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Dissertação

Mestrado em Finanças Empresariais

Board Conditioning Factors of Firm Performance

Bruno Loïc Roda

Leiria, setembro de 2013

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Dissertação de Mestrado realizada sob a orientação da Doutora Natália Maria Prudêncio Rafael Canadas, Professora da Escola Superior de Tecnologia e Gestão do Instituto Politécnico de Leiria e coorientação da Doutora Maria João da Silva Jorge, Professora da Escola Superior de Tecnologia e Gestão do Instituto Politécnico de Leiria.

Leiria, setembro de 2013

“I never see what has been done.
I only see what remains to be done.”

Marie Curie, Nobel Prize in Physics (1903)

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Resumo

O elevado número de estudos empíricos recentes, que procuram estabelecer uma relação entre os mecanismos do governo das sociedades e o desempenho financeiro empresarial, demonstra que esta área de investigação continua a ser um motivo de interesse. O nosso estudo analisa o impacto da dimensão do conselho de administração, a proporção de diretores independentes, a presença de diretores femininos e estrangeiros, e a frequência de reuniões, no desempenho financeiro, para uma amostra composta por 398 empresas de onze países europeus, no exercício económico de 2010. Conduzimos a análise estatística através de regressões lineares múltiplas pelo método dos mínimos quadrados, em que o indicador de desempenho financeiro Tobin's Q é a variável dependente. Em todos os modelos, utilizámos variáveis de controlo relativamente ao desempenho financeiro, à dimensão da empresa e ao nível de endividamento. Como forma de aprofundar a sensibilidade dos resultados, utilizámos alternativamente um controlo para o efeito "indústria", "país" e "sistema de governo das sociedades". Os nossos resultados apresentam maior consistência quando o controlo para o efeito "sistema de governo das sociedades" é utilizado. Ainda aplicámos um teste à endogeneidade, que nos permite perceber que a amostra do nosso estudo não sofre deste problema ao nível da dimensão do conselho de administração, mostrando suspeitas ao nível da relação entre independência e desempenho financeiro. Quanto aos resultados: a presença de diretores estrangeiros está positivamente e significativamente relacionado com Tobin's Q. Quando controlado pelo efeito "sistema de governo das sociedades", a percentagem de independentes exerce um impacto positivo e significativo sobre o desempenho financeiro. A frequência de reuniões exibe um impacto negativo e significativo sobre Tobin's Q, igualmente quando controlado pelo efeito "sistema de governo das sociedades". Relativamente às nossas três variáveis de controlo: a rendibilidade do ativo (positivo), o logaritmo natural do ativo (negativo) e o rácio de endividamento (positivo) exercem um impacto significativo sobre o desempenho financeiro.

Palavras-chave: Governo das Sociedades; Desempenho Financeiro; Dimensão do Conselho de Administração; Diretores Independentes; Presença de Mulheres e Estrangeiros; Frequência de Reuniões.

Abstract

The generous amount of recent empirical works attempting to find a relationship between corporate governance mechanisms and firm performance show that this research field continues to be a matter of interest. Our study analyses the impact of board size, the proportion of independent directors on the board, the presence of both women and foreign directors on the board, and meetings' frequency, on firm performance, in a sample of 398 companies from eleven European countries, over the fiscal year of 2010. We carried out the statistical analysis through ordinary least squares regressions, where firm performance measure Tobin's Q is the dependent variable. In all models, we controlled for firm performance, firm size and the level of debt. In order to test for the sensitivity of our results, we alternatively controlled for the industry, country and system effect. We find that our results are more robust when controlling for the system effect. Moreover, when testing for endogeneity, we find that our sample firms do not suffer from this problem for board size, but show suspicions regarding an endogenous relationship between board independence and firm performance. As for the results: our most outstanding outcome is that the presence of foreign directors on the board is significant and positively linked to Tobin's Q. When controlling for the system effect, the proportion of independent directors exerts a significant positive impact on firm performance. Board meetings exhibit a significant negative impact on Tobin's Q, also when controlling for the system effect. Regarding our control variables: return-on-assets ratio (positive), the natural logarithm of assets (negative) and debt-to-assets ratio (positive) are found to be significantly related to firm performance.

Keywords: Corporate Governance; Firm Performance; Board Size; Independent Directors; Board Diversity; Meeting Frequency.

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List of Acronyms

3SLS – Three-Stage Least Squares

CEO – Chief Executive Officer

CG – Corporate Governance

CMVM – Comissão do Mercado de Valores Mobiliários

EPS – Earnings per Share

EU – European Union

GDP – Gross Domestic Product

IV – Instrumental Variables

OLS – Ordinary Least Squares

OECD – Organisation for Economic Co-operation and Development

PBV – Price to Book Value

ROA – Return on Assets

ROE – Return on Equity

ROI – Return on Investment

SEC – Securities and Exchange Commission

UK – United Kingdom

USA – United States of America

VIF – Variance Inflation Factor

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1. Introduction

Corporate governance is a mechanism through which companies are directed and controlled (OECD, 2004). This system allows the distribution of both rights and responsibilities throughout several actors around an organization – directors, managers, shareholders and other stakeholders. Corporate governance, by dictating standards and methods for proper decision-making, provides a structure through which a company sets its goals and ways of attaining them, monitoring its performance. Recent literature has been revealing curiosity regarding this issue. A wide range of motivations pointed out by authors that studied this subject helps us understanding its importance. Some of the reasons cited as most significant are the wave of worldwide privatizations occurred in the 1980s and 1990s, the strong deregulation and global integration of capital markets, and the sequence of recent corporate scandals (Becht, Bolton & Röell, 2002).

We are, currently, experiencing a financial crisis with a magnitude not seen since the great depression of 1929 (Soros & Woodruff, 2008), that recently led to the implementation of austerity-based fiscal policies. As main consequence, the economic agents were forced to be more attentive toward decisions made by boards of directors from companies with greater economic impact. A satisfactory theory on the matter should be able to explain the importance of the size, composition, role, and even behavior of management boards (Rodrigues, 2008). It should also be capable of establishing a comparison between diverse organizational forms.

Explanatory variables that are most commonly referenced within the scientific research community associated with board of directors features are both board size and independence (Bhagat & Black, 1999). Although in a fragmented way, additional studies explore the influence of board diversity, through the impact of the gender effect (Erhardt, Werbel & Charles, 2003; Farrel & Hersch, 2005; Campbell & Mínguez-Vera, 2008) and the presence of foreign directors on the board (Oxelheim & Randoy, 2003; Masulis, Wang & Xie, 2012). Board meetings frequency has also recently been a matter of concern (Vafeas, 1999; Andres, Azofra & Lopez, 2005; Brick and Chidambaran).

Literature linking board of directors' characteristics with firm performance, although extensive, shows little evidence about the European situation. Recent studies focus on individual countries – e.g., United Kingdom (Vafeas & Theodorou, 1998), Ireland (O' Connell & Cramer, 2010) or the Netherlands (Ees, Postma & Sterken, 2003).

Even when a broader number of countries is approached, as attempted by Andres et al. (2005), the referenced periods concerning both board of directors and financial information are often related to the 1990s. Following these limitations, we conclude that this subject calls for a more detailed approach. Indeed, the use of a wide-ranging set of recent data, applied to an extended group of European countries, would surely add value to the research field linked to the board conditioning factors of firm performance.

Financial performance instruments measure the level of goals achieved by a company (Jorge, 2010), allowing the evaluation of both policies and operational efficiency. This issue is one of the aspects that deserved most of the attention from the scientific community associated with corporate finance. Its expansion remains on the agenda, as companies' financial performance has become the dominant dependent variable used over the last three decades, in research studies carried out on organizations (Margolis, Elfenbein & Walsh, 2007).

The dependent variables that attracted most dedication from the academic community are both Tobin's Q and Market-to-Book ratio. There is evidence that Tobin's Q offers a higher explanation power to the independent variables used in the empirical analysis. Therefore, we focus our attention on this firm performance measure, similarly to Hermalin and Weisbach (1998), Yermack (1996), Andres et al. (2005), among other authors.

Our study has the purpose of disclosing the main board characteristics related to firm performance. Explicitly, we aim at explaining the impact of five core board characteristics – board size, the proportion of independent directors, board diversity through the presence of women and foreign directors, and board meetings – on Tobin's Q. Our sample focuses on comparable information for the fiscal year of 2010, regarding 398 companies from eleven European countries – Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom.

The database was gathered on the basis of a mix between primary and secondary sources. Most of the information regarding board of directors' features was obtained through *Spencer Stuart Board Index*, while some remaining records were extracted from corporate governance reports. Financial data was obtained through *Amadeus*, provided by *Bureau Van Dijk*, a database of comparable financial information for public and private European companies. The structure of our study is divided as shown below.

Firstly, we carry out a literature review, which consists of an in-depth approach to the corporate governance background. We discuss the appearing of the concept, its evolution, the main existing corporate governance systems and their importance in the actual economic context. Additionally, we discriminate the composition of the board of directors. According to previous research studies, the notions associated with the dimension, independence, gender and foreigner effect, and board meeting, are explained as a function of firm performance measures. We also provide helpful matter concerning the assessment of conceivable endogeneity problem related with both board of directors' size and composition toward firm performance.

Secondly, we carry out the empirical analysis. Here, we clarify the data collection procedure and exhibit the whole set of explanatory variables selected for the statistical analysis. Furthermore, we formulate testable hypotheses, according to the theoretical background put forward. We also mention the tools used throughout the statistical research, and include a section of descriptive statistics. Additionally, we make a careful approach of the applied methodology. Next, we discuss the empirical results obtained through the statistical analysis. Finally, we expose both the conclusions and limitations of our study, and provide suggestions for the conceivable conduction of future research.

2. Theoretical Background

2.1. Corporate Governance

2.1.1. Emergence, Evolution and Meaning

Corporate governance has a direct association with several phases of the economic development. It is therefore challenging to trace its origins (Cheffins, 2012). This concept arises along with commercial firms' formation, which created conceivable conflicts between managers and investors (Wells, 2010). The academic community believes that corporate governance modern theory[1] appeared in the decade of 1930. Nevertheless, the roots implicit in the referenced publications go back to the end of the 19th century (Wells, 2010). Some authors were inclusively debating this concept, decades before of the Wall Street Crash of 1929.[2]

In the decades that followed World War 2, North-American enterprises revealed high levels of economic growth. Therefore, it would be expected that corporate governance subject gained some relevance, but such did not happen (Cheffins, 2009). On the one hand, board of directors were only focused on supporting companies' management (Seligman, 1987). On the other hand, shareholders were absorbed with both the obtainment of their dividends and the evolution of their share valuation (Livingston, 1958). The notion of corporate governance became popular only in the beginning of the 1970s, in the USA.

The North-American Securities and Exchange Commission (SEC) introduced the corporate governance concept in its agenda in the mid-1970s, and the term appeared for the first time in 1976 on the federal registry (Ocasio & Joseph, 2005). Corporate governance enclosure and development experienced a notorious boost. The revelation of several illicit payments made by North-American companies to non-resident employees, with the complete knowledge of outside directors (Seligman, 1987), helped accelerating

[1] Wells (2010) refers, in his research "The Birth of Corporate Governance", that the academic community points out the work published by Berle and Means "The Modern Corporation and Private Property" in 1932 as the original framework of reference related with the modern theory of corporate governance. It is discussed that this study initiated the debate on the concept of corporate governance, being also the first to identify structural problems around this issue in the United State of America. It is also affirmed that these authors were the pioneers in describing corporate governance with the issue related to the separation between property and control.

[2] In the decade of 1920, the separation between property and control started to be the object of public interest. William Z. Ripley, with his framework "Main Street and Wall Street", in 1927, make popular these two subjects related with corporate governance, and started a reluctant public campaign against the management of organizations (Wells, 2010).

the process. In the same year, SEC made a request to the New York Stock Exchange, in order to complement the requirement access with a condition, which forces listed companies to include, in their structure, an audit committee, composed of independent counsellors. Eventually, the demand was accepted (Cheffins, 2012).

This sequence of events supported the starting point to have a deeper look on the subject. Until the late 20th century, corporate governance became a matter of debate, in both the USA and elsewhere in the world, by academics, regulators, investors and executives (Cheffins, 2012). Financial markets' growth is directly connected with corporate governance development. With it, financial systems evolved, companies' management became more professional, shareholders' power has progressively spread, and family control lost its ubiquity (Morck & Steier, 2005). Davis (2005) argued that corporate governance expansion finds its origins in the requirement to meet shareholders' expectations, since they were gradually losing their importance.

The prominence of corporate governance for financial health led to a strong exposition of the subject in the public interest field. Because of its several economic events coverage, the concept shows absence of a concrete and indivisible definition. Therefore, different opinions about its meaning continue to exist. Some authors offer a restricted notion of the corporate governance meaning, as several limited definitions about its roles are commonly found.

Corporate governance is often used as synonymous of shareholders' democracy (Maw, Cooper & Lane, 1994). In a perspective focused on the shareholders' interest, Shleifer and Vishny (1997) argued that corporate governance reflects a set of mechanisms through which resource suppliers ensure their investments' return. These authors also circumscribes the concept as a tool used by investors. From this point of view, it becomes clear that shareholders use the underlying processes of corporate governance in order to minimize transaction and agency costs related to their businesses toward companies.

In a dualistic relationship perspective, several authors seek to combine in the same direction the concerns of both managers and shareholders. Wells (2010) clarified that corporate governance represent a set of mechanisms for internal and external control, created to appease the conflicts between shareholders and managers that result from the separation of ownership.

Additionally, Davis (2005) argued that corporate governance is a system used to monitor the contribution of different parts to a single and shared purpose. According to this author, corporate governance allows the monitoring of companies' board of directors, in order to protect both their interests and those of their investors. Corporate governance is connected to the resolution of collective action problems among dispersed investors. It aims at reconciling conflicts of interest between the various stakeholders related to a company (Becht, Bolton & Röell, 2002).

According to the recommendations of *Comissão do Mercado de Valores Mobiliários*[3], corporate governance refers to a system of rules and behaviors concerning the application of both guidelines and control instruments of companies. To this concept underlies both an internal and an external aspect. The internal dimension, on the one hand, aims at including a set of rules to be respected within societies. The external part, on the other hand, refers to the control enabled by market mechanisms.

Following the several definitions provided by the literature, we conclude that a proper corporate governance policy should ensure transparency; guarantee the protection of both shareholders and creditors; hold managers responsible for goals' failure and laws' violation; allow performance maximization; meet international standards; be adjusted to the countries' reality (Santos, 2003). Hence, corporate governance is a goal or a procedure to follow for the benefit of shareholders, employees, customers, banks, and certainly both the reputation and position of a country and its economy (Maw, Cooper & Lane, 1994).

2.1.2. Agency Theory and Mechanisms of Control

The academic community provides several arguments concerning corporate governance solutions, which aim at mitigating the conflicting relationship between managers and shareholders. This notion results from the agency theory. In a formal sense, the agency theory has its origins in the early decade of 1970, but the concept behind it has a long and wide-ranging history. Among its influences are property-rights theories, organization economics, contract law and political philosophy (Cengage, 2006). Progressively, the agency theory emerged as dominant model in the financial economic literature, being widely discussed in business ethic texts.

[3] See "Recommendations of CMVM regarding corporate governance", available at: http://www.cmvm.pt/cmvm/recomendacao/recomendacoes/soccot/soccot_set2007/Pages/indicea.aspx

The agency relationship notion is explained as a contract where one or more individual shareholders, called principals, hire one or more other individual managers, called agents, to perform services, and then delegate decision-making authority to the agents (Jensen & Meckling, 1976). It is common to find, within the corporation context, managers that want to achieve personal goals unrelated with those traced by the owners.

This situation may ultimately undermine to the shareholders' wealth maximization. Since shareholders authorize managers to control firms' assets, conceivable conflict of interest may emerge between the two groups. The work carried out by Jensen and Meckling (1976) was one of the first to approach this question, by pursuing the analysis of agency relationships. According to the authors, agency problems occur when the agent starts to behave according to his/her personal interests, rather than those of the principal.

Agrawal and Knoeber (1996) posited that "agency problems arise within a firm whenever managers have incentives to pursue their own interests at shareholders expenses" (p. 1). Both the studies referred to agree that those behaviors might eventually lead to costs borne by shareholders, aiming at encouraging managers to maximize shareholders' wealth rather than behave in their own self-interests. These expenditures are commonly known as agency costs.[4] Several authors agree that the relationship between shareholders and managers should be regulated through the creation of a contract that balances power between parties, therefore requiring responsibilities' assumption (Cengage, 2006). The need to separate the power of those who administrate from those who manage the business is essential. Indeed, subordination of interests is likely to avoid shareholders' wealth expropriation by managers, and strengthens both the security and confidence of financial markets (Rodrigues, 2012).

The agency model offers several corporate governance mechanisms designed to reduce agency costs associated with the separation of ownership and control (Weir, Laing & McKnight, 2002). Governance mechanisms may be divided into two separate categories. On the one side, there are the internal mechanisms, which include board structure variables – proportion of non-executive directors, number of independent directors, presence of board subcommittees, and level of debt.

[4] "Agency costs are incurred when, in the face of information asymmetry, principals introduce monitoring mechanisms designed to align management and shareholder interests." (Weir, Laing & McKnight, 2002, p. 582). There are three major types of agency costs: Expenditures to monitor managerial activities; Expenditures to structure the firm in a way that limits undesirable managerial behavior; Losses incurred from divergent principal and agent interests despite the use of monitoring and bonding (Cengage, 2006).

On the other side, the key external corporate control mechanism is the financial market itself, embodied by takeovers,[5] although those are considered instruments of last resort (Jensen, 1986). Our study further approaches in detail the internal governance mechanisms of control, in the section dedicated to the literature review concerning board of directors' features.

2.1.3. Principles of Corporate Governance

Corporate governance principles may be defined as a regulatory legal basis on several topics. Without the aim of being accepted as law, these principals are mainly proposals, which might still be eventually recognized by courts, legislators and civil society (Nunes, 2006). Hence, corporate governance codes can be accepted as both recommendations and goals to be achieved by companies. Corporate governance guidelines aim at providing useful directions in order to improve overall corporate behaviors, while assuming to exert a valuable impact on the relationship between shareholders and managers (Rodrigues, 2012). Throughout the years, several working groups gathered in order to document corporate governance principles, which would be further recognized as valuable for the formulation of a regulatory legal basis.

