AN ANALYSIS OF THE FACTORS DRIVING THE VOLUNTARY CREATION OF AUDIT COMMITTEES: EVIDENCE IN THE CASE OF SPAIN+

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Abstract

Following the publication of the Spanish Code of Corporate Good Governance in 1998 (known as the Olivencia Code), some companies voluntarily created audit committees in line with the recommendation that all firms, and especially listed companies, should do so. The aim of this work is to analyse the factors associated with voluntary audit committee formation in companies listed on the Spanish Capital Market through 1999. In particular we analyse factors such as board independence and size, the board chairman/CEO duality, auditor size, agency costs, ownership, economies of scale, institutional investors, the audit report and auditor tenure. We find that voluntary audit committee formation is positively correlated with the proportion of independent directors on the board of directors and economies of scale, while the evidence reveals a non-linear (quadratic) relationship between board size and voluntary audit committee formation. We also formed another sample excluding financial institutions, for which we found that audit committee formation is positively associated with board independence and economies of scale, and negatively associated with the audit report and audit tenure.

Keywords: audit committee; voluntary formation; corporate governance

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1. Introduction

Spanish interest in Codes of Good Governance (hereinafter CGG) as a means of improving management is relatively recent in comparison with the long tradition of such Codes in the English-speaking nations (see García Benau *et al.,* 2003), while the audit committee (AC) has gained a key role as the body entrusted with controlling and overseeing the preparation and public reporting of financial information in order to assure quality, reliability and credibility (Wolnizer, 1995).

A succession of international financial scandals, of which the Gescartera, BBVA, Forum Filatélico and Afinsa cases are the touchstones in Spain, made clear the need to further strengthen the effectiveness of ACs. For example, the Sarbanes-Oxley Act (2002) tightened the requirements for AC membership and competences, and established the duty of public disclosure of information relevant to the appointment of the external auditor, among other matters (see Willekens *et al.,* 2004, among others).

After the publication of the Olivencia Report in Spain in 1998, the Financial System Reform Act (2002), the Listed Companies Transparency Act (2003), the Aldama Report (2003) and the recently approved Unified Code of Good Governance (2006) have all envisaged the progressive implementation of mechanisms to improve corporate governance. The AC, which became mandatory for listed companies with the passage of the Financial System Reform Act, has consolidated its status as a key body in this regard. Its objectives include the identification of the principal risks to which a firm is actually or potentially exposed (Conthe Code) and the restoration of user confidence in financial reporting by enhancing the transparency and credibility of the financial statements.

While the existing literature contains numerous studies analyzing the factors underlying the voluntary formation of ACs, the majority of these refer to English-speaking countries, which possess a longer CGG tradition and deep capital markets with widespread ownership of listed companies. In Spain, meanwhile, the implementation of Good Governance mechanisms has prompted the publication of a succession of papers, among which we may cite the work of Rodríguez Gutiérrez (2005) as an initial

contribution on the subject of voluntary AC formation, although it now needs to be fleshed out with new hypotheses and research issues.

In this paper, we propose to broaden the scope of studies in this field. Our objective is to determine the factors that led listed Spanish firms voluntarily to create ACs in 1999, the year after the publication of the Olivencia Code (CEECECAS, 1998). We consider a number of factors that have not previously been considered in studies of this nature, such as the presence of institutional investors on the Board of Directors, the type of audit report received and the duration of audit firms' engagements. In contrast to earlier studies, we have also looked at the existence of non-linear relations between board size and voluntary AC formation.

The results of our study are relevant to the understanding of the behavior of listed firms and testing of the hypotheses derived from agency theory in civil legislation based on markets outside the Anglo-Saxon (common law) sphere.

Though ACs are now mandatory for listed companies, it would be highly desirable for major Spanish concerns, whether listed or otherwise; gradually to implement CGG recommendations. In this light, the identification of the factors underlying AC formation could produce a *call effect* for other firms, thereby contributing to the generalization of ACs as a part of companies' organizational structures.

The paper continues as follows. Section 2, which comes after this introduction, provides a brief review of the existing literature, examining the methodologies employed and findings obtained from other studies. The third section describes the hypotheses tested, the methodology and the sample utilized in the empirical study. Section 4 presents and examines the results obtained, and in the last section we set out our main conclusions.

2. Review of the literature

The existing AC literature begins with an initial descriptive approach (Bacon, 1979 and Braiotta, 1986), whereafter we may discern three main lines of research. The first seeks basically to examine the effectiveness of ACs. To this end, scholars have empirically tested whether the existence of an AC in a firm improves the quality and credibility of published information, and whether it helps prevent fraudulent accounting practices. This involved examining a series of variables associated with the quality of financial information in order to establish whether there were any statistically significant differences between a group of firms that had set up ACs and another group that had not.

The second line of research emerged in the 1990s in response to growing doubts about the effectiveness of ACs following the publication of a number of studies that had detected managerial malpractice in firms that did have an AC as part of their governance

structure. This led some scholars to focus on the relationships between AC effectiveness and their internal functioning and membership (an excellent review of these two lines of research may be found in Turley and Zaman, 2004).

The objective of the third and final group of papers, into which this study falls, was to analyze the factors related with voluntary AC formation. Let us now look at this line of research. In the framework of agency theory and in the presence of information asymmetry, the creation of an AC provides a mechanism for the control of financial information. Given the additional cost of establishing a committee, various studies have sought to identify the characteristics of firms that have voluntarily created a control body of this kind.

The first point to note is the absence of conclusive evidence in those studies that examine the relationship between the different variables used to measure agency costs and the voluntary formation of an AC. This is the case even in research carried out in English-speaking countries, where agency theory has been more extensively verified. Thus, Collier (1993) concluded that certain factors associated with the separation between ownership and control, and debt had a positive influence on voluntary AC formation. The influence of agency costs was confirmed by Pincus *et al.* (1989) in the United States. These scholars found that factors such as a low level of share ownership by directors and a high level of debt or leverage had a significant influence. However, Piot (2004) showed in the French context that the percentage of shares owned by management was negatively associated with voluntary AC formation, and he was unable to find evidence of a statistically significant relationship with the firm's level of indebtedness. In contrast, Menon and Williams (1994), who considered firms in the US over-the-counter (OTC) market in 1986 and 87, Bradbury (1990), who looked at the New Zealand stock market, and Willekens *et al.* (2004), studying the Belgian context, found no significant association between the agency costs of debt and ownership, and voluntary AC formation.

Meanwhile, Pincus *et al.* (1989), Collier (1993), Menon and Williams (1994) and Willekens *et al.* (2004) looked at the characteristics of the Board of Directors, finding a positive association between the percentage of independent directors sitting on the board and voluntary AC formation, although Piot (2004) was unable to confirm this evidence in the French context.

Finally, Bradbury (1990) and Piot (2004) found a positive relationship between the number of members of the Board of Directors and voluntary AC formation, but Menon and Williams (1994), Willekens *et al.* (2004) and Rodríguez-Gutiérrez (2005), working in the Spanish context, failed to repeat these results.

Another factor that has been widely tested is the size of the audit firm. Thus, Pincus *et al.* (1989), Menon and Williams (1994), Willekens *et al.* (2004) and Piot (2004) all found a positive association between the examination of the financial statements by one of the audit majors and voluntary AC formation, though the results obtained by Bradbury (1990), Collier (1993) and Rodríguez Gutiérrez (2005) were not statistically significant.

A further factor analyzed is the size of the company (i.e. economies of scale derived from the implementation of other control mechanisms). Pincus *et al.* (1989), Willekens *et al.* (2004), Piot (2004) and Rodríguez Gutiérrez (2005) all found evidence for a positive correlation between this factor and voluntary AC formation, but their results were not corroborated by Bradbury (1990), Collier (1993) or Menon and Williams (1994).

