

PANTEION UNIVERSITY OF SOCIAL AND POLITICAL SCIENCES



SCHOOL OF ECONOMY AND PUBLIC ADMINISTRATION
DEPARTMENT OF ECONOMIC AND REGIONAL DEVELOPMENT

Postgraduate program in Applied Economics and Regional Development
Direction: Applied Economics and Management

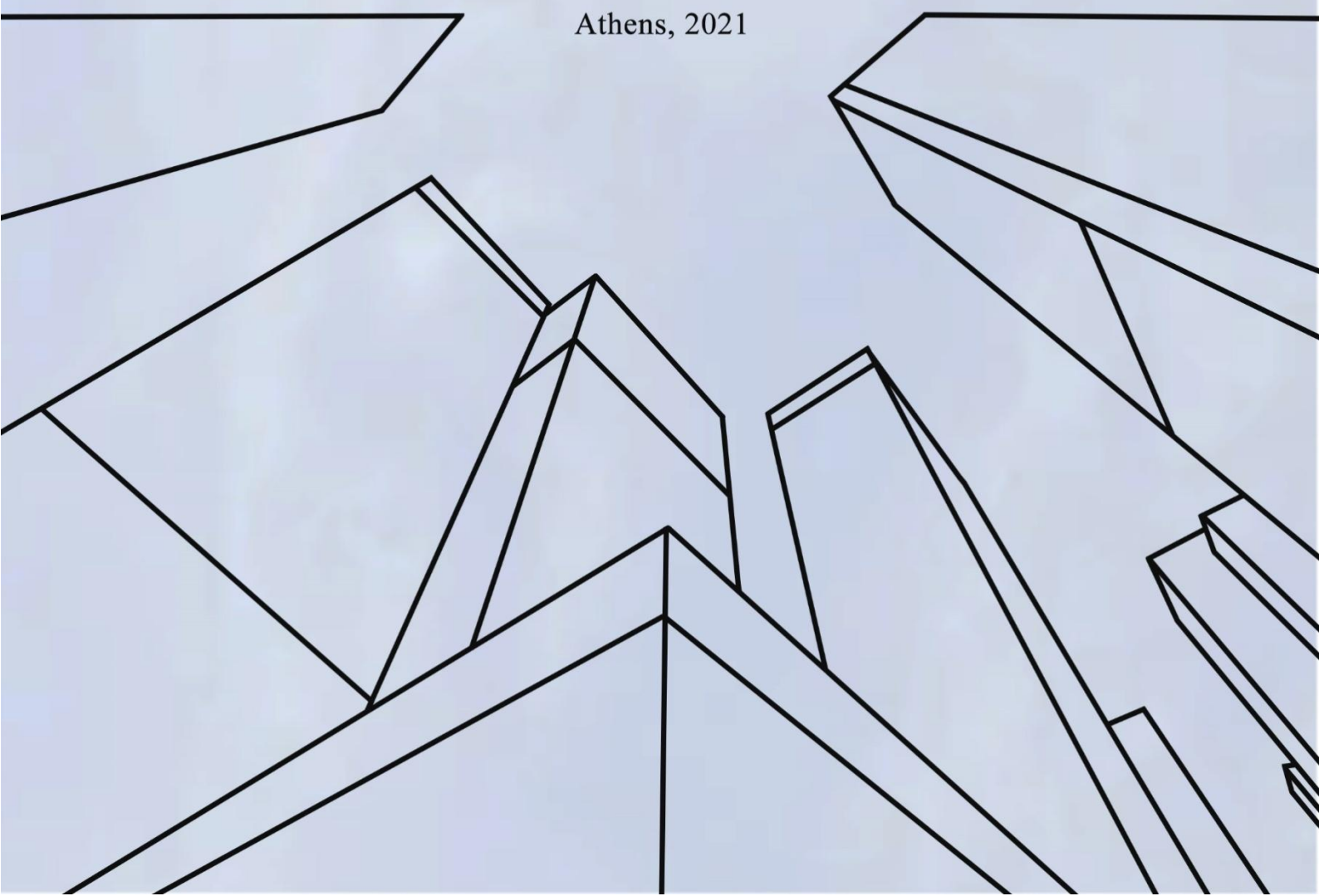
**A study on the corporate governance and economic outcomes
in the presence of global systemic shocks**

A thesis submitted by

Georgios D. Kyrkos

in fulfillment of the requirements for the degree of
Master of Science in Applied Economics and Regional Development

Athens, 2021



Three-member Committee:

Grigorios Siourounis, Associate Professor | Panteion University (Supervisor)

Sarantis Lolos, Professor Emeritus | Panteion University

Theodosios Palaskas, Professor | Panteion University



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This Thesis is dedicated to my parents Dimitris and Vasiliki and to my brother, Christos.

First and foremost, I would like to express my gratitude to my thesis supervisor, Mr. Grigorios Siourounis, for his valuable guidance, as well as keen interest, in the preparation of the present research.

I am very much thankful to Mr. Sarantis Lolos, Mr. Theodosios Palaskas, and to all the Professors of the Postgraduate program, for their teachings, the advices and dissemination of knowledge during the academic year.

Finally, I would like to thank Mrs. Evangelia Valavanioti and Mr. Michalis Vasiliadis for their fruitful comments on this thesis, as well as to express my gratitude to the people close to me for their support and understanding throughout the elaboration of the thesis.

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ABSTRACT

This study aims to investigate the factors that influence the economic outcomes of a group consisted by Greek firms from the corporate governance perspective when a scenario of high uncertainty period is applied. Building on agency theory and corporate governance mechanisms, we develop and examine a model that explains corporate performance metrics in terms of governance and in conditions affected by a strong crisis. The findings show a positive relationship between leverage and corporate performance, suggesting that lending can help the company grow, but this is not a panacea in all cases. The findings also reinforce the positive significance of a company's size in terms of its performance as well as the positive significance in specific cases where the chairman and CEO is the same person. Finally, the findings could provide some guidelines for structuring companies' strategic planning in Greece in order to improve their performance in times of high uncertainty.

Keywords: Corporate Governance, Agency Theory, Firm performance, Leverage, economic shock

1. Introduction

1.1 Background and Need

As it is already known, a social “ecosystem” consists of several institutions and organizations functioning in such ways in order to develop and flourish. However, what could possibly be the role of an organization?

As the economy now acquires a character as mainly a market-based economy, the importance of the quality of a company's governance in economic growth and social welfare is becoming increasingly apparent. A further approach and analysis on a company's role in economy and society will follow next.

The economic and financial environment has a vital impact on managers and their capabilities to operate efficiently as well as their strategic decisions. Furthermore, inflation and interest rates largely affect the availability and the cost of capital, the chances for growth and development, the prices and the products' demand.

After some significant financial crises in the late 1990s, the behavior of companies emerged significantly as it was the one that determined the course of a national economy and global economy as whole. Several examples of weak or malicious corporate governance associated with small or large-scale systemic crises appear to be affecting macroeconomic issues as well as the capacity of the industry in which companies operate.

Thus, it is vital to find out if low quality corporate governance appears only when a financial crisis occur or if it is an inevitable phenomenon that requires specialized measures in order to minimize its effect on the company's development.

1.2 Statement of the Problem

As mentioned above, during the last years there have been plenty enough examples of corporate malicious behavior and governance in order to examine them more thoroughly. Several large companies, either globally or in the Greek market, have committed financial crimes by falsifying their financial data and therefore endangering the integrity and reliability of the company itself. In addition, these

malicious practices can be just as destructive in a period of systemic shock and adversely affecting an economy nationally or even internationally.

1.3 Purpose of the Study

The purpose of this Master thesis is to shed light to the real problem that will be addressed in this study is what factors are those that belong to the corporate governance mechanism and how they affect the financial results of a set of companies in the midst of a period of high uncertainty. As in recent years the economic cycles that take place are more frequent, shorter in duration and with large fluctuations, it is therefore important to understand what is beneficial and what is not for a business in order to cope with such conditions in terms of corporate governance.

