LISBON
SCHOOL OF
ECONOMICS &
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UNIVERSIDADE DE LISBOA

MASTER OF SCIENCE IN
FINANCE

MASTER´S FINAL WORK
DISSERTATION

CORPORATE GOVERNANCE AND FINANCIAL PERFORMANCE

EMILIA PRONDETCHI

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GLOSSARY

AR – Arellano-Bond test.

CEO – Chief Executive Officer.

GMM – Generalized Method of Moments.

ISE – Irish Stock Exchange.

MTB – Market to Book.

OECD - Organization for Economic Cooperation and Development.

OLS – Ordinary Least Square.

ROE – Return on Equity.

ROA – Return on Assets.

ROIC – Return on Invested Capital.

STATA – Software for Statistic and Data Science.

UK – United Kingdom.

ABSTRACT

This study aimed to measure the impact of Corporate Governance on Firm Financial Performance of listed companies in France, Germany and UK. The study sample is composed of 214 listed companies between 2010 to 2019. The explanatory variables of the study are represented by some measures of corporate governance: board size, CEO/Chairman duality, board independence, board ownership and the largest five shareholders. The dependent variables are: LogROE, LogROIC and LogTobin´s Q, which represent Firm Performance. The study also considered two control variables, revenue and leverage, in order to help measuring the relationship between corporate governance and firm performance. Agency theory suggests that companies that comply with all measures of corporate governance perform better. We find that our measures of corporate governance are positively and significantly related with market performance.

Keywords: corporate governance, firm performance, listed companies, France, Germany, UK

RESUMO

Este estudo tem como objetivo medir o impacto da Governança Corporativa no Desempenho Financeiro das Empresas em França, Alemanha e Reino Unido. A amostra do estudo é composta por 214 empresas no período de 2010-2019. As variáveis explicativas do estudo são representadas por algumas medidas de governança corporativa: tamanho do conselho, dualidade CEO / presidente, independência do conselho, percentagem de ações do conselho e os cinco maiores acionistas. As variáveis dependentes são: LogROE, LogROIC e LogTobin's Q, que representam o desempenho da empresa. O estudo também considerou duas variáveis de controlo, rendimentos e alavancagem, com o objetivo de ajudar a medir a relação entre governança corporativa e desempenho da empresa. A teoria da agência sugere que as empresas que cumprem todas as medidas de governança corporativa têm um desempenho melhor. Concluímos que as medidas de governança corporativa têm um resultado positivo e significante relacionadas ao desempenho do mercado.

Palavras-chave: governança corporativa, desempenho financeiro, empresas listadas, França, Alemanha, Reino Unido

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ACKNOWLEDGEMENTS

I would like to thank to everyone who helped me during the period of producing my master thesis, either by technical or personal support.

I would like to thank to my family for all the unconditional support and understanding during my studies. I appreciate each word of encouragement, each technical help and each contribution necessary for this dissertation.

I would also like to thank to my supervisors, Telmo Francisco Salvador Vieira and João Carvalho das Neves, for their availability and support.

Special thanks to Professor Telmo Francisco Salvador Vieira for making available the database he built over time and for helping me with econometric models.

I would also like to thank to Professor Jorge Caiado, for the helpful advises on econometric matters.

1. INTRODUCTION

According to the Organization for Economic Cooperation and Development (2005) corporate governance is:

"Procedures and processes according to which an organization is directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among the different participants in the organization – such as the board, managers, shareholders and other stakeholders – and lays down the rules and procedures for decision-making."

It determines what relationship should be put in place between management, board of directors, controlling shareholders, minority shareholders and all other stakeholders in the organization. Transparency, timely disclosure of reliable information to the public and accountability are some of the most important basic elements for better corporate governance. It is important to find a balance in order to meet the needs of the different stakeholders. This often involves resolving conflicts of interest and ensuring that the company is well managed, that is, the processes and policies implemented must be in accordance with the ethical principles of the company. Through these elements, companies will more easily achieve sustainability. All of these measures are necessary to avoid mismanagement and enable companies to operate more efficiently, in order to mitigate risks, protect stakeholders and improve access to capital.

Corporate governance, in addition to the goal of making companies more transparent and accountable, provides the necessary tools to respond to stakeholder concerns. It contributes to the development of capital, offers job opportunities and stimulates economic growth. The lack of good corporate governance can be critical for a company. It may lead to loss of profits, bankruptcy, corruption and destruction of the company's reputation not only in the financial community, but to the whole of society. The implementation of these practices is also necessary to limit risks and eliminate corrosive elements within a company. We have the example of Volkswagen that tricked emissions testers to sidestep air pollution laws. The company has broken the trust of customers and the public. Another example is the case of Thomas Borgen, a Norwegian banker who was the CEO of Danske Bank but resigned in September of 2018 after a money-laundering scandal announcement. Due to the scandal the bank is facing a fine of up to 555.6 million euros in Denmark alone. After money laundering admissions, Danske Bank's market value fell by a third.

One of the most important principles of corporate governance is shareholders' recognition which ensures that everyone participates in the operation of the company, thus securing the value of the shares. The responsibilities of the members of the board of directors must be stipulated so that all of its members shares a common vision. Ethical guidelines are also a crucial part of ensuring better internal conduct and greater corporate profits. These ethical practices are applied to all employees of the company. Transparency must be present in all situations, which should take the form of record keeping and reports on income. All company employees must be encouraged to report illegal or unethical practices.

We can conclude that corporate governance is a cornerstone of trust, transparency, ethics, accountability and risk management supporting long-term investment, financial stability and integrity to both listed and state-owned companies (Nerantzidis and Filos, 2014).

This theme has been gaining more and more visibility and importance in developed and developing countries due to the high number of frauds and collapses of companies because of lack of good governance. We have the example of Banco Espírito Santo in Portugal, which is the largest financial fraud in the history of the country and the case of Portugal Telecom, where managers were accused of passive corruption, tax evasion and money laundering. There are several studies in the literature on the relationship between corporate governance and the financial performance of companies. However, the conclusions are contradictory.

This research aims to investigate the impact of corporate governance on the financial performance of 214 companies in Germany, France and United Kingdom. I chose these countries because they constitute the main European markets. The total sample consists of 340 stock listed companies in the time period 2010–2019, for which the necessary data are completely available. The reduction of the complete sample of 340 companies listed, resulted from the non-availability of corporate governance reports. Companies from financial sector were also excluded.

The work is organized as follows: literature review focused especially on the impact of corporate governance on the financial performance of companies. Next, I briefly present the corporate governance codes of the countries studied. Then, I present the data and methodology. After that, I analysed the results and findings. The last section is the conclusion.

