SMR), board size (BOASIZE), proportion of outside directors (OUTSIDERS), number of meetings per year (MEYEAR), total bank assets in U.S. \$ millions (SIZE), and loans to bank customers scaled by total assets at book value (LOANSTA). We calculate all values from the 620 bank-year observations for commercial banks in Canada, France, the UK, Italy, Spain, and the U.S. from 1996 to 2005.

Source: Spencer Stuart Database and Global Vantage Database

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Q	620	1.1504	1.081	0.2591	0.86631	3.8472
ROA	620	1.0184	0.8483	0.8940	-8.9965	7.7050
SMR	620	0.2192	0.1365	0.4176	-0.8209	4.0821
BOASIZE	620	15.7820	16	4.4648	6	32
OUTSIDERS	620	0.7913	0.8235	0.1499	0	1
MEYEAR	620	10.4540	10	4.649	4	42
SIZE	620	184909	91872.4	236522	79.6452	1501970
LOANSTA	620	0.4976	0.5067	0.1607	0.0046	0.8650

**Table 2**  
**Statistics per Country (1996-2005)**

The table shows the average values per country of board size (BOASIZE), proportion of non-executive directors (OUTSIDERS), board meetings per year (MEYEAR), total assets at book value in US \$ millions (SIZE), proportion of a country's bank deposits scaled by GDP (DBG), bank concentration measured by the proportion of the five main banks' assets over total bank assets (CB5), Tobin's Q proxy (Q), return on assets (ROA), and shareholder market return on a yearly basis (SMR).

	Obs	BOASIZE	OUTSIDERS	MEYEAR	lnSIZE	Q	ROA (%)	SMR
CANADA	61/6	19.688*	0.8554*	12.34*	12.2691	1.051*	0.6144	0.2158
FRANCE	34/4	17.264	0.7524	7.352*	12.0600	1.021	0.3495	0.3115
ITALY	108/13	15.426	0.8979*	16.10*	4.3735*	1.192*	0.8235	0.3105
SPAIN	78/9	14.731	0.7235	9.897	8.0233	1.092	0.7926	0.2097
UK	82/9	15.524	0.5994*	10.480	9.8068	1.082	0.7645	0.1531
US	256/28	15.203	0.8183*	8.183	8.4005	1.213*	1.437*	0.1937
ALL	620/69	15.780	0.7913	10.450	12.120	1.150	1.019	0.2194

\* Mean difference test statistically significant at 5 %.

**Table 3****Board characteristics and value creation. OLS Estimations**

We report the OLS estimations. The dependent variable is Tobin's Q proxy (Q). Explanatory variables are: board size (BOASIZE), board size squared (BOASIZE SQ), proportion of outside directors (OUTSIDERS), meetings per year (MEYEAR), the control variables that measure bank business (log of bank total assets -lnSIZE-; the ratio of loans to total assets, LOANSTA), the time dummies, and the country dummies.. P-values of coefficient significance are in brackets.

Dep.V.: Q	Coef.	P> t	Coef.	P> t	Coef.	P> t
BOASIZE	-.043850	***(.000)	-.041822	*** (.000)	-.058109	*** (.000)
BOASIZE SQ	.001149	*** (.001)	.001114	*** (.000)	.001658	*** (.000)
OUTSIDERS	.012467	(.853)	.038362	(.528)	-.118474	* (.097)
MEYEAR	-.005419	** (.010)	-.007662	*** (.000)	-.005336	** (.022)
LnSIZE	-.053557	*** (.000)	-.055652	*** (.000)	-.056946	*** (.000)
LOANSTA			-.559282	*** (.000)	-.573767	*** (.000)
y97			.086226	** (.031)	.078943	** (.038)
y98			.155428	*** (.000)	.145124	*** (.000)
y99			.152514	*** (.000)	.134215	*** (.000)
y00			.212923	*** (.000)	.197125	*** (.000)
y01			.091870	** (.017)	.079686	** (.029)
y02			.059336	(.124)	.047653	(.196)
y03			.095734	** (.015)	.092000	** (.014)
y04			.106980	*** (.007)	.102952	*** (.007)
y05			.113506	*** (.006)	.111196	*** (.005)
ctr1					-.041085	(.263)
ctr2					-.112325	** (.025)
ctr4					-.172671	*** (.000)
ctr5					-.040832	(.319)
ctr6					.052159	* (.097)
_cons	2.18940	*** (.000)	2.36317	*** (.000)	2.62018	*** (.000)
F-Rat	24.86	*** (.000)	20.33	*** (.000)	20.59	*** (.000)
R-sq	0.1684		0.3355		0.4074	
Adj R-Sq	0.1616		0.3190		0.3876	