For the purpose of the research we focus on Greece, and specifically on 70 companies that do not belong to the financial sector and are listed on the Athens Stock Exchange. The examined period of the research concerns the period 2005 to 2015 where in Greece but also in the European Union itself there were 2 intense crises, the financial crisis and the crisis of the Euro that followed immediately after. The present study examines corporate governance through the combination of its various elements that emerge from different areas of economics. For example, the duality of a company's management position refers to the agent problem which will be analyzed and discussed below.

To the best of our knowledge, during the research, some gaps were identified in the literature on the specific topic for which an attempt was made to fill them. For instance, the number of studies conducted for corporate governance is small, while at the same time very few of them have been conducted for Greek companies. In addition, different combinations of variables have been used for existing ones but with a similar dependent variable to measure business performance.

Finally, the remainder of this study is organized as follows: Chapter 2 recognizes the literature review and serves to build the research framework and construct the hypotheses under consideration. Then, Chapter 3 analyzes the research method, the data used for the analysis and the models that were constructed for the implementation of the research itself. The results of the analysis as well as their commentary are described in detail in Chapter 4, while in Chapter 5 the conclusions

and the analysis, the proposals for future analyzes as well as the limitations in the elaboration of this study are carried out.

2. Literature Review

2.1 *Definitions of Corporate Governance*

According to Marglin, a corporation is defined as a mechanism of exploitation of the employee (Marglin, 1974), whereas a mechanism that helps to overcome the obstacles of peculiarity of assets (Williamson, 1975), as well as a mechanism that reduces the cost measurement in economic activity (Barzel, 1982).

North underlines that the sole purpose of a neoclassical company's management is to choose the right portions of output and input that maximize profit which means to determine the quantity and subsequent price to be established (North, 1990). Before that, Knight has focused on the role of the entrepreneur who tries to reduce the level of uncertainty (Knight, 1921) and Coase introduced the term of transaction cost which imbued the true meaning of a company's existence (Coase R. H., 1937).

Bateman and Snell (2013) claim that all companies operate inside a macro-environment, which is determined by the most general features of the external environment, that it could probably influence strategic decisions. Therefore, it is understandable the fact that the managerial team has to think about their actions and the consequences they might have, as they could prove positively or negatively influential for the external environment.

Over the years, the bibliography of economics and business research field has been constantly enriched with new terminology and research findings. Recently, the term Corporate Governance was added in the context of the quality of a company's management. Mueller (2018), claims that the term of corporate governance can be interpreted in two contexts. Firstly, according to Mueller, it can be described as a set of institutions that regulate the ways that a corporation should be governed, including shareholder rights, the rules directing the way that members of the board of directors are elected, their responsibilities and rights etc. On the other hand, corporate governance can be affected by the state's role towards the corporation or company. That includes law regulations about mergers and acquisitions, illegal insider trading, corporations' information that needs to be published plus regulations over managerial compensation.

According to past empirical studies, the term of corporate governance is mainly reflected by agency theory (Shleifer & Vishny, 1997) in a theoretical manner. More specifically, La Porta et al. (1998) describe the fact that corporate governance mechanisms are economic and legal institutions. Furthermore, it can be used in order to separate ownership and control. While also, they took into consideration the means by financial investors consolidate the profitability of their investments (Ganescu & Gangone, 2012). Bostan and Grosu (2010) claim corporate governance could be defined as “a system of rules and norms, of either institutional or market nature, within which various categories of stakeholders, shareholders, management, public administration, staff, customers, suppliers, etc. arise or develop”. Elsewhere, it could be “a concept that encompasses a wide range of activities, rules, processes and procedures designed to ensure optimal use of resources and corporate strategies in order to meet its objectives” as defined by Dobroteanu et al. (2011).

Another useful point of view could be Tricker’s definition about management and governance (Tricker, 1984). More specifically, management is defined as the way a business operates and governance as a way to monitor the proper and smooth operation of a business. Next, the corporate governance process would be divided to four principal activities which are i) direction, ii) executive action, iii) supervision and iv) accountability. Those principles are vital in order to achieve smooth and efficient business operation.

All in all, it can be observed that many researchers have contributed towards the enrichment of that term. However, the defined term by OECD will be preferred as it describes corporate governance as a reference to relationships between a company’s management, its board, its shareholders, and other stakeholders. Furthermore, governance structures have a vital role towards the establishment of company objectives and the monitoring of performance. Therefore, a good practice of corporate governance provides a reasonable framework for balancing ownership and control, accurate incentives for the board and management to maintain objectives that benefit the company and its shareholders, plus efficient monitoring (Cadbury, 1992), (OECD, 2004), (Shrivastava & Addas, 2014).

As it is aforementioned, corporate governance is highly correlated with the agency problem, which results from agency theory that is being analyzed thoroughly by

Coase (1937), Jensen and Meckling (1976) and Fama and Jensen (1983a). Firstly, Jensen and Meckling (1976) interpreted agency theory as a way to explain the existence of a public corporation, whilst managers show self-interest. The main point of the agency problem is the separation of ownership and control. According to Shleifer and Vishny (1997) a manager raises funds from investors either for productive usage or to utilize his holdings in the firm. Thus, a causal relationship between the financiers and the manager is generated. That happens because, on the one hand, the financiers or owners need the manager's skills and qualities to generate returns based on their funds and, on the other hand, the manager needs the appropriate funds to utilize his or her abilities or else does not have enough capital to be an investor. Taking all facts into consideration, the agency problem is based on the uncertainty that owners' investments have based on the manager's performance.

Ehikioya (2009) claims that a functioning corporate system contributes to secure investment raise funds and strengthen the foundation for firm's performance. Furthermore, Škare and Hasic (2016) believe that a good corporate governance framework protect a firm from vulnerability to future financial distress.

In addition, they highlight the fact that the compliance with the standards of good corporate governance has a positive effect on reducing the conflict of interest between different stakeholders who participate in governance, thus reducing the aforementioned agency costs.

It is widely known that companies that have high quality corporate governance attract more investors. According to Škare and Hasic, good corporate governance is an outcome of the applied principles of accountability, efficiency, fairness and responsibility in terms of firm management, plus transparency. Those characteristics provide to investors the prerequisite insight into significant business and financial data in order to make the decision if share acquisition will be profitable or not.

Easier access to debt capital is also necessary in order to strengthen the quality of corporate governance. The level of risk that investors inherit when they supply a company with the needed capital determines its cost, specifically risk and capital cost have a positive relationship.

2.2 Corporate Governance Practices and Types

It is reasonable that each country has its own characteristics and peculiarities. That could also be said about a country's national economy, market performance or even corporate structure. Macdonald and Beattie (1993) thoroughly examined three different models of corporate governance applied in three countries (UK, Germany and Japan).

To begin with, the UK model of governance as described by Tricker, had the following responsibilities and status: i) a company is a legal entity quite separate from its owners; ii) the power to govern the company is derived from the ownership; iii) the company exists in perpetuity since its shares may be transferred; iv) the board oversees the operational procedures of the company and reports regularly to the members on the stewardship of their investment; and v) independent auditors, appointed by the members, report on whether the financial statements show a true and fair view (Macdonald & Beattie, 1993).

A few miles away, Germany introduced a rather different type of corporate governance. Specifically, the Supervisory Board does not possess executive power over direction or executive action. However it exercises its authority by the right to appoint, approve or dismiss the Management Board. Furthermore, the Supervisory Board is not eligible to take part in the active management, thus the Management Board has the responsibility to report to the Supervisory Board for issues such as profitability, policy, the state of company's affairs as well as any transactions of significant importance for the company.

The main difference between the two aforementioned models is that of the different capital market structures in the two countries. While German companies manage to raise funds with the assistance of banks, UK preferred public subscription. That is because German banks have the privilege to appoint representatives to the Supervisory Board, specifically those who have invested funds in the business have the right to influence the governance of the company, therefore be eligible to obtain useful information about the effectiveness of their investment.