1.1 *Research objective*

First, we can say that corporate governance is of a high importance for companies, seeking to make it more efficient and sustainable. In addition, we did not find any relevant studies performed for these three markets together. We decided to analyse the three countries in one study due to the fact that these indexes are broader compared to other European countries and thus the study would be more representative. Several studies have been carried out in various parts of the world, however they have not reached a unanimous conclusion, instead they present controversial results. The conclusions obtained are different because the results are influenced by external factors such as different organizational culture. Another reason is that the variables used in each study are not exactly the same, which ends up showing different results and conclusions. An example is the study of Akbar et al., (2016) where it is examined the relationship between corporate governance and financial performance and comes to the conclusion that corporate governance practices are not a determining factor in financial performance. This result is contradictory to the results found so far in the UK literature. The authors argue that results from prior studies showing a positive impact of corporate governance on firms 'performance may be biased as they fail to control for potential endogeneity. According to the study presented by Ammann et al., (2011) there is a strong and positive relation between corporate governance and firm valuation and between a company's social behaviour and firm value. On the contrary, Akbar et al., (2016) indicates in their study that "there is no significant relationship between the governance index and corporate performance". So the question remains, if there is a significant relationship between corporate governance and companies' financial performance? Thus, the given reasons explain my motives for the research in general. The main objective of the research can be formulated as follow: To evaluate the impact of corporate governance on financial performance in German, France and UK markets.

2. LITERATURE REVIEW

Corporate governance is a system that not only enhances the relationship between various stakeholders (firm's shareholders, managers, and investors), but it also ensures that proper provision of resources among competing users exists (W.M. Al-ahdal, et al. 2020).

The topic of corporate governance has been gaining more attention in the recent years and has also generated a vast number of research papers. A good "Corporate Governance is crucial to build a marketplace trust and attract investors in the corporation, as well as, encourages investors´ confidence by ensure the existence of independent board of directors" (Baullay, Hamdan & Zureigat, 2017). Listed companies are required to adopt the corporate governance principles due to the importance of corporate governance for effective financial, operational and market performance. The impact of corporate governance on financial performance continues to be studied. Several studies have been carried out using different performance measures. However, the most popular measures used are Return on Equity (ROE) to evaluate financial performance, Return on Assets (ROA) to evaluate operational performance and Tobin´s Q to evaluate market performance.

Rosenberg (2003) studied the corporate governance relationship and firm performance of Finnish firms. The empirical results show that corporate governance matters for firm performance. Tests indicate that companies that comply with all measures of corporate governance have delivered greater stock returns, are higher valued on the measure of Tobin´s Q, and exhibit higher ratios of cash flow to assets. Krivogorsky (2006) used ROA, ROE and Market-to-Book (MTB) from 87 European companies for her analysis and the results indicate a strong positive relation between the level of relational ownership and profitability ratios, and between the portion of independent directors on the board and profitability ratios. Another research realized by Drobetz et al. (2003) found a strong positive relation between the compliance with corporate governance measures and firm value. On the contrary, the research made by Demsetz (1985) and Demsetz and Vilallonga (2001) indicate that there is no relationship between corporate governance and firm performance. Drobetz (2003) investigate the relationship between corporate governance and firm performance on a sample of 253 firms and found that there is a positive relationship between corporate governance and firm value. In addition, there is strong evidence that expected returns are negatively correlated with the corporate governance, if dividend yields and price-earnings ratios are used as proxies for the cost of capital. Gürbüz et al. (2010); Garay and Gonzalez, (2008) also found a positive relation between ROA, ROE, Tobin´s Q and corporate governance. Sami et al (2011) investigated the

relations between corporate governance and firm performance by using log of total assets, ROA, ROE, Tobin´s Q and they also found positive relations. Another study realized by Dagli et al. (2012) found no difference between monthly average returns after and before entering into the ISE index of corporate governance of companies. Appendix 1 shows the literature review that sustains the research hypothesis.

However, it is very important to pay attention to the characteristics of the country as they significantly influence whether the applied principles are successful or not.

Next, I will present the three theories that in my opinion explain the need for a good corporate governance:

2.1 *Agency theory*

Agency theory is concerned to resolve two problems that can occur in agency relationships: (a) agency problem that appears when the desires or goals of the principal and agent conflict and (b) when it is difficult or expensive for the principal to verify what the agent in actually doing (Eisenhardt, 1989, p.58). The main objective of the theory is to determine the most efficient contract governing the principal-agent relationship taking into account assumptions about people, organizations and information. In the agency theory information is a commodity: it has a cost and can be purchased. Information asymmetry is a characteristic of the principal-agent relationship which can be used in favour of or as a disadvantage to the principal (Dunn, M ,2013, p.119-120).

The domain of agency theory is the relationships that represent the basic structure of a principal and an agent who are engaged in cooperative behaviour however have different goals and different attitudes toward risk. This theory emphasizes the necessity to know whether managers within the chosen structure are compensated by performance incentives.

Jensen and Meckling (1976) are co-founders of the principal–agent theory. Their model was based on the theory of incomplete contracts by Coase, R.H (1937). They define an agency relationship as a contract under which the principal(s) engage the agent to perform some service on their behalf which involves delegating some decision making authority to the agent. If both parties to the relationship are utility maximizers, there is good reason to believe that the agent will not always act in the best interests of the principal. It is usually impossible for the principal or the agent at zero cost to guarantee that the agent will make optimal decisions from the principal's perspective (Jensen and Meckling, 1976).

2.2 *Stakeholder theory*

Stakeholder theory is divided into three approaches: normative, instrumental and descriptive. The instrumental part says that corporations practicing stakeholder management will be relatively successful in conventional performance terms – profitability, stability, growth, etc. It establishes a framework for examining the connections between the practice of stakeholder management and the achievement of various corporate performance goals. The descriptive part defines the corporation as a constellation of cooperative and competitive interests possessing intrinsic value. It is used to describe and to explain specific corporate characteristics and behaviours. Stakeholder theory describes the nature of the firm, the way managers think about managing, how board members think about the interests of the corporations and how some corporations are actually managed. Although instrumental and descriptive parts are important the normative it is fundamental. Normative approach says that stakeholders are persons or groups with interests in the procedural and/or substantive aspects of corporate activity. Stakeholders are identified by their interests in the corporation, whether the corporation has any corresponding functional interest in them. Each group of stakeholders deserves consideration for its own sake. However, does not imply that all stakeholders should be equally involved in all processes and decisions.

The stakeholder theory recommends attitudes, structures, and practices that constitute stakeholder management. This theory is intended to explain and to guide the structure and operation of the established corporation. Highly successful companies share a stakeholder perspective. According to Clarke, T. (1998), interest in stakeholder approaches to strategic management is growing and the concern with stakeholder value has never been greater.

2.3 *Stewardship theory*

Stewardship theory defines situations in which managers are not motivated by individual goals, but rather are stewards whose intentions are aligned with the objectives of their principals (Davis, Schoorman and, Donaldson, 1997). It is essential to understand the characteristics of the manager and the situation to understand manager-principal interest convergence. This theory assumes that pro-organizational, collectivistic behaviours have higher utility than individualistic, self-serving behaviours. Thus, when the interests of the steward and the principal are not aligned, the steward places higher value on cooperation, because seeks to achieve the objectives of the company. This type of behaviour benefit principals taking into account that a steward maximizes shareholders´ wealth through firm

performance. The stewardship theory relates the success of the organization with the principals´ satisfaction.