One of the first released documents on the subject is the Cadbury Committee Report, entitled "The Financial Aspects of Corporate Governance", in 1992. The committee led by Adrian Cadbury was formed one year earlier by several members from a triumvirate with origins in the London Stock Exchange, the Financial Reporting Council and the Society of Accountants in England. The main purpose of the document conception was directly linked with the requirement of both recovering overall investors' confidence and restoring the British financial market reputation. The report is divided into four distinct parts: "The Code of Best Practice"; "The Board"; "Auditing"; "The Shareholders".

In 1995, a group of leading investors and industrialists, meeting under the leadership of Richard Greenbury, unanimously agreed on the publication of a radical set of proposals embodied in a new code of best practices. The report title enlightens about the main topics that were extensively discussed: "Directors' Remuneration". According to the corporate governance intention of aligning the interests of both shareholders and directors, the document focuses on accountability, responsibility, full disclosure and performance.

[5] "The probability of replacement following acquisition provides a direct incentive for top managers to perform well." (Weir, Laing & McKnight, 2002, p. 579).

The document had the main purpose of responding to public and shareholders concerns about directors' compensation. The Greenbury report focuses on three issues: Remuneration Committee/Policy; Service Contract/Compensation; Privatized Utilities.

The Ronnie Hampel committee also marked the year of 1995. The team was formed in order to combine, harmonize and both clarify Cadbury and Greenbury recommendations and develop conceivable changes. The document concerted efforts on four issues: The Role of Directors; Directors' Remuneration; The Role of Shareholders; Accountability and Audit. On the release of the report "Committee on Corporate Governance", in 1998, Ronnie Hampel was questioned about whose interests companies should be run. His answer was prompt and clear: "The single overriding objective shared by all listed companies, whatever their size or type of business, is the preservation and the greatest practical enhancement over time of their shareholders' investment".

Across the Atlantic Ocean, in the United States of America, the Sarbanes–Oxley Act made its appearance in 2002. The document was ratified[6] as a response to several major corporate and accounting scandals, which cost investors billions of US dollars, shivering public confidence toward the national securities market. The law forces top management to certify the companies' financial information accuracy. Moreover, fraudulent financial activity penalties became much more severe. Therefore, Sarbanes–Oxley Act helps increasing both outside financial auditors' independence and the boards of directors' oversight role (Paul, Jerry & Donald, 2011).

The Higgs Committee Report "Review of the Role and Effectiveness of Non-Executive Directors" was published in 2003. The document uncovered several recommendations related with the role of non-executive directors and the improvement through management diversity. The Higgs Committee (2003) referred that the purpose of this review was "to let in some daylight on the role of non-executive directors in the boardroom, and make recommendations to enhance their effectiveness" (p. 3). According to it, the corporate governance structure ensures that companies' management is harmonious with the interests of their shareholders and managers. The Report further stated that the code should regularly "evolve to lead best practices in the boardroom" (p. 4), raising simultaneously corporate performance standards.

[6] President George W. Bush, after signing the act, pronounced the following statement: "The era of low standards and false profit is over. No boardroom in America is above or beyond the law" (Elisabeth, 2002)

Half a year later, the "Combined Code on Corporate Governance" made its appearance, in order to replace the one issued by the Hampel Committee. The document outlines descend from a review of non-executive directors' role and effectiveness, together with a review on audit committees' participation. The combined code on corporate governance included several regulations on how to comply with specific parts: "Internal Control – Revised Guidance for Directors on the Combined Code", which relates to Code provisions on internal control, and "Audit Committees – Combined Code Guidance", which relate to the provisions on audit committees and auditors. In both cases, the guidelines suggest ways of applying relevant principles. This document replaced the 1998 code annexed to the listing rules (Financial Reporting Council, 2003).

The extensive development of working reports by several corporate governance commissions, in the United Kingdom, caught the attention of the Organisation for Economic Cooperation and Development (OECD). Furthermore, the Sarbanes–Oxley Act publication in the United States of America, one year before that, clearly enhanced corporate governance reputation. This sequence of events eventually motivated the OECD to publish an analogous code of best practices.

Simultaneously with the transition period conducted by several committees on corporate governance matters, the organization delivered the "OECD Principles of Corporate Governance" in 1999. The document would be revised and eventually released five years later, in 2004.

As its predecessors, OECD argued that corporate governance provides incentives for managers to pursue purposes that benefit both the company and its shareholders. Therefore, best practices of corporate governance contribute to sustainable growth, as well as other indicators of overall long-term success and performance of the company (OECD, 2004).

Over time, the document became one of the main worldwide cornerstones of corporate governance. The main aspects highlighted in the document are divided into six chapters: (1) Ensuring the Basis for an Effective Corporate Governance Framework; (2) The Rights of Shareholders and Key Ownership Functions; (3) The Equitable Treatment of Shareholders; (4) The Role of Stakeholders in Corporate Governance; (5) Disclosure and Transparency; (6) The Responsibilities of the Board.

2.1.4. Models across Europe

As approached in the previous section, the concept of corporate governance received a huge contribution from Anglo-Saxon countries. One of the main reasons for the extensive conceptual frameworks' development might be the highly expanded capital markets of both the United States of America and the United Kingdom. Thanks to the recent interest on the matter from OECD, a group of unique corporate governance systems have progressively been adopted in a widespread number of countries.

Because of opposing contexts related with countries' unique features,[7] the corporate governance system's basic structure underwent several adjustments across the globe. Among European countries,[8] a major difference between corporate governance systems arises, regarding board structure regulation – the use of a unitary versus a two-tier board, or a combination between the two structures (European Commission, 2002).

As exhibited in Table 1, the unitary board structure[9] is leading in five European Union Member States. Contrastingly, the two-tier board system[10] is predominant in six countries – Austria, Denmark, Finland, Germany, the Netherlands and Norway. Finally, a mixed system[11] between unitary and two-tier structure is dominant in Belgium, France, Greece, Portugal and Sweden.

Additionally, in certain countries, and under some conditions, employees also have the power to elect some of the supervisory body members. Typically, both the unitary and the supervisory board assign managerial bodies' members, which usually have to ensure that both financial reporting and control systems are running appropriately and in compliance with the law (European Commission, 2002).

[7] The corporate governance system adopted by a company might be influenced by basic aspects – cultural, legal, economic and social – related with the historical background of the country in which it operates.

[8] We are only extending the analysis of the models across Europe for EU Member States and Norway, before the adhesion verified both in 2004 and 2007, due to the lack of information on how this new set of Members behaves in terms of corporate governance.

[9] A unitary board is composed of non-executive and executive directors.

[10] The two-tier system gathers a supervisory board of non-executive directors and a separate management board of executive directors (Heidrick & Struggles, 2011).

[11] "System of two boards – a non-executive and an executive – meeting separately, but usually with the same chairman and CEO and some executives on the non-executive board" (Heidrick & Struggles, 2011, p. 10).

Table 1:
Prevalence of Board Structures in Europe

Member State	Board Structure	Employee Role in the Supervisory Body	Separate Supervisory and Managerial Leadership
Austria	Two-tier	Yes	Yes
Belgium	Mixed	No	Not Required
Denmark	Two-tier	Yes	Yes
Finland	Two-tier	Articles may provide	Yes
France	Mixed	Articles may provide	Not Required
Germany	Two-tier	Yes	Yes
Greece	Mixed	No	Not Required
Ireland	Unitary	No	Not Required
Italy	Unitary	No	Not Required
Luxembourg	Unitary	Yes	Not Required
Netherlands	Two-tier	Advisory	Yes
Norway	Two-tier	-	-
Portugal	Mixed	No	Not Required
Spain	Unitary	No	Not Required
Sweden	Mixed	Yes	Yes
United Kingdom	Unitary	No	Not Required

Note. Source: Adapted from European Commission (2002) (p. 44) and Heidrick and Struggles (2011) (p. 13)

Figure 1 presents the three prevalent board structures in European companies. All the three systems – unitary, two-tier or mixed – have their own benefits. The application of a unitary structure may eventually produce a better information flow between supervisory and managerial bodies. On the other side, the two-tier system marks a formal separation between the supervisory and the executive body. Heidrick and Struggles (2011) referred that the mixed system, although gathering both the benefits of the unitary and the two-tier structure, has to guarantee the monitoring of leadership activities when the roles of both the Chairman and the CEO are coinciding.

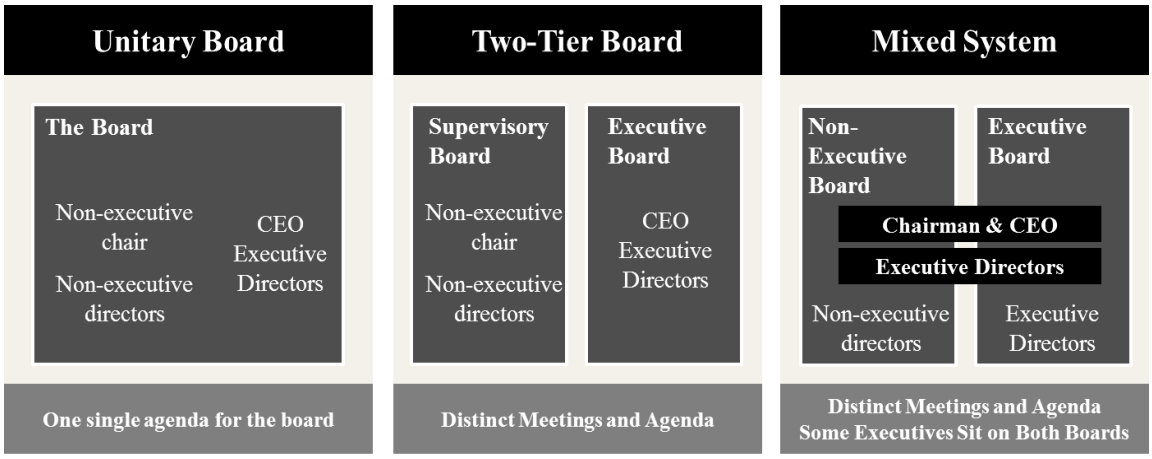

Figure 1. Board of directors structures in Europe
Source: Adapted from Heidrick and Struggles (2011) (p. 12)

With the recent evolution and concerns regarding best practices of corporate governance, the positive effects traditionally attributed to each system are progressively converging in a harmonious way. Concerning this matter, the European Commission (2002) informs that the several published codes seam to express a notable "consensus on issues related with board structure, function, roles and responsibilities" (p. 5).

2.2. Board of Directors and Firm Performance

Boards of directors are economic bodies, which aim at helping solving agency problems related with the organizations' management (Hermalin & Weisbach, 2001). Despite several regulatory requirements to which boards have to respond, their primary functions are determined by managerial problems, which they help to solve. Using a similar way of thinking, Jensen (1993) argued that boards of directors are one of the most powerful corporate governance mechanisms.

Davis (2005) argued that the relationship between corporate governance mechanisms and firm performance is considerable. Thus, its features must be taken into account throughout organizations' appraisal. Boards of directors' characteristics might be seen as instruments that contribute to shareholders' value maximization. Hence, the relationship between boards of directors' characteristics and companies' performance remain an interesting issue that needs to be approached in more detail (Cheng, 2008).

Financial performance measures assess the fulfilment of organizations' economic goals (Gentry & Shen, 2010). These instruments assist managers to better achieving their tasks, by providing them useful orientations. The simple interpretation enabled by financial performance measures is valuable when trying to understand previous events' consequences, by identifying business areas that can be improved. Thus, firm performance measures are essential, since they help understanding whether or not the company is reaching its goals. The achievement of companies' objectives can be estimated using both accounting[12] and market based[13] ratios.

[12] Accounting based ratios reflect prior or short-term firm financial performance due to the utilization of past financial information. Gentry and Shen (2010) provide some examples of accounting based ratio of firm performance: Return-on-Assets (ROA), Return-on-Equity (ROE) and Return-on-Sales (ROS).

[13] Market based ratios reflect forthcoming or long-term firm financial performance due to the utilization of prospective financial information. Examples of market based ratios are Price Earnings Ratio (PER) and Dividend Yield.

Until the late 1980s, authors which purpose was to obtain results on firm performance focused only on accounting based ratios (Hoskisson, Hitt & Wan, 1999). However, in the past two decades, two other measures, which combine both accounting and market information, emerged among academic research studies: Market-to-Book ratio and Tobin's Q.

Our study has the ambition of uncovering the board conditioning factors of firm performance. To do so, it becomes pertinent to scrutinize the existing literature on the subject. Notwithstanding the predominance of empirical papers over theoretical ones, connected with the relationship between board of directors' features and firm performance, we review the work developed by most of the influent authors on the subject.

The structure of this section is divided as follows: Firstly, we approach the literature that analyses the impact of board size. Secondly, we undertake in more details the composition of the board, by reviewing the research work carried out on the role of independent directors. Thirdly, we scrutinize recent papers built on two trendy variables: the presence of both women and foreign directors on the board. Fourthly, we focus on an issue also approached on studies related with the board conditioning factors of firm performance: board meetings frequency.

2.2.1. Board Size

Concerning the several significant aspects in the increase of board of directors' monitoring quality, board size assumes a decisive role (Ees, Postma & Sterken, 2003). According to the work conducted by Yermack (1996), board of directors' size represents an important determinant of firm performance. This author additionally argued that firm value, among other features, is influenced by "the quality of monitoring and decision-making" by the board of directors. Therefore, board size reflects the ability to both follow and control the activities undertaken by a company (Fama & Jensen, 1983).

Over the past three decades, a wide number of studies focused on the influence of board size over firm performance – see Table 2. Few of them displayed a positive relationship, some concluded in the opposite direction, while others determined a single explanation for an optimal bond with firm performance for both small and large boards of directors.

Table 2:
Empirical Evidence on the Impact of Board Size

Authors	Year	Region	Period	Performance Measure	Relationship	
					Direction	Significant
Pearce and Zahra	1992	USA	1983-1989	ROA | ROE	Positive	Yes
Yermack	1996	USA	1984-1991	Q	Negative	Yes
Bhagat and Black	1999	USA	1985-1991	Q	Negative	No
Eisenberg et al.	1998	Finland	1992-1994	ROA	Negative	No
Mak and Li	2001	Singapore	1995	Q	Positive	Yes
Ferris et al.	2002	USA	1995	MB	Positive	Yes
Andres et al.	2005	USA-EU	1996	Q | MB	Negative	Yes
Coles et al.	2008	USA	1992-2001	Q | ROA	Two-Way	Yes
O'Connell and Cramer	2010	Ireland	2001	Q	Negative	Yes

Note. This table displays the authors that turned their attention to the relationship between board size and firm performance, the respective year of the research, and the region and period concerned. In addition, the performance measures used in the empirical papers are presented, as well as the direction of the relationship and the respective indication of whether the connection is significant or not.

The literature is prolific in authors that reported a negative impact of board size on firm performance. Hermalin and Weisbach (2003) point out one of the main reasons for this finding, affirming that, with the increase of board size, agency problems triggers on the same direction, turning the board less effective. Yermack (1993) argued that small sized boards have many advantages, including lower misunderstanding problems, surplus of cohesion, and fewer individual motivations. In addition to these arguments, Eisenberg, Sundgren and Wells (1998) state that larger boards make their principal functions – namely coordination, communication and decision – clumsier than smaller groups.

According to this set of authors, it is perfectly clear that, the larger the board, the harder it becomes for its members to express both their ideas and opinions in the boardroom. Nonetheless, the results of Bhagat and Black (1999) cast doubt on the robustness[14] of any correlation between board size and firm performance. These authors revealed that the motive underlying the instable results of their research might be explained by a conceivable endogenous relationship between board size and internal factors correlated with firm performance.

Despite the heaviest evidence of a negative relationship of board size on firm performance, some authors found a positive inclination for this variable. Ferris, Jagannathan and Pritchard (2002) discovered a positive and significant relationship between board size and market-to-book ratio. Board size was also significantly and

[14] See Table 5 (Bhagat & Black, 1999). Board size takes a significant negative coefficient for sales to asset ratio, a negative and marginally significant coefficient for Tobin's Q, an insignificant and positive sign for operational income to asset ratio, is not significant using operating incomes to sales ratio and again significant and negative only for sales to asset ratio.

positively associated with firm performance by Pearce and Zahra (1992). For these authors, larger boards "permit the inclusion of a variety of perspectives on corporate strategy, enhancing the companies' ability to both understand and respond to diverse stakeholders" (p. 432), which might, ultimately, benefit the organization as a whole.

Mak and Li (2001) further claimed that, in some companies, the need for more directors with expertise in specific business areas[15] accelerates promotion processes from managers to directors, thus resulting into a firm performance increase through board size and quality improvement. In the middle of the wisdom, which separates positive from negative relationship of board size with firm performance, an interesting empirical study aimed at filling the gap between these two extremes.

Coles, Daniel and Naveen (2008) pointed out a U-shape relationship between firm performance and board size. Their results suggest that either very small or very large boards are optimal. According to the authors, large, complex and diversified firms across industries are likely to be under greater advising requirements, and might benefit from a larger board of directors. On the other hand, smaller, simple and specialized firms do not take profit from a larger board of directors, since outside expertise for a greater number of industries is not required. Thus, Coles et al. (2008) further concluded that Tobin's Q was "increasing (decreasing) in board size for complex (simple) firms" (p. 349).

2.2.2. Independence

The collected work connected with the influence of board composition on firm performance shows indications on the extensive interest on the matter over the past few decades. According to Hermalin and Weisbach (2003), directors are frequently divided into three distinct groups, as a consequence of their respective behaviors and incentives – insiders, outsiders, and affiliated[16] – each one having its advantages and disadvantages.

[15] Take as an example General Electric, a diversified and well performed company. The firm has a large and diverse board, with directors from the financial services, retail, tools and fasteners, automotive and industrial products, paper and packaging, and truck leasing industries. Still, its performance does not shrink with the addition of more expertized directors on the board (Coles, Daniel & Naveen, 2008).

[16] Inside directors are usually a company's current or former employees. It is not uncommon to find them attached to the CEO, due to self-interests of obtaining a successful career. Therefore, their independence is often jeopardized. Outside directors may be another firm's CEO's, or experts from other fields. Individuals composing this group are typically unrelated to the CEO interests, which benefit them when it comes to produce independent judgments (Hermalin & Weisbach, 2001). Affiliated directors are often businesspeople that have a longstanding relationship with the firm. They may include, for instance, family members of insiders or attorneys (Rosenstein & Wyatt, 1997). Thus, their independence depends widely on their self-interests, and whether or not those are connected with the ones of the CEO.