Other factors that have been positively associated with voluntary AC formation include the liquidity of a firm's securities (Pincus *et al.*, 1989), investment in a company by other firms (Collier, 1993) and listing on a new market (Rodríguez Gutiérrez, 2005). Finally, a range of factors such as international stock market listings, the duality of the office of chairman of the Board of Directors and chief executive, the breadth of the ownership structure and listing in the IBEX 35 index in Spain have all been analyzed (Collier, 1993; Piot, 2004; Rodríguez Gutiérrez, 2005) have all been considered, although the findings were not statistically significant.

3. Hypotheses, methodology and sample
3.1 Hypotheses tested

International studies have associated various factors with voluntary AC formation, including the independence and size of the Board of Directors, the size of the audit firm, economies of scale and agency costs (see Pincus *et al.,* 1989; Bradbury, 1990; Collier, 1993; Menon and Williams, 1994; Piot, 2004 and Willekens *et al.,* 2004). This evidence supports the formulation of the following model:
Voluntary AC formation = f (membership, size and structure of the Board of Directors, enhancement of financial information quality, economies of scale from the implementation of other control mechanisms, agency costs, institutional investors)
The relevance of these factors will be tested on the basis of the hypotheses proposed below.

3.1.1. Membership, size and structure of the Board of Directors
Independence and size of the Board of Directors

Various studies (inter alia, Pincus *et al.,* 1989; Collier, 1993; Menon and Williams, 1994; Piot, 2004 and Willekens *et al.,* 2004) have shown that the number of

independent directors with seats on the Board of Directors is an explanatory factor for voluntary AC formation, since such board members reduce information asymmetries between independent and executive directors. The independence of the Board of Directors is fundamental to the performance of control functions and effectiveness (Baysinger and Butler, 1985; Hermalin and Weisbach, 1988; Weisbach, 1988; Rosenstein and Wyatt, 1990; Hermalin and Weisbach, 1991; Rosenstein and Wyatt 1997; John and Senbet, 1998; Bhagat and Black, 2000). An interesting summary of the relationship between board independence and corporate results may be found in Hermalin and Weisback (2003). Nevertheless, this function may be adversely affected by information asymmetries between independent and executive directors, because the latter have access to internal information concerning the firm's operations. According to Willekens *et al.* (2004), the formation of ACs helps mitigate these asymmetries, because they allow independent directors to obtain information from internal and external auditors, among other sources. In this light, independent directors will be more open to voluntary AC formation, not only because the existence of a committee not only reduces information asymmetry, but also because it helps enhance their reputation with shareholders and provides a measure of legal protection. Consequently, the larger the percentage of independent board members, the more likely it is that these directors will support the voluntary formation of an AC. The hypothesis tested will be:

H_{01}: *Voluntary AC formation is positively associated with the percentage of independent members of the Board of Directors.*

It is not easy, *a priori*, to establish whether the size of the Board of Directors has a positive or negative influence on the effectiveness of supervision. In principle, it might be thought that numerous members would enrich the spread of opinions and boost the supervisory capacity of the board (Pearce and Zahra, 1992). However, this could also be seen as an obstacle to quick, efficient decision making, given the possibility of coordination, communication and information problems (Pfeffer, 1972; O'Reilly *et al.,* 1989; Lipton and Lorsch, 1992; Jensen, 1993; Willekens *et al.*, 2004). Psychology has empirically shown that large groups often suffer from dysfunctions in terms of responsibility and unproductiveness, resulting in limited effort and poor quality work (Latene *et al.*, 1979; Janis, 1989).

In the field of corporate governance, Song and Windram (2004) have argued against large boards on the grounds that they weaken individual responsibility. According to Lipton and Lorsch (1992), the optimum number of board numbers would be between seven and nine. Empirical evidence in this field is mixed, since various scholars (Jensen, 1993; Yermarck, 1996; Eisenberg *et al.*, 1998) have shown that there is a close association between size and effectiveness, while others have shown that this

relationship is negative (Kin, *et al.,* 1995; Yermarck, 1996; Eisenberg *et al.*, 1998; Azofra *et al.*, 1999; Wiblin and Wood, 1999; Andrés *et al.*, 2000). Other contributions, meanwhile, provide evidence that the relationship is not linear, since increases in the size of the Board of Directors raise the value of a firm to the point where the effect of an additional board member switches from positive to negative (Fernández *et al.,* 1998), or ceases to exist (Yermarck, 1996).

Thus, large boards that lack motivation because individual members lack weight (Song and Windram, 2004) may be dominated by the management team and fail to favor the formation of ACs, which could control executive activity. Meanwhile, it might be argued, given the scant effectiveness of large boards, that the firm would be more likely to form an AC in order to strengthen control and facilitate communication between directors and the external auditors (see, *inter alia*, AISG, 1977 and Collier, 1997). In this context, it is difficult *a priori* to predict the relationship between the size of the board and the creation of a CA, and for this reason we shall test for the presence of either a linear or a non-linear (quadratic) relationship between the variables board size and voluntary AC formation. Specifically, the hypothesis[1] is as follows:

H02: Voluntary AC formation can be positively or negatively associated with the number of members of the Board of Directors, or may take non-linear forms.

Duality of office of the chairman of the Board of Directors and the Chief Executive Officer (DPC)

When the offices of chairman of the Board of Directors and that of Chief Executive Officer are held by the same person, the result may be opportunistic behavior (Jensen, 1993), or the board may lose efficiency and effectiveness (Blackburn, 1994). The literature provides evidence that such duality does indeed have repercussions and may lead to the preparation of poor quality financial information (Forker, 1992) or the manipulation of earnings (Dechow *et al.,* 1996), and it may hinder the board's efforts to supervise the work of the management team (see Weir *et al.,* 2002). As regards ACs, Beasley and Salterio (2001) showed that firms in which the office of chairman of the board and chief executive were held by the same person were more likely to have ACs with less external (independent members) than would be required under Canadian law, and were also less likely voluntarily to include qualified people with experience in the business world as members of their ACs. Based on the dysfunctional effects described in the literature, we predict that a chief executive who is also chairman of the Board of Directors may influence the remaining members to prevent the voluntary formation of an AC, the mission of which would be to oversee the quality of financial information and control the management of the business. Our hypothesis, then, is as follows:

H03: Voluntary AC formation is negatively

associated with the duality of office between the chairman of the board and the chief executive.

3.1.2. Enhancement of the quality of financial information
Auditor's reputation

Aside from voluntary AC formation, where a firm engages high quality audit services, this may be another sign of its concern to improve the objectivity, credibility and reliability of its financial reporting. Since this variable is very difficult to evaluate externally, empirical studies have traditionally used the auditor's reputation and image as a surrogate. A good example of the use of this term is the recently approved VIII Directive (EU, 2006), article 4 of which only authorizes individuals or firms of good reputation to conduct audit examinations.

The empirical literature contains numerous papers describing the differentiated reputation of International Audit Firms, which is translated into the price of their services (among others, Francis, 1984; Palmrose, 1986; Johnson et al. 1995; Karim and Moizer, 1996; Gul, 1999; Peel and Roberts, 2003 and Carson *et al*, 2004). Based on Klein and Lefler's (1981) model, this premium price can only be maintained long term if it is associated with high quality audit services. Likewise, the results of DeFond's (1992) empirical study support the hypothesis that not all providers of audit services enjoy the same reputation, and that the market perceives the Big Audit Firms (BAF) as providing higher quality audit services. In Spain, the image and reputation enjoyed by the BAF are borne out by García Benau *et al.* (1998) and Moizer (2004).

In this light, we predict that the presence of a BAF in a company may be viewed as a control mechanism in itself, given these firms' reputation and the quality of the information they prepare. Consequently, the auditor will be perceived as more independent, which implies more and closer control and, therefore the need to implement other oversight mechanisms such as the AC will be reduced. The hypothesis formulated is as follows:

H04: Voluntary AC formation is negatively associated with the fact that the auditor engaged is one of the Big Audit Firms.