The principal assumption of the theory is that the behaviours of the executive are aligned with the interests of the principals. CEOs who are stewards have pro-organizational actions that are made easier when corporate governance structures give them high authority and discretion. Stewardship concepts consider structure of the board affecting the firm performance significantly.

2.4 *Corporate Governance Codes*

Countries have a corporate governance code that needs to be followed by companies. They aim to build or reinforce shareholders' trust in companies. In most countries, these codes are not law but a set of recommendations to be followed by companies on the basis of "comply or explain". However, achieving trust from shareholders is essential to the company's long-term success. The corporate governance codes, in addition to advising the rules, emphasize the company's diversity and good practices. Companies are required to report how they apply the principles of the code, thus giving shareholders the opportunity to evaluate their application.

2.4.1 *UK Corporate Governance Code - 2020*

This Code requires the Chair to be independent on an ongoing basis. It is indicated that the Chair may not remain in post beyond nine years. Anyone of the board member is eligible for the position otherwise would be a disincentive for individuals that want to grow in the company. It is emphasised the criteria around independence for non-executive directors. Companies should explain why they consider a director is independent and how the board take actions to identify and manage conflicts of interest.

Firms should provide more information about the composition of the board and the board evaluation. It is also highlighted that appointments and succession planning should be based on merit and aim to promote diversity across a broader range of areas independently of the gender, social and ethnic backgrounds, cognitive and personal strength. Companies are required to disclose their policy on diversity and inclusion.

In relation to workforce engagement, it is necessary to include reference to the broader stakeholders and it is also important that the board understands their views and then demands specific involvement of the workforce. They should report on how stakeholder interests were considered in board discussions and decision-making.

It is mandatory for companies to carry out a robust assessment of emerging risks and identify the most significant and probability of risks that might occur. It must be clear what procedures are in place to identify emerging risks, and how these are being managed or mitigated. When a company does not have an internal audit function or an audit committee it is necessary to explain in the annual report the absence, how internal assurance is achieved and how this affects the work of external audit.

It is important to make the CEO pay ratio known. This requires a pay ratio table of executive pay to the first, second and third quartile.

2.4.2 German Corporate Governance Code – 2020

The Supervisory Board should include an appropriate number of independent members. If the Supervisory Board comprises more than six members, at least two shall be independent. If comprises six or less members, at least one shall be independent. Each member of the Supervisory Board shall inform the Chair of the Supervisory Board of any conflicts of interest without delay.

Management Board remuneration aims to create incentives for the actions of the Management members, to pay an acceptable remuneration for the performance, to respect social acceptance and to explain clearly and understandably how much Management Board members receives, and for what performance the remuneration is paid. It is necessary to exist a remuneration system that defines the total remuneration, the fixed and variable remuneration components. The correlation between achieving objectives and variable remuneration must therefore be determined previously, and must not be changed subsequently. Total target remuneration and maximum remuneration should be communicable overall in contrast to the remuneration of other senior managers and the employees, and should be justified to the general target. Firms are obligated to provide relevant disclosures regarding corporate governance standards applied at the respective entities above and beyond legal requirements.

2.4.3 *France Corporate Governance Code - 2020*

Regardless of its membership or how it is structured, the board of directors is and must remain a collegial body mandated by all shareholders. The Board should act in the company interest, so having a high number of special interests represented within it should be avoided. French regulation allows all public limited companies to choose between Board of Directors

and Supervisory Board and Management Board. The law does not support either formula and allows the company to choose between these two forms of exercise of executive management.

Each Board of Directors define the company's financial disclosure policy. All companies should have a rigorous policy for communication with the market and analysts. Any communications activities must allow everyone to access the same information at the same time.

Each Board should discuss the desired balance of its membership and that of the Board committees should be, principally in terms of diversity. It must make public on corporate governance report a description of the diversity policy applied to members of the Board of Directors as well as a description of the objectives of this policy, its application measures and the results accomplished in the past financial year.

The independent directors should account for half the members of the Board in widely held corporations without controlling shareholders.

3. RESEARCH HYPOTHESIS

The aim of this dissertation is to understand if corporate governance has a significant impact on the companies' performance. Based on the main corporate governance studies analysed, concerning the chosen determinant variables, the hypotheses to test are going to be described.

As shown in Appendix 1, several authors have addressed the topic of board independence. According to Berghe and Baelden (2005) board independence is an important factor in ensuring board efficiency through the monitoring and strategic roles of the directors. One of the most important factors for board independence is by acquiring enough quantity of independent directors on board. They affirmed that the director's ability, willingness and board environment might lead to the independent attitude of each director. Ameer, Ramli and Zakaria (2010) found that over the period of 2002 to 2007, companies with high representation of outside and foreign directors on the board had a significant correlation with the company's better performance. Fama & Jensen (1983) affirmed that higher board independence is expected to represent better monitoring of the board insiders' decisions.

Leung, Richardson and Jaggi (2014) found a positive relationship between firm performance and board independence. The research realized by Abdullah (2004) showed a positive and significant correlation with operating performance. Bhagat & Bolton (2008),

found that after 2002 there is a positive correlation between board independence and ROA, stock return and Tobin´s Q. All these studies showed evidences that an high number of independent directors influenced a firms´ financial performance. Considering this information, the first hypothesis is:

Hypothesis 1: *Board Independence is positively related to financial performance (measured by LogROE), operational performance (measured by LogROIC) and market performance (measured by LogTobin´s Q),*

Several studies have examined the separation or duality of CEO and chairman roles. Yermack (1996) demonstrated that companies are more valuable (in terms of Tobin's Q), when the CEO and Chairman positions are separated. Abdullah (2004) found that financial and operating performance is negatively related to CEO/Chairman duality. Chen et al. (2005) also found a negative relation between Tobin´s Q and CEO/Chairman duality. Bhagat & Bolton (2008) identified a negative relation of CEO-Duality with operating performance, the second hypothesis to test is:

Hypothesis 2: *CEO/Chairman duality is negatively related to financial performance (measured by LogROE), operational performance (measured by LogROIC) and market performance (measured by LogTobin´s Q),*

The following hypothesis aims to test the significance of board ownership. According to Morck, Shleifer, & Vishny (1988), Agrawal & Knoeber (1996), and Yermack (1996) there is a positive relation between board ownership and firms' performance, in terms of Tobin's Q. The third hypothesis to test is:

Hypothesis 3: *Board Ownership is positively related to financial performance (measured by LogROE), operational performance (measured by LogROIC) and market performance (measured by LogTobin´s Q),*

Regarding the distribution of shares through multiple shareholders, Agrawal & Knoeber (1996), Demsetz & Lehn (1985) and Guedri & Hollandts (2008) found negative effects of ownership concentration on performance measures (as measures by ROE, Tobin's Q or ROIC). Guerrero-Villegas et al. (2018) found that the improvement in the firms´ performance is more intense in low levels of ownership concentration than in high levels. The fourth hypothesis is:

Hypothesis 4: *Largest five shareholders is negatively related to financial performance (measured by LogROE), operational performance (measured by LogROIC) and market performance (measured by LogTobin´s Q),*

Table I - Summary of the expected results, under the hypothesis studied

Hypothesis	Variable	Financial performance (LogROE)	Operational performance (LogROIC)	Market based performance (LogTobin´s Q)
1	Board Independence	+	+	+
2	CEO/Chairman duality	-	-	-
3	Board Ownership	+	+	+
4	Shareholder concentration	-	-	-

4. DATA AND METHODOLOGY

4.1 *Research methodology*

Considering the specificity of the main research question (whether the relation between corporate governance and financial performance is significant on German, France and UK markets), a quantitative research approach seems appropriate. As Babbie (2010) defines, quantitative research study determines the relationship between independent variables and dependent variables. Quantitative research designs are either descriptive or experimental. The descriptive study can only establish associations between variables, whereas an experimental study establishes causalities. Therefore, the present thesis is quantitative in nature and experimental design, as it aims to establish causality between corporate governance practices and corporate financial performance. Five types of corporate governance practices were considered to understand what effect they provoke on the three selected measures of the financial performance. The independent variables are: ownership of the five largest shareholders, size of the board of directors, board ownership, independency of board of

directors and position of Chairman and CEO. The literature review identified these variables as some of the main governance characteristics of previous studies (Appendix 1). I chose these variables based on previous research.

Financial performance is the dependent variable measured by LogROE, LogROIC and LogTobin´s Q. The three measures were selected as the most adequate for the purpose of the research, following the analysis of the main research papers that investigated the same relationship on other markets.

This study used the logarithm of return on equity (ROE) to measure financial performance, the logarithm of return on invested capital (ROIC) to measure operational performance and the logarithm of Tobin´s Q to measure market performance. Some literature that considers the use of LogTobin's Q is the following: Griliches, 1981; Jaffe, 1986; Cockburn and Griliches, 1988.

According to Gompers, Ishii, and Metrick (2003) better corporate governance is associated with higher firm valuation as measured by Tobin's Q. Kumalasari & Pratikto (2018) found in their study that corporate governance measures has a significant positive effect on ROE. Vuran & Adiloglu (2017) used in their research ROIC to measure firm performance and found that companies that comply with corporate governance measures have better profitability performance.

Table II - Firm performance measures in different studies

Measure	**Authors**
Return on Equity (ROE)	Shaw, Gupta & Delery (2005) ; Sami, Wang & Shou (2011) ; Yilmaz, I. (2018)
Return on Invested Capital (ROIC)	Michelberger, K. (2017) ; Vuran & Adiloglu (2017)
Tobin´s Q	Gompers, Ishii, and Metrick (2003) ; Al-ahdal, W. et al (2019) ; Vo, D. H. & Nguyen, T. M. (2014)

Considering the quality of the previous research, OLS panel and Two-Step Differences GMM were chosen as the most appropriate for the purpose of the study.

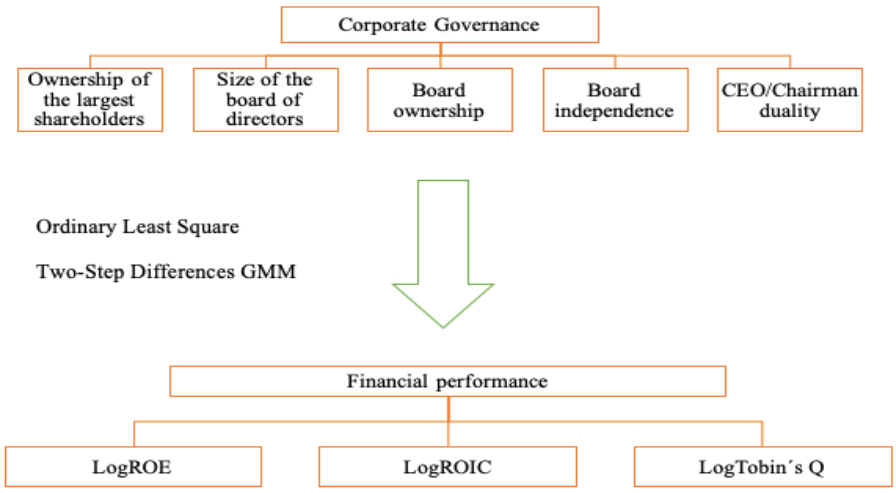

Figure 1 - Research model

As previously mentioned, the markets to be studied are: UK, Germany and France. In Appendix 4 we have the descriptive analysis of each country. Analysing the dependent variable ROE, we see that in the UK the mean is 22.31% which is higher compared to Germany with a mean of 13,01% and France with a mean of 7,62%. This analysis is maintained when we analyse the ROIC variable. However, in this case the differences in values are not so pronounced.

Starting to analyse the explanatory variables, we observed that board size does not differ much between countries. The difference is approximately one for each country, with France being the country with the highest mean of approximately 13. UK is the country with the highest percentage of independent directors (64%), however the three countries on average have a percentage above 50%. Analysing the variable CEO / Chairman duality we observe that Germany do not have any case in which the CEO and the Chairman are the same person and the country with the highest value cases where CEO/Chairman are the same person is France. When analysing board ownership, we observed a significant difference between France with a value of 21.83% and UK with a value of 2.33%. Germany's average is 19.61%. The largest five shareholders variable also differs between countries. The country with the highest value is France with 45.29%, followed by Germany with a value of 42.56% and finally we have UK with a value of 26.28%.

Analysing the control variables, we see that UK is the country with the highest average revenue, followed by Germany and finally France. Leverage is not much different between countries. UK has the highest value of 0.26, France has a value of 0.25 and Germany has a value of 0.22.

4.2 *Measurement of Variables and Descriptive Statistics*

As previously mentioned, this study aims to investigate the relationship between corporate governance and companies' financial performance. In order to achieve this, we decided to study the effects of corporate governance measures on three types of performance: financial, operational and market. The dependent variables are: Return on Equity that is used to measure the return on the shareholders' equity and the firms' efficiency in making profits. It is calculated as Profit after tax divided by total equity at the end of the year. Tobin-Q that represents the market's expectation of the company performance. It can be calculated by dividing market capitalization plus liabilities, preferred equity and minority interest divided by total assets. The last one is Return on Invested Capital that is a profitability or performance ratio that aims to measure the percentage return that a company earns on its invested capital. It is calculated dividing operational profit by invested capital. Invested capital is calculated as assets minus operational liabilities.