One of the most widely discussed questions pointed out by Hermalin and Weisbach (2003), concerning companies' board of directors composition, is: "Does having more outside directors increase corporate performance?" (p. 11). According to Alves and Mendes (2004), independent directors help obtaining a more effective monitoring of the decisions made by the board. Fama (1980) and Jensen (1993) also consider that independence is an attribute that composes effective mechanisms of corporate control. Thus, board composition is a determinant of firm performance. Again, the literature provides studies from authors with three different standpoints concerning board independence impact on firm performance: positive, negative and a two-way relationship.

Table 3:
Empirical Evidence on the Impact of Board Independence

Authors	Year	Region	Period	Performance Measure	Relationship	
					Direction	Significant
Pearce and Zahra	1992	USA	1983-1989	ROA | ROE	Positive	Yes
Barnhart et al.	1994	USA	1990	MB	Positive	Yes
Agrawal and Knoeber	1996	USA	1987	Q	Negative	Yes
Yermack	1996	USA	1984-1991	Q	Negative	No
Vafeas and Theodorou	1998	UK	1994	MB	Negative	No
Bhagat and Black	1999	USA	1985-1991	Q	Negative	Yes
Andres et al.	2005	USA-EU	1996	Q | MB	Negative	No
Coles et al.	2008	USA	1992-2001	Q | ROA	Two-Way	No
O'Connell and Cramer	2010	Ireland	2001	Q	Positive	Yes

Note. This table displays the authors that turned their attention to the relationship between board independence and firm performance, the respective year of the research, and the region and period concerned. In addition, the performance measures used in the empirical papers are presented, as well as the direction of the relationship and the respective indication of whether the connection is significant or not.

According to Agrawal and Knoeber (1996), the fraction of outsiders on the board is an internal decision. Hence, it is expected that choosing to either include or retrieve an independent director from the board will, ultimately, have an impact on the firm's value. Although Andres et al. (2005) did not find a positive direction for the impact of independence on Tobin's Q, they mentioned authors in favor of outside-dominated boards. The basic argument is that outside directors provide superior benefits to the firm, resulting from their independence (Baysinger & Butler, 1985).

Based on a strategic point of view, Pearce and Zahra (1994) analyzed a sample of USA companies between 1983 and 1989. They explained that a higher proportion of independents directors is likely to "ensure careful analyses of managerial proposals and enhance firms' ability to respond effectively at diverse interest groups expectations" (p. 432). Therefore, adding an independent director to the boardroom is expected to provide a welfare situation to the company.

Barnhart, Marr and Rosenstein (1994) found that "board composition and overall performance are positively related" (p. 338). Hermalin and Weisbach (1988) concluded that there is a good chance of a replacement of an insider by an outsider, in the subsequent periods following firms' underperformance. While there are diverse authors that found evidence of a positive upshot for board independence on firm performance, others, on the contrary, found a negative effect.

Higher proportion of insiders has also been pointed out as an indicator of improved knowledge to companies. Andres et al. (2005) and Yermack (1996) brought to discussion the positive impact of non-independent directors, which help improving firm's performance, especially in industries requiring high levels of expertise. Bhagat and Black (1999) shared a similar judgment, finding a negative and significant relationship between the proportion of independent directors and Tobin's Q.

The referred authors suggested a conceivable explanation for this inverse association, stating that, sometimes, "directors who are classified as independent are not truly independent".[17] These authors also built another theory, based on the real value of independent directors, stating that "some types of independent directors may be valuable, while others are not" (p. 267).

Agrawal and Knoeber (1996) established a parallel bond in their study, finding also a significant and negative impact of board independence on Tobin's Q. A suggestion for these results might be related with the possibility that firms tend to increase the number of outsiders on poorly performing firms (Hermalin & Weisbach, 1988). Again, we refer the interesting empirical study of Coles et al. (2008), which found both a negative and positive association between the number of independent directors and Tobin's Q.

As previously elucidated, these authors argued that complex firms are likely to benefit from having more directors on the board, while simple firms do not. Their results indicate that "the impact of outsiders on Tobin's Q is positive and significant" for large firms, which means that "increasing board size, specifically adding outsiders, does not necessarily detract from firm value" (p. 344).

[17] Bhagat & Black (1999) explain that this situation occurs because directors might be connected to the company in ways "too subtle to be captured in customary definitions of independence". Since data on these connections are not usually available, it remains difficult to conduct a complete study on the subject. An example of false director's independence given by these authors is the following: "some independent directors may serve as paid advisors or consultants to a company, or may be employed by a university or foundation that receives financial support from the company" (p. 267).

Coles et al. (2008) concluded that companies for which "firm-specific knowledge[18] of insiders is relatively important are likely to benefit from greater representation of insiders on the board" (p. 351). Concerning the point of view on this two-way relationship between firm performance and the proportion of outsiders, Rosenstein and Wyatt (1997) reveal that adding an insider (outsider) to an outside-dominated (inside-dominated) board improves shareholders' wealth.

2.2.3. Board Diversity

Board size and independence, although being the most approached features literature focuses energies on, does not make those two core characteristics the only which can explain firms' efficiency. Other features are likely to influence board undertakings, having, thus, an impact on further results obtained by companies (Godard & Schatt, 2000).

Recently, there has been a prominent debate toward board of directors' diversification across the European area. The increase of both female and non-national[19] representation on the board is considered as a benefit for the company, since these features are supposed to bring a different culture and mind-set to the boardroom (Egon Zehnder International, 2012). With this notorious global trend in hiring women and foreign directors – as displayed in Figure 2 – boards are combining different capabilities that may, ultimately, add proficiency to their decisions, thus increasing firms' performance and value.

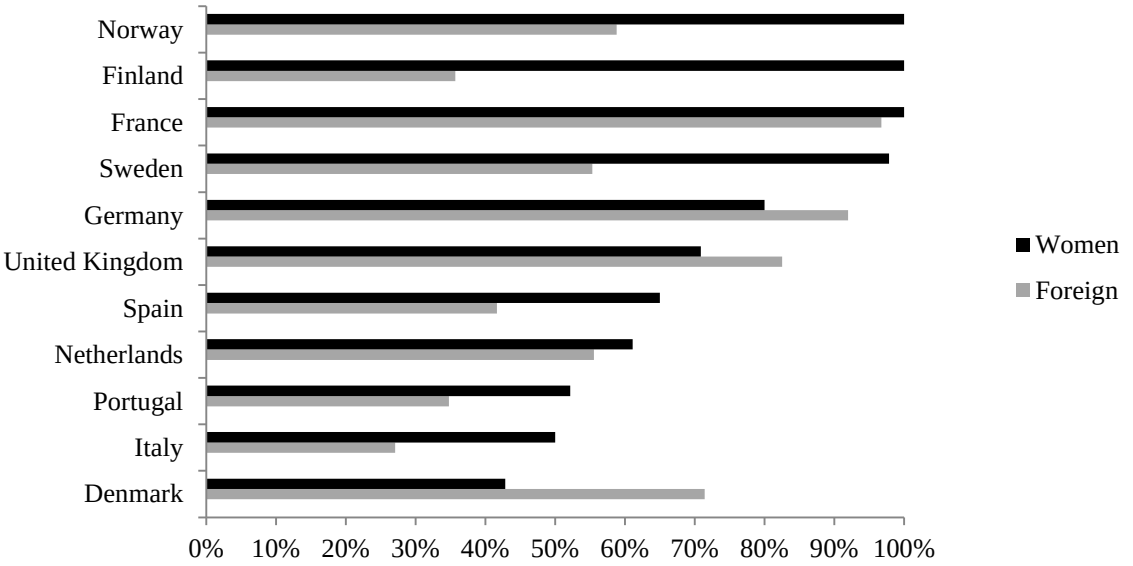

Figure 2. Boards with, at least, one woman or one foreign director, in 2010 (%)

[18] This knowledge is mainly related with insiders composing the board of R&D intensive companies.

[19] Non-nationals are directors with a nationality different from the origin of the company.

The academic community linked to board structures' influence on firm performance, although in a sparse proportion, has recently made an effort in order to pay more attention to this phenomenon. A limited number of authors have approached the impact of both foreign and women directors on the board. In addition, the inconsistence on the publications' frequency, concerning this matter, suggests an uncertain absorption from the literature of the significance of this new tendency.

The introduction of a common currency for seventeen of the twenty-seven EU members, since 2002, has progressively increased the free circulation of people, merchandise and money across Europe. Because of that, companies from European countries have progressively expanded their operations over frontiers, putting into practice plans of expansion and international growth.

According to Matos and Góis (2013), diversified boards of directors are likely to bring a better understanding on several key business issues. Therefore, the addition of foreign directors in European firms' boardrooms is likely to provide valuable international expertise and advice to companies as a whole. Table 4 summarizes the literature review and empirical evidence on the impact of foreign directors on firm performance.

Table 4:
Empirical Evidence on the Impact of Foreign Directors

Authors	Year	Region	Period	Performance Measure	Relationship	
					Direction	Significant
Oxelheim and Randoy	2003	NW-SW	1996-1998	Q	Positive	Yes
Erhardt et al.	2003	USA	1993-1998	ROA	Positive	Yes
Choi et al.	2007	S. Korea	1999-2002	Q	Positive	No
Carter et al.	2010	USA	1998-2002	Q	Positive	No
Masulis et al.	2012	USA	1998-2006	Q	Negative	Yes

Note. This table displays the authors that turned their attention to the relationship between the presence of foreign directors on the board and firm performance, the respective year of the research, and the region and period concerned. In addition, the performance measures used in the empirical papers are presented, as well as the direction of the relationship and the respective indication of whether the connection is significant or not.

Choi, Park and Yoo (2007) found a positive effect for the existence of foreign directors on South Korea companies' boards. They suggested that the presence of foreigners enhances firm performance, thanks to an upgraded monitoring and discipline. In a similar way of thinking, Oxelheim and Randoy (2003), at the light of their results on Nordic companies, argued that, when a firm exerts the option of adding a foreign director to the board, that is interpreted as a sign of its "willingness to improve monitoring opportunities" (p. 2372). These authors also stated that this decision represents a "higher commitment toward both corporate monitoring and transparency".

In a mixed and opposite set of conclusions, Masulis, Wang and Xie (2012), using information from a sample of American firms between 1998 and 2006, found that companies with foreign directors on their board "exhibit significantly poorer performance" (p. 552). Nonetheless, they also found that firms benefit from this kind of expertise, insofar as they "generate a higher percentage of total sales from their operation in the home region of the foreign director" (p. 552). Masulis et al. (2012) also concluded that the announcement of foreign directors' appointment on the board causes significantly negative stock market reactions, therefore decreasing Tobin's Q.[20]

In addition to the impact of foreign directors, several authors also found evidence that the presence of women on the board has an impact on firm performance. There are indications of both a negative and a positive influence of the presence of women on the board. From the authors who found a positive influence of women on the board, four stand out by the positive impact on firm performance – see Table 5.

Table 5:
Empirical Evidence on the Impact of Women on the Board

Authors	Year	Region	Period	Performance Measure	Relationship	
					Direction	Significant
Erhardt et al.	2003	USA	1993-1998	ROA	Positive	Yes
Farrell and Hersch	2005	USA	1990-2000	ROA	Positive	No
Campbell and Minguez-Vera	2007	Spain	1995-2000	Q	Positive	Yes
Adams and Ferreira	2009	USA	1996-2003	Q	Negative	Yes
Carter et al.	2010	USA	1998-2002	Q	Positive	No
Bohren and Strom	2010	Norway	1989-2002	Q	Negative	Yes
Ahern and Dittmar	2011	Norway	2001-2009	Q	Negative	No

Note. This table displays the authors that turned their attention to the relationship between the presence of women directors on the board and firm performance, the respective year of the research, and the region and period concerned. In addition, the performance measure used in the empirical papers are presented, as well as the direction of the relationship and the respective indication of whether the connection is significant or not.

Erhardt, Werbel and Charles's (2003) and Carter, D' Souza, Simkins and Simpson's (2010) outcomes shows that the number of women on the board is positively related with firm performance. One reason that might explain these results resides in the women's need to outperform their counterparts, in order to be promoted. Consequently, firm performance enhancement is generated through higher levels of expectations and qualifications from the diversified members in the boardroom (Erhardt, Werbel & Charles, 2003).

[20] This signal is taken as being a noticeable shareholders' skepticism about the positive contributions from foreign directors for firm value.

Moreover, Farrel and Hersch (2005) found evidence that women are likely to serve on higher performing firms. Although finding a positive connection between those two variables, they failed to establish a significant relationship for the impact of gender diversity on firm performance.

Campbell and Mínguez-Vera (2008) added to the positive impact of board diversity, suggesting that diversification can be achieved without destroying firm value. They further argued that companies should focus on a more balanced ratio between the presence of both men and women on the board.

In the light of these results, regarding the presence of both foreign and women on the board, firms should contemplate the prospective enhancement of performance that diversity might generate (Erhardt, Werbel & Charles, 2003). However, in recent research studies, the presence of women on the board of directors has been found to be negatively associated with firm performance.

Adams and Ferreira's (2009) results suggest that boards with more female representation exert stronger monitoring on the CEO. Nevertheless, the authors found that firms with strong governance and high quotas of women in the boardroom show higher probability of decreasing shareholders' value. The explanation resides in the over-monitoring provided by gender diversity, which might ultimately contract firm performance.

In addition, Bohren and Strom (2010) found a negative and significant impact of women representation on Tobin's Q for Norwegian firms. Earlier studies using both different methods and institutional settings also pointed toward the same direction, suggesting that "heterogeneous boards are less effective decision makers".

Finally, Ahern and Dittmar (2011) added to the empirical evidence on the matter, by finding that higher presence of women on the board through law regulation "led to a substantial decline in Tobin's Q" (p. 32). Their results suggest that, when guidelines impose constraints on the choice of directors, firm performance is likely to decline, since genuinely chosen board are designed to maximize shareholder value.

2.2.4. Meetings Frequency

The board of directors has an important role regarding companies' governance structure. Among other duties, directors have to meet frequently,[21] in order to work and formulate decisions, which aim at enhancing the company's operational and financial performance. Therefore, it may be stated that the number of meetings held by the board of directors is a metric of its activity (Brick & Chidambaran, 2010). In the literature, there has been a recent, yet scarce and fragile, interest on the impact of board meetings over firm performance – see Table 6.

Table 6:
Empirical Evidence on the Impact of Board Meetings Frequency

Authors	Year	Region	Period	Performance Measure	Relationship	
					Direction	Significant
Vafeas	1999	USA	1990-1994	MB	Negative	Yes
Andres et al.	2005	USA-EU	1996	Q | MB	Positive	No
Brick and Chidambaran	2010	USA	1999-2005	Q	Positive	Yes

Note. This table displays the authors that turned their attention to the relationship between board meetings and firm performance, the respective year of the research, and the region and period concerned. In addition, the performance measures used in the empirical papers are presented, as well as the direction of the relationship and the respective indication of whether the connection is significant or not.

It is rather easy to understand that the outcomes produced from previous studies show only slight hints of robustness. Vafeas (1999) is one of the few authors addressing some concerns about the importance of board meetings. The inverse relationship between board meeting and preceding firm performance found by this author suggests that poor performing companies might require greater monitoring levels. In line with this point of view, Andres et al. (2005) state that sometimes, the board of directors is "a reactive institution rather than a proactive way of improving corporate governance" (p. 200). Thus, the number of meetings held in subsequent years is likely to increase, since higher monitoring is supposed to benefit the quality of the decisions made, enhancing firm value.

Andres et al. (2005) alert that more meetings are not synonymous of better monitoring,[22] but they also agree that the number of meeting held is a "key point to identify the activity of the board" (p. 200). The authors justify the positive impact found between board meetings and Tobin's Q by arguing that the shareholders' wealth benefits from an

[21] "The directors may meet as often as required, according to the company's Articles of Association. The King II Report suggests that the directors meet at least once per quarter, and more regularly, depending on the circumstances of the company throughout the year" (Deloitte, 2006, p. 20).

[22] Both the scarcity of time from outside directors and the long routine associated with some meetings' tasks are factors that may force the need to the schedule of more meetings, without taking the proper benefits from higher monitoring opportunities.

enforced control of managers provided by frequent meetings. Recently, a research carried out by Brick and Chidambaran (2010) shows that Tobin's Q is significantly higher when faced with a higher level of board monitoring. They suggest that the main contribution of board monitoring is "in helping identify investment opportunities, as opposed to improving current operating performance" (p. 545).

Considering this set of results, one interesting assumption may be drawn. If a company is able to set an efficient number of meetings, depending on their board of directors' features, it is, therefore, possible to enhance firm performance. The expenditures associated with board meetings, balanced with additional available time for directors to make better decisions, has to be correctly measured, in order to extract the potential benefits for the firm.

2.3. Firm Performance and the Endogeneity Problem

An interesting discussed issue in empirical researches on the board conditioning factors of firm performance is the impact of endogeneity. Endogeneity problems may occur when, in an ordinary least square regression model, the independent variable has a high correlation with the error term, implying that the regression coefficient is biased. To our study, the central question about endogeneity problems is connected with the direction of causality.

Regarding this question, several authors struggled trying to understand if board features are likely to affect firm financial performance, rather than the prospect of firm financial performance having an impact on board features. Chi (2005) provides three possibilities concerning the causal relationship between corporate governance mechanisms and firm performance – see Figure 3.

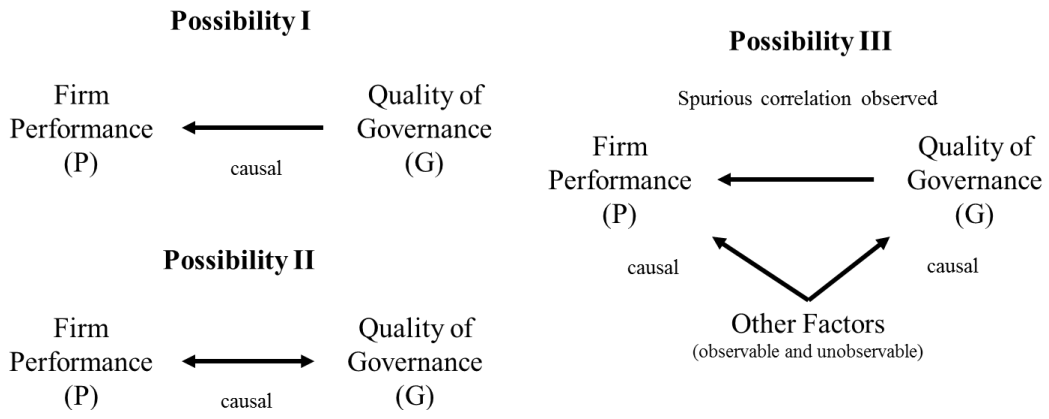

Figure 3. Endogeneity relationships
Source: Adapted from Chi (2005)

Barnhart et al. (1994) help us interpreting the first possibility. Indeed, these authors affirmed that most of the empirical evidence on the subject assumes causality as the effect of governance mechanisms over firm performance. Nonetheless, there is empirical evidence that reduced levels of performance may lead to changes in the board of directors' features, which brings us to the second possibility. For instance, Kole (1992) found that the direction of causality was running from firm performance to corporate governance mechanisms. The third possibility is even more complex, and includes other factors, which may affect both corporate governance mechanisms and firm performance. This last classification requires a deeper analysis of both endogenous and exogenous features connected with the board conditioning factors of firm performance. Recently, the academic community has made an effort trying to uncover endogeneity problems, focusing essentially on board size and composition.