Moving to Japan, Cooke and Kikuya (1992) found some similarities with the UK model in terms of one tier board system, but in practice it shares common traits with

the German model because of the influence of the banks in corporate governance. In fact, until the late 1980s, it was common for the companies to deposit cash in interest-bearing time accounts to maintain satisfactory and fruitful relationships with the banks in case a banking support was needed in future emergency situations. Financing through commercial banks and other financial institutions accounted for nearly 90 percent of the external funds raised by companies in the late 1980s, as described by Ernst and Whinney (1988). This shared interdependence between banks and companies resulted to the banks taking a major role towards vital decisions of the company.

Another insightful categorization of types of corporate and corporate governance could be the analysis of De Jong (1997). According to his research, European capitalism has resulted to a plurality of forms in the same degree as its varied history. Certainly, it is hard to describe with details and maintain the meaning of the great variety of governance types that exist. An analytical classification will follow, illustrating the important differences among three major types of corporate.

Table 1. Characteristics of European Corporate Types and Features

	Types of corporations		
	Anglo-Saxon	Germanic	Latinic
1. Shareholder concentration	-	+	++
2. Firm networks	-	+	++
3. Capital market orientation	++	-	-
4. Market for corporate control	++	-	+
5. Bank-orientation	-	++	+
6. Employee participation	-	+	-
7. Autonomy of corporate management	++	+	-
Remarks	++ means important in a general sense; + means of some importance, but not in a general way; - Unimportant, not at all or only indirectly influential.		
Anglo-Saxon firms:	Those with headquarters in the UK and Ireland;		
Germanic firms:	Those with headquarters in Germany, The Netherlands, Scandinavia, Switzerland and Austria;		
Latinic firms:	With headquarters in France, Belgium, Italy, Spain, Portugal, Greece.		

Source: Adapted by De Jong (1997)

A distinguish can be made among large corporations, according to ownership and control variables into i) an Anglo-Saxon type, ii) a Germanic type and iii) a Latinic type. The table above illustrates with great detail the orientation of each corporate type. Firstly, Anglo-Saxon corporations possess a wide shareholder base including both private and financial institutional owners of shares who evaluate a corporation's management based on its financial performance, plus they are mostly quoted on the stock exchange. Moreover, the fact that the manager of the corporate maintains its autonomy from the board and decides on the policy of the firm can be observed. On the other hand, as far as Bank-orientation is concerned, the findings of De Jong and Macdonald and Beattie agree with each other's point of view. In fact, banks have neither direct interest in the firm nor in the policy making. As a result, the progress of a company's share price is a determining factor that judges the behavior and the effectiveness of management.

By taking into account this information, a corporation can gain reputation for its sustainability and growth by expanding its operation and profits, leading to an increase of its shares in the stock market. However, the management team takes full responsibility for the smooth operation of the firm and may be heavily criticized if a major decline of share price occurs. That should be a motive for top management in order to take initiative for effective firm governance and achieve corporate targets that contribute to the return of shareholders' investment.

For the Germanic-type Corporation, bank-orientation has a major role towards its structure. Specifically, De Jong mentioned that business politics are also affected by employee-influence, plus a strong position of stakeholders who have a large influence to the firm and share their thoughts, views and targets and they expect to be fulfilled in return. He also claims that "bank orientation means one or more of the following aspects: 1) banks may hold shares in the corporation; 2) they may have voting power in the general assembly through the deposit voting system, which involves a transfer of votes of (small) individual shareholders to the banks; and 3) banks, who have voting power by means of 1) and 2) may concert their actions to jointly force a solution in case a corporation runs into difficulties".

The last and most significant type of firm and corporate governance for this research is the Latinic Corporation, which consists of France, Belgium, Italy, Spain, Portugal and Greece. One main characteristic is that they are owned by large shareholders and influenced mainly by financial groupings and banks. Shareholders may consist of wealthy persons, or tycoons as described by De Jong, or even families, which is common in Southern EU countries to have family businesses that flourish. Latinic management is characterized by its competency and the main reasons are i) education and ii) training, therefore they are able to deliver desirable results. However, labor has not the same recognition as a stakeholder compared to Germanic firms, where labor unions have considerable power and influence.

Taking the organizational system into account, it appears to be highly centralized and concentrated at the top. That type of organizations leads to the prevention of external influence and issues in order to maintain the position of the firm. Szarka (1992) believes that by preventing outsider influence, managers could be more flexible, versatile and adaptive given their decision making responsibility.

Summing up, the three types of firms share some common traits or else could have some fundamental differences. It seems that, Latinic and Germanic firms are not subjected to control from capital market compared to Anglo-Saxon plus decision making is less autonomous. Having that in mind, it is reasonable that Latinic and Germanic firms tend to be more owners' interests orientated, therefore the managerial decision making is not equally balanced in order to evenly satisfy all the parties that contribute to the firm.

2.3 CG Measurement, Previous Work & Hypothesis Development

Given the evolution of the economy, technology and business, it becomes increasingly important to find and apply one or more equations that will help measure and evaluate corporate governance and company performance. Given the fact that business cycles are now more frequent, it is important for a company and its management to know the factors that affect its performance in order to be shielded.

De Jong (1997) mentions that four basic standards should be taken into account in order to efficiently measure firm performance; i) sales, ii) net surplus value or added value, iii) market capitalization and iv) employment. Analytically, employment is described as a significant factor especially from the point of view of the national governments which have been affected from the high rates of unemployment. Given the fact that sales is an often used standard for measurement, is rather incomplete because it ignores facts such as capital intensity or sectoral differences. Lastly, market capitalization could mostly be used for Anglo-Saxon firms.

Gompers et al. (2003) have used a corporate governance index which was consisted of 24 factors divided into five groups, namely: “tactics for delaying hostile bidders, voting rights, director protection, other takeover defense and state laws”. Furthermore, Brown and Caylor (2004) have introduced the “Gov-Score index” based on 51 elements divided into eight categories which are: audit, board of directors, charter/by-laws, directors’ level of education, executive and director compensation, ownership, progressive practices and state of incorporation.

Salim and Yadav (2012) examined a sample consisted of 237 Malaysian companies listed on the Bursa Malaysian Stock exchange during 1995-2011. They used four performance measures, namely return on equity (RoE), return on asset (RoA), Tobin’s Q and earning per share as dependent variable for each regression. Their research results indicated that capital structure had a negative impact, while measured by RoE. Moreover, measures by RoA indicated that capital structure had negative impact on firm’s performance, while Tobin’s Q shows the opposite effect.

For the structure of hypotheses some elements of previous work on Corporate Governance analysis will be examined in order to shed light on the research population that is to be used.

Observing the agency cost to significantly affect the profitability of each company, the need arose for the board’s composition of a majority of outside directors. It is characterized as highly significant for the smooth operation and profitability of a firm to have board independence, because outside directors can be proved indefinite monitors (Fama & Jensen, 1983a).

Furthermore, because of their “independent” nature in terms of management and conflicting situations they can eliminate principal-agent problems and protect shareholders interests (Rhoades, Rechner, & Sundaramurthy, 2000). In addition, Fama and Jensen (1983a) also claimed that if the proportion of non-executive directors on the board is larger enough, then it could have positive effects towards monitoring managerial opportunism and alignment of firm resources for better firm performance.

Minichilli, Zattoni, Nielsen and Huse (2011) examine the Board task performance using micro- and macro- level determinants of effectiveness and taking into account data sample from medium and large-sized industrial firms in Italy and Norway. Specifically, using micro- level determinants they found that the presence of non-executive members is not only marginally relevant but seems to be negative for advice, highlighting the fact that “how an unbalanced mix of directors towards outsiders favor board control yet at the price of lower inside knowledge of the firm”. By applying macro-level determinants, they proved with evidence that a positive effect of the Scandinavian institutional context on board control and advisory task performance is detected.