Audit tenure

Audit quality may be improved if the same audit firm is kept on or reappointed, because with time the audit team gains understanding of the background, the industry and the company, enhancing control of the financial information prepared. If tenure is extended too long, however, the relationship may generate harmful side effects, such as auditor complacency, less rigorous audit procedures and blind trust in the client (Shockley, 1982), as well as declining service quality (Deis and Giroux, 1992 and Cople and Doucet, 1993). Similarly, Raghunathan *et al.* (1994) argue that the auditor is likely to relax with the passage of time, losing professional skepticism and

becoming less innovative. A long-running relationship may also result in company-auditor *familiarity* (article 4.70 of the ICAEW Guide to Professional Ethics), undermining independence. In this regard, Richard and Vanstraelen (1999) found that long engagements significantly reduced the auditor's willingness to issue qualified reports.

In the European Union, auditor rotation has in fact been used as a mechanism to safeguard auditor independence and has been adopted by the majority of regulators. Italy has opted for the most extreme form of this instrument, requiring listed companies to change their auditors on a regular basis, although the requirement for internal rotation of the professionals assigned to an engagement is more common (EU, 2006).

In this light, we may predict that long audit tenures may encourage the client to opt to create an AC in order to assure the quality of financial reporting, given the knowledge and experience acquired by the audit team and the high cost of switching firms. In this way, the AC will safeguard the independence of the external auditor without the need to change the provider of the service. Our hypothesis, then, is as follows:

H_{05}: *Voluntary AC formation is positively associated with the length of audit tenure.*

Audit report

García-Ayuso *et al.* (2003), and Sánchez-Ballesta and García-Meca (2004) have tested the relationship between firms' profits and the issuance of audit reports containing an unqualified opinion. According to the latter, this is consistent with agency theory, since a clean opinion increases the trust of shareholders and stakeholders alike, encouraging increased flows of funding into the business, which in turn generates higher returns and raises the value of the company.

Consequently, we may expect that the desire to obtain an unqualified audit report may lead companies that receive qualifications to create an AC in order to improve the quality and rigor of financial reporting (see, CEECECAS, 1998). Nevertheless, this does not apply to all possible qualifications, but only to those that can be corrected from one year to the next, such as errors, non-compliance and matters related with changes in accounting standards. ACs cannot, however, correct matters such as uncertainties and scope limitations, which may take years to rectify. Consequently, we have included a variable that has not previously been tested in order to measure the influence of the opinion expressed in the audit report on voluntary AC formation. The hypothesis is as follows:

H_{06}: *Voluntary AC formation is positively associated with the receipt of an audit report containing certain qualifications.*

3.1.3. Economies of scale from the implementation of other control mechanisms

The implementation of control mechanisms, including the formation of an AC, entails costs for the company concerned. According to Pincus *et al.* (1989), large companies find it easier to absorb such costs than small ones. To put this another way, the net benefit derived from economies of scale is greater in large companies. Size has therefore been included as a factor in the model as a surrogate for the economies of scale generated by the implementation of control mechanisms. A positive association between size and voluntary AC formation is expected. However, the evidence provided by earlier studies is not conclusive. Pincus *et al.* (1989), Piot (2004) and Willekens *et al.,* (2004) conclude that a positive relationship exists between the size of the firm and voluntary AC formation, but other studies (Bradbury, 1990; Collier, 1993 and Menon and Williams, 1994) find no evidence for this. Our hypothesis, then, is as follows:

H_{07}: *Voluntary AC formation is positively associated with the size of the company.*

3.1.4. Agency costs
Agency cost of debt

A company's capital structure is the result of the financial decisions taken by managers with the aim of creating value. However, indebtedness is a financial situation that may, *a priori*, generate agency costs. According to Jensen and Meckling (1976), the agency costs derived from indebtedness are directly related to the proportion of debt on the balance sheet. These agency costs include the implementation of control mechanisms, such as the formation of an Audit Committee (see Pincus *et al.,* 1989 and Collier, 1993), which creditors may demand to ensure that the financial information provided is not massaged to hide inefficient use of loans (see Ruiz Barbadillo *et al.,* 2005) and to allow observation of management's conduct of affairs. In this light, we have included the level of indebtedness as a variable in the model. We expect to find a positive association with voluntary AC formation because creditors may be assumed to demand more control mechanisms, including an AC, the higher the level of indebtedness. Our hypothesis is as follows:

H_{08}: *Voluntary AC formation is positively associated with the level of a company's indebtedness.*

Agency cost of ownership

The delegation of management to executives by the shareholders or partners of large firms also entails agency costs. This principal-agent relationship is defined, among other matters, by the existence of information asymmetry, which encourages owners to establish a range of control mechanisms to ensure that the actions of managers conform with the guidelines

established and that they do not act in their own interest. In this light, it seems reasonable to expect that the agency costs of ownership are positively related with voluntary AC formation, since such ACs represent a control mechanism that helps reduce agency costs. Existing studies (see, for example, Pincus *et al.*, 1989; Menon and Williams, 1994 and Piot, 2004) have measured the agency costs of ownership using the percentage of shares owned by managers as a surrogate. Jesen and Meckling (1976), meanwhile, suggest that ownership by managers of a significant percentage of a company's shares reduces the need for control. In this light, we shall examine whether management share ownership reduces the demand for control mechanisms, and we expect a negative association with voluntary AC formation (Pincus *et al.*, 1989; Menon and Williams, 1994 and Piot, 2004. Our hypothesis, then, is as follows:

H_{09}: Voluntary AC formation is negatively associated with the percentage of shares owned by management.

Corporate ownership structure (concentration vs. diversification)

In addition to ownership of shares by managers and executives (Jensen and Meckling, 1976), other scholars have found that the corporate ownership structure may place bounds on management discretionality (Demsetz and Len, 1985; Shleifer and Vishny, 1986; Zeckhauser and Pound, 1990).

The presence of a majority shareholder with the power to control and dismiss managers may mitigate agency problems and influence decision making by the Board of Directors, either through directorships or through the presence of a shareholder representative, thereby limiting possible opportunistic behavior (Cuervo Cazurra, 1998). Such concentration of power in the hands of major shareholders may, however, raise the problem of who controls the controller (Steinherr and Huveneers, 1990), because they are in a position to use their influence to the detriment of minority shareholders, who lack representation at board level (La Porta *et al.,* 1999, 2001; Burkart and Panunzi, 2001). Meanwhile, the interrelationships between owners and the Board of Directors have been examined by scholars such as Morck *et al.* (1988), Rediker and Seth (1995), Whidbee (1997) and Coles *et al.* (2001). These authors consider that there is a *substitution effect* between the Board of Directors and owners, which acts as an internal control mechanism, because a high level of control by shareholders implies less potential for control by the board, diminishing the importance of its work. This phenomenon has been confirmed in the Spanish context by Cuervo-Cazurra (1997) and Reyes Recio (2000).

Grossman and Hart (1980), John and Senbet (1998) and Azofra and Santamaría (2002) argue that shareholders have little incentive to control the actions of managers in an organization in which shares can be easily sold without loss of value and the ownership of capital is widely dispersed. This is because the cost of supervision would be higher than the benefits obtained, which will be proportional to the interest held in the company's share capital. Bradbury (1990) and Rodríguez Gutiérrez (2005) also suggest that an increase in the number of non-executive shareholders increases the likelihood that the company will voluntarily form an AC.

Widespread share ownership in the common law countries of the English-speaking world means that companies are controlled mainly by managers, and the Board of Directors therefore needs to harmonize the interests of owners and managers. In Spain, where the ownership of companies is much more concentrated than in the Anglo-Saxon context, agency problems between shareholders and managers are less pronounced, while conflicts between majority and minority shareholders are more frequent and intense. In the Spanish context, then, we may predict that the absence of incentives for minority shareholders, together with majority shareholders' control of company boards, will diminish interest in voluntary AC formation. Our hypothesis is as follows:

H_{10}: Voluntary AC formation is negatively associated with the concentration of ownership of a company in the hands of a single large shareholder.