Yermack (1996) asserted that causal relationships occur when using board size, stating that "the number of directors might arise endogenously as a function of other variables". Controlling for endogeneity, this author found that causality was running from board size to Tobin's Q. Hence, there was no evidence that board size was undergoing changes because of past performance. Additionally, O'Connell and Cramer (2010) assumed that "board size is an endogenous variable which may be modelled as function of financial performance" (p. 394). After using various regressions, they concluded that endogeneity was not a significant issue when crossed with firm performance.

Regarding board composition, Hermalin and Weisbach (1988) found that independent directors were likely to join the board after poorer performance levels. Hermalin and Weisbach (1998) resolved this line of thought, arguing that, since changes in board composition following poor performance are relatively low, evidence of a causal relationship concerning this feature is limited.

Bhagat and Black (1999) attempted to correct for the endogeneity effect. Still, results obtained through 3SLS did not reveal any empirical relation between board composition and firm performance. Barnhart et al. (1994), through the IV method, concluded that board composition and firm performance were endogenously related. Beiner, Drobetz, Shmid and Zimmermann (2006) confirmed this trend, by finding a substitution effect through 3SLS, based on the impact of "higher shareholdings of officers and directors" (p. 27) on the proportion of independent directors.

Board adjustments between mandates are opportunities to either react or anticipate poor performing periods. Adding a director in the boardroom can be synonym of losses in decision-making efficiency, or a way to help finding solutions for the diverse branches of a company. The literature suggests that board fluctuations might be subject to endogeneity problems. However, it is not granted that changes in board size or composition are an effective response to prior poor firm performance. In order to be proficient and adapted to the specific needs of each company, choosing an optimal board structure must be a measure taken without any type of exogenous pressure.

As seen above, the conventional wisdom linked to possible endogenous relationship between board size and firm performance shows only slight hints of robustness. Indeed, both Yermack (1996) and O'Connell and Cramer (2010) found that causality was running from board size to firm performance, hence concluding that endogeneity was not significant. Regarding board composition, the literature is divided by two trendy empirical evidences. Nevertheless, we also consider this matter in our study, by testing for endogeneity problems regarding both board of directors' size and composition toward firm financial performance.

3. Sample Selection and Methodology

Our study aims at uncovering the board conditioning factors of firm performance. Here, we expose both the sample selection and the methodology used. The section is divided as follows: Firstly, we explain the process behind data collection, and the steps that allowed us assembling the final sample. Secondly, we describe the methodology applied for the precise conduction of our statistical analysis, stressing both the definition and the source of the variables included in the equations. Thirdly, we build testable hypotheses, establishing references to the previously approached literature. Fourthly, we provide a careful statistical description of the collected data, in order to enlighten about the sample characteristics. The results, core findings and suggestions for future research are further displayed in their respective chapters.

3.1. Data Collection

In order to conduct an appropriate analysis on the board conditioning factors of firm performance for European companies, we had to reach a high level of commitment toward the collection of a selective amount of data. The database of our study was gathered through a mix between primary and secondary sources. We took a number of steps, with the main intention of accumulating comparable data concerning both board of directors' features and firm financial information – see Table 7.

Table 7:
Sample Selection

Selection Criteria	Sample Size
Firms with comparable data on board of directors features	653
Firms with data on board size, meetings, independent, foreign and women directors	598
Firms with accounting data on the *Amadeus* database	420
Firms included in the category of large companies	418
Firms without severe outliers in their variables	398

Our initial sample is drawn from comparable data on the board of directors, obtained through the 2010 *Spencer Stuart Board Index* reports, regarding nine European countries – Denmark, Finland, France, Italy, the Netherlands, Norway, Spain, Sweden and the United Kingdom. In short, the *Spencer Stuart Board Index* provides information on board size, board composition – number of outsiders – board diversification – number of both foreign and women directors on the board – and board internal functioning – number of annual meetings held by the board.

The absence of certain board of directors' features for both Germany and Portugal was surpassed by the extraction of comparable data from corporate governance reports accessible through the companies' webpages. The lack of information about board meetings for Italian firms forced us to adopt a similar approach of data mining, seeking directly into the corporate governance reports accessible through the webpages of 75 out of 130 Italian companies. The described steps allowed us gathering a sample with a total number of 598 companies.

Accounting information, which is essential to construct several variables of our study, was obtained through the *Amadeus* platform, and provided by *Bureau Van Dijk*, a database of comparable financial information for both public and private companies across Europe. This phase directly excluded companies included in section 64 and 65 of the NACE Rev.2[23] from our analysis. Data on those companies could have been extracted through the *Bankscope* platform, a world banking information source also provided by *Bureau Van Dijk*. However, we preferred to ignore this data, similarly to Erhardt et al. (2003), which referred that board composition and ownership structure of both financial and insurance companies differ significantly from those of other industries. This last phase dismissed 178 companies, reducing our sample at 420 observations.

Our study focuses on the board conditioning factors of firm performance for large European companies. Therefore, we needed to find and delete observations which characteristics were not compatible with the European Commission definition of "large enterprises". As it can be observed in Table 8, the European Commission qualifies as large enterprises those with a staff headcount over 250, cumulative with a turnover above 50 million Euros, or a balance sheet total over 43 million Euros. Through an analysis of our sample firms' accounting information, we were able to find and erase two companies, which conditions were not appropriate to include them in the "large enterprises" category.

Table 8:
Enterprise Category Definition

Enterprise Category	**Ceilings**		
	Staff Headcount	**Turnover**	**Balance Sheet Total**
Micro	< 10	≤ 2 million	≤ 2 million
Small	< 50	≤ 10 million	≤ 10 million
Medium	< 250	≤ 50 million	≤ 43 million
Large	≥ 250	> 50 million	> 43 million

Note. Source: Adapted from European Commission (2009)

[23] The Eurostat NACE Rev.2 represents the statistical classification of economic activities in the European Community. Division 64 contains firms with financial activities, except insurance and pension funding. Division 65 contains insurance and pension funding companies, except compulsory social security.

Finally, we checked for the conceivable existence of severe outliers.[24] These unusual data values occur in almost all researches involving data gathering, even when the information originates from reputable sources. In order to detect severe outliers, we applied the analyzing tools provided by *IBM SPSS Statistics* software.

Through boxplots extracted from the interaction between variables, labelling cases by the respective number of observations, we figured out which data to erase. This screening procedure allowed us removing 20 severe outliers – Tobin's Q (10), Return-on-Assets (8) and Board Meetings (2).

In brief, our sample selection procedure consisted of a cross-sectional gathering of both accounting information and board of directors' features, which allowed us extracting comparable data concerning 398 companies from 11 European countries. We exhibit both sample country composition and specifications in Table 9.

United Kingdom companies contribute with almost 24% of our sample, providing the higher representation, while Denmark only adds a 1.26% share to our sample, or five companies. Through Table 9, we are also able to conclude that about 60% of our sample firms uses the Euro as official currency.[25] In addition, 20% adopt a two-tier board structure predominance, 57% a unitary board structure, and 23% a mix between the two.

Table 9:
Country Composition and Specifications

Country	Official Currency	Board Structure	Observations	% of Sample
Denmark	Danish Krone	Two-tier	5	1.26 %
Finland	Euro	Two-tier	17	4.27 %
France	Euro	Mixed	30	7.54 %
Germany	Euro	Two-tier	25	6.28 %
Italy	Euro	Unitary	74	18.59 %
Netherland	Euro	Two-tier	18	4.52 %
Norway	Norwegian Krone	Two-tier	13	3.27 %
Portugal	Euro	Mixed	20	5.03 %
Spain	Euro	Unitary	58	14.57 %
Sweden	Swedish Krona	Mixed	43	10.80 %
United Kingdom	Pound Sterling	Unitary	95	23.87 %

[24] Outliers are observations that have extreme values relative to other observations observed under the same conditions. Observations may be outliers because of a single large or small value of one variable or because of an unusual combination of values of two or more variables. According to Mason, Gunst and Hess (2003), outliers produce several problematic effects such as estimates distortion, sums of squares inflation, statistical significance distortion, and might led to faulty conclusions.

[25] Although 60% of our sample firms uses the Euro as official currency, the financial information provided by Amadeus database is in Euro for the 398 companies of our study.

The *Amadeus* database also provided information on the several industries in which companies are classified, according to the *NACE Rev.2* code. This procedure assigned the 398 firms of our sample across sixteen industries. Table 10 displays the number of observations and respective weigh of each industry on our sample. The manufacturing industry is the one with most representation, with about 27%, or 107 companies. Contrariwise, agriculture, human health and arts industries only contribute with one company each, representing 0.75% of our sample.

Table 10:
Industry Composition

Section	Description	Observations	% of Sample
A	Agriculture, Forestry and Fishing	1	0.25 %
B	Mining and Quarrying	21	5.28 %
C	Manufacturing	107	26.88 %
D	Electricity, Gas, Steam, Air Conditioning Supply	14	3.52 %
E	Water Supply, Sewerage, Waste Management	3	0.75 %
F	Construction	24	6.03 %
G	Wholesale and Retail Trade, Repair of Motor Vehicles	22	5.53 %
H	Transportation and Storage	12	3.02 %
I	Accommodation and Food Service Activities	6	1.51 %
J	Information and Communication	33	8.29 %
K	Financial Activities	60	15.08 %
L	Real Estate Activities	7	1.76 %
M	Professional, Scientific and Technical Activities	76	19.10 %
N	Administrative and Support Service Activities	10	2.51 %
Q	Human Health and Social Work Activities	1	0.25 %
R	Arts, Entertainment and Recreation	1	0.25%

3.2. Development of the Hypotheses and Proposed Model

In this section, we define both the model and variables, as well as the hypotheses which will be tested. Our study has the ambition of uncovering the board conditioning factors of firm performance. Using an econometric point of view, and similarly to Barnhart et al. (1994), Vafeas and Theodorou (1998), Yermack (1996) and Andres et al. (2005), among others, the common way to conduct the empirical analysis is through Ordinary Least Squares regressions.

In our study, we use several variables. Thus, we estimate the parameters through a multiple linear regression model, which is similar to Equation 1. Here, Y represents the dependent variable, the values β_0, β_1, β_2, and β_k represent parameters to estimate, X_1, X_2, and X_k are the independent variables, and ε_i is the independent distributed normal error.

$$Y = \beta_0 + \beta_1.X1 + \beta_2.X2 + \ \ldots + \beta_K.Xk + \ \varepsilon i$$

Equation 1: Multiple Linear Regression

For our analysis' purposes, the dependent variable is a proxy for firm performance: Tobin's Q. The literature review presented in the last section provides orientations on the independent variables commonly used in the empirical model, which exert an impact on firm performance. Hence, board composition features are on the right side of the equation: board size; board independence; the presence of both women and foreign directors on the board; and board meetings.

Additionally, we include variables that aim at controlling for the outcomes of our experiment: return-on-assets; debt-to-assets; the natural logarithm of total assets; country, industry and corporate governance system dummies. Therefore, and considering the specifications enlightened above, the empirical model through which we produce statistical results concerning the board conditioning factors of firm performance is represented in Equation 2.

$$Q = \beta_0 + \beta_1.BSIZE + \beta_2.INDEP + \beta_3.WOM + \beta_4.FOR$$

$$+ \beta_5.MEET + \beta_6.ROA + \beta_7.FSIZE + \beta_8.DEBT$$

$$+ \sum_{i=1}^{15} \beta_8 + i\,.INDUSTRYi + \sum_{i=1}^{10} \beta_{23} + i\,.COUNTRYi + \sum_{i=1}^{2} \beta_{33} + i\,.SYSTEMi + \ \varepsilon i$$

Equation 2: The Empirical Model

Essentially, and as fully described throughout the data collection section, accounting and financial data were mainly obtained from the *Amadeus* database. This material was useful to compute the following independent variables: Q; ROA, FSIZE and DEBT. Besides, the *Amadeus* database provided valuable information on which industries our sample firms were included. Thus, the addition of the industry effect in the model became possible. Moreover, data on board of directors' features were gathered, in order to build the five core independent variables of our study.

Through *Stuart Spencer Board Index* and firms' corporate governance reports, we were able to collect a valuable amount of comparable information. BSIZE, INDEP, WOM, FOR and MEET are independent variables directly computed from data on board of directors' features. Furthermore, two other control variables are exhibited in our main empirical model.

We constructed dummy variables with the intention of accounting for the country effect. In addition, we built another set of dummy variables that seek to represent for the corporate governance systems effect. In order to incorporate these effects in Equation 2, and based on the information provided by both Table 1 and Table 9, we constructed both COUNTRY and SYSTEM dummy variables. Table 11 summarizes both the definitions and sources of the variables.

Table 11:
Definitions and Sources of Variables

Variable	Definition
Dependent Variable	
Q	The ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. Accounting and Market data were obtained through *Amadeus*.
Independent Variables	
BSIZE	The natural logarithm of the total number of directors on the board of each firm. The total number of directors on the board for each firm was obtained through *Spencer Stuart Board Index*.
INDEP	The proportion of independent directors, defined as the ratio of the number of independent directors to the total number of directors. The number of independent directors on the board for each firm was obtained through *Spencer Stuart Board Index*.
WOM	A dummy variable that is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise. The presence of women on the board of directors was obtained through *Spencer Stuart Board Index*.
FOR	A dummy variable that is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise. The presence of foreigners on the board of directors was obtained through *Spencer Stuart Board Index*.
MEET	The natural logarithm of the total number meetings held by the board of directors. The number of meetings was obtained through *Spencer Stuart Board Index* and from some firms' Corporate Governance Reports.
Control Variables	
ROA	Operating income before interest and taxes scaled by total assets. The ratio was obtained through *Amadeus*.
FSIZE	The natural logarithm of total assets. Accounting data was obtained through *Amadeus*.
DEBT	The ratio of short-term debt plus long-term debt over total assets. Accounting data was obtained through *Amadeus*.
INDUSTRY	Dummy variables, each one representing a specific industry. [1]
COUNTRY	Dummy variables, each one representing a specific country. [2]
SYSTEM	Dummy variables, each one representing a system of corporate governance. [3]

Note. [1] Firms were classified into 16 industries, based on the information from Table 10. [2] Firms were classified into 11 countries, based on the information from Table 9. [3] Firms were classified into 3 corporate governance system, based on the information from Table 9.

Q proxies for firm performance, and is defined as the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. Table 12 shows that this indicator is widely used in research studies linked to the board conditioning factors of firm performance. Agrawal and Knoeber (1996), Bhagat and Black (1999) and Andres et al. (2005), among other authors, addressed their attention to the higher explanatory power of the independent variables used, when crossed with Tobin's Q. Hence, in order to add empirical value to this research field, in the European context, we make Q as the dependent variable of our study.

Table 12:
Firm Performance Measures Used by Authors on the Subject

Authors	Year	Region	Period	Firm Performance Measures	
				Tobin's Q	Others
Pearce and Zahra	1992	USA	1983-1989		ROA; ROE; EPS
Barnhart et al.	1994	USA	1990		MB
Agrawal and Knoeber	1996	USA	1987	X	
Yermack	1996	USA	1984-1991	X	
Vafeas and Theodorou	1998	UK	1994		MB
Bhagat and Black	1999	USA	1985-1991	X	
Vafeas	1999	USA	1990-1994		MB
Mak and Li	2001	Singapore	1995	X	
Ferris et al.	2002	USA	1995		MB
Oxelheim and Randoy	2003	NW-SW	1996-1998	X	
Farrell and Hersch	2005	USA	1990-2000		ROA
Andres et al.	2005	USA-EU	1996	X	MB
Campbell et al.	2007	Spain	1995-2000	X	
Choi et al.	2007	S. Korea	1999-2002	X	
Adams and Ferreira	2009	USA	1996-2003	X	
Carter et al.	2010	USA	1998-2002	X	ROA
Brick and Chidambaran	2010	USA	1999-2005	X	
O'Connell and Cramer	2010	Ireland	2001	X	
Masulis et al.	2012	USA	1998-2006	X	

Note. This table shows the summary of working papers from authors that approached the board conditioning factors of firm performance, the respective period and region concerned, and the firm performance measures used in their study. EPS is the ratio of Earnings per Share; MB is the Market-to-book ratio – market value of equity divided by the book value of equity; ROA is the Return-on-assets ratio; ROE is the Return-on-equity ratio, and Tobin's Q is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity.

The core independent variables included in Equation 2 are connected with companies' board of directors' features.[26] We previously clarified the steps underlying the data collection, which allowed us assembling comparable information to build and include essential variables in our main equation. The purpose of our study is to uncover the board conditioning factors of firm performance. Thus, our hypotheses aim at providing an answer to a key issue: does board of directors' features have a positive or a negative impact on the financial performance measure Tobin's Q?

[26] Board size; Proportion of independent directors; Presence of both women and foreigners on the board, and Board meetings.

BSIZE is the natural logarithm of the total number of directors on the board, and is informative about board size. Yermack (1996), Bhagat and Black (1999) and Ferris et al. (2002) turned their attention to the impact of this variable on firm performance. Specifically, Yermack (1996) affirmed that the size of the board is an important conditioning factor of firm performance. Therefore, the inclusion of BSIZE in our study is not to be discarded, since it plays a significant role in the empirical analysis.

The relationship between board size and firm performance is known to have been largely scrutinized by several authors. As shown earlier, from the wide number of studies carried out on this connection, most of the results pointed to the negative effect for firm performance of adding more directors on the board. Nevertheless, the sample firms of our study have similar characteristics with those documented in the empirical research studies drawn by both Coles et al. (2008) and Pearce and Zahra (1992). These authors obtained a positive association between board size and large companies' financial performance. Our research focuses on 398 large companies from eleven European countries. Hence, the first research hypothesis is that firm performance has a positive relationship with board size.