Statistically significant at 1 % (\*\*\*), 5 % (\*\*) and 10 % (\*)

**Table 4**  
**Board characteristics and value creation. Within Estimator.**

We report the Within estimations. The dependent variable is Tobin's Q proxy (Q). Explanatory variables are: board size (BOASIZE), board size squared (BOASIZE SQ), proportion of outside directors (OUTSIDERS), meetings per year (MEYEAR), the control variables that measure bank business (log of bank total assets – lnSIZE-; the ratio of loans to total assets, LOANSTA), the time dummies, and the country dummies.. P-values of coefficient significance are in brackets.

Dep.V.: Q	Coef.	P> t	Coef.	P> t	Coef.	P> t
BOASIZE	-.022999	*(.090)	-.023762	* (.060)	-.031869	** (.010)
BOASIZE SQ	.000586	(.102)	.000576	* (.086)	.000824	** (.013)
OUTSIDERS	-.045114	(.564)	-.050356	(.488)	-.111339	(.147)
MEYEAR	-.003996	(.168)	-.006018	** (.023)	-.005311	* (.064)
LnSIZE	-.060779	*** (.000)	-.055235	*** (.000)	-.056663	*** (.000)
LOANSTA			-.435502	*** (.000)	-.467833	*** (.000)
y97			.065787	** (.046)	.066989	** (.044)
y98			.128656	*** (.000)	.130069	*** (.000)
y99			.125742	*** (.000)	.124238	*** (.000)
y00			.180824	*** (.000)	.181007	*** (.000)
y01			.055212	* (.093)	.056551	* (.087)
y02			.017769	(.594)	.020317	(.545)
y03			.053394	(.117)	.059301	* (.084)
y04			.060156	* (.086)	.066423	* (.059)
y05			.070666	* (.053)	.076991	** (.036)
ctr1					-.033986	(.598)
ctr2					-.114218	(.166)
ctr4					-.154017	*** (.009)
ctr5					-.051414	(.417)
ctr6					.046425	(.349)
_cons	2.12266	*** (.000)	2.23996	*** (.000)	2.389526	*** (.000)
Chi Sq	39.10	*** (.000)	144.54	*** (.000)	187.19	*** (.000)
R-sq within	0.0276		0.1376		0.1343	
R-sq between	0.2633		0.4757		0.6070	
R-sq overall	0.1633		0.3263		0.3966	

Statistically significant at 1 % (\*\*\*), 5 % (\*\*) and 10 % (\*)

**Table 5**  
**Board characteristics and value creation. System Estimator.**

We report the two-step GMM system estimator (SE) with the robust adjustment for small samples proposed by Windmeijer (2000). The dependent variable is Tobin's Q proxy (Q). Explanatory variables are: board size (BOASIZE), board size squared (BOASIZE SQ), proportion of outside directors (OUTSIDERS), meetings per year (MEYEAR), the control variables that measure bank business (log of bank total assets –lnSIZE-; the ratio of loans to total assets, LOANSTA), time dummies, and country dummies.. P-values of coefficient significance are in brackets.