Given the effects of the independent directors, the principal-agent problem will impose a threat to the firm’s operational procedure and to shareholders’ targets. It is suggested that market intervention could prevent that kind of threat. Lskavyan and Spatareanu (2006) describe hostile takeovers as maybe the most important external control mechanism, while as they say “the idea is that the existence of takeover threats will deter managers from deviating from shareholder value maximization. Once again, the evidences are bidirectional. For instance, a positive relationship between takeover threats and bank performance is found by Schranz (1993) using a sample consisted of US banks. Previously, Ravenscraft and Scherer (1987) found that the hypothesis of a target’s operating profitability increases after takeovers has no real evidence.

A theoretical article written by Kumar (2008) explains the reason why independent directors may have negative effects on firm performance, contrasted by other beliefs. He claims that as directors obtain more independence from the CEO, the monitoring efficiency of independent directors may show a downfall and that could worsen the financial performance.

2.3.1 Leverage Ratio

The leverage ratio shapes up an important consideration for investors in order to make stock assessment. Firms that use debt portion greater than capital have greater capability to generate profit for each shareholder than firms which use less than their own capital.

On its relationship to corporate governance and firm's performance, several researches have been conducted and examine their evidences. For instance, Opler and Titman (1994) by using firm level data from the 1992 Standard & Poors, containing 105.074 firm-years of data on income statement and balance sheet items during the time span from 1972 to 1991, underline the fact that highly leveraged firms, which are more likely to be financially distressed, record a downward operating income. Specifically, they highlight the facts that during industry downturns more highly leveraged firms tend to lose market share plus to be more prone to lower operating profits than their competitors.

Similarly to these results, Lang, Ofek and Stulz (1996), by using a sample consisting of 142 listed firms for each year, indentify negative relationships between leverage ratio and firm's performance. Furthermore, another finding of their study supports the fact that leverage is negatively associated with performance only for those firms which have good investment opportunities that the market does not recognize plus the firms which do not have good investment opportunities but the incentive to grow and perform even better.

Andrade and Kaplan (2002) by utilizing the term of leverage, claim that the higher the firm's leverage, the higher is probability of financial distress. Asgharian (2003) examines the relationship between firm performance and financial distress using as a sample Swedish firms and the results indicate that highly leveraged firms in distressed industries face lower stock returns.

Cai and Zhang (2011) for their study used a sample of firms during the time span from 1975 to 2002. Their results and findings pointed towards to the fact that there is no evidence that firms with higher leverage increase have consistently higher expected future returns.

Chandrakumarmangalam and Govindasamy (2010), used a sample consisting of 18 cement manufacturers in Pakistan, during the time period between 2005 and 2010. Their results find evidences about negative relationship between leverage ratio and firm performance in the cement manufacturing sector of Pakistan.

However, other studies highlight that the importance of the control of leverage ratio might have positive relationship with firm's performance. Scharfstein and Stein (2002) underline the importance of leverage as an assistance to control value-reducing behavior in order to enhance firm's performance.

Furthermore, Abor (2005), by using a sample consisting of 22 Ghanaian listed firms over a five-year period, estimated a model in order to find the relationship between debt and profitability. The findings of this research hinted to the fact that profitable firms depend more on their debt as their main financing option.

Ruland and Ping (2005) used an empirical model that was based upon the specification of Berger and Ofek (1995) and a sample consisting of firms during the period between 1990 and 2001. It is found that the association of leverage and excess value has a strong presence for smaller firms.

H₁: There is a significant relationship between leverage ratio and firm's performance

2.3.2 CEO Duality

Jensen and Meckling (1976), underlined the importance to having a separate board of directors in order to monitor that the actions of the manager align with the interests of shareholders. It seems that if an individual holds both CEO and chairman position could spark opportunistic behavior that would disturb firm's operations (Gubitta & Gianecchini, 2004).

Baliga, Moyer and Sao (1996), used a data sample consisting of 500 firms during the time span between the years 1980 and 1991. Their findings indicate a strong contrast to the recommendations of other researchers for the abolition of duality as a way to improve firm governance and performance.

Boyd (1995) by applying agency and stewardship theory worked on a data sample consisting of 192 in 12 industry groups for one year, specifically 1980. An interesting finding on his research was that CEO duality occurred in 46 percent of the sample. Furthermore, the finding of his study suggested that neither agency nor stewardship models could predict the consequences of CEO duality. In addition, while CEO duality correlation connects with lower performance, it is not justified by its weak effect and statistical insignificance.

Peng, Zhang and Li (2007), examined the relationship of CEO Duality and firm performance during China's institutional transitions, by using a sample consisting of 403 publicly listed firms and 1.202 company-years accordingly. Their findings implied that CEO duality is not likely to have a positive impact on firm performance during institutional transitions. In fact they believe that such a positive impact is most probably to be profound for firms that confront problems that are associated with resource scarcity.

Lam and Lee (2008) have examined a possible existence of a relationship between role duality and firm's performance in Hong Kong. The results showed that a negative relation between duality and firm's performance exists in family businesses, while in other businesses a positive relationship is detected.

In addition, Ehikioya (2009) analyzed the structure of corporate governance and firm's performance in developing economies, specifically in Nigeria. By using RoA, RoE, price-earnings ratio and Tobin's Q as firm's performance indicators, a negative relation between duality and performance was found.

H₂: There is a significant relationship between CEO-Chairman role duality and firm's performance

2.3.3 Big 4 audit firms' presence and effectiveness

According to Ika and Ghazali (2012) in order to characterize an Audit committee as effective, it should comprise of Non-executive directors who are independent of management responsibilities. Al-Sayani et al. characterize the role of an Audit

committee as essential to enhance the financial reporting (Al-Sayani, Nor, & Amran, 2020).

Evidences from the United States showed that Big 4 auditors enhance the quality of audits compared to non-Big 4 auditors, and that seems to be affected by the characteristics of their clients especially when corporations' size is concerned (Lawrence, Minutti-Meza, & Zhang, 2011).

Al Ani and Mohammed (2015), in order to analyze the effects of auditor quality on the firm performance in three Omani sectors, used a sample consisting of 112 listed firms on the Muscat Securities Market for 2009-2013. Their findings indicated towards a positive relationship between Big 4 audit firms and Return on Equity.

Farouk and Hassan (2014) used a sample consisting of the majority of listed cement companies in Nigeria during the time span between 2007 and 2011, and conducted OLS Regression analysis. The reported results indicated that the relationship of firm performance with net profit margin as dependent variable is statistically significant and positive as well.

Al-Matari et al. (2014) used 81 non-financial listed Omani companies for year 2011 and 2012 and conducted multiple regression analysis and Pearson correlation analysis. By using Return on Assets as dependent variable they found that no significant relationship is detected between audit firm size and firm performance.

However, Zraiq and Fadzil (2018) used a data sample consisting of 228 non-financial Jordanian firms during 2015-2016 time periods, and analyzed using OLS with Return on Assets as dependent variable. Their findings point towards the detection of a positive and significant relationship between Return on Assets and audit firm size.

For the case of Greece, Spathis et al. (2003) examine the possibility of an imminent association between firm performance and audit report. The results showed that financial ratios and types of audit reports have a close relation to each other. Zhou et al. (2018) found that in Greece there is little or no association between audit committees and firm performance.

H₃: There is a significant relationship between Big 4 audit firms' presence and firm performance

2.3.4 Board of Directors' size

According to Jensen (1993) and Yermack (1996) Board of Directors seems to be less effective at monitoring while they grow on size, because the share of the control over management will be reduced.

Vafeas (2000) highlights the fact that smaller boards of directors will tend to take more responsibility for monitoring operational procedures of a firm compared to a larger board of directors. For his research a sample comprised of 307 of the 800 firms which were listed on the Forbes 1992 compensation survey was examined. His findings indicated also that there is no significant evidence that board composition mitigates the firm's returns.