3.1.5. Institutional investors

Another factor that has escaped examination to date, but which we believe may influence voluntary AC formation, is the representation of institutional investors on company boards. As Monterrey (2004) observes, the incentive for internal directors to massage a company's results is limited by the effectiveness of control mechanisms. Institutional investors represent a control mechanism of this kind, because they have an interest in controlling management activity, constraining the opportunism of internal directors and reducing agency costs (see Shleifer and Vishny, 1997). In this regard, Rajgopal *et al.* (1999) showed that the existence of shareholdings in the hands of institutional investors, who tend to be well informed about the capital markets, inhibits the internal directors on the board and provides a disincentive for any attempt to manipulate the accounts. Chung *et al.* (2002) obtained similar results, documenting how institutional investors track the actions of managers. Likewise, we predict that the presence of institutional investors on company boards will provide an incentive for voluntary AC formation, because they will act as a control mechanism, tracking the activities of internal directors and preventing them from subordinating shareholder interests to their own. In this light, we may express our hypothesis in the following terms:

H_{11}: Voluntary AC formation is positively associated with the presence of institutional investors on the Board of Directors.

Finally, we have considered a number of control variables reflecting the financial situation of the

company and the industry.

Financial situation

The model includes three variables to control for the company's financial situation or return. Thus, we examine whether the company incurred a loss in either or both of the last two financial years, sales growth and the return on assets. A poor financial situation may increase agency costs, because it will increase the likelihood that managers may manipulate the financial information reported. It therefore seems reasonable to suppose that the demand for control mechanisms such as ACs will increase in the face of financial difficulties. We expect to find a positive association between losses incurred in the last two years and voluntary AC formation, and a negative association between high sales growth and high return on assets and the voluntary formation of ACs, since it may be assumed that the company's financial situation is good.

Sector

As Willekens *et al.* (2004) argue, it is necessary to control for sector effects, because both agency problems and the relevant control mechanisms may differ between industries. The sector classification used in this study was prepared in line with the Spanish National Classification of Economic Activities (CNAE). Given the nature of the variables, we make no conjecture about the expected sign.

3.2. Methodology

We shall calculate the following logistic regression model to test whether the factors described above encourage voluntary AC formation in Spain:

$$CAUD_i = \beta_0 + \beta_1\%INDEPCA + \beta_2\#MIEMBROSCA + \beta_3\#MIEMBROSCA^2 + \beta_4DPD + \beta_5BIG5 + \beta_6DEA + \beta_7OPINAUD + \beta_8TAM + +\beta_9LEV + \beta_{10}\%ACCMAN + \beta_{11}GCP + \beta_{12}INVINST + \beta_{13}PERD + + \beta_{14}CV + \beta_{15}RA + \sum_{i=1}^{8}\beta_iSECT_i + \varepsilon_i$$

where the dependent variable CAUD is equal to 1 if the company has created an AC and 0 otherwise. The independent variables are[2]:

Independence and size of the Board of Directors

The variable *%INDEPCA*, which is measured as the percentage of independent members of the Board of Directors, has been defined as an approximation to board independence. This percentage was calculated as the ratio of independent directors to total board members. Both the number of independent directors and total directors were obtained either from the 1999 Board Index published by the consultancy Spencer Stuart, or from corporate websites or from the Spanish National Securities Market Commission (CNMV) website. The variable *#MIEMBROSCA* measures the size of the Board of Directors in terms of the number of board members to analyze the linear relationship, while the variable *#MIEMBROSCA²* is used to analyze the non-linear relationship, which is quadratic.

Duality of office of the chairman of the Board of Directors and the Chief Executive Officer

A dummy variable, DPC, has been defined to examine duality of office of the chairman of the company's Board of Directors and Chief Executive. The dummy takes a value of 1 where both offices are held by the same person, and 0 otherwise. This information was obtained from the CNMV website or from the SABI data base.

Auditor's reputation

The size of the audit firm and audit quality were measured using the variable BIG5, a dummy taking a value of 1 if the company was audited by one of the big five audit firms (the base year for the study is 1999, when there were still five audit majors, although this group shrank to four in 2002 after the Enron scandal), and 0 otherwise. Information concerning the audit firm responsible for the examination of the company's financial statements was obtained either from the CNMV website or from the SABI data base.

Audit tenure

The variable *DEA*, which measures the number of years without a change of auditor between the initial engagement until 1999, was defined as an approximation to audit tenure. This information was also obtained from the CNMV website.

Audit report

The dummy variable *OPINAUD* was defined to reflect the audit report. It takes a value of 1 if the audit report contained certain qualifications (i.e. errors, non-compliance with generally accepted accounting standards or inconsistency) and 0 otherwise. The audit opinion was obtained from the CNMV website.

Economies of scale from the implementation of control mechanisms

We defined the variable *TAM* as an approximation to the economies of scale generated from the implementation of control mechanisms. This is measured as the natural logarithm of total assets (expressed in thousand of euros) by way of a surrogate for the size of the company. Total assets were obtained either from the SABI data base or from the CNMV website.

Agency costs of debt and ownership

The agency cost of debt has been defined as *LEV* (leverage or the level of indebtedness), measured as the coefficient of total debt to total assets. Meanwhile, the variable *%ACCMAN* was defined as an approximation to the agency cost of ownership, measured as the percentage of shares owned by the company's management team. Total debt was obtained either from the SABI data base or from the CNMV website, while information concerning the percentage of shares held by managers comes from

the section of the CNMV site referring to significant shareholders and treasury stock.

Corporate ownership structure

The variable GCC was defined to measure the concentration of ownership of the company. It is measured as the percentage equity or shares in the hands of the company's majority shareholder. This information was obtained from the annual reports of each company.

Institutional investors

The variable *INVINST* was defined as an approximation to institutional investors. This is a dummy, which takes a value of 1 if institutional investors are represented on the company's Board of Directors and 0 otherwise (in this paper, institutional investors are considered to be represented on the Board of Directors if its members include any representative of an investment fund, pension fund or insurer holding shares in the company). This information was obtained from the CNMV website or from the SABI data base.

Financial situation

The companies' financial situation was defined through the variables *PERD, CV* and *RA*. The first of these variables is a dummy, which takes a value of 1 if the company incurred losses in either of the two preceding fiscal years and 0 otherwise. The second reflects the change or growth in sales, measured as the coefficient of the difference between the current year's sales and sales for the prior year, and the third represents the return on assets, measured as the coefficient of income/losses on ordinary activities and total assets. The information for both variables was obtained either from the SABI data base or from the CNMV website.

Sector

Since our sample does not include observations for all of the sectors included in the CNAE classification, we have looked at only 9, which comprise extractive industry (IE), manufacturing (IM), electricity, gas and water (EGA), construction (CON), retail (COM), hotels and catering (HOS), logistics and communications (TAC), financial services (IF) and real estate (AIA). These dummy variables take a value of 1 where the company belongs to the sector in question and 0 otherwise. In order to avoid multicolinearity problems, one of the nine sectors considered in the study was eliminated from the model. Hence, the model includes only 8 dummy variables to represent the sector[3].

3.3 Sample

The initial sample for the study comprised the 142 companies listed on the Spanish capita market in 1999. The final sample, however, contains 122 companies, following the elimination of 20 observations, either because it was not possible to obtain data on one or more of the relevant variables, or because certain variables exhibited extreme values, or because the company in question had already formed an AC prior to 1999. Likewise, we formed another sample of companies excluding financial firms in order to ensure that results were not biased due to leverage or indebtedness, since this ratio is very high in the financial services industry due to the nature of the business. The total sample included only 12 financial institutions, and the sub-sample formed thus comprised 110 companies.

As explained above, the Olivencia Code of Corporate Good Governance published in Spain in 1999 recommended all firms, and especially listed companies, to create ACs. However, the formation of ACs was made mandatory with the passage of the Financial System Reform Act in 2002.