Dep.V.: Q	Coef	P> t						
BOASIZE	0.1307	***(.001)	0.1266	**(.011)	0.1298	**(.047)	0.1210	**(.039)
BOASIZE SQ	-0.0033	***(.001)	-0.0032	**(.015)	-0.0033	**(.047)	-0.0032	**(.045)
OUTSIDERS	0.8878	**(.018)	0.8801	**(.038)	0.7091	**(.018)	0.4944	**(.017)
MEYEAR	0.0129	(.370)	0.0136	(.281)	0.0113	(.175)	0.0095	(.342)
LnSIZE	-0.0761	**(.023)	-0.0758	**(.039)	-0.0724	*(.091)	-0.0488	(.225)
LOANSTA			0.06447	(.829)	0.1758	(.585)	0.1959	(.501)
y97d					0.0355	(.395)	0.0509	(.396)
y98d					0.0525	*(.091)	0.0496	(.184)
y99d					0.0231	(.440)	0.0144	(.615)
y00d					0.0489	*(.101)	0.0565	*(.081)
y01d					-0.0928	***(.004)	-0.0845	**(.016)
y02d					-0.0622	***(.000)	-0.0585	**(.016)
y03d					0.0162	(.332)	0.0255	*(.091)
y04d					0.0067	(.657)	0.0025	(.876)
y05d					0.0075	(.559)	0.0035	(.838)
ctr1d							-0.0017	(.906)
ctr2d							-0.0314	(.502)
ctr4d							-0.0013	(.872)
ctr5d							-0.0064	(.797)
ctr6d							0.1210	**(.039)
Optimum board size	20		20		19		19	
F Test	489.20	***(.000)	407.21	***(.000)	193.95	***(.000)	192.47	***(.000)
Test Hansen chi2	64.04	(.496)	63.27	(.999)	52.45	(.999)	49.91	(.999)
AR(1)	-0.79	(.430)	-0.79	(.429)	-0.84	(.404)	-0.80	(.422)
AR(2)	-1.07	(.284)	-1.11	(.268)	-1.15	(.252)	-1.05	(.292)

Statistically significant at 1 % (\*\*\*), 5 % (\*\*) and 10 % (\*)

**Table 6**  
**Board characteristics and value creation: Board Composition.**

We report the two-step GMM system estimator (SE) with the robust adjustment for small samples proposed by Windmeijer (2000). The dependent variable is Tobin's Q proxy (Q). Explanatory variables are: board size (BOASIZE), proportion of outside directors (OUTSIDERS), proportion of outside directors squared (OUTSIDERS SQ), meetings per year (MEYEAR), the control variables that measure bank business (log of bank total assets -lnSIZE-; the ratio of loans to total assets, LOANSTA), the time dummies, and the country dummies.. P-values of coefficient significance are in brackets.

Dep.V.: Q	Coef.	P> t	Coef.	P> t	Coef.	P> t
BOASIZE	-.007737	(.142)	-.000053	(.993)	-.0016932	(.743)
OUTSIDERS	3.850641	*** (.000)	4.754660	*** (.000)	4.399603	*** (.000)
OUTSIDERS SQ	-2.250726	*** (.000)	-2.976308	*** (.000)	-2.801552	*** (.000)
MEYEAR	.010380	(.255)	.005029	(.484)	.0029521	(.591)
LnSIZE	-.058999	*** (.004)	-.057238	*** (.003)	-.0411926	* (.100)
LOANSTA			-.314319	(.250)	-.1991683	(.589)
y97			.052897	* (.067)	.0528444	(.117)
y98			.071463	** (.017)	.0744619	** (.017)
y99			-.017005	(.501)	-.016967	(.556)
y00			.056449	** (.038)	.0573875	** (.029)
y01			-.091997	** (.013)	-.0901049	** (.010)
y02			-.055096	** (.016)	-.04949	** (.018)
y03			.022484	** (.048)	.0258168	** (.050)
y04			.005429	(.695)	.0013191	(.906)
y05			.001002	(.934)	.0039966	(.717)
ctr1					.0020224	(.871)
ctr2					-.0162151	(.692)
ctr4					-.0028774	(.627)
ctr5					-.0220145	(.372)
ctr6					-.0005067	(.939)
Optimum	0.85		0.80		0.78	
F test	881.18	*** (.000)	688.27	*** (.000)	383.93	*** (.000)
Hansen Test	67.28	(.365)	65.74	(.131)	61.07	(.116)
AR(1)	-0.97	(.332)	-0.96	(.336)	-0.96	(.338)
AR(2)	-0.82	(.415)	-0.69	(.488)	-0.70	(.485)