The explanatory variables have been measured using the (i) Board ownership, (ii) Ownership of the five largest shareholders, (iii) Size of the board of directors, (iv) Independency of board of directors and (v) CEO/Chairman duality. Table III show that the mean percentage for this first corporate governance variable is around 15.61%. This means that on average the board of directors holds approximately 16% of the company's shares. Bhagat & Boltogn (2008) found a positive relationship between board ownership and performance. The mean percentage for the second corporate governance variable which is ownership of the five largest shareholders is 38.89% shows that the companies have multiple shareholders control. This result show that in average there is no control by the five largest shareholders as they on average control less than 50% of shares. Guedri & Hollandts (2008) found negative effects of ownership concentration on performance measures. The mean for the third corporate governance variable is around 12. The greater the number, the longer it will take to make a decision as the divergence of opinions would be longer. According to Detthamrong et al. (2017) when the board size increases, firm performance tends to decrease. When conducting the study, we noticed that the number of directors has remained stable over the years and in some cases it has decreased which can result in much more efficient decision making. For the fourth

corporate governance variable which is the independency of the board of directors, the mean percentage is 57.87% of board independency. This result indicates that more than 50% of total directors are appointed as independent directors. Jackling & Johl (2009) and Muniandy & Hillier (2015) find that board independence has a positive impact on firm performance. The mean percentage for the last corporate governance variable which is the separation in roles of the CEO and the chairman is 78%. The duality takes place when the chairman of the board and CEO roles are combined. CEO/Chairman duality is a dummy variable, taking the value of 0 if the chairman is the same of CEO and 1 otherwise. According to Bouaziz (2014) the separation between CEO and chairman can lead to an effective board. Khiari, (2013) argued that combining CEO and chairman role could lead to conflict of interests.

Two control variables will be discussed for all estimated models in the research. They are:

-Firm size: revenues of the company – Revenues

-Leverage: book value of the total debt divided by the book value of total assets – Leverage

The following Table III summarizes the measurement of the dependent, explanatory and control variables:

Table III – Descriptive Statistics Total Sample (n=214; 2010-2019)

Dependent Variables	**Mean**	**SD**	**Min.**	**Max.**
ROE (%)	12.88	33.44	-770.23	494.30
ROIC (%)	8.78	10.62	-101.57	194.6
Tobin´s Q	1.72	0.98	0.06	11.45
Explanatory Variables				
Board ownership (%)	15.61	22.39	0.00	88.02
Ownership of the largest shareholders (%)	38.89	22.38	2.89	100.00
Board size	12.01	3.84	3.00	23.00
Independence of board of directors (%)	57.87	19.24	0.00	100.00
CEO/Chairman duality	0.78	0.41		
Control Variables				
Leverage	0.25	0.15	0.00	1.64
Revenues	20730.21	48452.46	0.20	470 171

There are 2140 observations, this value is referring to the number of periods which are 10 times the 214 companies under analysis. Regarding Performance variables, ROE varies between -770.23% and 494.30%, with a mean of 12.88%. ROIC varies between -101.57% and 194.60%, with a mean of 8.78%. Finally, Tobin´s Q varies between 0.06% and 11.45%, with a mean of 1.72%.

Regarding Corporate Governance variables analysed, board ownership varies between 0.00% and 88.02%, with a mean of 15.61%. Ownership of the largest five shareholders varies between 2.89% and 100.00%, with a mean of 38.89%. Board size varies between 3 and 23, with a mean of 12.01. Independence of the board of directors varies between 0% and 100%, with a mean of 57.87%.

4.3 *Data collection method*

Regression model requires the introduction of control variables that complement the model. These variables are very important to build an effective regression model. We chose the following control variables: firm size (measured by revenue) and leverage.

The data sample comprises 110 listed companies from United Kingdom, 120 from France and 110 from Germany. One hundred and twenty-six of those 340 listed companies were excluded. Forty-two of the excluded companies were in the financial sector. We removed all those firms for which the corporate governance compliance and/or financial data was not available during the sample period and for being in the financial sector. Financial companies were excluded because their leverage is strongly influenced by explicit (or implicit) investor insurance schemes. Also, their debt-like liabilities are not strictly comparable to the debt issued by nonfinancial firms (Rajan & Zingales, 1995).

The study contains listed companies from eight sectors. Table IV shows that there are 18.22% listed companies from Consumer, Cyclical sector, 9.35% from Basic Material sector, 11.21% from Communications sector, 24.30% from Consumer, Non-cyclical sector, 3.27% from Energy sector, 18.69% from Industrial sector, 9.35% from Technology sector and 5.61% from Utilities sector.

Table IV - Sample Selection

Sector	Study population	Germany	France	UK
Consumer, Cyclical	39	10	15	14
Basic Materials	20	8	5	7
Communications	24	8	11	5
Consumer, Non-cyclical	52	13	18	21
Energy	7	-	3	4
Industrial	40	20	14	6
Technology	20	9	10	1
Utilities	12	2	5	5
Total	214	70	81	63

Time period for collection of observations is from 2010 until 2019. Data was gathered from various sources. All financial data is obtained from Bloomberg database and Thompson Reuters DataStream. Nonfinancial data (ex. Board independence and board ownership) was collected manually from the annual reports of the companies.

4.4 *Statistical model*

As explained earlier, the statistical models used (OLS and Two-Step Differences GMM) were chosen based on previous research and also based on the tests performed. Appendix 1 presents the research that supports my choice. After defining the variables and the hypotheses to be studied, I had to pay attention to the most common statistical problems: multicollinearity, endogeneity, heteroscedasticity, and autocorrelation. I will start with multicollinearity which is the existence of a high correlation between independent variables. To avoid this problem, variables that measure similar factors were excluded from the database. The second problem that can occur is endogeneity. "A regressor is endogenous when the independent variable is correlated with the error term. If any one regressor is endogenous then in general OLS estimates of all regression parameters are inconsistent – unless the exogenous regressor is uncorrelated with the endogenous regressor" (Cameron & Trivedi, 2005).

Endogeneity can arise from unobserved heterogeneity and reverse causality. In the perspective of the corporate governance–performance relationship, the problem of unobserved heterogeneity arises when one or more latent variables drive the observed relationship between governance dimensions and firm performance. To assess endogeneity, I applied the Hausman test. The null hypothesis is that the preferred model is random effects versus the alternative hypothesis, the fixed effects. As we can see in Appendix 2, we reject the null hypothesis, that is, the model to be used will be Fixed effects. However, in this research we will not use fixed-effects model because "If lagged dependent variables appear as explanatory variables, strict exogeneity of the regressors does not hold, and the maximum-likelihood estimator or the within estimator under the fixed-effects specification is no longer consistent…" (Pesaran. M., 2015). Another statistical problem that may arise is heteroscedasticity. This happens when a sequence of Y_t given X_t, the conditional variance of Y_t given X_t, changes with t. The regular procedure is to apply the White Test. The null hypothesis is that there is no homoscedasticity and the alternative hypothesis is that there exists heteroscedasticity. Finally, we have the problem of autocorrelation. This problem arises when there is correlation between values of the process at different times. The Wooldridge test was applied to test the null hypothesis of no first order autocorrelation. As we can see in Appendix 2, we reject the null hypothesis, so we do not reject the existence of autocorrelation. In the end, after several tests were performed in order to correct errors results are believed to be accurate.