Table I presents data concerning the presence of ACs in listed Spanish companies, reflecting the number and percentage of firms that had formed an AC in 1999. As may be observed, some 33.60% of the total sample of 122 companies had created an audit committee, while the remaining 66.40% had not done so. These figures are not consistent with the results of a KPMG (2001) study, which revealed that 67% of European firms had formed an AC (United Kingdom 100%, France 80%, Belgium 59%, Switzerland 62% and Germany 41%).

[Insert Table 1]

The information reflected in Table II constitutes an initial descriptive analysis of the composition of ACs in 1999. As can be seen, the number of AC members fluctuates, on average, around 3.63. Looking at the composition of the ACs, Table II shows that ACs had an average of around 44% independent members 1999. Meanwhile, the percentage of external shareholder representatives was also significant, representing 45% of total committee members. Finally, 3% of committee members were not directors, and 8% were executive members. One of the main weaknesses of ACs in listed Spanish companies is the presence of executive committee members, even though the Olivencia Code and the Aldama Code (2003), not to mention the codes of the other countries referred to above, recommend that ACs should not include executives or even prohibit them entirely, since they cast doubt on the AC's independence. The KPMG (2001) study also revealed that around one third of AC members in other European countries (France, Belgium and the Netherlands) were executive directors.

These data are a reflection of the importance of precisely regulating eligibility to form part of an AC, because their effectiveness and, above all, shareholder and user trust depend to a great extent on this issue.

On average, ACs held 2.90 meetings in 1999, which is approximately in line with the recommendations of various codes of good governance (see, inter alia, CEECAS, 1998; Aldama, 2003).

[Insert Table II]

4. Analysis of results
4.1. Descriptive statistics for the companies in the sample

The descriptive statistics for the companies in the sample are shown in Table III, panels A and B. In panel A we may observe, as indicated above, that 33.60% of the companies in the total sample had formed an AC, and that the same person holds office as chairman of the Board of Directors and Chief Executive in 45%, while 92% were audited by the big five audit firms. Specifically, PriceWaterhouse Coopers (PWC) audited 22.13% of the sample companies, Arthur Andersen (AA) 40.98%, Ernst and Young (EY) 12.30%, KPMG 11.48% and Deloitte and Touche (DT) 4.92%. The financial statements of the remaining 8.20% were examined by other audit firms (OAF). Meanwhile, 12% of the companies received audit opinions containing certain qualifications, institutional investors were represented on the boards of 21% and 17% incurred losses in at least one of the two preceding years. In terms of sectors, just 1% of the companies belonged to the extractive industry and 40% to manufacturing industry. The logistics and communications sector and financial services represented 12% each of the companies in the sample, and 15% were involved in the real estate sector. Electricity, gas and water utilities represented 6% of the sample and construction companies 5%. Finally, 7% of the companies belonged to the retail sector and 2% to hotels and catering.

As shown in Table III, Panel B, company boards had an average of 10.16 members, while the average for independent directors was around 31.29%. The average period elapsed between the initial audit engagement and 1999 was 4.78 years, and mean total assets were around €2,554,927. The mean level of indebtedness was 51.90 %, the mean percentage of shares held by the management team was 6.87% and concentration of ownership averaged around 34.92%. Finally, sales growth was in the region of 12.66% and the mean return on assets was around 4.35%.

[Insert Table III]

The descriptive statistics excluding financial institutions are shown in Table IV, panels A and B. There is little difference in the data in panel A compared to table III, except for the percentage of firms operating in the financial sector: the elimination of financial institutions reduces the percentage of companies in this sector from approximately 9% to 3%.

The only significant change in table IV, panel B compared to table III concerns total assets, which amount to an average €765,667 thousand.

[Insert Table IV]

4.2. Univariate Analysis

Table V presents the mean values for the independent and control variables for companies with or without a CA, as well as the results of the parametric t test for the continuous variables and the Chi-squared test for the dichotomous variables, throwing light on differences in the mean scores between both groups of firms.

Based on the results, we may conclude that the group of companies with an AC has a significantly higher percentage of independent directors, includes larger companies and exhibits a lower level of management ownership than the group of firms that lack an AC among their control mechanisms. Meanwhile, the results of the tests performed on the control variables show that the existence of an AC is positively associated with the group of companies displaying the fastest sales growth, which is significantly lower in the manufacturing sector.

[Insert Table V]

Table VI shows the differences between mean values for the companies with and without ACs after the exclusion of financial institutions from the sample. As may be observed, the results of the parametric t test (continuous variables) and the Chi-squared test (dichotomous variables) do not change. We may therefore affirm that the group of financial institutions does not introduce any bias into the above results.

[Insert Table VI]

4.3. Multivariate Analysis

The results of the logistic regression for the total sample are shown in table VII. The goodness of fit of the model is 36.20, and the level of correct classification (percentage correct predictions) is 87.70 %. Meanwhile, the Chi-squared test shows that the model is statistically significant.

Table VII also shows that out of the three variables used to measure the membership, size and structure of the Board of Directors, the percentage of independent directors is statistically significant and is positively associated with voluntary AC formation. The results also show a non-linear relationship between the number of board members and voluntary AC formation. Thus, the coefficient obtained for the linear variable #MIEMBROS is positive but not significant, while the quadratic variable, $\#MIEMBROS^{2}$, is negative and significant. We may therefore conclude that the positive, though not significant, sign exhibited by the number of board members indicates that increases in the number of directors makes voluntary AC formation more likely, while the non-linear quadratic relationship between voluntary AC formation and the size of the Board of Directors shows that the appointment of an additional

member reduces the likelihood of voluntary AC formation. The reason why the variable #MIEMBROS is not statistically significant may lie in the sample size, although significance (.168) is closer to 0.1 than to 0.99.

Meanwhile, we may observe that the variables size and sales growth have a positive and significant influence on voluntary AC formation, while manufacturing industry presents a negative sign and is significant.

[Insert Table VII]

The results of the logistic regression change after the exclusion of financial institutions from the sample, as may be observed in Table VIII. Thus, the variables that proved significant for the total sample are joined by the negative influence of audit tenure, DEA, certain qualifications in the audit report, OPINAUD, and firms in the hotel and catering sector, HOS. However, the quadratic board size variable, #MIEMBROS^2, did not turn out statistically significant for the sub-sample. In this light, we may affirm that results do indeed vary compared to the total sample, and we may therefore conclude that the financial institutions do introduce bias in the initial results.

[Insert Table VIII]

We calculated Spearman's correlation coefficients for all of the variables included in the model to test for the presence of multicolinearity. Table IX presents the results of the correlation matrix for the total sample and table X for the sample of companies excluding financial institutions. Based on an analysis of these tables, the correlation between certain pairs of variables is significant at the 1% or 5% significance level. These results are consistent with the findings of earlier studies of ACs (see Menon and Williams, 1994; Turpin and DeZoort, 1998; Archambeault and DeZoort, 2001; Willekens *et al.*, 2004). However, none of the correlation coefficients in either the total sample or the sub-sample excluding financial institutions is sufficiently higher (> 80) to cause significant multicolinearity problems (see Archambeault and DeZoort, 2001). We also analyzed the variance inflation factor (VIF) for all of the independent variables in both the total sample and the sub-sample excluding financial investments. The results obtained show that no factor is sufficiently large (> 10) to reflect the presence of multicolinearity problems (see Neter *et al.*, 1985).

[Insert Table IX]
[Insert Table X]

4.4 Validation of results

In order to validate the results obtained, we performed the same study for 2000 and 2001, when the creation of ACs was still voluntary for listed companies. The results obtained, which are not presented here, were affected because none of the variables analyzed proved to be statistically significant. One possible explanation could lie in the evolution of AC formation over time between 1994 and 2004. While 33.6 % of listed companies had created an AC in 1999, this percentage hardly changed in the following three years, rising to almost 100% only after the enactment of the Financial System Reform Act at the end of 2002, which enshrined the AC as a mandatory body in all listed companies, and the Transparency Act in 2003.