Statistically significant at 1 % (\*\*\*), 5 % (\*\*) and 10 % (\*)

**Table 7****Board characteristics and alternative measures of bank performance**

Column A shows regression results over the dependent variable return on assets (ROA). Column B shows regression results over the dependent variable shareholder market return (SMR). We report the two-step GMM system estimator (SE) with robust adjustment for small samples proposed by Windmeijer (2000). Explanatory variables are: board size (BOASIZE), board size squared (BOASIZE SQ), proportion of outside directors (OUTSIDERS), meetings per year (MEYEAR), the log of total bank assets (lnSIZE); time dummies, and country dummies. P-values of coefficient significance are in brackets.

	Column A.- ROA		Column B.-SMR	
	Coef	P> t	Coef	P> t
BOASIZE	0.24053	**(.050)	0.08028	***(.005)
BOASIZE SQ	-0.00617	*(.056)	-0.00209	***(.003)
OUTSIDERS	0.83152	*(.077)	0.36076	(.113)
MEYEAR	0.00011	(.996)	0.00595	(.351)
lnSIZE	-0.17491	**(.090)	-0.06949	***(.003)
y97d	0.00680	(.940)	0.44674	***(.000)
y98d	0.05205	(.380)	-0.36233	***(.000)
y99d	0.23463	***(.000)	-0.16553	***(.003)
y00d	-0.01110	(.861)	0.15111	*(.052)
y01d	-0.31073	**(.011)	-0.31070	***(.000)
y02d	0.12569	(.168)	-0.04925	(.202)
y03d	0.00661	(.883)	0.40075	***(.000)
y04d	0.10854	**(.013)	-0.21109	***(.000)
y05d	-0.00135	(.978)	0.05321	**(.048)
ctr1d	0.05063	(.210)	0.00736	(.585)
ctr2d	-0.05234	(.610)	0.07202	**(.015)
ctr4d	-0.01563	(.468)	-0.01023	(.171)
ctr5d	-0.07931	(.331)	-0.00123	(.944)
ctr6d	0.01085	(.490)	-0.00661	(.328)
Optimum board size	19		19	
F Test	22.76	***(.000)	26.9	***(.000)
Hansen test	46.61	(.610)	49.40	(.497)
AR(1)	-1.40	(.162)	-2.90	(.004)
AR(2)	-0.44	(.663)	-0.11	(.915)

Statistically significant at 1 % (\*\*\*), 5 % (\*\*) and 10 % (\*)

Table 8

**Board Characteristics, Performance and Regulatory and Institutional Setting**

We report the two-step GMM system estimator (SE) with robust adjustment for small samples proposed by Windmeijer (2000). The dependent variable is Tobin's Q proxy (Q) in all estimations. Explanatory variables are: board size (BOASIZE), board size squared (BOASIZE SQ), proportion of outside directors (OUTSIDERS), meetings per year (MEYEAR), log of total bank assets (lnSIZE); proportion of a country's bank deposits scaled by GDP (TDGPD), time dummies, country dummies, and several variables that account for regulation and institutional setting. In Panel I, these variables are bank activity and ownership restrictiveness (BAOR); in Panel 2, official supervisory power (OSP); in Panel 3, prompt corrective action (PCA); in Panel 4, ownership of banks by Government (OBG); and in Panel 5, the degree of investors' legal protection (ILP). DON'T FORGET TO ADD THE ZEROES!