First we applied OLS dynamic model by considering the number of lags of firm performance which are sufficient for capturing the dynamic completeness of our model. Glen et al., 2001 and Gschwandtner,2005 recommends the use of two lags for capturing the influence of past performance on current data.

$$\text{LogROE} = \beta_0 + \beta 1\text{LogROE(t-1)} + \beta 2\text{LogROE(t-2)} + \beta_3\text{Board ownership} + \beta_4\text{Ownership of the largest five shareholders} + \beta_5\text{Board independence} + \beta_6\text{Board size} + \beta_7\text{CEO/Chairman duality} + \beta_8\text{Revenue} + \beta_9\text{Leverage} \quad (1)$$

$$\text{LogROIC} = \beta_0 + \beta 1\text{LogROIC(t-1)} + \beta 2\text{LogROIC(t-2)} + \beta_3\text{Board ownership} + \beta_4\text{Ownership of the largest five shareholders} + \beta_5\text{Board independence} + \beta_6\text{Board size} + \beta_7\text{CEO/Chairman duality} + \beta_8\text{Revenue} + \beta_9\text{Leverage} \quad (2)$$

(3) $$\text{LogTobin´s Q} = \beta_0 + \beta 1\text{LogTobin´s Q(t-1)} + \beta 2\text{LogTobin´s Q(t-2)} + \beta_3\text{Board ownership} + \beta_4\text{Ownership of the largest five shareholders} + \beta_5\text{Board independence} + \beta_6\text{Board size} + \beta_7\text{CEO/Chairman duality} + \beta_8\text{Revenue} + \beta_9\text{Leverage}$$

In addition to the OLS dynamic model we performed another analysis through the application of Two-Step Differences GMM:

(4) $$Y_{it} = \Phi Y_{it-1} + \gamma Z'_{it} + \beta X'_{it} + d_t + \varepsilon_{it}$$

5. RESULTS AND DISCUSSION

The results of the econometric models tested with OLS and Two-Step Difference GMM estimator are summarized in one table for each dependent variable. Table V, VI and VII report the results for the relationship between LogROE, LogROIC, LogTobin´s Q, and the corporate governance measures.

Table V presents results from the estimation of the regression using LogROE. We find that in UK using OLS model, board ownership is positive and significant at 10% level and largest five shareholders is negative and significant at 5% level. These results do not hold when applying GMM model. Board size, CEO/Chairman duality, board independence and the control variables leverage and revenue are not significant. In Germany and France when applying OLS model, we can observe that board size is significant at 10% level.

The results obtained from UK support the hypotheses 1, 2, 3 and 4. When analysing the results obtained from France, we observe that they support hypothesis 1, 2 and 3. However, do not support hypothesis 4.

Table VI presents results from the estimation of the regression using LogROIC. We find that in Germany when applying GMM model, board size is positive and significant at 5% level. When applying OLS model, board size, and largest five shareholders are not significant in all countries. CEO/Chairman duality variable is omitted when analysing Germany because as we can see in Appendix 4, in Germany does not exist this duality. When analysing France, we can note that only control variables, revenue is significant at 10% and leverage is significant at 1%.

Table VII presents results from the estimation of the regression using LogTobin´s Q. When analysing UK and using OLS model, we find that board size, CEO/Chairman duality,

board independence and revenue are significant at 10% level. When using GMM model, board size is significant at 10% level, board independence is significant at 5% level and board ownership, and the control variables revenue and leverage are significant at 1% level. When analysing Germany, we note that board size, board independence, control variables revenue and leverage are significant at 1% level, when using OLS model. Largest five shareholders is significant at 5% level. These results do not hold when applying GMM model. When analysing France, board size is significant at 1% level. Also the control variables revenue and leverage are significant at 1%.

The results from UK support hypothesis 2 and 3. The results obtained for Germany do not support hypothesis 4.

When analysing the three dependent variables, we observe that the corporate governance measures have a larger impact on market performance.

Table V - LogROE outcomes

LogROE	UK		Germany		France	
	OLS	GMM	OLS	GMM	OLS	GMM
Board size	-0.0256	-0.0602	-0.0112	0.0247	-0.0128	-0.0043
	(0.225)	(0.842)	(0.080)*	(0.626)	(0.098)*	(0.833)
CEO/Chairman duality	-0.4176	14.4414	-	-	-0.0367	-0.0071
	(0.352)	(0.835)			(0.430)	(0.941)
Board Independence	0.0004	0.0038	0.0003	0.0009	-0.0008	-0.0009
	(0.911)	(0.939)	(0.834)	(0.806)	(0.592)	(0.701)
Board ownership	0.0080	0.0108	0.0007	0.0027	0.0015	-0.0032
	(0.055)*	(0.580)	(0.620)	(0.624)	(0.288)	(0.567)
Largest five shareholders	-0.0070	0.0059	0.0001	-0.0009	-0.0013	-0.0028
	(0.028)**	(0.494)	(0.952)	(0.852)	(0.436)	(0.585)
Revenue	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.117)	(0.641)	(0.118)	(0.031)**	(0.317)	(0.678)
Leverage	-0.0001	-0.0012	-0.0379	-0.1310	-0.1742	0.0943

	(0.701)	(0.524)	(0.796)	(0.833)	(0.295)	(0.866)
LogROE(t-1)	0.2463	0.1336	0.4574	0.5180	0.4585	0.2955
	(0.000)***	(0.329)	(0.000)***	(0.000)***	(0.000)***	(0.010)***
LogROE(t-2)	0.0697		0.1365		0.1498	
	(0.085)*		(0.000)***		(0.000)***	
R-squared	0.1063		0.2985		0.3291	
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2) test (p-value)		0.861		0.824		0.063
Hansen test (p-value)		0.526		0.239		0.242

***,**,*, are significant at levels 1%, 5% and 10%, respectively.

Table VI - LogROIC outcomes

LogROIC	UK		Germany		France	
	OLS	GMM	OLS	GMM	OLS	GMM
Board size	-0.0173	0.0113	-0.0076	0.0665	-0.0107	-0.0136
	(0.161)	(0.842)	(0.197)	(0.048)**	(0.188)	(0.456)

CEO/Chairman duality	-0.2588	-2.7509	-	-	-0.0573	-0.1053
	(0.290)	(0.787)			(0.241)	(0.545)
Board Independence	0.0026	-0.0035	0.0008	0.0006	-0.0012	-0.0020
	(0.249)	(0.708)	(0.453)	(0.869)	(0.464)	(0.472)
Board ownership	-0.0010	0.0265	0.0010	0.0008	0.0007	-0.0027
	(0.664)	(0.208)	(0.452)	(0.904)	(0.635)	(0.514)
Largest five shareholders	-0.0004	-0.0026	-0.0004	-0.0027	-0.0008	-0.0014
	(0.827)	(0.441)	(0.800)	(0.485)	(0.617)	(0.762)
Revenue	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.192)	(0.556)	(0.390)	(0.412)	(0.054)*	(0.059)*
Leverage	0.0000	0.0000	-0.4686	-0.8690	-1.1498	-0.3942
	(0.974)	(0.959)	(0.001)***	(0.393)	(0.000)***	(0.426)
LogROIC(t-1)	0.5585	0.5048	0.4450	0.2956	0.4615	0.2774
	(0.000)***	(0.000)***	(0.000)***	(0.009)***	(0.000)***	(0.017)**
LogROIC(t-2)	0.0871		0.1004		0.1030	
	(0.045)**		(0.011)**		(0.013)**	