5. Conclusions

The Spanish Financial System Reform Act was passed in November 2002 in the wake of a series of financial scandals. The Act required listed companies to create an AC as a corporate good governance mechanism, if they had not already done so. The formation of ACs was voluntary for both listed and unlisted companies in the period from the publication of the Code of Corporate Good Governance in 1998 until the Act entered the statute book in 2002.

In this paper, we have sought to shed light on the factors and reasons that led companies listed on the Spanish capital market in 1999 voluntarily to create an audit committee. Based on the results obtained, we may conclude that voluntary AC formation among the companies listed on the Spanish capital market was driven on the one hand by the quality of other corporate governance mechanisms, such as board independence, and by the size of the Board of Directors. In the latter case, the result obtained for the number of board members is not statistically significant, but the significance of this variable was close to 0.10 and the sign of the coefficient is positive. Meanwhile, we have found that there is a non-linear, quadratic, relationship between voluntary AC formation and the number of board members. This suggests that the likelihood of voluntary AC formation increases the more members the Board of Directors has. However, above a certain threshold, the appointment of an additional director may reduce the likelihood that the board will decide to create an audit committee.

Meanwhile, our results also show that voluntary AC formation is positively influenced by both the size of the company, due to the existence of economies of scale in the implementation of other control mechanisms, and sales growth. Finally, voluntary AC formation appears to be less likely in the manufacturing sector.

Our results also suggest that the agency costs of debt and ownership, and the ownership structure of the company are important for both shareholders and creditors but do not increase the demand for additional control mechanisms, such as voluntary AC formation. This result appears to indicate that listed Spanish companies deal with agency costs using other mechanisms. In this light, a future line of research

might analyze the nature of such alternative mechanisms. Our results also indicate that duality of the offices of chairman of the Board of Directors and chief executive do not affect voluntary AC formation in listed companies, and nor do the size of the audit firm, the presence of institutional investors on the Board of Directors, qualified audit opinions or audit tenure.

However, the findings vary somewhat if financial institutions are excluded from the sample. In this case, the factors driving voluntary AC formation are the percentage of independent board members, the size of the company and sales growth, while audit tenure and audit opinions containing certain qualifications had a negative influence. The results further suggest that the voluntary formation of an audit committee is less likely in manufacturing industry and the hotel and catering sector. The remaining factors considered did not influence voluntary AC formation.

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Appendices

Table I. Study sample

Sample of companies with and without an audit committee

Year	Companies with an audit committee		Companies without an audit committee		Total companies with available information
1999	41	33.60%	81	66.40%	122

Table II. Composition of Audit Committees

Panel A. Average number of members and audit committee meetings

Year	NC	NM	NMMC= NM/NC	IND		DOM		OT		EJE		NR	NMR= NR/NC
				Total	%	Total	%	Total	%	Total	%		
1999	41	149	3.63	66	44	67	45	5	3	11	8	119	2.90

NC, Number of audit committees in companies listed on the Spanish capital market
NM, Number of audit committee members
NMMC, Average number of audit committee members
IND, Number of independent audit committee members
DOM, Number of shareholder representatives on the audit committee
OT, Number of audit committee members who are not directors
EJE, Number of audit committee members who are executive directors
NR, Number of meetings held by the audit committee during the financial year
NMR, Average number of meetings held by the audit committee

Table III. Descriptive statistics for the companies in the sample
Panel A. Dichotomous variables

Variable	N	Percentage dummy = 1(%)
CAUD	122	34
DPC	122	45
BIG5	122	92
PWC	122	22.13
AA	122	40.98
EY	122	12.30
KPMG	122	11.48
DT	122	4.92
OTFA	122	8.20
OPINAUD	122	12
INVINST	122	21
PERD	122	17
IE	122	1
IM	122	40
EGA	122	6
CON	122	5
COM	122	7
HOS	122	2
TAC	122	12
IF	122	12
AIA	122	15

Panel B. Continuous variables

Variable	N	Mean	Median	Standard Deviation
%INDEPCA	122	31.29	30.39	22.53
#MIEMBROSCA	122	10.16	9	4.75
DEA	122	4.78	3	3.78
TACTIVO(€)	122	2.554.927	276.382	15.000.000
TAM	122	12.58	12.53	1.95
LEV	122	51.90	50.45	28.79
%ACCMAN	122	6.87	0	13.98
GCP	122	34.92	29.87	25.62
CV	122	12.66	2.58	56.43
RA	122	4.35	4.66	19.60

CAUD = 1 if the company has created an audit committee and 0 otherwise
DPC = 1 if the same person holds office as chairman of the Board of Directors and chief executive, and 0 otherwise
BIG5 = 1 if the company is audited by one of the big five audit firms and 0 otherwise
PWC = 1 if the company is audited by PriceWaterhouseCoopers and 0 otherwise
AA = 1 if the company is audited by Arthur Andersen and 0 otherwise
EY = 1 if the company is audited by Ernst and Young and 0 otherwise
KPMG= 1 if the company is audited by KPMG and 0 otherwise
DT = 1 if the company is audited by Deloitte and Touche and 0 otherwise
OFTA = 1 if the company is audited by other, non-big 5, audit firms and 0 otherwise
OPINAUD = 1 if the audit report contains a qualification and 0 otherwise

INVINST = 1 if the institutional investors hold seats on the Board of Directors and 0 otherwise
PERD = 1 if the company incurred a loss in either of the two preceding financial years, and 0 otherwise
IE = 1 if the company operates in the extractive industry and 0 otherwise
IM = 1 if the company operates in manufacturing industry and 0 otherwise
EGA = 1 if the company operates in electricity, gas and water production and distribution, and 0 otherwise
CON = 1 if the company operates in construction industry and 0 otherwise
COM = 1 if the company operates in the retail sector, vehicle, motorcycle and moped repair, and personal and domestic consumer goods, and 0 otherwise
HOS = 1 if the company operates in hotel and catering sector and 0 otherwise
TAC = 1 if the company operates in the logistics and communications sector and 0 otherwise
IF = 1 if the company operates in the financial services industry and 0 otherwise
AIA = 1 if the company operates in the real estate sector and 0 otherwise
%INDEPCA = percentage of independent members on the Board of Directors measured as the ratio of independent to total board members
#MIEMBROSCA = Number of board members
DEA = number of years between initial auditor engagement and 1999 with no change in auditor
TACTIVO = Total assets expressed in thousands of euros
TAM = Natural logarithm of total assets as a surrogate for the size of the company
LEV = Leverage of level of indebtedness measured as the ratio of total debt to total assets
%ACCMAN = percentage of shares owned by management of the company
GCP = Concentration of ownership of the company measured as the percentage equity or shares held by the majority shareholder
CV = Sales growth measured as the ratio of the difference between current and prior year's sales to prior year's sales
RA = Return on assets measured as the ratio of income from ordinary activities to total assets

Table IV. Descriptive statistics for the sample variables after the exclusion of financial institutions
Panel A. Dichotomous variables

Variable	N	Percentage dummy = 1(%)
CAUD	110	35
DPC	110	48
BIG5	110	91
PWC	110	20
AA	110	40.91
EY	110	11.82
KPMG	110	12.73
DT	110	5.45
OTFA	110	9.09
INVINST	110	22
OPINAUD	110	14
PERD	110	19
IE	110	1
IM	110	45
EGA	110	6
CON	110	5
COM	110	8
HOS	110	2
TAC	110	14
IF	110	3
AIA	110	16

Panel B. Continuous variables

Variable	N	Mean	Median	Standard Deviation
%INDEPCA	110	32.27	30.89	21.35
#MIEMBROSCA	110	10.11	9	4.37
DEA	110	4.69	3	3.73
TACTIVO(€)	110	765.667	247.906	1.883.097
TAM	110	12.31	12.42	1.76
LEV	110	47.90	49.15	27.29
%ACCMAN	110	6.90	0	14.16
GCP	110	32.62	28.30	22.79
CV	110	15.03	4.86	58.95
RA	110	4.62	6.12	20.63

Table V. Difference in mean scores for the independent and control variables between companies with and without an audit committee for the total sample (N = 122 companies)