Horváth and Spirollari (2012) examined the relationship of Board of Directors' characteristics and firm's financial performance for 136 U.S. firms from S&P 500 index for the period 2005-2009. They found that neither Board Activity nor Board size have a significant effect on firm's performance. The results indicated the significance of insider ownership, which has positive effect, for determining the price to book ratio. It also needs to be mentioned that the higher age of Board of Directors have a negative impact to the firm performance.

Moreover, Patro, Lehn and Zhao (2009), used a sample consisted of 82 U.S. firms for a relatively long time period during 1935 through 2000. Their report has shown no robust relationship between firm performance and either board size or board composition.

However, using listed firms from Oslo Stock Exchange as a research sample, Bohren and Odegaard (2003) found out that firm performance decreases along with board size, thus a negative relationship is detected.

H₄: There is a relationship between Board of Directors' size and firm's performance

At the previous sub-chapter, Latinic Corporate shows a more concentrated organization focused on top management levels. Some researchers find evidences of

significant relationship between ownership concentration and firm performance, while others do not. Specifically, a positive relationship is detected by Gorton and Schmid (2000), Mitton (2002), Claessens and Djankov (1999). On the other hand, some researchers prove that there is not any significant relationship between concentration and firm performance, including Demsetz and Lehn (1985), Demsetz and Villalonga (2000) and Kocenda (2003).

Taking into account Anglo-Saxon and Germanic firms, Lskavyan and Spatareanu (2006) by using data from UK, Czech Republic and Poland, found that ownership concentration does not affect firm performance and that justifies the firm classification made by De Jong. Furthermore they found that the concentration “seems to be determined by the characteristics of the firm and the environment in which it operates”.

Lemmon and Lins (2003) highlighted the fact that the agency problem mostly occurs in firms with highly-concentrated ownership between corporate insiders and outside investors. Guerrero-Villegas et al. (2018) by using a sample consisting of 600 firms quoted on the EUROSTOXX 600 index in 2011 found that the improvement in the firm’s performance is more intense in low levels of ownership concentration than in high levels.

2.3.5 Corporation size

It is often highlighted that a positive relationship between a corporation’s size and its firm performance exists. More specifically, larger corporations tend to publish more information in the annual reports than smaller companies do (Stanga, 1976).

The aforementioned claim is an outcome of the political pressure that its existence is profound on larger corporations (Buzby, 1975), therefore the corporations have higher incentives to disclose more information in order to ease off the pressure from the government. Moreover, larger corporations need more external funds so that increases the chance of higher information disclosures percentage (McKinnon & Dalimunthe, 2009).

Yuliarti and Diyani (2018) used for their analysis and research 7 pharmaceutical industry companies in Indonesia Stock Exchange for the time span between 2011 and 2016, plus Stock Return as dependent variable. Their results have shown a positive effect of firm's size to Stock Return.

In addition, a positive relationship between corporation size and performance was detected by Vijayakumar and Tamizhselvan (2010). Specifically, by using different measures of size such as sales and total assets and for performance; profit margin and profit on total assets, found the positive association in a sample consisted of 15 companies operating in South India.

Furthermore, on the Greek case, Papadognas (2007) examined a sample consisting of 3035 Greek firms belonging to the manufacturing sector for the period 1995-1999. The results indicated to a positive relationship between firm size and performance-profitability.

H₅: There is relationship between corporate size and firm's performance

2.3.6 Global Systemic Shocks

According to OECD (2011) "a global shock is a major rapid-onset event with severely disruptive consequences covering at least two continents". More specifically, OECD focuses on particular events that could be characterized as global shocks such as financial crises, pandemics etc. According to studies and numerous researches, crises are often used as exogenous shocks to reduce endogeneity issues (Tan, 2015).

Notta and Vlachvei (2014) examined the effect of the economic crisis on firm performance in 128 large Greek dairy firms. The results showed that before crisis only market share, as independent variable, affect positively and statistically significant profitability of dairy firms. Therefore, the overall outcome of the aforementioned study was that the larger the firm is, the greater the level of profitability. Furthermore, during crisis period liquidity and leverage gain more significant impact on profitability.

H₆: An impact is detected on performance indicators when a major crisis occurs

3. Methodology & Data Selection

This chapter describes the procedure in order to achieve the purpose of the present study and research. Thus, it is needed to mention again the main purpose of this master thesis. That is to examine whether a firm's performance is affected by certain factors in certain times in terms of corporate governance. However, what could be the best and most efficient way to approach the certain point of interest and analyze it?

3.1 Reasoning & Approach

According to Creswell (2007) research approaches could be classified into two categories which are inductive and deductive. More specifically, a deductive researcher moves on from a theory to hypotheses to data in order to “add to or contradict the theory”. On the other hand, an inductive researcher is defined as the one who “uses the participants' views in order to construct broader themes and generate a theory by connecting the different strands of themes”. In other words, deductive reasoning works from the more general to more specific and conclusion follows logically from premises, while inductive reasoning moves from specific observations to broader generalizations and theories and involves a degree of uncertainty (Burney & Saleem, 2008).

In addition, deductive approach corresponds conceptually to quantitative analysis, while inductive approach corresponds to qualitative analysis. As it is described by Creswell (2003), a quantitative research establishes statistically significant conclusions about a population by studying a representative sample of the population. Campbell and Stanley (1963) claim that quantitative research is either experimental or descriptive.

On the other hand, Abusabha and Woelfel (2003) describe qualitative research as a description for an event in its natural setting. Creswell (2003) describes the fact that qualitative researches use anthropological and ethnographic methods in order to study the participants, rather than design an experiment and “artificially control the variables”.

Taking all facts into consideration, this master thesis will follow a deductive approach and quantitative analysis procedure, by analyzing the research results numerically in order to justify or not the present theory.

3.2 Research Procedure

A proper quantitative or qualitative analysis is required to comply with specific standards as well as a specific writing process. Several scientists have defined a variety of methods for designing phases and appropriate ways of developing a research. Specifically, the research process by Zafiropoulos (2015) will be followed in order to structure the framework of the present thesis. The phases of a research process should be classified as following: i) clarification of the research problem and purpose, ii) hypothesis formation and structure, iii) data collection, iv) data processing and analysis, v) demonstration of results and further discussion.

Concerning the significance of corporate governance as research subjected, it is observed that each year receives ever-growing attention not only because of the corporate scandals, reported in multiple countries such as in Greece (Follie Follie), but also how much the quality and implementation of corporate governance changes whenever a major crisis occurs, if it does at all.

Secondly, in order to meticulously choose the right articles and sources, research was conducted on specialized internet search engines, such as ScienceDirect and Taylor&Francis, which have a complete collection of top scientific articles and studies in journals. In order to narrow down the reported results and specify the literature that is to be used, the papers were filtered according to key words and JEL Classification System, which has been created by the American Economic Association¹. Therefore, as it is classified by AEA, Financial Economics which is the major branch that includes Corporates Governance has the letter G as well as the JEL codes of the articles studied.

After the selection and collection of the articles, it was the turn of their study in order to examine the conclusions of the scientists who had written the above studies.

¹ <https://www.aeaweb.org/econlit/jelCodes.php?view=jel#D>

Something that was quite noticeable in these articles was the variety of countries for which the corporate governance analyzes were conducted, as well as the significant differences that emerged in the results they produced.

Following to that, a frame of reference has to be constructed. By studying the articles, a very good awareness was gained about what corporate governance is and what elements and theories govern it. This created the motivation for conducting the research with the most important source of information for companies in Greece, the Athens Stock Exchange.

According to Zafiroopoulos (Zafiroopoulos, 2015), hypothesis formulation often occurs after literature review. The hypotheses are directly related to the literature that has been cited and are questions that arise from it and definitely in relation to the application of this research. After searching, compiling, indexing and describing the existing and used literature, it is good to introduce the hypotheses.

Zafiroopoulos by using the term hypotheses means those propositions which, starting from the previous knowledge and experience acquired through the literature cited, and with the tool of the proposed methodology and the data used, formulate some properties related to the subjects or variables of the research. These properties come to agree or disagree with similar properties described in the literature on relevant topics or even to introduce new formulations that could properly be initial references for future researchers on the same topic (Rudestam & Newton, 2001).