R-squared	0.4144		0.3535		0.3988	
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2) test (p-value)		0.080		0.744		0.398
Hansen test (p-value)		0.079		0.096		0.047

***,**,*, are significant at levels 1%, 5% and 10%, respectively.

Table VII - LogTobin´s Q outcomes

LogTobin´s Q	UK		Germany		France	
	OLS	GMM	OLS	GMM	OLS	GMM
Board size	-0.0081	-0.0340	-0.0082	0.0114	-0.0128	0.0002
	(0.088)*	(0.061)*	(0.000)***	(0.672)	(0.000)***	(0.998)
CEO/Chairman duality	-0.1797	5.5488	-	-	-0.0058	0.0796
	(0.072)*	(0.152)			(0.749)	(0.109)
Board Independence	0.0016	0.0047	0.0022	0.0014	-0.0005	0.0002
	(0.060)*	(0.045)**	(0.000)***	(0.564)	(0.413)	(0.864)
Board ownership	0.0004	0.0257	0.0001	-0.0032	0.0005	0.0002

	(0.709)	(0.000)***	(0.902)	(0.249)	(0.937)	(0.940)
Largest five shareholders	-0.0005	0.0007	0.0016	0.0019	0.0004	-0.0019
	(0.513)	(0.550)	(0.011)**	(0.278)	(0.529)	(0.276)
Revenue	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.053)*	(0.009)***	(0.002)***	(0.029)**	(0.003)***	(0.077)*
Leverage	0.0001	-0.0003	-0.1533	0.0960	-0.3107	-0.1781
	(0.193)	(0.008)***	(0.008)***	(0.720)	(0.000)***	(0.400)
LogTobin´s Q(t-1)	0.8721	1.0492	0.6542	0.2034	0.6839	0.3003
	(0.000)***	(0.000)***	(0.000)***	(0.168)	(0.000)***	(0.147)
LogTobin´s Q(t-2)	-0.0665		0.0759		0.0615	
	(0.099)*		(0.034)**		(0.070)*	
R-squared	0.7223		0.7012		0.6806	
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2) test (p-value)		0.313		0.241		0.438
Hansen test (p-value)		0.273		0.212		0.018

***,**,*, are significant at levels 1%, 5% and 10%, respectively.

6. CONCLUSION AND RECOMMENDATIONS

The main objective of this research was to analyse the impact of corporate governance measures on firms´ performance in listed companies in France, Germany and UK. The study aims to measure the impact of the corporate governance measures on operational, financial and market performance.

We live in a time where companies are increasingly observed by society and feel the need and pressure to act with integrity and with the greatest possible transparency. Corporate governance codes serve to help companies with guidance to achieve shareholders' trust but also serve as a mechanism for controlling companies so that financial fraud is avoided. Through the understanding of corporate governance theories and concepts, and based on the results of the empirical research, the main conclusions and contributions of this research are summarized as follows.

This study examined the relationship between corporate governance measures and financial performance, using OLS and Two-Step Differences GMM models. The results in our study suggest that there is significant relationship between the corporate governance measures and market performance.

It is for the LogTobin´s Q dependent variable that models have more significant variables. This means that the corporate governance measures chosen for this study have an impact on market performance. The market responds positively to companies' compliance with the code recommendations. The relationship between the corporate governance measures and financial and operational performance is mostly not significant. Our study contributes to the literature on the corporate governance addressing the three main European markets. Nevertheless, our study has some potential limitations, namely the following: the empirical research focus was given solely to large and publicly listed companies.

For future research we suggest to increase the analysis, to other explanatory variables related with corporate governance, as for the ones pointed in Appendix 1, but not covered in this research. Another suggestion is that future researchers should include small and medium size companies, since this type of companies present very distinctive characteristics. The last suggestion for a future study would be to compare this three principal markets with smaller European countries where it can be verified if the measures are implemented and if the results are significant.

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APPENDICES

Appendix 1 – Studies sustaining the research hypothesis

Authors	Performance variables	Corporate governance measures	Country	Sample	Period	Statistical Models	Main Results
Akbar, S. et al (2016)	-ROA; Tobin´s Q; GI Index; SALEG; CAPITE; FSIZE; LEV; R&D.	-Board of directors: chairman and CEO; Board structure; Senior independent director; Board Sub-Committees: structure; Chairman of remuneration committee; Financial expert.	UK	435 firms	1999-2009	Generalized Method of Moments	Compliance with corporate governance regulations is not a determinant of corporate performance in UK.
Sami, Heibatollah et al (2011)	ROE; ROA; Tobin´s Q; LASSETS; CSRATIO; ISRATIO; Leverage; GOV-SCR	-CEO and chairman duties; Independence; Successor; Top 10 shareholders; State ownership; Percentage of foreign investors ownership; Percentage of the shares owned by the largest shareholders; Percentage of directors ownership; Percentage of institutional investors ownership; If all directors with more than one year own stock.	China	1236 firms	2001-2003	Ordinary Least Squares	Corporate governance is positively and significantly associated with firm performance and valuation.

Al-ahdal, Walled et al (2019)	ROE; Tobin´s Q	Board accountability; Transparency and Disclosure; Audit Committee Index;	India	106 firms	2009-2016	Generalized Method of Moments	Variables of corporate governance have an insignificant impact on firms´ performance measures.
Ammann, Manuel et al (2011)	LNTA; PGSALES; RD/Sales; Cash/Assets; Leverage; ADR; EBIT/Sales; PPE/Sales; Tobin´s Q	Managers´ ownership; Board accountability; Financial disclosure and internal control; Shareholder right; Remuneration; Market for control; Corporate behavior.	22	1499 firms	2003-2007	Generalized Method of Moments	Strong and positive relation between corporate governance and firm valuation.
Yermack (1996)	Tobin´s Q	Capital Expenditures over Sales; Firm Size (Total Capital, Total Assets, and Net Sales); Non-CEO Chairman; and CEO Founder.	US	500 firms	1984-1991	OLS; Fixed Effects.	Positive relationship between "Officer and director ownership (%)" and the performance, measured by Tobin's Q.
Yilmaz, Ilker (2018)	Tobin´s Q; ROA; NPM; ROE	Board size; board independence; Number of board meetings; Institutional ownership; Ownership concentration	Oman	61 firms	2013-2016	Hausman test	The relationship between corporate governance and financial ratios is weak.
Paniagua, Jordi et al (2018)	ROE	Board members; Ownership; Property dispersion;	59	1207 firms	2013-2015	OLS; Poisson	Negative relationship between corporate governance and ROE.