	1		2		3		4		5		6	
	Coef	P> t	Coef	P> t								
BOASIZE	0.13186	***(.006)	0.14017	***(.002)	0.12977	***(.004)	0.12242	**(.033)	0.12884	***(.008)		
BOASIZE SQ	-0.0035	***(.004)	-0.0037	***(.002)	-0.0034	***(.004)	-0.0032	**(.026)	-0.0034	***(.007)		
OUTSIDERS	0.73780	**(.016)	0.71425	**(.010)	0.65802	**(.013)	0.66620	***(.010)	0.60702	***(.004)		
MEYEAR	0.00867	(.303)	0.01054	(.223)	0.01192	(.141)	0.01397	**(.129)	0.00836	(.385)		
lnSIZE	-0.0763	**(.027)	-0.0830	**(.014)	-0.0759	***(.005)	-0.0694	*(.059)	-0.0654	*(.098)		
tdgdp	0.21692	(.297)	0.21868	(.317)	0.29689	(.162)	0.07217	(.759)	0.23739	(.166)		
y97d	0.05147	(.287)	0.05389	(.278)	0.05859	(.293)	0.05111	(.234)	0.04904	(.287)		
y98d	0.05358	*(.071)	0.05102	*(.076)	0.05074	*(.074)	0.04553	(.137)	0.05408	**(.034)		
y99d	0.02475	(.481)	0.01454	(.647)	0.01335	(.627)	0.01050	(.739)	0.01483	(.631)		
y00d	0.04554	*(.099)	0.05530	*(.076)	0.04821	*(.074)	0.04996	(.152)	0.04598	*(.077)		
y01d	-0.0951	***(.006)	-0.0928	***(.010)	-0.0965	***(.004)	-0.1002	**(.011)	-0.0976	***(.006)		
y02d	-0.0684	***(.001)	-0.0700	***(.001)	-0.0694	***(.000)	-0.0650	***(.001)	-0.0664	***(.001)		
y03d	0.01068	(.487)	0.01365	(.404)	0.01648	(.301)	0.01485	(.379)	0.01502	(.300)		
y04d	0.01349	(.385)	0.01521	(.410)	0.01359	(.344)	0.00454	(.817)	0.01372	(.323)		
y05d	0.00703	(.673)	0.00775	(.558)	0.00748	(.566)	0.00570	(.682)	0.00361	(.815)		
BAOR1D	-0.0021	(.655)										
BAOR2D	0.00219	(.836)										
OSP1D			0.00027	(.954)								
OSP2D			-0.0026	(.752)								
PCA1D					-0.0020	(.659)						
PCA2D					-0.0037	(.498)						
OBG1D							0.00169	(.322)				
ILP1									0.00521	(.722)		
ILP3									-0.0192	(.584)		
ILP4									-0.0015	(.798)		
	19		19		19		19		19			
F Test	209.83	***(.000)	201.51	***(.000)	281.70	***(.000)	307.5	***(.000)	257.84	***(.000)		
Hansen test $\chi^2$	55.59	(.341)	55.89	(.331)	5.90	(.517)	55.85	(.368)	49.88	(.518)		
AR(1)	-0.83	(.407)	-0.82	(.411)	-.82	(.412)	-0.84	(.401)	-0.81	(.420)		
AR(2)	-1.06	(.290)	-1.11	(.265)	-1.05	(.293)	-1.01	(.315)	-1.02	(.307)		

Statistically significant at 1 % (\*\*\*), 5 % (\*\*) and 10 % (\*)

## Appendix

### Regulation, Ownership and Banking System Characteristics.

Panel A: Bank activity and ownership restrictiveness (BAOR) measures the overall degree to which banks are permitted to engage in securities, insurance, and real estate activities, and the extent to which they can own nonfinancial firms. The measures range from one to four. The lowest value indicates that no restrictions are placed on this type of diversification by banks. The highest value indicates that such diversification is prohibited. We build three dummy variables from the BAOR index: Canada, France, Spain, and the UK have the lowest BAOR values, Italy is in the middle, and the U.S. has the highest value. Official supervisory power (OSP) measures whether officials have the authority to take specific action to prevent and correct problems. This measure ranges from zero to 16. The higher the value, the more power officials have. We build three dummy variables from the OSP index: one each for Canada, France and Italy; Spain and the UK; and the U.S. Prompt corrective action (PCA) measures whether laws establish predetermined levels of bank solvency that forces action by the authorities. This measure ranges from zero to six. A higher value indicates greater promptness to respond to problems. We build three dummy variables from the PCA index: Canada, France, Italy, and the UK; Spain; and the U.S. Deposit insurance design (DID) takes the value of one if it has a limit per person (Italy, Spain, and the UK), two if the limit is by account (Canada and the U.S.), and three if it has both limits (France).