Hypothesis 1: *There is a positive association between BSIZE and Q*

INDEP characterizes board of directors' independence. For our empirical research, this feature is represented by the proportion of independent directors on the board, being defined as the ratio of independent directors to the total number of directors. Yermack (1996), Vafeas and Theodorou (1998) and Bhagat and Black (1999) considered that this variable was an attribute that exerts an influence on firm performance. Since the proportion of independent directors composes effective mechanisms of corporate control (Fama & Jensen, 1983), its addition in Equation 2 is categorical.

The association between independent directors' proportion and firm performance has been abundantly discussed within the academic community related with the subject of our study. Similarly to the obtained results for board size, many authors concluded for a negative impact of the independence level on firm performance. Still, the proportion of empirical papers that display a positive association between those variables is higher than in the case of board of directors' size.

Additionally, there is a particularity to consider. The sample firms of our study are large. Therefore, their board of directors might have to deal with great levels of strategic concerns. As seen earlier, Pearce and Zahra (1992) considered that the presence of independent directors might, in some cases, be essential, in order to "enhance a firm's ability to respond effectively to the expectations of diverse interest groups" (p. 432), thus increasing firm performance. Hence, the second research hypothesis is that the presence of independent directors has a positive connection with firm performance.

Hypothesis 2: *There is a positive association between INDEP and Q*

WOM is a variable that typifies for board of directors' diversification. Equation 2 accounts for the presence of women on the board through a dummy variable, which is assigned the value of one if the firm has at least one woman on its board of directors, zero otherwise. Several authors have recently included this variable in their empirical analysis. For instance, Erhardt et al. (2003), Campbell and Minguez-Vera (2007) and Bohren and Strom (2010) found significant evidence that the presence of women on the board has an effect on firm performance.

WOM must be included in Equation 2, since it represents an innovation for the research field linked to the board conditioning factors of firm performance. Recent corporate financial scandals led to the creation of several guidelines, which aim at adjusting the board of directors' composition, encouraging the inclusion of more women (Egon Zehnder International, 2012). However, over the past few years, several authors interested in the effect of women's presence in the boardroom over firm performance have found a negative association between these two variables.

Adams and Ferreira's (2009) results suggest that board of directors with more female representation exerts stronger monitoring, showing higher probability of decreasing shareholder value. Thus, over-monitoring provided by gender diversity might lead to poorer firm performance. Hence, the third research hypothesis is that firm performance is negatively associated with the presence of women on the board.

Hypothesis 3: *There is a negative association between WOM and Q*

FOR also represents a board of directors' diversification feature. As displayed in Table 11, the presence of foreigner directors on the board is materialized through a dummy variable, which is assigned the value of one if the firm has at least one foreigner on its board, zero otherwise.

Oxelheim and Randoy (2003), Erhardt et al. (2003) and Masulis et al. (2012) found a significant impact of FOR on firm performance. We, hence, decided to include this variable in Equation 2. Throughout the literature review, we discovered that four out of five authors found a positive association between the presence of foreigner directors on the board and firm performance.

It is, therefore, clear that the presence of such directors can be interpreted as an encouraging signal. In the European context, companies that hire foreign directors might be willing to upgrade the level of discipline and decision making of their board. Hence, our fourth research hypothesis is that firm performance has a positive association with the presence of foreign directors on the board.

Hypothesis 4: *There is a positive association between FOR and Q*

MEET is the last core independent variable of Equation 2. Its connotation is retrieved from the natural logarithm of the total number of meetings held by the board of directors. There is still little evidence about the specific effect of board meetings on firm financial performance. The definition of the fifth hypothesis of our study is, therefore, under supported. Also, the analysis of a single fiscal year challenges the prediction of whether past board meetings signal for better present firm performance or not.

However, we find support on the empirical studies developed by Vafeas (1999), Andres et al. (2005) and Brick and Chidambaran (2010). These authors are among the few academics that have spent some interest on the analysis of this variable. According to them, board of directors has an important role concerning corporate governance structure.

Brick and Chidambaran (2010) argued that directors have to meet frequently, in order to work and make decisions that may increase the performance of the company. Andres et al. (2005) affirmed that a "key point to identify the activity of the board is the number of meetings" (p. 200). The purpose of our study is to uncover the board conditioning factors of firm performance. MEET is a variable that proxies for directors' effort and involvement. Therefore, the inclusion of this variable in our empirical model makes perfect sense.

In Europe, the financial crisis stroke with greater impact from 2008 onwards. Companies that suffered from this adverse period might have wanted to increase the number of meetings, in order to find solutions to mitigate the negative effects of a global recession.

Vafeas's (1999) results suggest that poor performing companies might require greater monitoring levels. Therefore, those firms are likely to gather more frequently their boards. Hence, our fifth research hypothesis is that firm performance is negatively associated with board meetings.

Hypothesis 5: *There is a negative association between MEET and Q*

In research studies carried out on the relationship between corporate governance mechanisms and firm performance, the use of control variables is a common procedure. The inclusion of indicators such as return-on-assets and debt-to-assets ratio, as well as the natural logarithm of assets, in empirical models, has been frequently followed by several authors in the past two decades – see Table 13. With the purpose of controlling for firm performance, firm size and debt, we also decided to include this set of variables in our main equation.

Table 13:
Control Variables in Research Studies on the Subject

Authors	Year	Control Variables		
		ROA	FSIZE	DEBT
Morck et al.	1988			X
McConnell and Servaes	1990			X
Hermalin and Weisbach	1992		X	
Barnhart et al.	1994		X	X
Agrawal and Knoeber	1996		X	X
Yermack	1996	X		
Vafeas and Theodorou	1998	X		X
Bhagat and Jefferies	2002			X
Weir et al.	2002			X
Andres et al.	2005	X		X
Campbell and Minguez-Vera	2007	X	X	X

Note. This table displays the authors that included control variables in their equations. DEBT is the ratio of short-term debt plus long-term debt over total assets; FSIZE is the natural logarithm of total assets; ROA is the ratio of operating income before interest and taxes scaled by total assets.

ROA is a financial ratio that comes from operating income before interest and taxes scaled by total assets. In empirical studies regarding the impact of board of directors' features on firm performance, this variable is usually comprised in the equations. Similarly to Yermack (1996), Andres et al. (2005) and Campbell and Mínguez-Vera (2008), we decided to include ROA in Equation 2. The purpose of this is essentially to control for financial performance. ROA partly reflects permanent future operating cash-flows' stream (Vafeas & Theodorou, 1998). Therefore, it is expected to be positively related with firm performance measured by Tobin's Q.

FSIZE, which aims at controlling for firm size, is included in our main model. While several authors use the natural logarithm of firms' sales for the same purpose, others, as, for instance, Barnhart et al. (1994), Yermack (1996) and Campbell and Mínguez-Vera (2008), decided to include an asset-based variable in their equations. Due to the lack of information about total sales on the *Amadeus* database for the sample firms of our study, FSIZE reflects the natural logarithm of total assets. Both Barnhart et al. (1994) and Campbell and Mínguez-Vera (2008) found a negative association between the natural logarithm of assets and firm performance. Similarly to these authors, we expect FSIZE to be negatively related with Tobin's Q.

DEBT is a control variable employed to determine a company's level of risk, and is obtained through the division between short-term debt and long-term debt over total assets. Knowing how much of a firm's assets are financed by debt is enlightening about the danger associated with its management. DEBT is supposed to discipline managers (Andres, Azofra & Lopez, 2005), and was present in several empirical research studies. Thus, we decided to include this variable in our study, expecting it to be positively associated with firm performance.

Table 14 summarizes the predicted influence of the variables described above. In brief, on the one hand, we expect BSIZE, INDEP, FOR, ROA and DEBT to have a positive impact on Tobin's Q. On the other hand, we forecast a negative sign for WOM, MEET and FSIZE on Tobin's Q.

Table 14:
Predicted Influence of the Variables on Firm Performance

Variable	Predicted Influence	Argument
BSIZE	(+) Positive	Positive for large firms
INDEP	(+) Positive	Positive for large firms
WOM	(-) Negative	Negative impact due to over-monitoring
FOR	(+) Positive	Positive sign by upgrading the level of discipline
MEET	(-) Negative	More meetings in poor performing periods
ROA	(+) Positive	Reflects future operating cash-flows
FSIZE	(-) Negative	Empirical evidence of a negative association
DEBT	(+) Positive	Supposed to discipline managers

Note. BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets; FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; MEET is the natural logarithm of the total number of meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

Several authors have included industry, country, and corporate governance system dummies in their equations – see Table 15. The academic community linked to the board conditioning factors of firm performance has undeniably preferred to contemplate the industry effect. This trend, sustained until the late 1990s, was challenged with a study conducted by Andres et al. (2005). Similarly to this empirical research, we decided to incorporate INDUSTRY, COUNTRY and SYSTEM in Equation 2. This approach is expected to be enlightening toward the sensitivity of the results obtained.

Table 15:
Industry, Country and System Dummies in the Literature

Authors	Year	Dummy Variables		
		INDUSTRY	COUNTRY	SYSTEM
Morck et al.	1988	X		
Hermalin and Weisbach	1992	X		
Barnhart et al.	1994	X		
Agrawal and Knoeber	1996	X		
Yermack	1996	X		
Bhagat and Black	1999	X		
Vafeas and Theodorou	1998	X		
Andres et al.	2005	X	X	X

Note. This table shows the summary of working papers from authors that approached the board conditioning factors of firm performance and the dummy variables used in their study.

INDUSTRY is incorporated in our model through a set of dummy variables, which assume the value of one when the company relates to its respective industry, zero otherwise. For this specific purpose, we created fifteen dummy variables. Since board of directors characteristics may vary across industries, we decided to include this variable in our model. Board of directors' features may also suffer from the influence of governmental, economical and sociocultural implications. Therefore, our empirical model has to account for those repercussions. In order to include the COUNTRY effect, we adopt a similar procedure of dummy variable construction. To account for this effect, we constructed ten dummy variables.

Finally, SYSTEM, a set of dummy variables, which aim at controlling for corporate governance system settings, is incorporate in Equation 2. The SYSTEM effect is not to be rejected, since corporate governance models adopted directly influence board of directors' specifications. In order to account for this particular effect, and similarly to the steps undertaken for INDUSTRY and COUNTRY dummies, we constructed two dummy variables, since our sample firms are spread among three corporate governance systems.

3.3. Descriptive Statistics

The main purpose of our study is to disclose the board conditioning factors of firm performance. The data collection process undertaken and previously described resulted in a sample of 398 companies from eleven European countries. Descriptive statistics on the board, accounting data, financial ratios and computed variables are displayed in Table 16.

Table 16:
Descriptive Statistics

Variable	Mean	Median	Minimum	Maximum	St. Deviation
Panel I – Data on the Board of Directors					
Board Size	10.43	10.00	3.00	23.00	3.69
Insiders	2.73	2.00	0.00	12.00	2.20
Insiders (%)	0.26	0.23	0.00	1.00	0.18
Outsiders	5.43	6.00	0.00	16.00	2.46
Outsiders (%)	0.54	0.50	0.00	1.00	0.24
Affiliated	2.28	10.00	0.00	14.00	2.81
Affiliated (%)	0.20	0.13	0.00	0.91	0.21
Women	1.16	1.00	0.00	4.00	1.00
Women (%)	0.12	0.10	0.00	0.57	0.12
Foreigners	1.82	1.00	0.00	12.00	2.29
Foreigners (%)	0.17	0.10	0.00	1.00	0.21
Meetings	8.85	8.00	4.00	21.00	3.04
Panel II – Accounting Data (in million Euros)					
Total Assets	17.535	3.815	43	240.559	
Shareholders' Equity	5.905	1.504	-146	112.079	
Liabilities	11.626	2.319	25	209.242	
Long-Term Debt	3.819	750	0	55.031	
Net Income	795	179	-2.487	15.321	
Market Capitalization	8.000	1.913	0	101.063	
Panel III – Financial Ratios and Computed Variables					
Q	1.23	1.09	0.42	3.28	0.52
BSIZE	2.29	2.30	1.10	3.14	0.35
INDEP	0.54	0.50	0.00	1.00	0.24
WOM	[a] 0.71	1.00	0.00	1.00	[b] __
FOR	[a] 0.59	1.00	0.00	1.00	[b] __
MEET	2.12	2.08	1.39	3.04	0.34
ROA	0.05	0.04	-0.14	0.20	0.05
FSIZE	22.14	22.07	17.58	26.21	1.82
DEBT	0.20	0.18	0.00	0.63	0.14

Note. The statistics reported are obtained by using summary statistics procedure in Gretl (version 1.9.12). The financial ratios and variables displayed in Panel III are as follows: BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets; FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; Q is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise. [a] The computing of dummy variables means give the information about the percentage of firms which are assigned the value of 1. [b] The computing of dummy variables standard deviation is considered inappropriate.

Data on board of directors are denoted in Table 16, Panel I. Board size represents the total number of directors on the board. Mean board size is consistent with the data reported by Góis (2011), Andres et al. (2005), Barnhart et al. (1994) and Yermack (1996). The high value of the standard deviation shown for this variable is closely related with firm size and the different corporate governance models embraced across countries. On average, European companies' board size reaches approximately 10 directors. The smallest boards are composed of three directors, while larger boards do not exceed 23 individuals. Directors can also be divided into three distinct categories: insiders, outsiders and affiliated.

In the literature, while it is easy to find designations of what kind of directors are the insiders, the concept of outsiders continues to assume different terminologies. Although it is clear that outsiders are detached from the CEO interests, which represents a sign of independence, it remains challenging to separate the directors who are truthfully independents from those who are not.

The information gathered trough the *Spencer Stuart Board Index* provides orientations to the following assumption: the executive directors characterize the insiders, the non-executive independent directors are denoted as outsiders, and the remaining directors are affiliated. Descriptive statistics show that most of the boards are outsider-dominated, with an overall weight of 54%. On average, only 26% of directors are insiders, while affiliated represent 20% of the directors.

Recent empirical works also focus interest on the presence of both women and foreign directors on the board. Table 16 shows interesting results. The average proportion of women on the board is about 12%. This data is encouraging, since European countries have recently made efforts to promote the inclusion of more women in the boardroom.

However, the assembled database enables both a motivating and a discouraging aspect. While it is true that 51 out of 400 companies display a proportion above 25% of women representation, it is also a fact that 117 of the sample firms have no female representation on their board of directors. Building a parallel approach regarding the presence of foreigners on the board, one conclusion is obvious: the majority of the sample firms embrace the benefice of internationalizing their boardroom.

On average, the representation of foreigners is about 17%. Using similar means to uncover how many companies have a share of non-national directors above 25%, we concluded that this assumption was true for 111 of them. Furthermore, 59% of the sample firms have at least one foreign director on their board. Additionally, the literature centers interests on board monitoring functions, using a metric that proxies for the effort made by directors toward managers' control: board of directors' meetings.

For our sample firms' 398 European companies, the average number of meetings held in 2010 was approximately nine. It seems like the companies' board of directors of our sample worked intensively, if compared with the data delivered by Yermack (1996), Andres et al. (2005) and Brick and Chidambaran (2010). The mean number of meetings per year reported by these authors displays average values close to seven.

If we take a closer look to the minimum number for this variable, it is easy to conclude that no company held a frequency of meetings below one per trimester. In fact, while board of directors from 16 companies met only four times in 2010, 79 organizations held a frequency of meetings equivalent at one per month, or 12 in the entire year.

Once again, the standard deviation[27] shown for board meetings is high. This value can be explained by understandable differences between companies for board meetings' schedules. Features such as firm size, industry specifications, and corporate governance model standards, among others, explain those differences. Those features may possibly affect the required monitoring level, which aims at improving board of directors' decision making, in order to enhance firm performance. Other indicators included in our empirical analysis were found in the companies' financial statements.

Financial data, in million Euros, is represented in Table 16, Panel II. As we can see, there are no observations with a value of total assets below 43 million Euros. This is a clear indicator that our sample includes only large companies, as previously reported. Mean value for total assets is relatively high, reaching 17.535 million Euros, which surpasses the values exhibited by, for instance, Ees, Postma and Sterken (2003) or Brick and Chidambaran (2010). Additionally, data on complementary items from the companies' balance sheet were extracted – shareholders' equity, liabilities, and long-term debt.

[27] A high standard deviation indicates that the data points are spread out over a large range of values.

Figure 4 shows the mean capital structure of our sample firms. Mean value for shareholders' equity is 5.905 million Euros. This rubric is guided by a range of values between a minimum of minus 146 and a maximum of 112.079 million Euros. Four companies exhibited negative values of shareholders' equity for the fiscal year 2010. Liabilities' variability resulted in a mean value of 11.626 million Euros. The company with the lowest value of total liabilities exhibits 25 million Euros, while the higher value of total liabilities is above 209.000 million Euros.

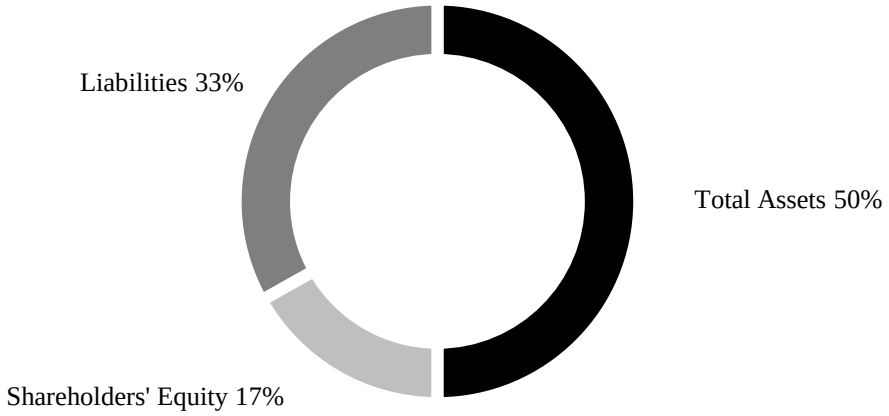

Figure 4. Mean capital structure of the sample firms

One of the items that composes the total value of liabilities is long-term debt. Its inclusion in our study is directly related with the calculation of debt-to-asset ratio. Long-term debt assumes a range of values from four thousand Euros to 55.031 million Euros, resulting in a mean value of 3.819 million Euros. To close this panel of financial data, we also make a review on net income and market capitalization.