Vo, D. H. & Nguyen, T. M. (2014)	ROA; ROE; Tobin´s Q; Z-score	Board size; CEO duality; Board independence; Ownership; CEO ownership;	Vietnam	177 firms	2008-2012	OLS; FGLS	Duality role of the CEO is positively correlated with firm performance; Board independence has opposite impacts on firm performance.
Susoiu, Anca	ROE	Board size; Independence; Directors ownership; Directors remuneration;	Germany	23 firms	2009-2013	Multiple Regression Analysis; Hausman test	Only a few of the corporate governance variables influence on financial performance.
Michelberger, Knut (2017)	Revenue growth; ROIC; Total shareholder return; Finance leverage	Board independence; Board compensation; Board size; Meeting frequency; Number of committees	Germany	128 firms	2010-2014	Descriptive, Bivariate, and Multiple Regression Analysis	The maximum fulfilment of good corporate governance standards has no effect on firm performance neither in terms of revenue growth or profitability nor in terms of shareholder return.
Bhagat & Bolton (2008)	ROA; Stock Return; Tobin's q	CEO Ownership; Leverage (Debt to Equity Ratio); Firm Size (log of total assets); R&D Advertising Expenses; Board Size; Risk (standard deviation of monthly stock returns).	US	1500 firms	1990-2004; 1990-2007	OLS; 2SLS; and 3SLS.	Regarding operating performance (as measured by ROA) and board independence, prior to 2002, they found a negative relationship, and after 2002, they observed a positive relationship.

Appendix 2 – Statistical tests

Explanatory variables		Ownership of the largest shareholders; Size of board of directors; Independency of board of directors; Posts of chairman and CEO; Board ownership						
Dependent variables		ROE		ROIC		Tobin´s Q		Conclusions
Test	Null hypothesis	Dist.	Prob.	Dist.	Prob.	Dist.	Prob.	
Test for choosing endogeneity estimator: Hausman Test.	Ho: difference in coefficients not systematic.	chi2(6)=36.38	Prob>chi2(6) = 0.0000	chi2(6)=22.27	Prob>chi2(6) = 0.0011	chi2(6)=55.72	Prob>chi2(6) = 0.0000	Since Prob>chi2(7): <0.05 thus we reject the null hypothesis. This means that Fixed effect model is appropriate.
Test for the existence of heteroscedasticity: White Test	Ho: homoscedasticity Ha: heteroscedasticity	chi2(7)=17.14	Prob>chi2 = 0.00165	chi2(7)=586.51	Prob>chi2 = 0.0000	chi2(8)=708.12	Prob>chi2 = 0.0000	Since Prob>chi2: < 0.05 we reject the null hypothesis, which means that there is heteroscedasticity.
Test for the existence of autocorrelation: Wooldridge test	Ho: No first-order autocorrelation	F(1, 213)= 6.41	Prob>F=0.0120	F(1,213)=6.03	Prob>F= 0.0149	F(1,213)=19.91	Prob>F= 0.0000	Since Prob>F: < 0.05, we reject Ho, so we do not reject the existence of autocorrelation.

Appendix 3 – Model variables definition

Performance variables	**Formula**
ROE (Return on Equity)	$ROE = \frac{\text{Net Earnings}}{\text{Shareholders´Equity}}$
ROIC (Return on Invested Capital)	$ROIC = \frac{\text{Operating Earnings or EBIT}}{\text{Invested Capital}}$ IC= Assets - operational liabilities
Tobin´s Q	$Tobin´s\ Q = \frac{\text{Mkt cap.} + \text{L} + \text{PE} + \text{MI}}{\text{Total Assets}}$ Mkt cap = Market capitalization L= Liabilities PE= Preferred equity MI= Minority interest
Corporate Governance Measures	
Board size	Executive and non-executive directors
Board ownership	$DO = \frac{\text{N of shares held by directors}}{\text{Total shares}}$ DO= Director ownership
Board independence	$BI = \frac{\text{N of independent board members}}{\text{Total number of board members}}$ BI=Board independence
CEO/Chairman duality	CEO/Chairman: taking the value of 0 if the chairman is the same of CEO and 1 otherwise
Ownership of the largest shareholders	$DO = \frac{\text{N of shares held by directors}}{\text{Total shares}}$
Control Variables	
Revenue	Sale of goods or services
Leverage	$Leverage = \frac{\text{Book value of total debt}}{\text{Book value of assets}}$

Appendix 4 – Descriptive Statistics

CEO/Chairman duality analysis by country

Year	Duality Role			Role Separation		
	Germany	France	UK	Germany	France	UK
2010	0	43	2	70	38	61
2011	0	45	1	70	36	62
2012	0	48	1	70	33	62
2013	0	48	1	70	33	62
2014	0	48	1	70	33	62
2015	0	47	0	70	34	63
2016	0	45	0	70	36	63
2017	0	43	0	70	38	63
2018	0	42	0	70	39	63
2019	0	41	0	70	40	63

Descriptive analysis UK

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROE	630	22.31	161.688	-770.23	494.30
ROIC	630	11.251	9.821	-59.62	53.16
Tobin´s Q	630	1.81	0.851	0.617	8.214
Board size	630	10.592	1.966	5	19
Board independence	630	64.103	11.189	30	92.857
CEO/Chairman duality	630	0.992	0.089	0	1
Board ownership	630	2.326	11.794	0	77.064
Largest shareholders	630	26.283	16.921	0	86.29
Revenue	630	28915.07	74892.89	838.4	470171
Leverage	630	0.26	0.1347	0.01	0.71

Descriptive analysis Germany

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROE	700	13.006	15.573	-132.89	92.215
ROIC	700	9.559	11.099	-28.92	194.6
Tobin´s Q	700	1.794	1.042	0.462	8.310
Board size	700	12.476	5.069	3	23
Board independence	700	57.475	23.768	10	100
CEO/Chairman duality	700	1	0	1	1
Board ownership	700	19.607	24.710	0	88.02
Largest shareholders	700	42.557	22.550	7	100
Revenue	700	18360.51	34456.86	49.7	252633
Leverage	700	0.221	0.177	0.01	1.643

Descriptive analysis France

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROE	810	7.623	25.115	-430	108.320
ROIC	810	6.232	10.229	-101.57	34.02
Tobin´s Q	810	1.586	1.002	0.064	11.453
Board size	810	12.653	3.277	3	22
Board independence	810	53.485	18.420	0	100
CEO/Chairman duality	810	0.437	0.496	0	1
Board ownership	810	21.825	22.111	0	74.51
Largest shareholders	810	45.287	21.567	2.89	94.57
Revenue	810	17128.22	27283.52	0.2	234424.6
Leverage	810	0.253	0.138	0.001	0.739