Panel B: Bank deposits over GDP (TDGDP) measures the relevance of the bank deposits in each country, and Bank concentration (BC5) measures the proportion of a country's bank assets as reported in the balance sheet of the five largest banks.

Panel C: 5OWN04, 5OWN99 and 5OWN96 are dummy variables that take the value of one when the main shareholder holds less than 5 % of the shares for 2004, 1999 and 1996 and 0 otherwise. In other words, there is no controlling shareholder in that year. CH&CEO is a dummy that takes the value of one when the Chair is also the CEO, and zero otherwise.

Panel D: Legal protection (ILP) measures the degree of investor protection. This measure ranges from zero to six.

Source: Beck, Demirgüç-Kunt, and Levine (2000 and 2006), La Porta et al., (1998), and Bureau Van Dyck databases.

		Canada	France	Italy	Spain	UK	U.S.
<i>Panel A: Bank Regulation.</i>							
Bank activity and ownership restrictiveness	BAOR	1.8	1.5	2.5	1.8	1.3	3
Official supervisory power	OSP	7	8	6	10	12	14
Prompt corrective action	PCA	0	0	0	3	0	5
Deposit insurance design	DID	2	3	1	1	1	2
<i>Panel B: Banking Industry Size</i>							
Bank deposits / GDP	TDGDP	0.75	1.02	0.99	1.11	1.24	0.78
Bank concentration	BC5	0.52	0.32	0.28	0.49	0.26	0.24
<i>Panel C: Bank Ownership Structure</i>							
Minority control (2004)	5OWN04	0.860	0.000	0.210	0.115	0.475	0.523
Minority control (1999)	5OWN99	0.640	0.000	0.460	0.333	0.536	0.937
Minority control (1996)	5OWN96	0.820	0.000	0.550	0.397	0.549	0.785
Chairman = CEO	CH&CEO	0.524	0.760	0.000	0.884	0.109	0.890
<i>Panel D: Investors Legal Protection</i>							
Legal Protection	ILP	5	3	1	4	5	5

## Edicions / Issues:

- 95/1 *Productividad del trabajo, eficiencia e hipótesis de convergencia en la industria textil-confección europea*  
Jordi López Sintas
- 95/2 *El tamaño de la empresa y la remuneración de los máximos directivos*  
Pedro Ortín Ángel
- 95/3 *Multiple-Sourcing and Specific Investments*  
Miguel A. García-Cestona
- 96/1 *La estructura interna de puestos y salarios en la jerarquía empresarial*  
Pedro Ortín Ángel
- 96/2 *Efficient Privatization Under Incomplete Contracts*  
Miguel A. García-Cestona  
Vicente Salas-Fumás
- 96/3 *Institutional Imprinting, Global Cultural Models, and Patterns of Organizational Learning: Evidence from Firms in the Middle-Range Countries*  
Mauro F. Guillén (The Wharton School, University of Pennsylvania)
- 96/4 *The relationship between firm size and innovation activity: a double decision approach*  
Ester Martínez-Ros (Universitat Autònoma de Barcelona)  
José M. Labeaga (UNED & Universitat Pompeu Fabra)
- 96/5 *An Approach to Asset-Liability Risk Control Through Asset-Liability Securities*  
Joan Montllor i Serrats  
María-Antonia Tarrazón Rodón
- 97/1 *Protección de los administradores ante el mercado de capitales: evidencia empírica en España*  
Rafael Crespi i Cladera
- 97/2 *Determinants of Ownership Structure: A Panel Data Approach to the Spanish Case*  
Rafael Crespi i Cladera
- 97/3 *The Spanish Law of Suspension of Payments: An Economic Analysis From Empirical Evidence*  
Esteban van Hemmen Almazor
- 98/1 *Board Turnover and Firm Performance in Spanish Companies*  
Carles Gispert i Pellicer
- 98/2 *Libre competencia frente a regulación en la distribución de medicamentos: teoría y evidencia empírica para el caso español*  
Eva Jansson
- 98/3 *Firm's Current Performance and Innovative Behavior Are the Main Determinants of Salaries in Small-Medium Enterprises*  
Jordi López Sintas y Ester Martínez Ros