Net income for the sample firms is, on average, 795 million Euros. This item balances between a minimum of minus 2.487 and a maximum of 15.321 million Euros, which represent a large discrepancy of values. Among the sample of 398 European companies, 44 of them reported a net loss in 2010, i.e., a negative value of net income.

Regarding market capitalization, it seems that the average value is relatively high, reaching almost 8.000 million Euros. The highest record for our sample firms attains an impressive 101.063 million Euros, contrasting with five companies which market capitalization is null. Additionally, in order to carry out our empirical analysis, we also computed three essential variables.

Three financial ratios can be consulted in Table 16, Panel III: Q, ROA and DEBT. The mean value for Tobin's Q, our dependent variable, is 1.23. This value is relatively inferior to the 2.57 and 1.79 score reported by the studies of Andres et al. (2005) and Coles et al. (2008), on European and North-American companies. The discrepancy of values is explained by the punishing behavior of equity markets toward European companies over the subsequent years of the financial crisis started in the 2007-2008 period.

Figure 5 shows the evident diving tendency of market capitalization – as a percentage of gross domestic product – both around the world and in Europe. Furthermore, we can observe that European Union companies' market capitalization has a lower weight, as a percentage of GDP, when compared with the rest of the world. The transition between 2010 and 2011 marks a second negative period for market capitalization. This fact may clarify the reason why mean value of Tobin's Q for the sample firms of our study is lower if paralleled with other working papers on the subject,[28] since this indicator includes market value of equity in its formula.

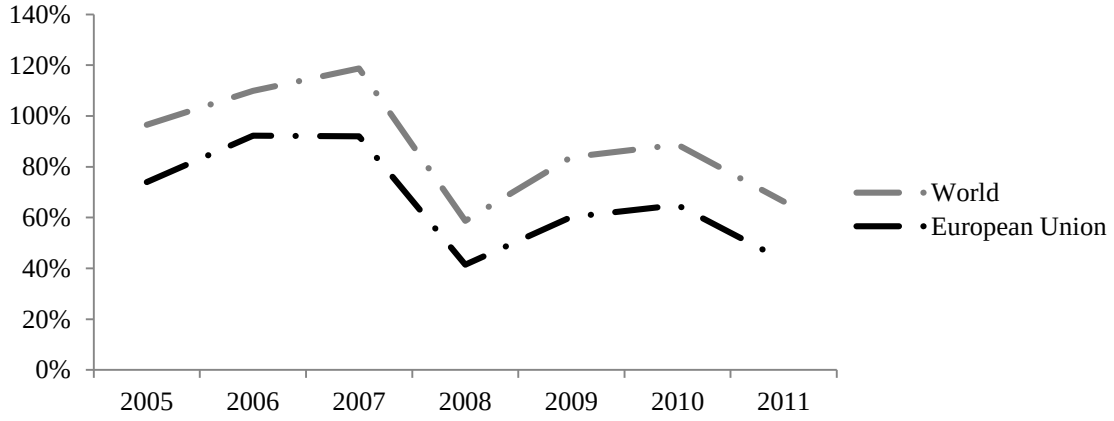

Figure 5. Market capitalization of listed companies (percentage of GDP)
Source: Adapted from the World Bank Group (2013)

Panel III from Table 16 displays two other variables that respectively control for firm performance and leverage. Our sample firms' ROA balanced between negative returns for 44 observations, with a minimum of minus 14%, and positive returns for the remaining, attaining 20%. Mean value for ROA reached 5%. On average, European firms were able to generate earnings through their assets. This is a positive scenario, assuming that the turbulent financial period was supposed to disable firms' management efficiency.

[28] Related studies on the subject using market capitalization as an item included into formulas, which result in ratios *proxying* for firm value, focus interests on companies' data prior to 2008. For that reason, reported values of Tobin's Q are likely to be higher than the one presented in our research.

Figure 6 shows that the ROA of our study is one of the lowest reported, when compared with authors using this variable in their equations. This circumstance shows the reduced firms' ability to obtain proper levels of profitability. Finally, our study also focuses interests on another indicator: DEBT.

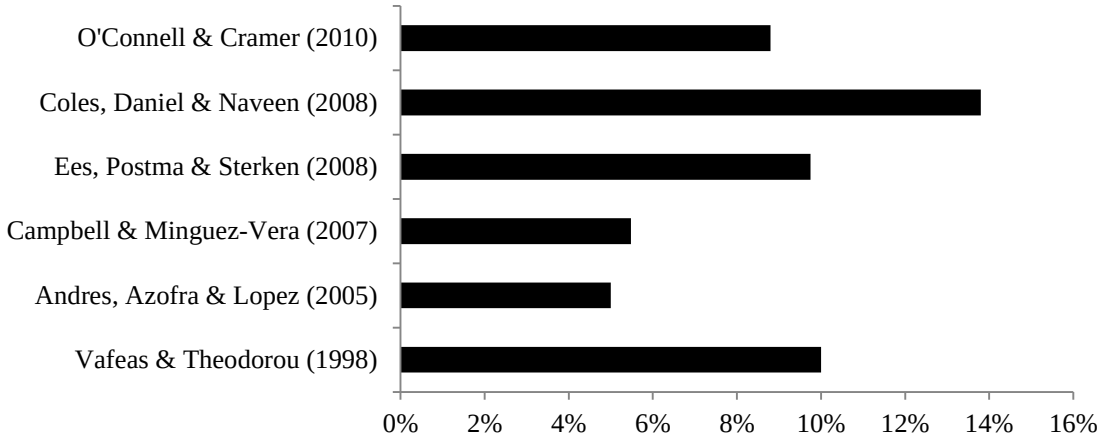

Figure 6. Average ROA reported by authors on the subject

The average DEBT ratio for our sample firms is 20%. This is a highly volatile indicator, since its values vary between a minimum of zero and a maximum of 63%. Of the 398 companies, only a third has a ratio above 25%, 18 of which presenting a leverage level above 50%. This outcome can be interpreted from two distinct points of view. Firstly, low share of debt over assets may indicate a company's ability of financing its operations through equity, which is positive. Secondly, poor levels of leverage among European companies might be, instead, a sign of resignation or incapacity from the banking system to lend capital, which is negative.

Before any OLS analysis, particularly through a multiple regression model, an indispensable test to assess problems of multicollinearity is fundamental. In brief, collinearity is an existing linear relationship[29] between variables. Multicollinearity problems happen when, in a multiple regression model, high linearly relationship manifests between two or more explanatory variables. A way of assessing multicollinearity problems is through the analysis of the bivariate correlation coefficient,[30] which is only a matter of concerns when its value is higher than 0.75.

[29] An exact linear relationship takes place when there is a perfect collinearity between two variables. Perfect multicollinearity happens when the correlation between two independent variables is equal either to +1 or -1 – which is a relatively rare situation.

[30] The bivariate correlation coefficient is represented by |R|. In order to assess problems of multicollinearity, the results of the correlation matrix must be compared and interpreted either being positive or negative.

Table 17 shows that the highest correlation coefficients are between FSIZE and both BSIZE and FOR. In those cases, the bivariate correlation coefficient does not exceed 0.53. Thus, multicollinearity is not a major problem for our sample firms. Another way to measure problems of multicollinearity is through the consideration of the variance inflation factor.[31] The highest VIF is pointed out by FSIZE, but is far below the limit considered as problematic. Again, multicollinearity is not relevant for the sample of our study. Therefore, it seems like the empirical analysis has what it takes to make it through.

Table 17:
Correlation Matrix

	Q	BSIZE	INDEP	WOM	FOR	MEET	ROA	FSIZE	DEBT	VIF
Q	1.000									
BSIZE	-0.066	1.000								1.795
INDEP	0.134	-0.252	1.000							1.487
WOM	0.024	0.116	0.270	1.000						1.133
FOR	0.141	0.309	0.201	0.185	1.000					1.409
MEET	-0.130	-0.086	0.048	-0.045	-0.068	1.000				1.069
ROA	0.479	-0.048	0.236	0.067	0.154	-0.158	1.000			1.121
FSIZE	-0.056	0.526	0.220	0.222	0.508	0.021	0.129	1.000		2.083
DEBT	0.002	0.106	-0.082	0.002	0.019	0.133	-0.108	0.215	1.000	1.109

Note. The coefficients of correlation are obtained through Stata (version 10.1). This table provides the Pearson correlation matrix for the explanatory variables used in OLS regression of firm performance. Variables are as follows: BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets; FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; Q is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

[31] The VIF quantifies the severity of multicollinearity in an ordinary least square regression analysis, providing an index that measures how much the variance – the square of the estimate's standard deviation – of an estimated regression coefficient increases because of collinearity. VIF points out problems of multicollinearity when its value surpasses 10.

4. Results

Our study aims at disclosing the board conditioning factors of firm performance. The literature review related to corporate governance, board of directors and firm performance is of great support to understand the impact and extent of the results further displayed.

In this chapter, we depict the results obtained through the empirical analysis, under two distinct methods: First, we make an approach on the board conditioning factors of firm performance through ordinary least squares regressions, and reveal the respective outcomes. Second, we adopt a process that aims at detecting problems of endogeneity.

4.1. Board Conditioning Factors of Firm Performance

In order to reach the purposes of our study, the first part of the analysis is made through ordinary least squares regressions. Most of the papers on the issue use a similar approach, as for instance those presented by Barnhart et al. (1994), Vafeas and Theodorou (1998), Yermack (1996) and Andres et al. (2005), among others. Therefore, there seems to be no constraints in using this methodology. Our analysis is divided into five distinct parts.

Firstly, we exhibit basic results, by including five core independent variables, switching only between models by considering alternatively the industry, country and system effect. Secondly, we reveal some exhaustive tests, by considering together the industry, country and system effect, gathering and isolating the five core independent variables, in order to capture with more precision the results' sensitivity. Thirdly, we make similar tests to the second approach, by considering independently the industry, country and system effect. Fourthly, we repeat the same process, this time considering both the industry and system effect. Fifthly, we assemble the results obtained from our four approaches, and draw overall assumptions on the results.

4.1.1. Baseline Model

Our baseline model analysis' results are exhibited in Table 18. We ran a regression where Q depended on several explanatory variables. All the estimation include both all five core independent variables – BSIZE, INDEP, WOM, FOR and MEET – and our three control variables – ROA, FSIZE and DEBT. The distinctiveness of this first set of regressions lies in the inclusion of the industry, country and system effect, alternatively.

Table 18:
Baseline Model Results

Dependent: Q	1		2		3		4		5	
INTERCEPT	2.432	***	2.376	***	2.005	***	3.176	***	2.637	***
	7.290		**4.130**		**0.564**		**7.740**		**4.400**	
BSIZE	0.062		0.026		0.062		0.032		0.026	
	0.730		**0.260**		**0.740**		**0.320**		**0.260**	
INDEP	0.141		0.008		0.146		0.110		0.008	
	1.250		**0.050**		**1.270**		**0.700**		**0.050**	
WOM	-0.005		-0.038		-0.015		-0.029		-0.038	
	-0.090		**-0.690**		**-0.300**		**-0.510**		**-0.690**	
FOR	0.179	***	0.137	**	0.151	***	0.135	**	0.137	**
	3.350		**2.370**		**2.700**		**2.400**		**2.370**	
MEET	-0.084		0.016		-0.066		-0.030		0.016	
	-1.240		**0.210**		**-0.950**		**-0.390**		**0.210**	
ROA	4.998	***	5.119	***	5.092	***	4.836	***	5.119	***
	10.530		**10.520**		**10.640**		**9.860**		**10.520**	
FSIZE	-0.075	***	-0.099	***	-0.072	***	-0.101	***	-0.099	***
	-4.340		**-5.130**		**-4.120**		**-5.240**		**-5.130**	
DEBT	0.415	**	0.744	***	0.603	***	0.484	***	0.744	***
	2.510		**4.130**		**3.510**		**2.780**		**4.130**	
INDUSTRY			YES		YES				YES	
COUNTRY			YES				YES		YES	
SYSTEM					YES		YES		YES	
Sample Size	398		398		398		398		398	
Adjusted R^2	0.268		0.328		0.316		0.281		0.328	
F-Statistic	19.180		6.880		8.340		9.620		6.880	

Note. Ordinary Least Squares coefficients and *t-statistic* obtained through Stata (version 10.1) are shown. The significance levels are indicated by *, **, and *** representing 10%, 5%, and 1% level, respectively. *t-statistics* are in bold. The dependent variable is always Q, which is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; the INDUSTRY, COUNTRY and SYSTEM effect are included in some of the equations, through dummy variables constructed, as stressed in Table 11; INTERCEPT is the constant term of the regression; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

Our first approach is expected to give some interesting preliminary results. Since the five models exhibited in Table 18 account for both the core independent and control variables, only switching the inclusion or withdrawing of industry, country and system effect, the direction of the obtained coefficients is likely to be a solid base for the assumptions further pronounced. Board size, the first core independent variable, shows a positive association with firm performance. Although not exhibiting a strong relationship, the coefficient is always positive throughout the five models.

The proportion of independent directors exhibits a positive association with Tobin's Q. Similarly to board size, none of the coefficients of INDEP exhibit a significance level below 10%. However, its coefficients are higher than those presented by board size, especially in models one, three and four.

The presence of women on the board, a variable which has recently received a significant amount of interest from the academic community, exhibits a negative association with firm performance. Although WOM does not show a strong association with firm performance, its coefficients are always negative, even considering the variability in the inclusion of the industry, country and system effect.

The most remarkable result of our first set of regressions is the strong positive impact of the presence of foreign directors on Tobin's Q. We identified preliminary this possibility in the development of hypothesis 4, and our assumptions are now confirmed. The highest coefficient (0.179) derives from model 1, with a level of significance below 5% (*p-value* = 0.001). This result is consistent throughout all the estimations, and does not depend on the industry, country or system effect.

Board meetings show contradictory results. In the first model, without the consideration of the industry, country and system effect, we find a negative and insignificant association between MEET and firm performance. This assumption is also true for both model three and four – the third model accounts for both the industry and system effect, while the fourth model accounts for both the country and system effect.

When considering both the industry and country effect, or all three control variables together, the coefficient of MEET becomes positive, but remains insignificant. Although this aggregate of results for the impact of board meetings on Q is inconsistent, we may observe that the coefficients are higher when the sign is negative. This relationship will be further stressed in detail, in order to obtain more reliable and conclusive outcomes.

As for our three control variables – ROA, FSIZE and DEBT, there is no doubt about the direction of their influence on Q. Indeed, in all models from Table 18, the direction of the coefficients for ROA is positive. The same course is found between DEBT and Tobin's Q, in all the regressions. Concerning FSIZE, we can see that its influence is always negative. These results are consistent with the expected signs. The coefficients are all significant below the 1% level, except for DEBT in model 1, which is significant at the 5% level.

Overall, the *f-statistic* for each model in Table 18 varies between 6.88 and 9.62, except for model 1, which exhibits 19.18, the highest value. The adjusted R^2 varies between 27% and 33%, the lowest for the first model, the highest for model two and five. In a preliminary approach, the explanatory power of the models appears to be satisfactory, if compared with similar studies on the matter – e.g. Agrawal and Knoeber (1996) or O' Connell and Cramer (2010), both with 35%. In a second approach, we exhibit the results obtained through OLS, combining the industry, country and system effect in all models.

4.1.2. Combining the Industry, Country and System Effect

Table 19 reports results from equations linking firm performance with board of directors' features. In all regressions, the dependent variable is Tobin's Q. All models include the industry, country and system effect, and control for ROA, FSIZE and DEBT.

Table 19:
Combining the Industry, Country and System Effect

Dependent: Q	1		2		3		4		5	
INTERCEPT	2.637	***	2.353	***	2.346	***	2.668	***	2.324	***
	4.400		**4.140**		**4.120**		**4.580**		**3.960**	
BSIZE	0.026		0.063		0.065		0.026		0.063	
	0.260		**0.670**		**0.680**		**0.270**		**0.660**	
INDEP	0.008				0.051					
	0.050				**0.330**					
WOM	-0.038						-0.039			
	-0.690						**-0.710**			
FOR	0.137	**					0.137	**		
	2.370						**2.390**			
MEET	0.016								0.015	
	0.210								**0.200**	
ROA	5.119	***	5.122	***	5.118	***	5.101	***	5.140	***
	10.520		**10.690**		**10.660**		**10.700**		**10.540**	
FSIZE	-0.099	***	-0.088	***	-0.089	***	-0.099	***	-0.089	***
	-5.130		**-4.720**		**-4.710**		**-5.170**		**-4.710**	
DEBT	0.744	***	0.712	***	0.711	***	0.744	***	0.712	***
	4.130		**3.950**		**3.940**		**4.140**		**3.940**	
INDUSTRY	YES		YES		YES		YES		YES	
COUNTRY	YES		YES		YES		YES		YES	
SYSTEM	YES		YES		YES		YES		YES	
Sample Size	398		398		398		398		398	
Adjusted R^2	0.328		0.324		0.322		0.332		0.322	
F-Statistic	6.880		7.560		7.300		7.360		7.290	

Note. Ordinary Least Squares coefficients and *t-statistic* obtained through Stata (version 10.1) are shown. The significance levels are indicated by *, **, and *** representing 10%, 5%, and 1% level, respectively. *t-statistics* are in bold. The dependent variable is always Q, which is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; the INDUSTRY, COUNTRY and SYSTEM effect are included in the equations, through dummy variables constructed, as stressed in Table 11; INTERCEPT is the constant term of the regression; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

The *f-statistics* exhibit a small variability, since the difference between models for this indicator is not higher than 0.68. Importantly, the explanatory power for each of the five models is between 32% and 33%, which is fairly high. The first model from Table 19 is a reproduction of model 5 from Table 18. Model 2 only includes board size as core independent variable.

Here, we can see that BSIZE has an insignificant, yet positive, association with Tobin's Q, which is consistent with the results previously shown. Model 3 add the proportion of independent directors on the board. Again, although not showing any sign of robustness, the coefficient for INDEP is positive toward Tobin's Q. In model 4, we withdraw the proportion of independent, and include two variables that aim at accounting for board of directors' diversification: WOM and FOR.

Similarly to our earlier obtained results, WOM has a negative, yet insignificant, association with Q. This result contrasts with FOR, which exerts a positive (coefficient = 0.137) and significant (*p-value* = 0.017) impact on firm performance, hence validating hypothesis 4. Model 5 shows the positive insignificant association of MEET with Tobin's Q. Again, hypothesis 5 cannot be confirmed.