The hypotheses that are formed should not be confused with statistical hypotheses, as the latter are mathematical propositions used in statistical hypothesis testing. These are divided into two, the null and alternative hypothesis, as the null hypothesis expresses the case of no correlation or equality of parameters and after statistical control is either accepted or rejected.

Below follows the complete list of the hypotheses that are to be examined and tested:

H₁: There is a significant relationship between leverage ratio and firm's performance

H₂: There is a significant relationship between CEO-Chairman role duality and firm's performance

H₃: There is a significant relationship between Big 4 audit firms' presence and firm performance

H₄: There is a relationship between Board of Directors' size and firm's performance

H₅: There is relationship between corporate size and firm's performance

H₆: An impact is detected on performance indicators when a major crisis occurs

3.3 Sample Selection

This research takes into account 70 Greek non-financial listed firms, during a 10-year time span (2005-2015). All financial firms (including banks) were excluded because they certainly have different cash flow compared to non-financial firms. Furthermore, firms with insufficient data, such as undisclosed balance sheets, had to be removed as well as absent data for the construction of new variables. The table below describes some elements that could be used as variables but sufficient data were not available or negatively affected the explanatory nature of the model constructed.

Table 2: List of excluded variables

Name of Variable	Definition
Liquidity Ratio	The ability to convert assets into cash flow with low cost and rapidly
Ownership Concentration	Whether the firm is family, State, bank or individually owned
Manager Ownership	The percentage of equity of the firm that managers hold
Board Activity	The number and the length of the meetings
Tobin's Q	Also known as Q Ratio, is used in order to express the relationship between market value and intrinsic value

Note: Table 2 reports a list of unused variables because of either lacking data or deteriorating effect to the constructed models. Liquidity Ratio is calculated by dividing Current Assets with Current Liabilities. Tobin's Q is calculated by dividing Total Market Value with Total Asset Value of the firm.

The data collection completed through hand-collection process from annual reports for each firm. That includes board characteristics data, Big 4 audit firm presence and financial and accounting data. Then, we constructed the following metrics that are to be analyzed thoroughly below.

3.3.1 Return on Assets

According to Heikal et al. (2014), Return on Assets (RoA) has the ability to measure the effectiveness of the firm in generating profits with the exploitation of its assets. Another term to explain RoA would be that it is a financial ratio that is used to measure the degree to which the assets have been exploited in order to generate profits. In addition, if the value of RoA is high then it explains the firm's enhanced performance affected by the high rate of return on investment.

3.3.2 Return on Equity

The Return on Equity ratio shows the degree to which companies manage effectively their own capital or net worth, plus it measures the profitability of the investments that is made by the shareholders of the firm own capital. Overall, RoE is calculated by taking the profit after tax and preference dividends of a given year and dividing it by the book value of equity at the beginning of the year (De Wet & Du Toit, 2007).

3.3.3 Leverage Ratio

According to Nissim and Penman (2003), leverage is viewed as something that arises from financial activities; specifically firms borrow in order to raise cash for operations. More specifically, debt or leverage ratios show how a firm finances its total investment, i.e. its assets. In particular, these indicators reflect, first, the extent to which a firm finances its investments with loan capital and, second, the likelihood of defaulting on loan obligations. The relevant indicators mentioned above are divided into two which are used with great frequency and are analyzed below as follows:

3.3.3.1 Debt-to-Assets Ratio

The fractional numerator is defined as the sum of short-term and long-term liabilities. Business lenders prefer low levels of total debt burden because the smaller the ratio, the more equity there is to satisfy lenders in the event of business bankruptcy. On the other hand, the shareholders of the company prefer relatively high levels because in this way the increase of their profits is achieved.

3.3.3.2 Debt-to-Equity Ratio

This index is a simple conversion of the above index and provides the same information. The only substantial difference is that the Equity is placed in the denominator of the fraction.

3.3.4 CEO Duality

In private sector companies, the owners have absolute power. In most small businesses that have a simple structure, the owner also holds the role of CEO, something that is also observed in family businesses of independent size.

Every listed company is obliged to disclose information about its CEO and Chairman. Therefore, the way to find out if the CEO and the Chairman of each firm is the same or different person is to compare the names and the surnames after each title accordingly.

3.3.5 Big 4 audit firms

For this variable, each balance sheet had to be examined by each company as to which audit firm carried out the audit and whether it was in the top 4. As the total sample includes only listed companies, the participation of an external auditor in the valid audit of the financial statements is assumed.

3.3.6 Board of Directors size

In the case of public limited companies, the owners are the shareholders. The shareholders elect a board of directors through elections in order to achieve proper

supervision of the company. The board, headed by the chairman, makes important decisions that affect the company, which are subject to departmental regulations and legislation. The main tasks to which each Board of Directors is subject are the following: a) selecting, evaluating and rewarding the Chief Executive Officer, b) defining the strategic direction of the company and reviewing the financial performance and c) ensuring ethics, of socially responsible and lawful behavior.

This variable includes all the members that comprise a firm's Board of Directors, from the Chairman to even non-executive members.

3.4 Variables & Definitions

In order to fully examine the formulated hypotheses and to draw the corresponding conclusions about the course of the research, it is necessary to use specific variables. These variables were selected based on the existing theoretical framework on the examined topic. The measures *Return on Assets* and *Return on Equity* were selected as dependent variables for the models to be constructed in the present study because they are considered to be more reliable.

As for the independent variables, following the analysis of agency theory the *CEO Duality* was decided to be used in order to examine the importance of having the same person in the position of Chairman and CEO respectively. Secondly, *Board of Directors' Size* was the characteristic of the Board of Directors to be chosen, not only because other data such as (BoD meetings etc.) were unavailable but because the size seems to have greater impact in terms of decision making that could affect firm's performance.

In addition, because the main aspect of this research is to examine the practices and the factors of corporate governance in the presence of global systemic shocks, a time dummy that takes the value of 1 during the year of 2010 due to the global financial crisis, occurred on 2007 in the USA and spread across the world, and clearly its effects acted on the Greek market later than the original date, therefore the year 2010 due to the observation of several changes in the financial data of companies was defined as a key year..

Briefly, the table that describes the variables that are to be used is the following:

Table 3: Description of Variables

Variable Name	Description / Measurement
RoA – Return on Assets	Calculated by dividing Net Income with Total Assets
RoE – Return on Equity	Calculated by dividing Net Income with Average Shareholders' Equity
LEV – Leverage Ratio	Obtained by dividing Current Liabilities with Total Average Assets
CEO Duality	0 if Chairman and CEO are occupied by different people, 1 otherwise
Big 4 Audit firms	0 if a non-Big 4 audit firm is present, 1 otherwise
Board of Directors' size	Obtained by the number of Board of Directors' members according to annual balance sheet information disclosed
Corporation Size	Calculated by natural logarithm of Total Assets
GSS – Global Systemic Shock	1 if date equals to 2010, 0 otherwise

Note: Table 3 reports the variables, both dependent and independent, that are being constructed and used for the present study.

3.5 Model Specification & Methodology

The hypothesis to be tested is that each of the performance measures of the firm (RoA and RoE respectively) is affected by the corporate governance factors, controlled by specific firm characteristics. In order to examine the aforementioned hypothesis, panel data analysis and regression will be implemented.

However, before moving on to regression, the importance of including descriptive statistics should also be mentioned. According to Hussain (2012), a descriptive analysis consists of description of data in terms of different statistical measures such as frequencies, proportions, mean, median, standard deviation, Number of observations etc. It becomes useful in order to observe not only the trend of the observed values but also the existence of any extreme values or outliers that might negatively affect our analysis.

According to Johnston and DiNardo (1997) panel data is a combination of layered data with time series. More precisely, these are repetitive observations in the same set of spatial units. Moreover, a panel data set has n entities, each of which includes T

observations measured at 1 through t time period. Therefore, the total number of observations in the panel data is $n \cdot T$, according to Park (2011). Depending upon the formation of space and time relative to each other, panels can take two forms: either time is stacked or nested within the cross-section or the opposite.