- 98/4 *On The Determinants of Export Internalization: An Empirical Comparison Between Catalan and Spanish (Non-Catalan) Exporting Firms*  
Alex Rialp i Criado
- 98/5 *Modelo de previsión y análisis del equilibrio financiero en la empresa*  
Antonio Amorós Mestres
- 99/1 *Avaluació dinàmica de la productivitat dels hospitals i la seva descomposició en canvi tecnològic i canvi en eficiència tècnica*  
Magda Solà
- 99/2 *Block Transfers: Implications for the Governance of Spanish Corporations*  
Rafael Crespí, and Carles Gispert
- 99/3 *The Asymmetry of IBEX-35 Returns With TAR Models*  
M.<sup>a</sup> Dolores Márquez, César Villazón
- 99/4 *Sources and Implications of Asymmetric Competition: An Empirical Study*  
Pilar López Belbeze
- 99/5 *El aprendizaje en los acuerdos de colaboración interempresarial*  
Josep Rialp i Criado
- 00/1 *The Cost of Ownership in the Governance of Interfirm Collaborations*  
Josep Rialp i Criado, i Vicente Salas Fumás
- 00/2 *Reasignación de recursos y resolución de contratos en el sistema concursal español*  
Stefan van Hemmen Alamazor
- 00/3 *A Dynamic Analysis of Intrafirm Diffusion: The ATMs*  
Lucio Fuentelsaz, Jaime Gómez, Yolanda Polo
- 00/4 *La Elección de los Socios: Razones para Cooperar con Centros de Investigación y con Proveedores y Clientes*  
Cristina Bayona, Teresa García, Emilio Huerta
- 00/5 *Inefficient Banks or Inefficient Assets?*  
Emili Tortosa-Ausina
- 01/1 *Collaboration Strategies and Technological Innovation: A Contractual Perspective of the Relationship Between Firms and Technological Centers*  
Alex Rialp, Josep Rialp, Lluís Santamaria
- 01/2 *Modelo para la Identificación de Grupos Estratégicos Basado en el Análisis Envoltante de Datos: Aplicación al Sector Bancario Español*  
Diego Prior, Jordi Surroca
- 01/3 *Seniority-Based Pay: Is It Used As a Motivation Device?*  
Alberto Bayo-Moriones
- 01/4 *Calidad de Servicio en la Enseñanza Universitaria: Desarrollo y Validación de una Escala de Medida.*  
Joan-Lluís Capelleras, José M.<sup>a</sup> Veciana

- 01/5 *Enfoque estructural vs. recursos y capacidades: un estudio empírico de los factores clave de éxito de las agencias de viajes en España.*  
Fabiola López-Marín, José M.<sup>a</sup> Veciana
- 01/6 *Opción de Responsabilidad Limitada y Opción de Abandonar: Una Integración para el Análisis del Coste de Capita.*  
Neus Orgaz
- 01/7 *Un Modelo de Predicción de la Insolvencia Empresarial Aplicado al Sector Textil y Confección de Barcelona (1994-1997).*  
Antonio Somoza López
- 01/8 *La Gestión del Conocimiento en Pequeñas Empresas de Tecnología de la Información: Una Investigación Exploratoria.*  
Laura E. Zapata Cantú
- 01/9 *Marco Institucional Formal de Creación de Empresas en Catalunya: Oferta y Demanda de Servicios de Apoyo*  
David Urbano y José María Veciana.
- 02/1 *Access as a Motivational Device: Implications for Human Resource Management.*  
Pablo Arocena, Mikel Villanueva
- 02/2 *Efficiency and Quality in Local Government. The Case of Spanish Local Authorities*  
M.T. Balaguer, D. Prior, J.M. Vela
- 02/3 *Single Period Markowitz Portfolio Selection, Performance Gauging and Duality: A variation on Luenberger's Shortage Function*  
Walter Briec, Kristiaan Kerstens, Jean Baptiste Lesourd
- 02/4 *Innovación tecnológica y resultado exportador: un análisis empírico aplicado al sector textil-confección español*  
Rossano Eusebio, Àlex Rialp Criado
- 02/5 *Caracterización de las empresas que colaboran con centros tecnológicos*  
Lluís Santamaria, Miguel Ángel García Cestona, Josep Rialp
- 02/6 *Restricción de crédito bancario en economías emergentes: el caso de la PYME en México*  
Esteban van Hemmen Almazor
- 02/7 *La revelación de información obligatoria y voluntaria (activos intangibles) en las entidades de crédito. Factores determinantes.*  
Gonzalo Rodríguez Pérez
- 02/8 *Measuring Sustained Superior Performance at the Firm Level*  
Emili Grifell - Tatjé, Pilar Marquès - Gou
- 02/9 *Governance Mechanisms in Spanish Financial Intermediaries*  
Rafel Crespi, Miguel A. García-Cestona, Vicente Salas
- 02/10 *Endeudamiento y ciclos políticos presupuestarios: el caso de los ayuntamientos catalanes*  
Pedro Escudero Fernández, Diego Prior Jiménez