Variable	Companies with an audit committee (N=41) Mean (DT)	Companies without an audit committee (N=81) Mean (DT)	Difference between means (Companies with AC – Companies without AC)	Univariate test[A] (sig.)
%INDEPCA	38.12 (17.34)	27.84 (24.12)	10.27	-2.696*** (.008)
#MIEMBROSCA	10.89 (4.68)	9.74 (4.775)	1.23	-1.361 (.176)
#MIEMBROSCA^2	141.90 (125.34)	117.24 (140.62)	24.66	.948 (.345)
DPC	.51 (.506)	.42 (.497)	.09	.603 (.437)
BIG5	.93 (.26)	.91 (.28)	.02	.000 (1.000)
DEA	4.85 (3.92)	4.74 (3.73)	.11	-.155 (.877)
OPINAUD	.10 (.30)	.14 (.34)	-.04	.100 (.752)
TAM	13.05 (1.70)	12.34 (2.04)	0.71	-1.900* (.060)
LEV	50.38 (22.41)	52.67 (31.63)	-2.29	.413 (.681)
%ACCMAN	4.14 (9.81)	8.25 (15.54)	-4.11	1.777* (.078)
GCP	30.22 (21.82)	37.30 (27.15)	-7.08	1.450 (.150)
INVINST	.20 (.40)	.22 (.42)	-.02	.012 (.911)
PERD	.12 (.33)	.20 (.40)	-.08	-1.311 (.192)
CV	28.51 (79.29)	4.64 (38.46)	23.87	1.822* (.074)
RA	5.72 (6.90)	3.65 (23.57)	2.07	.625 (.429)
IE	.02 (.15)	.00 (.00)	.02	.121 (.727)
IM	.27 (.45)	.47 (.50)	-.20	3.772* (.052)
EGA	.10 (.30)	.04 (.19)	.06	.894 (.344)
CON	.10 (.30)	.02 (.16)	.08	1.729 (.189)
HOS	.02 (.15)	.01 (.11)	.01	.000 (1.000)
TAC	.12 (.33)	.12 (.33)	.00	.000 (1.000)
IF	.12 (.33)	.12 (.33)	.00	.000 (1.000)
AIA	.15 (.36)	.15 (.36)	.00	.000 (1.000)
COM	.10 (.30)	.06 (.24)	.04	.122 (.727)

[A] The t test was used to analyze the difference between the continuous variables, and Pearson's chi-squared for the dichotomous variables
*** Significant at the 1% significance level
** Significant at the 5% significance level
* Significant at the 10% significance level

Table VI. Difference in mean scores for the independent and control variables between companies with and without and audit committee excluding financial institutions from the sample (N = 110 companies)

Variable	Companies with an audit committee (N=38) Mean (DT)	Companies without an audit committee (N=72) Mean (DT)	Difference between means (Companies with AC – Companies without AC)	Univariate test[A] (sig.)
%INDEPCA	36.86 (17.35)	29.85 (22.86)	7.01	-1.800* (.075))
#MIEMBROSCA	10.89 (4.72)	9.69 (4.15)	1.2	-1.374 (.172)
#MIEMBROSCA^2	140.42 (127.14)	110.97 (100.70)	29.45	1.329 (.187)
DPC	.55 (.50)	.44 (.50)	.11	.773 (.379)
BIG5	.92 (.27)	.90 (.29)	.02	.000 (1.000)
DEA	4.79 (3.93)	4.64 (3.65)	.15	-.200 (.842)
OPINAUD	.11 (.31)	.15 (.36)	-.04	.159 (.690)
TAM	12.99 (1.66)	11.95 (21.73)	1.04	-3.025*** (.003)
LEV	47.96 (22.88)	47.88 (30.27)	.08	-.015 (.988)
%ACCMAN	3.47 (8.49)	8.71 (16.15)	-5.23	2.226** (.028)
GCP	30.84 (22.33)	33.56 (23.13)	-2.72	.595 (.553)
INVINST	.18 (.39)	.24 (.42)	-.06	.147 (.701)
PERD	.13 (.34)	.22 (.42)	-.09	.801 (.371)
CV	31.25 (81.79)	6.47 (40.41)	24.78	1.758* (.085)
RA	6.02 (7.08)	3.88 (25.02)	2.14	-.515 (.607)
IE	.03 (.16)	.00 (.00	.03	.107 (.744)
IM	.29 (.46)	.53 (.50)	-.24	4.794** (.029)
EGA	.11 (.31)	.04 (.20)	.07	.790 (.374)
CON	.11 (.31)	.03 (.16)	.08	1.588 (.208)
HOS	.03 (.16)	.01 (.11)	.02	.000 (1.000)
TAC	.13 (.34)	.14 (.35)	-.01	.000 (1.000)
IF	.05 (.23)	.01 (.12)	.04	.326 (.568)
AIA	.16 (.37)	.17 (.38)	-.01	.000 (1.000)
COM	.11 (.31)	.07 (.26)	.04	.082 (.775)

[A] The t test was used to analyze the difference between the continuous variables, and Pearson's chi-squared for the dichotomous variables
*** Significant at the 1% significance level
** Significant at the 5% significance level
* Significant at the 10% significance level

Table VII. Results of the logistic regression for the total sample (N = 122 companies)

$$CAUD_i = \beta_0 + \beta_1\%INDEPCA + \beta_2\#MIEMBROSCA + \beta_3\#MIEMBROSCA^2 + \beta_4DPD + \beta_5BIG5 +$$

$$\beta_6DEA + \beta_7OPINAUD + \beta_8TAM + +\beta_9LEV + \beta_{10}\%ACCMAN + \beta_{11}GCP + \beta_{12}INVINST + \beta_{13}PERD +$$

$$+ \beta_{14}CV + \beta_{15}RA + \sum_{i=1}^{8} \beta_i SECT_i + \varepsilon_i$$

Variables	Predicted sign	Estimated parameters	Wald test	Significance
CONSTANT	+/-	-4.719	2.740	.098*
%INDEPCA	+	.041	8.748	.003***
#MIEMBROSCA	+/-	.267	1.897	.168
#MIEMBROSCA^2	+/-	-.011	2.945	.086*
DPC	—	-.100	.032	.857
BIG5	—	-.261	.085	.771
DEA	+	-.099	1.728	.189
OPINAUD	+	-.866	.951	.329
TAM	+	.327	2.965	.085*
LEV	+	-.008	.474	.491
%ACCMAN	—	-.028	1.375	.241
GCP	—	-.012	1.154	.283
INVINST	+	.214	.085	.770
PERD	+	-.104	.019	.890
CV	—	.010	4.053	.044**
RA	—	-.002	.011	.916
IE	+/-	23.161	.000	1.000
IM	+/-	-1.848	4.452	.035**
EGA	+/-	-.162	.015	.902
CON	+/-	-.481	.126	.722
HOS	+/-	-3.369	2.515	.113
TAC	+/-	-.830	.659	.417
IF	+/-	-.248	.050	.823
AIA	+/-	-1.532	2.135	.144

Chi^2= 36.863** (Sig. .034)
Pseudo R^2= 36.20%
% Classification = 87.70%

*** Significant at the 1% significance level
** Significant at the 5% significance level
* Significant at the 10% significance level

Table VIII. Results of the logistic regression excluding financial institutions from the sample (N = 110)

$$CAUD_i = \beta_0 + \beta_1\%INDEPCA + \beta_2\#MIEMBROSCA + \beta_3\#MIEMBROSCA^2 + \beta_4DPD + \beta_5BIG5 +$$

$$\beta_6DEA + \beta_7OPINAUD + \beta_8TAM + +\beta_9LEV + \beta_{10}\%ACCMAN + \beta_{11}GCP + \beta_{12}INVINST + \beta_{13}PERD +$$

$$+ \beta_{14}CV + \beta_{15}RA + \sum_{i=1}^{8} \beta_i SECT_i + \varepsilon_i$$