Furthermore, panel data can be classified as balanced or unbalanced depending upon whether the panels include missing values or not plus depending upon the relative size of space and time, panel data are classified to short and long panels. Specifically, in a short panel the number of time periods is less than the number of cross section units and in a long panel the opposite is valid.

The advantages of using panel data instead of clear cross-section or pure time series data are analyzed thoroughly by Baltagi (2008) and Hsiao (2014). Namely, a panel possesses the advantage of having N cross-section and T time series observations, therefore is beneficial for obtaining a large sample, with more degrees of freedom, more information and less multicollinearity effect among the variables. Another beneficial factor is that there is a higher possibility of controlling individual or time heterogeneity.

The types of panel analytic models are mainly classified to three types, which are i) constant coefficients or pooled regression models, ii) fixed effects models and iii) random effects models. In order to decide which of these models will be used for the analysis, a sequence of tests will be performed according to the instructions of Vijamohan (2017). Namely, those tests are F or Wald Test, Breusch-Pagan Test and Hausmantest.

For the analysis, the general form of the empirical panel model can be written as:

$$Y_{it} = \beta_0 + \beta_1 X_{it,1} + \beta_2 X_{it,2} + \dots + \beta_k X_{it,k} + u_{it}; i = 1, 2, \dots, N; t = 1, 2, \dots, T; k = 1, \dots, K$$

Whereas i is the unit of observation, t is the period of time, k accounts for the k th explanatory variable, β_0 is the intercept, β_k is the coefficient of each explanatory variable and u_{it} is the error term.

Accordingly to the above instructions and theoretical framework, the two selected models for the analysis shape up as the following:

Model 1: $RoA_{it} = \beta_{it} + \beta_1 CEO_{it} + \beta_2 Big4_{it} + \beta_3 BoDSize_{it} + \beta_4 CorpSize_{it} + e_{it}$

Model 2: $RoE_{it} = \beta_{it} + \beta_1 CEO_{it} + \beta_2 Big4_{it} + \beta_3 BoDSize_{it} + \beta_4 CorpSize_{it} + e_{it}$

Note that in the above regression equations the dummy variable for the existence of a crisis will be added in order to represent its effects if they exist.

4. Analysis & Results

4.1 Descriptive Statistics Findings

Starting with Table 3 below, it presents the proportions of specific values, namely the proportions of the firms that comprise each of 4 classified Industries, the CEO Duality and the presence of a Big 4 audit firm. As it can be seen below, around the 40% of the 70 firms belong to Industrials, 27% to Services, 23% to Retail and only 9% to Constructions. Those proportions indirectly describe the type of firms that has a large market share, excluding as aforementioned the financial firms.

Moving on to a categorical variable, it can be seen that while Greek companies have as their main feature the family structure, it is found that the firms which have different people maintaining the position of CEO and Chairman are slightly more than those who have the same person maintaining both titles. However, we should not forget that the examined data are time series, so in order to compare with greater detail the data should be examined yearly.

Another categorical variable, which is the presence of Big 4 audit firms, seems to have greater divergence than CEO Duality. Specifically, the non presence of a Big 4 audit firm accounts for almost 80% while the remainder is for the presence of a Big 4 audit firm at 20%.

Table 4: Proportions of Categorical Variables

	Proportions
Industry	
1	0.4142
2	0.2714
3	0.2285
4	0.0857
CEO Duality	
0	0.5221
1	0.4779
Big 4 Audit firm	
0	0.7922
1	0.2078

Note: Table 4 reports i) the industrial classification of the firms to which the firms belong to, as well as the proportions that consist them, ii) the proportions of the managerial status and iii) the proportions of

the presence of a Big 4 audit firm. Numbers 1, 2, 3 and 4 stands for the classification of the industries that firms belong to. Specifically, 1 is for Industrials, 2 for Services, 3 for Retail and 4 for Constructions, respectively.

Moving on to further descriptive statistics, because of Return on Equity outliers, they had to be winsorized and recoded in order to minimize their effect on the variable and on the analysis as whole, same goes for Leverage Ratio because outliers were detected.

Table 5: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
RoA	-0.0016	0.1507	-0.5222	0.5095
RoE	-0.0064	0.1607	-0.2091	0.1927
LEV	0.5723	0.1702	0.0434	0.7472
BoD Size	7.3273	2.1850	4	26
Corp. Size	18.4573	1.3723	15.5356	22.8063
Observations	770			

Note: Table 5 reports the descriptive statistics of the constructed variables. Return on Assets, Return on Equity and Leverage Ratio are in log or percentage level. Board size is in level form and stands for the total number of member of the Board. Corporation size is calculated by taking the natural log of total assets of each firm.

It can be observed from the above table that the average number of persons is 7.33, with no clear evidence though if they are executive or non executive members. As per the size of the firms or corporations is by average 18.45, calculated as described above by the natural logarithm of total assets that belong to each firm respectively. By observing the standard deviations of the variables it can be deducted that, except Board of Directors' and Corporations' Size, they have relatively small.

After that, it is important to highlight the results of correlation analysis for all variables, using Pearson's correlation, in order to find out evidences of linear relationships between the variables.

Table 6: Pearson's Correlation

	RoA	RoE	LEV	CEO Dual	Big 4	BoD Size	Corp. Size
RoA	1.0000						
	770						
RoE	0.7375**	1.0000					
	0.0000						
	770	770					
LEV	0.1152**	0.0685	1.0000				
	0.0014	0.0575					
	770	770	770				
CEO Dual	-0.0359	0.0307	-0.0178	1.0000			
	0.3197	0.3957	0.6228				
	770	770	770	770			
Big 4	0.0318	-0.0132	0.1838**	-0.0863*	1.0000		
	0.3786	0.7152	0.0000	0.0166			
	770	770	770	770	770		
BoD Size	0.0504	0.0309	0.1176**	-0.2422**	0.2897**	1.0000	
	0.1628	0.3921	0.0011	0.0000	0.0000		
	770	770	770	770	770	770	
Corp. Size	0.1872**	0.1570**	0.2069**	-0.2676**	0.2725**	0.3827**	1.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
	770	770	770	770	770	770	770

Source: Secondary Data /**Note:** Table 6 reports the results of Pearson correlation which is used in order to measure the strength of a linear association between two variables. The significance levels are given by the following symbols: *, **, *** for 10%, 5% and 1% level of significance respectively.

In order to assign strength of association, there will be used some guidelines provided by Cohen (1988). Namely, he classifies r into 3 classes i) 0.1 to 0.3 small correlation, ii) 0.3 to 0.5 medium correlation and iii) above 0.5 strong correlation. First of all, the variable that shows positive and significant correlation with all the other is Corporation Size, which seems reasonable because almost always the size of a firm determines its welfare.

Furthermore, Leverage Ratio shows a weak but significant correlation with Return on Assets. That would be attributed to the fact that according to literature Leverage Ratio is calculated by total liabilities divided by total assets. Another interesting observation could be that the presence of a Big 4 audit firm in terms of information disclosure might be a factor that contributes positively to higher incentives in order to achieve better Leverage Ratio.

4.2 Panel data analysis

In this sub-chapter, the summary results from the assessment of the theoretical models that were defined at Chapter 3 will be presented and analyzed meticulously, in order to proceed to agreement or disagreement to our hypotheses.

Panel was the selected structure of our data, as well as for the following analysis, from 70 Greek listed companies comprising 4 industries during the time span between 2005 and 2015. However, the companies will not be further analyzed in sectors because of the small number of them comprising particular sectors, i.e. Constructions (Code 4). In addition, it is important to specify the fact that our panel data set is characterized as a short panel because the number of time periods (T) is less than the number of cross section units (N), plus it is a strongly balanced panel without any missing values.