4.1.3. Separating the Industry, Country and System Effect

4.1.3.1. The Industry Effect

In this section, we provide results on the board conditioning factors of firm performance, considering the industry effect. The core explanatory variables' inclusion and withdrawing procedure is similar to the one adopted in the previous section. This time, our models' explanatory power varies between 30% and 31%, while *f-statistics* fluctuate between 8.70 and 9.72, which is relatively parallel to the scores exhibited in Table 19.

In all regressions, although not showing signs of robustness, the association of both BSIZE and INDEP with Tobin's Q is positive. However, this result is a good indication, since the direction for the influence of those variables is consistent with earlier reported outcomes. As for board diversification, the results seem to be fairly stable.

On the one hand, in both models 1 and 4 from Table 20, WOM has a negative association with firm performance. The lack of significance of its coefficients indicates inexistent signs of robustness. Still, this is not the first time that we find this direction toward firm performance. Therefore, results regarding WOM are likely to be reliable.

Table 20:
Considering the Industry Effect

Dependent: Q	1		2		3		4		5	
INTERCEPT	2.090	***	1.476	***	1.495	***	1.994	***	1.583	***
	3.700		**2.860**		**2.900**		**3.720**		**2.900**	
BSIZE	0.066		0.072		0.111		0.043		0.067	
	0.800		**0.960**		**1.340**		**0.560**		**0.880**	
INDEP	0.096				0.126					
	0.840				**1.140**					
WOM	-0.012						-0.002			
	-0.230						**-0.030**			
FOR	0.172	***					0.178	***		
	3.140						**3.260**			
MEET	-0.043								-0.041	
	-0.620								**-0.600**	
ROA	5.274	***	5.519	***	5.439	***	5.372	***	5.474	***
	11.120		**11.840**		**11.550**		**11.600**		**11.590**	
FSIZE	-0.072	***	-0.047	***	-0.054	***	-0.069	***	-0.047	***
	-4.140		**-3.070**		**-3.280**		**-4.090**		**-3.040**	
DEBT	0.628	***	0.587	***	0.607	***	0.608	***	0.593	***
	3.650		**3.410**		**3.510**		**3.570**		**3.440**	
INDUSTRY	YES		YES		YES		YES		YES	
COUNTRY										
SYSTEM										
Sample Size	398		398		398		398		398	
Adjusted R^2	0.309		0.295		0.295		0.310		0.293	
F-Statistic	8.700		9.720		9.310		9.500		9.240	

Note. Ordinary Least Squares coefficients and *t-statistic* obtained through Stata (version 10.1) are shown. The significance levels are indicated by *, **, and *** representing 10%, 5%, and 1% level, respectively. *t-statistics* are in bold. The dependent variable is always Q, which is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; the INDUSTRY effect is included the equations, through dummy variables constructed, as stressed in Table 11; INTERCEPT is the constant term of the regression; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

The same indication appears to be valid also for the presence of foreign directors on the board. Indeed, this explanatory variable exerts a positive and significant influence on Tobin's Q, both in models 1 and 4, which confirms hypothesis 4. The individual consideration of the industry effect increases the importance of FOR, since its significance now reaches the 1% level (*p-value* = 0.001), against the 5% level found in Table 19.

A curious outcome regarding board meetings can be extracted from the set of regressions presented on Table 20. In the previous sections, this explanatory variable was exhibiting instable results. Table 18 reports both a negative and a positive impact of MEET on Tobin's Q, whereas Table 19 shows that this variable is a positive conditioning factor of firm performance.

This time, both in model one and five, board meetings seem to gain some demarcation. Indeed, the insignificant, yet negative, association found between MEET and Tobin's Q, is an encouraging aspect toward the assumption of hypothesis 5. Regarding the signs revealed by ROA, FSIZE and DEBT, nothing seems to be different from what was initially expected.

In all models, both return-on-assets and debt-to-assets have a clear and obvious positive effect on firm performance. FSIZE, a variable computed through the natural logarithm of total assets, shows again a negative effect on Tobin's Q. We do not anticipate any changes in these results, since the significance exhibited by those three control variables is always below the 1% level.

4.1.3.2. The Country Effect

In this section, we run all regressions reported both in Table 19 and in Table 20, this time accounting only for the country effect. Removing the dummy variables attached to the industry effect, it has a direct influence on the explanatory power of these new regressions. Here, the reported R^2 are not superior to 28%, against the 31% found in models that included the country effect. Still, the reported *s-statistics* are slightly higher than in the previous sets of regressions, varying between 9.62 and 11.77. The coefficients for both core independent variables and control variables are in line with the results obtained earlier.

ROA, FSIZE and DEBT preserve their significant impact on firm performance. Almost all the coefficient are above the 1% level of significance, except for DEBT in a couple of models. This means that the results on those three control variables are robust: ROA and DEBT exert a significant positive impact on firm performance; in turn, FSIZE has a strong negative relationship with Q. Concerning the core independent variables, the expected signs appear to be consistent.

As displayed in Table 21, BSIZE has, again, a fragile positive association with firm performance. When combined with the proportion of independents, its coefficient gains a little more importance. As for INDEP, both model 1 and 3 report a positive association, although insignificant, with Tobin's Q. The component regarding board of directors' diversification does not show any kind of variation. Table 21 shows that the presence of foreign directors on the board reports a significant positive impact on Tobin's Q, hence, again confirming hypothesis 4.

Table 21:
Considering the Country Effect

Dependent: Q	1		2		3		4		5	
INTERCEPT	2.867	***	2.575	***	2.564	***	2.846	***	2.612	***
	7.890		**7.740**		**7.700**		**8.150**		**7.490**	
BSIZE	0.032		0.056		0.061		0.025		0.056	
	0.320		**0.580**		**0.640**		**0.250**		**0.590**	
INDEP	0.110				0.143					
	0.700				**0.930**					
WOM	-0.029						-0.027			
	-0.510						**-0.480**			
FOR	0.135	**					0.140	**		
	2.400						**2.510**			
MEET	-0.030								-0.027	
	-0.390								**-0.350**	
ROA	4.836	***	4.907	***	4.891	***	4.881	***	4.878	***
	9.860		**10.140**		**10.100**		**10.130**		**9.930**	
FSIZE	-0.101	***	-0.089	***	-0.091	***	-0.100	***	-0.088	***
	-5.240		**-4.810**		**-4.890**		**-5.290**		**-4.720**	
DEBT	0.484	***	0.437	**	0.437	**	0.483	***	0.439	**
	2.780		**2.510**		**2.510**		**2.780**		**2.520**	
INDUSTRY										
COUNTRY	YES		YES		YES		YES		YES	
SYSTEM										
Sample Size	398		398		398		398		398	
Adjusted R^2	0.281		0.275		0.275		0.284		0.274	
F-Statistic	9.620		11.770		11.040		10.830		10.970	

Note. Ordinary Least Squares coefficients and *t-statistic* obtained through Stata (version 10.1) are shown. The significance levels are indicated by *, **, and *** representing 10%, 5%, and 1% level, respectively. *t-statistics* are in bold. The dependent variable is always Q, which is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. BSIZE is the natural logarithm of the total number of directors on the board of each firm; the COUNTRY effect is included in the equations, through dummy variables constructed, as stressed in Table 11; DEBT is the ratio of short-term debt plus long-term debt over total assets FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; INTERCEPT is the constant term of the regression; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

However, when compared with results presented in Table 20, the importance of FOR is slightly inferior. In model 4, its coefficient (0.140) is significant at the 5% level (*p-value* = 0.012). The presence of women on the board has, again, a negative and insignificant relationship with firm performance. Board meetings' relationship with firm performance is progressively finding its direction.

In Table 19, the impact of MEET on Tobin's Q was positive, while, in Table 20, this association exhibited a negative sign. Here, through Table 21, we can see that, with the individual consideration of the country effect, board meetings disclose a negative relationship, although insignificant, toward firm performance. In the next section, we repeat all the regressions, this time including only the system effect.

4.1.3.3. The System Effect

Table 22 shows outstanding results. The explanatory power of the regressions fluctuates between 25% and 27%. The *f-statistics* are relatively high, oscillating between 15.86 and 23.07. These scores display some important variability, if compared with the results obtained in the previous analysis. When considering exclusively for the system effect, the core independent variables respond with higher levels of significance.

Table 22:
Considering the System Effect

Dependent: Q	1		2		3		4		5	
INTERCEPT	2.459	***	1.852	***	1.852	***	2.272	***	2.105	***
	7.300		**6.530**		**6.550**		**7.390**		**6.560**	
BSIZE	0.068		0.044		0.111		0.023		0.028	
	0.810		**0.580**		**1.330**		**0.300**		**0.360**	
INDEP	0.191	*			0.221	**				
	1.660				**1.980**					
WOM	-0.011						0.013			
	-0.210						**0.250**			
FOR	0.159	***					0.178	***		
	2.920						**3.290**			
MEET	-0.110								-0.116	*
	-1.590								**-1.670**	
ROA	4.826	***	5.224	***	5.047	***	5.093	***	5.081	***
	10.040		**11.110**		**10.580**		**10.910**		**10.650**	
FSIZE	-0.075	***	-0.046	***	-0.059	***	-0.069	***	-0.045	***
	-4.340		**-3.050**		**-3.600**		**-4.170**		**-2.950**	
DEBT	0.370	**	0.262		0.297	*	0.326	**	0.286	*
	2.230		**1.580**		**1.790**		**1.970**		**1.720**	
INDUSTRY										
COUNTRY										
SYSTEM	YES		YES		YES		YES		YES	
Sample Size	398		398		398		398		398	
Adjusted R^2	0.272		0.250		0.256		0.267		0.254	
F-Statistic	15.860		23.070		20.490		19.090		20.260	

Note. Ordinary Least Squares coefficients and *t-statistic* obtained through Stata (version 10.1) are shown. The significance levels are indicated by *, **, and *** representing 10%, 5%, and 1% level, respectively. *t-statistics* are in bold. The dependent variable is always Q, which is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; INTERCEPT is the constant term of the regression; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets; the SYSTEM effect is included in the equations, through dummy variables constructed, as stressed in Table 11, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

BSIZE continues to be positively related with Tobin's Q, albeit without showing any signs of robustness. *T-statistic* for this variable is higher when combined with INDEP – see model 3. A remarkable output is precisely connected with INDEP. Both in models 1 and 3, this variable has a significant positive impact on Q, which confirms hypothesis 2. The level of significance in model 1 is at the 10% level (*p-value* = 0.098), while, in model 3, the significance is at the 5% level (*p-value* = 0.048), which is quite remarkable. Board diversification seems to suffer some adjustments due to the inclusion of the system effect.

Concerning FOR, Table 22 shows that its impact on Q continues to be significantly positive at the 1% level (*p-value* = 0.001), confirming hypothesis 4. Contrary to outputs already obtained, WOM shows inconsistent results. In model 1, this variable has a negative, yet insignificant, relationship with Tobin's Q, which is consistent with most of the outcomes from Table 18 to Table 21. Model 4 shows a new direction for this variable.

Indeed, for the first time, WOM exhibit a positive sign. Nonetheless, the weak coefficient for this relationship, together with the continuous negative impact of WOM on firm performance previously displayed, shows that WOM has an overall insignificant negative connection with Q. Another fascinating result is linked with board meetings.

When considering individually the industry, country or system effect, the results on the impact of MEET on Q are likely to be negative. Board meetings appear to attain a little more importance, when combined with the system effect. Model 5, which includes board size and board meetings as core independent variables, shows that MEET is significantly associated with Tobin's Q – coefficient (-0.116) and *p-value* (0.096). This outcome is encouraging, since hypothesis 5 was orientating toward that direction.

ROA, FSIZE and DEBT, the three control variables of Equation 2, do not suffer any kind of significant deviations. ROA continues to be positively related with firm performance, while FSIZE is still negatively associated with Tobin's Q. Their levels of significance are below the 1% level, in all five models.

The only variable exhibiting a downgrade is DEBT. Although its impact on firm performance is again positive, the significance level is now weaker than in the previous regressions. In model 2, the coefficient for DEBT even displays an insignificant association, while, in the remaining regressions, the best reached level of significance is 5%. As last approach, the next section exhibits regressions that include both the industry and system effect.

4.1.4. Considering the Industry and System Effect

Table 23 shows regressions reflecting both the industry and country effect. *F-statistics* fluctuate between 8.34 and 9.24, which means that the variability for this set of regressions is relatively low. The explanatory power of the models oscillates between 30% and 32%, which is fairly high, if compared with previous obtained results.

Table 23:
Considering the Industry and System Effect

Dependent: Q	1	2	3	4	5
INTERCEPT	2.005 ***	1.410 ***	1.423 ***	1.873 ***	1.579 ***
	0.564	**2.730**	**2.760**	**3.480**	**2.890**
BSIZE	0.062	0.055	0.104	0.027	0.046
	0.740	**0.730**	**1.260**	**0.350**	**0.600**
INDEP	0.146		0.169		
	1.270		**1.530**		
WOM	-0.015			0.001	
	-0.300			**0.020**	
FOR	0.151 ***			0.162 ***	
	2.700			**2.930**	
MEET	-0.066				-0.066
	-0.950				**-0.950**
ROA	5.092 ***	5.357 ***	5.239 ***	5.262 ***	5.277 ***
	10.640	**11.450**	**11.070**	**11.310**	**11.100**
FSIZE	-0.072 ***	-0.047 ***	-0.057 ***	-0.067 ***	-0.047 ***
	-4.120	**-3.080**	**-3.430**	**-3.970**	**-3.040**
DEBT	0.603 ***	0.547 ***	0.571 ***	0.578 ***	0.554 ***
	3.510	**3.170**	**3.310**	**3.380**	**3.210**
INDUSTRY	YES	YES	YES	YES	YES
COUNTRY					
SYSTEM	YES	YES	YES	YES	YES
Sample Size	398	398	398	398	398
Adjusted R^2	0.316	0.304	0.306	0.316	0.303
F-Statistic	8.340	9.240	8.960	8.960	8.860

Note. Ordinary Least Squares coefficients and *t-statistic* obtained through Stata (version 10.1) are shown. The significance levels are indicated by *, **, and *** representing 10%, 5%, and 1% level, respectively. t-statistics are in bold. The dependent variable is always Q, which is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity. BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; the INDUSTRY and SYSTEM effects are included in the equations, through dummy variables constructed, as stressed in Table 11; INTERCEPT is the constant term of the regression; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

The core independent variables' impact on firm performance seems to be in line with our developed hypotheses. BSIZE is positively related to Q in all models. However, this association is here again insignificant. Moreover, and although being also statistically insignificant, INDEP maintains its positive association with Tobin's Q. This outcome is enlightening about the true relationship between these two variables, since the expected sign for the proportion of independent on the board has been continuously confirmed.

Concerning the presence of women on the board, the same situation as the one presented in Table 22 appears to be happening. In model 1, WOM has a negative impact on Tobin's Q. However, when combined only with BSIZE and FOR, WOM exhibits a positive association with firm performance, although offering both a reduced coefficient and *t-statistic*.

The results obtained regarding the presence of foreign directors on the board casts no doubt about its true impact on firm performance. Table 23 confirms that FOR is clearly a positive conditioning factor of firm performance, which confirms hypothesis 4. Indeed, the coefficient for this variable (0.162) remains significant at the 1% level (*p-value* = 0.004). Board meetings seem to show reliable outcomes.

When considering for both the industry and system effect, the impact of MEET on Q is negative. Contrary to the outcomes obtained in the last section, board meetings appears to be less important. Both models 1 and 5 show that MEET is not significantly associated with Tobin's Q. However, its coefficients are higher than, for instance, the one exhibited both by BSIZE and WOM.

As for the impact of the three control variables of our main equation, no changes has been observed. ROA is still positively linked with Tobin's Q, FSIZE continue to have a negative relationship with firm performance, and DEBT has again a positive influence on Tobin's Q. All models from Table 23 exhibit coefficients that are significant at the 1% level. The projected signs for each of the three control variables are in line with what we expected. In the following section, we put together the overall assumptions on the results.

4.1.5. Overall Assumptions on the Results

In the previous sections, we showed outcomes obtained from a broad panel of OLS regressions. It is now time to describe to what extent those are consistent with the expected signs earlier outlined. For this purpose, we assemble the overall results exhibited from Table 18 to Table 23, corroborating the assumptions made throughout the hypotheses development. Moreover, we provide some useful content.

For instance, Table 24 supports for the task of building comparable assumptions between the results of our study and those from previous empirical evidence. Table 25 summarizes our empirical evidence on the board conditioning factors of firm performance, which enables an easier appraisal between studies.

Table 24:
Board Conditioning Factors of Firm Performance – Literature Summary

Authors	Year	Region	Period	Firm Performance Measures		Board Conditioning Factors of Firm Performance				
				Tobin's Q	Others	BSIZE	INDEP	WOM	FOR	MEET
Pearce and Zahra	1992	USA	1983 - 1989		ROA; ROE; EPS	**Positive**	**Positive**			
Barnhart et al.	1994	USA	1990		MB		**Positive**			
Agrawal and Knoeber	1996	USA	1987	X			**Negative**			
Yermack	1996	USA	1984 -1991	X		**Negative**	Negative			
Eisenberg et al.	1998	Finland	1992 - 1994		ROA	Negative				
Vafeas and Theodorou	1998	UK	1994		MB		Negative			
Bhagat and Black	1999	USA	1985 - 1991	X		**Negative**	**Negative**			
Vafeas	1999	USA	1990 - 1994		MB					**Negative**
Mak and Li	2001	Singapore	1995	X		**Positive**				
Ferris et al.	2002	USA	1995		MB	**Positive**				
Erhardt et al.	2003	USA	1993 - 1998		ROA; ROI			**Positive**	**Positive**	
Oxelheim and Randoy	2003	Norway - Sweden	1996 - 1998	X					**Positive**	
Farrell and Hersch	2005	USA	1990 - 2000		ROA			Positive		
Andres et al.	2005	USA - EU (8)	1996	X	MB	**Negative**	Negative			Positive
Campbell and Minguez-Vera	2007	Spain	1995 - 2000	X				**Positive**		
Choi et al.	2007	South Korea	1999 - 2002	X					Positive	
Coles et al.	2008	USA	1992 - 2001	X	ROA	**Two-way**	Two-way			
Adams and Ferreira	2009	USA	1996 - 2003	X				**Negative**		
Bohren and Strom	2010	Norway	1989 - 2002	X				**Negative**		
Carter et al.	2010	USA	1998 - 2002	X	ROA			**Positive**	Positive	
Brick and Chidambaran	2010	USA	1999 - 2005	X						**Positive**
O'Connell and Cramer	2010	Ireland	2001	X		**Negative**	**Positive**			
Ahern and Dittmar	2011	Norway	2001-2009	X				Negative		
Masulis et al.	2012	USA	1998 - 2006	X					**Negative**	

Note. This table shows the summary of working papers from authors that approached the board conditioning factors of firm performance, the respective period and region concerned, and the obtained signs toward the core independent variables of the present study. Strong relationships between board characteristics and firm performance measures are in underlined bold. BSIZE is the natural logarithm of the total number of directors on the board of each firm; EPS is the ratio of Earnings per Share; FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; MB is the Market-to-book ratio, which is obtained through the market value of equity divided by the book value of equity; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the Return-on-assets ratio; ROE is the Return-on-equity ratio; ROI is the Return-on-investment ratio; Tobin's Q is the ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

Table 25:
Board Conditioning Factors of Firm Performance – Results' Summary

Variable	Impact	Significant
Independent Variables		
BSIZE	Positive	NO
INDEP	Positive	YES (considering the system effect)
WOM	Negative	NO
FOR	Positive	YES (regardless of industry, country and system effect)
MEET	Negative	YES (considering the system effect)
Control Variables		
ROA	Positive	YES
FSIZE	Negative	YES
DEBT	Positive	YES

Note. The present table summarizes the impact direction of the independent variables on Q, indicating also if this relationship is significant or not. BSIZE is the natural logarithm of the total number of directors on the board of each firm; DEBT is the ratio of short-term debt plus long-term debt over total assets; FOR is a dummy which is assigned the value of 1 if the firm has at least one foreigner on its board of directors, 0 otherwise; FSIZE is the natural logarithm of total assets; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors; MEET is the natural logarithm of the total number meetings held by the board of directors in 2010; ROA is the ratio of operating income before interest and taxes scaled by total assets, and WOM is a dummy which is assigned the value of 1 if the firm has at least one woman on its board of directors, 0 otherwise.