Variables	Predicted sign	Estimated parameters	Wald test	Significance
CONSTANT	+/-	-4.745	1.951	.162
%INDEPCA	+	.043	7.389	.007***
#MIEMBROSCA	+/-	-.363	1.635	.201
#MIEMBROSCA^2	+/-	.013	1.417	.234
DPC	—	.216	.138	.710
BIG5	—	-.520	.315	.574
DEA	+	-.145	2.986	.084*
OPINAUD	+	-1.962	3.388	.066*
TAM	+	.650	7.196	.007***
LEV	+	-.003	.049	.824
%ACCMAN	—	-.029	1.342	.247
GCP	—	-.018	1.644	.200
INVINST	+	.225	.086	.770
PERD	+	-.252	.105	.746
CV	—	.010	3.380	.066*
RA	—	-.012	.274	.601
IE	+/-	25.662	.000	.999

IM	+/-	-2.021	4.385	.036**
EGA	+/-	-1.223	.751	.386
CON	+/-	-.679	.236	.627
HOS	+/-	-4.192	3.466	.063*
TAC	+/-	-1.102	1.001	.317
IF	+/-	2.929	2.031	.154
AIA	+/-	-1.699	2.228	.136

Chi^2= 41.043** (Sig. .012); Pseudo R^2= 43%; % Classification = 88.90%

*** Significant at the 1% significance level; ** Significant at the 5% significance level; * Significant at the 10% significance level

Table IX. Spearman's correlation coefficient for the total sample

	%INDE PCA	#MIEM BROS CA	DPC	BIG5	DEA	OPINA UD	TAM	LEV	%ACC MAN	GCP	INVIN ST	PERD	CV
#MIEMBR OSCA	-.042												
DPC	.224**	.107											
BIG5	-.188**	.158	.091										
DEA	.052	.286***	.031	.083									
OPINAU D	.043	.034	.062	-.161	-.072								
TAM	-.195**	.395***	.162	.243***	.206**	-.039							
LEV	-.094	-.096	.112	.062	-.101	.070	.356***						
%ACC-MAN	-.001	-.199**	-.058	-.221**	-.129	-.066	-.146	.050					
GCP	-.364***	-.106	-.098	.221**	-.023	-.150	.256***	.108	.038				
INVINS T	-.077	.135	.132	.010	-.086	-.012	-.012	.025	.479***	.016			
PERD	.100	-.201**	.111	-.180**	-.167	.292***	-.254***	.151	.016	-.177	-.078		
CV	.044	.049	.203**	.024	-.008	-.185**	-.024	-.020	.048	.027	.091	.006	
RA	.003	-.015	.105	.098	-.023	-.230**	-.223**	-.351***	.011	.106	-.065	-.355***	.245***
IE	-.053	.057	-.082	.027	.116	.243***	-.105	-.076	-.080	.089	-.047	-.041	-.071
IM	.123	-.242***	-.003	-.060	-.177	.101	-.285***	-.261***	.077	-.096	-.059	-.019	-.042
EGA	-.112	.319***	.201**	.074	.142	.015	.343***	.116	-.065	-.073	-.042	-.112	.127
CON	.100	.187**	.175	.068	.248***	-.085	.198**	-.038	-.016	.045	.067	-.104	.005
HOS	.148	-.039	.142	.039	.060	-.048	.104	.060	.012	-.071	-.067	.112	.165
TAC	-.010	.106	.162	.021	-.155	-.064	-.097	.072	-.014	-.010	.232***	.094	.020
IF	-.221**	.047	-.239***	.112	.058	-.064	.354***	.380***	-.012	.218***	-.012	-.171	-.268***
AIA	.053	-.106	-.191**	-.213**	.051	-.015	-.198**	-.139	-.033	-.117	-.047	.178	.188**
COM	-.048	-.034	-.004	.084	-.017	-.010	-.003	.037	.012	.109	-.070	.037	-.039

	RA	IE	IM	EGA	CON	HOS	TAC	IF	AIA
IE	.102								
IM	.212**	-.074							
EGA	.028	-.022	-.202**						
CON	-.069	-.021	-.186**	-.056					
HOS	-.058	-.012	-.106	-.032	-.029				
TAC	.037	-.034	-.307***	-.092	-.085	-.048			
IF	-.258***	-.034	-.307***	-.092	-.085	-.048	-.140		
AIA	-.208**	-.038	-.341***	-.103	-.095	-.054	-.156	-.156	
COM	.187**	-.026	-.231**	-.070	-.064	-.036	-.106	-.106	-.117

***The correlation is significant at 1%; **The correlation is significant at 5%

Table X. Spearman's correlation coefficient excluding financial institutions from the sample

	%INDEPCA	#MIEMBROSCA	DPC	BIG5	DEA	OPINAUD	TAM	LEV	%ACCMAN	GCP	INVINST	PERD	CV
#MIEMBROSCA	-.179												
DPC	.209**	.074											
BIG5	-.196**	.179	.115										
DEA	.020	.225**	.016	.083									
OPINAUD	.029	.032	.041	-.151	-.073								
TAM	-.149	.449***	.254***	.231**	.203**	.006							
LEV	-.025	-.102	.226**	.016	-.140	.131	.215**						
%ACC-MAN	.034	-.201**	-.038	-.235**	-.135	-.072	-.177	.072					
GCP	-.277***	-.013	-.053	.225**	.020	-.144	.237**	.036	.001				
INVINST	-.104	.114	.151	.014	-.145	-.017	-.016	.051	.457***	.025			
PERD	.088	-.227**	.087	-.168	-.172	.279***	-.218**	.229**	.015	-.167	-.089		
CV	-.020	.020	.154	.055	.000	-.244**	.133	.154	.059	.118	.088	-.050	
RA	-.045	-.017	.051	.133	.001	-.284***	-.126	-.219**	-.002	.175	-.076	-.416***	.151
IE	-.066	.059	-.092	.030	.124	.241***	-.104		-.085	.104	-.051	-.047	-.095
IM	.095	-.285***	-.059	-.035	-.184	.070	-.207**	-.071	.081	-.054	-.075	-.063	-.165
EGA	-.137	.337***	.196**	.082	.153	.005	.401***	-.159	-.069	-.063	-.048	-.127	.114
CON	.098	.196**	.169	.076	.268***	-.095	.258***	.181	-.018	.063	.067	-.117	.006
HOS	.158	-.043	.141	.043	.071	-.054	.139	-.001	.013	-.068	-.072	.107	.167
TAC	-.030	.108	.147	.034	-.162	-.081	-.053	.094	-.018	.014	.239***	.077	-.011
IF	-.209**	.223**	-.161	.053	.053	.096	.034	.135	.001	.138	.047	-.081	.018
AIA	.035	-.126	-.230**	-.202**	.060	-.033	-.161	-.054	-.037	-.104	-.055	.160	-.156
COM	-.072	-.043	-.022	.098	-.011	-.022	.035	-.094	.025	.140	-.077	.024	-.064

	RA	IE	IM	EGA	CON	HOS	TAC	IF	AIA
IE	.101								
IM	.150	-.086							
EGA	-.006	-.025	-.234**						
CON	-.116	-.023	-.215**	-.063					
HOS	-.085	-.013	-.122	-.0355	-.033				
TAC	.016	-.038	-.356***	-.104	-.095	-.054			
IF	.031	-.016	-.150	-.044	-.040	-.023	-.067		
AIA	-.272***	-.042	-.396***	-.115	-.106	-.060	-.176	-.074	
COM	.163	-.029	-.268***	-.078	-.072	-.041	-.119	-.050	-.132

***The correlation is significant at 1%; **The correlation is significant at 5%

Notes

[1] For more details about the relationship between these variables and the efficiency of company boards, see John and Senbet (1998).

[2] All of the values for the independent variables have been estimated for 1999, because the analysis focuses on the factors that might explain voluntary AC formation in that year.

[3] The coefficients of the sector dummy variables may be interpreted as representing differences between industries as regards the formation of audit committees with respect to the sector excluded from the regression model.