- 02/11 *The phenomenon of international new ventures, global start-ups, and born-globals: what do we know after a decade (1993-2002) of exhaustive scientific inquiry?*  
Alex Rialp-Criado, Josep Rialp-Criado, Gary A. Knight
- 03/1 *A methodology to measure shareholder value orientation and shareholder value creation aimed at providing a research basis to investigate the link between both magnitudes*  
Stephan Hecking
- 03/2 *Assessing the structural change of strategic mobility. Determinants under hypercompetitive environments*  
José Ángel Zúñiga Vicente, José David Vicente Lorente
- 03/3 *Internal promotion versus external recruitment: evidence in industrial plants*  
Alberto Bayo-Moriones, Pedro Ortín-Ángel
- 03/4 *El empresario digital como determinante del éxito de las empresas puramente digitales: un estudio empírico*  
Christian Serarols, José M.<sup>a</sup> Veciana
- 03/5 *La solvencia financiera del asegurador de vida y su relación con el coste de capital*  
Jordi Celma Sanz
- 03/6 *Proceso del desarrollo exportador de las empresas industriales españolas que participan en un consorcio de exportación: un estudio de caso*  
Piedad Cristina Martínez Carazo
- 03/7 *Utilidad de una Medida de la Eficiencia en la Generación de Ventas para la Predicción del Resultado*  
María Cristina Abad Navarro
- 03/8 *Evaluación de fondos de inversión garantizados por medio de portfolio insurance*  
Sílvia Bou Ysàs
- 03/9 *Aplicación del DEA en el Análisis de Beneficios en un Sistema Integrado Verticalmente Hacia Adelante*  
Héctor Ruiz Soria
- 04/1 *Regulación de la Distribución Eléctrica en España: Análisis Económico de una Década, 1987-1997*  
Leticia Blázquez Gómez; Emili Grifell-Tatjé
- 04/2 *The Barcelonnettes: an Example of Network-Entrepreneurs in XIX Century Mexico. An Explanation Based on a Theory of Bounded Rational Choice with Social Embeddedness.*  
Gonzalo Castañeda
- 04/3 *Estructura de propiedad en las grandes sociedades anónimas por acciones. Evidencia empírica española en el contexto internacional*  
Rabel Crespí; Eva Jansson
- 05/1 *IFRS Adoption in Europe: The Case of Germany.*  
Soledad Moya, Jordi Perramon, Anselm Constans

- 05/2 *Efficiency and environmental regulation: a 'complex situation'*  
Andrés J. Picazo-Tadeo, Diego Prior
- 05/3 *Financial Development, Labor and Market Regulations and Growth*  
Raquel Fonseca, Natalia Utrero
- 06/1 *Entrepreneurship, Management Services and Economic Growth*  
Vicente Salas Fumás, J. Javier Sánchez Asín
- 06/2 *Triple Bottom Line: A business metaphor for a social construct*  
Darrel Brown, Jesse Dillard, R. Scott Marshall
- 06/3 *El Riesgo y las Estrategias en la Evaluación de los Fondos de Inversión de Renta Variable*  
Sílvia Bou
- 06/4 *Corporate Governance in Banking: The Role of the Board of Directors*  
Pablo de Andrés Alonso, Eleuterio Vallelado González