BSIZE, in all the displayed regressions, although statistically insignificant, is positively related with Q. Similar to Ferris et al. (2002), Pearce and Zahra (1992) and Mak and Li (2001), it seems that having more directors on the board is an aspect that increases firm performance. As referred by Pearce and Zahra (1992), a larger board size might benefit the organization as a whole, since it "permits the inclusion of various perspectives on firm strategy, enhancing the company's ability to understand and respond to diverse stakeholders" (p. 432). Our sample firms are "large enterprises", which means that the corporate strategy component is likely to be a key issue. However, since we do not find any signs of robustness for BSIZE, the assumption of hypothesis 1 cannot be confirmed.

INDEP exhibits consistent outcomes. Indeed, this variable displays a positive sign toward Tobin's Q in all models, and it even shows a significant association in Table 22. To interpret this result, we remind the discussion on the influence of INDEP on firm performance. Pearce and Zahra (1994), Barnhart et al. (1994) and O' Connell and Cramer (2010) demonstrated that core companies' performance is likely to benefit from the presence of independent directors in the boardroom. Pearce and Zahra (1994) help understanding that large firms may take profit from a higher proportion of independent directors. Indeed, increasing independence level is likely to provide a welfare situation to the company, since its ability of effectively reacting to several interest groups' expectations enhances. Consequently, hypothesis 2 is corroborated: there is a positive association between INDEP and Q.

WOM shows ambiguous results. None of the coefficients for this variable are significant at any conventional level. Recent studies connecting WOM to firm performance suggest that this relationship is negative, arguing that heterogeneous boards are less effective decision makers. To support the results obtained through OLS regressions, we mention Ahern and Dittmar's (2011) arguments, which affirmed that genuinely chosen boards are designed to maximize shareholder value. Recent guidelines, which make some recommendations on directors' choice, are therefore likely to be prejudicial for firm performance. Adams and Ferreira (2009), Bohren and Strom (2010) and Ahern and Dittmar (2011) confirmed this trend. According to these authors, gender diversity has been proved to provide overmonitoring, which eventually led to poorer firm performance. Nonetheless, and since our results do not show any significant relationship, hypothesis 3 cannot be confirmed.

FOR is the core independent variable with most outstanding results. The variable exhibits strong significance levels in all regressions. In the literature, only Masulis et al. (2012) found a negative relationship between FOR and Tobin's Q. Inversely, Oxelheim and Randoy (2003) and Erhardt et al. (2003) reported a significant influence of FOR on firm performance. Recent corporate scandals left a feeling of distrust among economic agents around the world. Choi et al. (2007) referred that the presence of foreign directors on the board provides an upgrade, both in monitoring and discipline. Indeed, the decision of adding foreigners in the boardroom represents a clear commitment to enhance corporate transparency. Thus, the significant positive impact revealed through OLS is a strong indicator that approves hypothesis 4: there is a positive association between FOR and Q.

MEET exhibited shifting outcomes throughout the empirical analysis. Yet, board meetings showed slight hints of robustness in Table 22, being significant at the 10% level, which is quite encouraging for the formation of reliable conclusions on its influence. Empirical evidence concerning the relationship between board meetings and firm performance is sparse. Andres et al. (2005) and Brick and Chidambaran (2010) found a positive sign toward Q for board meetings, whereas Vafeas (1999) negatively associated MEET with firm performance. Following Andres et al. (2005) point of view, firms' board of directors of our study may be included in the reactive institutions' category, which means that companies gather more frequently their board in poor performing subsequent years. Hence, when combined with BSIZE, and under the SYSTEM effect, hypothesis 5 is confirmed: there is a negative association between MEET and Q.

The substance of our models' explanatory power stems from the control variables. As expected, ROA, FSIZE and DEBT are found to be significantly related to firm performance. These results persist across all models from Table 18 to Table 23, except for model 2 in Table 22, where DEBT is found to be statistically insignificant at any conventional level. Although they are not involved in the main question of the developed hypotheses, we have to establish a brief summary of the direction obtained for all three variables' coefficients.

ROA, a variable that controls for firm performance, is understandably positively related to Tobin's Q. The same direction was found in the empirical studies conducted by Yermack (1996), Andres et al. (2005), and Campbell and Mínguez-Vera (2008). This result is quite understandable, since ROA reflects future operating cash-flows. FSIZE, a variable that controls for firm size, exhibits a negative sign toward firm performance. This result is similar to the outcomes displayed by Barnhart et al. (1994), and Campbell and Mínguez-Vera (2008), which support our empirical findings. Finally, DEBT, which controls for leverage, is, similarly to the study by Andres et al. (2005), positively associated with Tobin's Q. This result is reasonable, since DEBT is supposed to discipline managers, thus enhancing firm performance.

4.2. Assessing Endogeneity Problems

As previously mentioned, the academic community interested in assessing conceivable endogenous connections between both board of directors' size and composition, and firm performance, has been showing enlightening disclosures. Here, we add empirical evidence to this specific matter, trying to uncover potential problems of endogeneity for our sample firms.

In order to test for conceivable endogeneity problems, the literature recommends procedures, which encompass advanced econometric techniques (Mitton, 2004). A common way undertaken to test for the direction of causality is through IV regressions. For instance, Barnhart et al. (1994), Andres et al. (2005) and O' Connell and Cramer (2010) made use of this approach. Using advanced techniques – e.g., IV regressions or 3SLS equations – would involve a proper identification of instruments correlated with both board size and independence, being otherwise uncorrelated with Tobin's Q. Beiner et al. (2006) provide precious information concerning the assessment of conceivable endogeneity problems.

When attempting to test for a causal relationship, where both board size and the proportion of independent directors are individually made to depend on exogenous features, Beiner et al. (2006) identified crucial variables, which assisted them to attain their purpose – see Table 26. In order to conduct an appropriate analysis, which would contribute to uncover endogeneity problems, we would have to include several exogenous variables in the equation.

Table 26:
Exogenous Variables Concerning Board Size and Independence

Dependent Variable		Variable Definition	Accessible?
BSIZE	INDEP		
LNASSETS		The natural logarithm of total assets.	YES: FSIZE
SOWN	SOWN	A dummy variable with the value of 1 if the state owns >5% of the company, 0 otherwise.	NO
ROA	ROA	The ratio of operating income before interest and taxes scaled by total assets.	YES: ROA
INDUSTRY	INDUSTRY	Represented by several dummy variables, each one representing a specific industry.	YES: INDUSTRY
	CEOP	A dummy variable with the value of 1 if the CEO is also the president of the board, 0 otherwise.	NO
	FOUNDER	A dummy variable with the value of 1 if the CEO or board president founded the company, 0 otherwise.	NO
	GROWTH	Average annual growth of sales over the past three years.	NO

Note. This table provides information regarding exogenous variables included in two of the equations built in the study of Beiner et al. (2006). On a first approach, BSIZE depends on LNASSETS, SOWN, ROA and INDUSTRY. On a second approach, INDEP depends on SOWN, ROA, INDUSTRY, CEOP, FOUNDER and GROWTH.

As can be observed, there are four exogenous variables on whose information we are not able to access – SOWN, CEOP, FOUNDER and GROWTH. At this stage, gathering comparable data, which could enable us running any advanced technique, is a rather challenging task. Therefore, we have to turn our attention toward an alternative way of assessing endogeneity problems.

To cope with this limitation, we follow the method used by Jorge (2013). Her study also involved conceivable issues related with endogeneity. In order to assess the requisite of running advanced econometric procedures, Jorge (2013) conducted in advance a helpful set of basic regressions. Essentially, the technique consists of regressing "each of the variables suspected to be endogenous on the set of the other endogenous regressors" (p. 169). The author argued that this method "gives a clearly indication of the causal relationships between the possible endogenous variables" (p. 169).

Therefore, similarly to the method suggested by Jorge (2013), we test for conceivable endogeneity problems by regressing the variables suspected to be endogenously related with Tobin's Q – board size and the proportion of independent directors. Hence, the consequent regressions to estimate for this purpose are the following:

$$Q = \beta_0 + \beta_1 . BSIZE + \varepsilon i$$

Equation 3: Assessing endogeneity problems for BSIZE

$$Q = \beta_0 + \beta_1 . INDEP + \varepsilon i$$

Equation 4: Assessing endogeneity problems for INDEP

Table 27 shows outcomes obtained through the OLS regression, where Tobin's Q is the dependent variable, and both board size and the proportion of independent directors are made as explanatory variables. On the one hand, the coefficient of BSIZE is statistically insignificant at any conventional level. On the other hand, the coefficient of INDEP is significant at the 1% level.

Table 27:
Assessing Endogeneity Problems

Dependent: Q	1	2
INTERCEPT	1.455 ***	1.073 ***
	8.480	**16.800**
BSIZE	-0.098	
	-1.320	
INDEP		0.292 ***
		2.710
Sample Size	398	398
Adjusted R^2	0.002	0.016
F-Statistic	1.740	7.340

Note. OLS coefficients and *t-statistic* obtained through Stata (v. 10.1) are shown. The significance levels are indicated by *, **, and *** representing 10%, 5%, and 1% level, respectively. *t-statistics* are in bold. The dependent variable is Q (ratio of book value of debt plus the market value of equity to the book value of debt plus the book value of equity); BSIZE is the natural logarithm of the total number of directors on the board of each firm; INDEP is the proportion of independent directors, defined as the ratio of the number of outsiders to the total number of directors, and INTERCEPT is the constant term of the regression.

In light of this set of results, we can pronounce two important assumptions. First, a possible endogeneity relationship concerning BSIZE and Tobin's Q is confirmed to be inexistent. This result is consistent with both Yermack's (1996) and O' Connell and Cramer's (2010) outcomes. Indeed, the direction of causality for their sample firms was running from board size to firm performance. This empirical evidence allows concluding that endogeneity concerning board size is not a significant issue for the sample firms of our study.

Second, and regarding conceivable problems between Tobin's Q and INDEP, we confirm suspicions about endogeneity. In an IV approach, Barnhart et al. (1994) concluded that "board composition and overall performance" (p. 338) were endogenously related. Furthermore, Beiner et al. (2006) confirmed this trend, by finding that "higher shareholdings of officers and directors" (p. 27) were associated with a lower fraction of independent directors. Hence, the deduction about the endogeneity problem concerning INDEP is that a deeper analysis needs to be conducted.

Nonetheless, the lack of suitable corporate governance instruments restricts us to apply appropriate econometric techniques to reach this purpose. As seen above, and accordingly with the study by Beiner et al. (2006), running a proper analysis to learn with precision which features influence board independence would involve the gathering of several information. For instance, to run an advanced technique, we would need to collect data on four exogenous variables – e.g., a dummy variable with the value of 1 if the state owns >5% of the company, 0 otherwise; a dummy variable with the value of 1 if the CEO is also the president of the board, 0 otherwise; a dummy variable with the value of 1 if the CEO or board president founded the company, 0 otherwise, and the average annual growth of sales over the past three years.

Gathering this amount of data, a part of being a challenging task in itself, could also be a problematic issue. Indeed, even if the necessary information were accessible, there is a high probability that comparable data concerning specifically the 398 companies from eleven European countries of our study could not be easy to reach. Therefore, the number of observations of our study would likely shrink. This quite discouraging bottom line was also a difficulty found by Mitton (2004), which helps us understand that this type of problem is a recurring issue in corporate governance studies.

5. Conclusions

In this chapter, we bring together essential conclusions regarding the board conditioning factors of firm performance, exposing our empirical analysis' core findings. In addition, we identify limitations of our study, providing suggestions for future research.

5.1. Core Findings

Recent discussions on the board conditioning factors of firm performance have focused on the efficiency demonstrated by the board of directors. The literature suggests four main issues that may affect firm performance: board size, independence, diversification and functioning.

Previous research on the subject essentially focuses on the USA or on individual countries. Those papers stress the positive effect of board size on firm performance, the positive impact of independent members, the uncertain role of women directors, the value added by the presence of foreigners, and the importance of board meetings' frequency.

Our work analyses the impact of board size, the proportion of independent members, the presence of both women and foreign directors, and board meetings frequency, on firm performance measured by Tobin's Q. We use a sample of 398 companies from 11 European countries: Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom. Comparable data concerning the fiscal year 2010 allowed us extending the analysis to a wider number of European countries, wherein most of the previous research is limited.

Our most outstanding empirical result is the strong impact of the presence of foreign directors on Tobin's Q. This effect is robust even after testing for the sensitivity of our results, or controlling for the industry, country and system effect. Our result is supported by the empirical evidence provided in the study by Oxelheim and Randoy (2003). The strong impact for this relationship suggests that the presence of foreigners enhances firm performance, thanks to an upgrade in both monitoring and discipline.

When controlling for the system effect, we find a robust impact of the proportion of independent directors on Tobin's Q. Thus, and following the arguments of Fama (1980) and Jensen (1993), independence is an attribute that composes effective mechanisms of corporate control for the sample firms of our study. This result is consistent with the empirical evidence shown by Coles et al. (2008) and O' Connell and Cramer (2010).

We find that board meetings exhibits a significant and negative impact on Tobin's Q, when controlling for the system effect and combined with board size. This result suggests that poor performing companies require a greater monitoring level. Similarly to the study by Vafeas (1999), it appears that, for our sample firms, "frequent board meetings are one way the board responds to tough years of operation" (p. 140).

Regarding our three control variables, their relationship with Tobin's Q is in line with our expectations. ROA (positive), FSIZE (negative) and DEBT (positive) are found to be significantly related to firm performance. As for board size, our statistical analysis did not produce any significant association toward Tobin's Q, although the positive sign found for this variable persists even when controlling for the industry, country and system effect. Concerning the presence of women on the board, we did not find any strong relationship between this variable and firm performance, although the expected negative sign for this variable is confirmed. Finally, we assessed problems of endogeneity.

First, we found that a conceivable endogeneity relationship between board size and firm performance is inexistent. Yermack (1996) and O' Connell and Cramer (2010) confirmed this trend, finding that it was likely board size that affects overall firm performance. Second, we found evidence of endogeneity problems between the proportion of independent directors and firm performance. Barnhart et al. (1994) and Beiner et al. (2006) supported this assumption, finding that board independence and firm performance were endogenously related. Although we did not test in details the endogenous relationship, our results add empirical evidence on this specific matter.

5.2. Limitations and Suggestions for Future Research

Our results point out a number of fruitful findings, which add value to the empirical evidence linked to the board conditioning factors of firm performance. Nonetheless, as it happens in most papers, there is room for improvement. Here, we identify eventual limitations of our study, and also provide suggestions, which may be taken in consideration by future researchers interested in crossing the path of this research field.

Board of directors' features provide enlightening results about the matter approached in our study. However, this area is only a fragment of all potential board conditioning factors of firm performance. Hence, considering a wider set of explanatory variables related to directors' characteristics is something that may be proposed.

For instance, analyzing the effect of board members' compensation, similar to Kaplan (1994), Murphy (1999) and Fernandes (2005), can be an interesting issue. Executive compensation was found to be strongly positively related to firm performance. According to Shleifer and Vishny (1997), equity-based compensation should maximize shareholders' wealth. Thus, directors' remuneration is likely to be a determinant of firm performance. Hence, adding this sort of information is expected to grant enlightening conclusions in studies on the matter.

Another criticism to our work is related with our sample firms' structure consistency. The lack of comparable material from secondary sources, regarding board of directors' features, is the main reason behind this limitation. Managing a method to gather a sufficient amount of information about companies from a wider set of European countries would indeed be rewarding. It would be, therefore, possible to deeply comprehend the substance behind the board conditioning factors of firm performance in this region.

In our study, we only conduct a one year analysis. This question is justified by a central reason. The changeability of directors' mandate is relatively low, since board members are elected for wide periods of time. Thus, either board size, the proportion of independent or even the presence of both women and foreigners on the board are unlikely to fluctuate. Hence, conducting a cross sectional analysis throughout multiple years does not add substantial value. Nevertheless, adding explanatory variables with higher probability of oscillation would require gathering information over multiple fiscal years.

Our suggestions could lead to conceive a new way of developing an empirical analysis concerning the board conditioning factors of firm performance. Indeed, comparable information, over several years, regarding board of directors' features, compensation and managerial ownership, over a wider set of European countries, would be likely to enable researchers to develop a statistical analysis through progressive econometric techniques.

Additionally, the issue related to endogeneity problems could benefit from an extensive gathering of comparable data on European companies. In fact, completing this task would allow analyzing in more detail the extent behind conceivable endogenous relationship for both board size and the proportion of independent directors, toward firm performance. Hence, a higher commitment regarding the assignment of uncovering the board conditioning factors of firm performance might be reached.

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