In order to choose if the type of panel data analysis will be i) pooled OLS, ii) fixed effects model or random effects model, there has to be conducted a series of important tests, as well as assumptions must be fulfilled. In the light of the above, the Hausman test is necessary in order to decide whether to use fixed effects or random effects model in order to extract the valid results. However, it should be highlighted that if

heteroskedasticity is present, the Hausman test results could lead to the wrong option. Therefore, Pedace (2013) suggests estimating an auxiliary regression that includes all the variables from the original model with an additional set of variables. After that, a joint test of significance on the coefficients of the aforementioned variables should be performed in order to accept or reject the null hypothesis that the coefficients are simultaneously zero and, therefore, chose RE or FE estimates.

Table 7: Regression Analysis of Return of Assets Results

Variable Name	Coefficients	Std. Err.	P-Value
LEV	0.1573	0.0383	0.000***
CEO Duality	0.0068	0.0137	0.618
Big 4	-0.0073	0.0181	0.686
BoD Size	-0.0026	0.0035	0.460
Corp Size	0.0223	0.0060	0.000***
dummy	-0.0271	0.0174	0.121
C	-0.4822	0.1069	0.000***
Number of Obs. = 770 / Number of Groups = 70			
F = 39.56***			
R² = 0.0416			

Source: Secondary data

Note: The significance levels are given by the following symbols: *, **, *** for 10%, 5% and 1% level of significance respectively. Model 1 reports random effects estimates. After applying a joint test on significance of the coefficients of the additional variables, we concluded that random effects estimates are preferable over fixed effects estimates. The dependent variable is in logarithmic form as it stands for the return of assets. Dummy variable is in effect when the year is 2010.

Table 8: Regression Analysis of Return on Equity Results

Variable Name	Coefficients	Std. Err.	P-Value
LEV	0.1245	0.0417	0.003***
CEO Duality	0.0385	0.0150	0.010***
Big 4	-0.0288	0.0200	0.152
BoD Size	-0.0025	0.0039	0.514
Corp Size	0.0237	0.0068	0.000***
dummyS	-0.0459	0.0184	0.013**
C	-0.5052	0.1201	0.000***
Number of Obs. = 770 / Number of Groups = 70			
F = 34.98***			
R² = 0.0371			

Source: Secondary data

Note: The significance levels are given by the following symbols: *, **, *** for 10%, 5% and 1% level of significance respectively. Model 2 reports random effects estimates. After applying a joint test on significance of the coefficients of the additional variables, we concluded that random effects estimates are preferable over fixed effects estimates. The dependent variable is in logarithmic form as it stands for the return of equity. Dummy variable is in effect when the year is 2010.

4.2.1 Model I Results

Table 5 provides the results for Model I, as it is described in Chapter 3. As it can be seen above, Leverage Ratio is statistically significant and has a positive relationship with Return on Assets, given the fact that a financial or economic crisis occurs. That finding contrasts to the evidences of the majority of conducted empirical studies that hint towards to a negative relationship. A part of this majority is conducted by Arditti (1967), Rajan and Zingales (1995), Michaelas, Chittenden and Poutziouris (1999), Bevan and Danbolt (2002) and more.

However, in terms of Leverage Ratio, the aforementioned finding of Model I, does agree with several studies, which found as well positive relationship between the former variable and corporate returns. Researchers like Hamada (1969), Masulis (1983), Bhandari (1988) and Brav (2009), prove the positivity of that relationship. According to Muradoglu and Sivaprasad (2012), in order to examine in depth the effects of leverage ratio to corporate returns there might be needed different definitions of leverage, stock returns, methodologies and samples to be used.

Moving on to CEO duality status of the chairman, no significant relationship is detected between the former variable and Return on Assets. That finding provides to us mixed evidence. For instance, Daily and Dalton (1992) plus Brickeley, Coles and Jarrell (1997) extract evidences that if the position of CEO and Chairman is occupied by the same person, then it is not necessary that Returns on Asset will be affected.

Furthermore, by observing the variables Big 4 audit firms and Board of Directors' size it can be deducted that they are statistically insignificant, therefore having no true impact on Return on Assets. As far as the former variable is concerned, several studies indicated that non Big 4 or Big 4 audit firms imply any changes on Return on Assets (Laurence, Minutti-Meza, & Zhang, 2011). However, Louis (2005) underlines the fact that non-Big 4 firms, relative to their Big 4 rivals, possess a greater information advantage about local firms and their business communities, thus providing more valuable and customized services to their audit clients.

About Board of Directors' size, the finding implies that no significant relationship is detected, in contrast to Rostami et al. (2016), who found a negative relationship instead. This result might indicate to the fact that Board of Directors in Greek firms has less influence on managerial actions and decisions.

In terms of Return on Assets, it seems that Corporation Size has a significant positive role in the relationship of the former and latter variable. It is reasonable to have a positive relationship between these two variables because there is a two-way causal relationship.

Finally, the lastly introduced variable as a dummy variable, standing for Global Systemic Shock, has a negative yet insignificant relationship with the dependent variable. Its implication serves not only in order to observe its relationship with Return on Assets, but also to observe its impact to other variables in order to indicate their "behavior" under the presence of an unexpected event.

4.2.2 Model II Results

Model II replaces Return on Assets with Return on Equity as the dependent variable. Starting with Leverage Ratio, again a positive significant relationship with the dependent variable is observed at Table 6. Several studies indicated a negative relationship between leverage ratio and return on equity as part of firms' returns. For instance, Ahmad, Salman and Shamsi (2015), as well as Sheel (1994), supported the negative relationship between leverage ratio and return on assets. However, as it was described at previous chapter, the finding of this research can be supported by several studies conducted by researchers such as Abor (2005), Ruland and Zhou (2005) prove that gains from leverage can prove useful and significant for a firm's performance.

An interesting fact about the next independent variable is that CEO duality status in dependence with Return on Equity has a significant relationship plus it is positive. Many studies construct arguments against dual leadership that are mainly based on the agency theory (Fama & Jensen, 1983a). However, the above result is justified by Dalton et al. (1998) who claim that dual leadership potentially has large cost savings

by the elimination of information transferring and processing costs associated with non-CEO chairmen.

Moreover, Brickley et al. (1997), by using a sample consisting of 661 U.S. firms, found that firms with separate leadership do not perform better; instead, they conclude that firms which have duality characteristics are associated with better accounting performance. Therefore, despite the majority of studies that with their evidences support the negative relationship of CEO duality, the coefficient of this study is justified sufficiently by similar findings.

Unsurprisingly, a Big 4 audit firm presence has not a significant impact on Return on Assets. Allegedly, the literature suggests that Big 4 audit firms provide further assurance to the market than non-Big 4 audit firm therefore that would cause pressure to each of the firms that cooperate with a Big 4 audit firm in order to enhance their performance.

Regarding the relationship between Board of Directors' size and Return on Equity, our results indicate that there is an absence of significant relationship between the independent and dependent variable. By comparing with other researchers' results, Chen et al. (2005) measured the relationship between the board structure and performance of 412 listed firms in Hong Kong stock exchange. Their results suggested that there was not any significant relationship detected between board size and RoA and RoE. That would come to support our research findings. However, according to a number of studies the findings seem to differ from country to country. Using data belonging to firms that are listed in Romanian stock exchange, Moscu (2013) found also statistically insignificant results between Board Size and RoE for 62 firms. Similar results were also extracted by Velnampy (2013), Oxelheim and Randoy (2003) and Lefort and Urzúa (2008). Despite the fact of majority of studies that conclude to insignificant relationship between board size and firm performance, there should be given focus on either the positivity or the negativity of the extracted coefficients in order to observe whether the board size improves or impedes the progress inside the firm.

By examining the variable Corporate Size, it has a slight but significant and positive relationship with RoE. It is reasonable that the larger a firm is, the better economic results and outcomes tend to have. For instance, various research works have shown a

significant and positive relationship that exists between corporate size and firm performance (Bonaccorsi (1992); Hall (1987); Moen (1999)). However, results that point to insignificant relationships between corporate size and firm performance are not absent, for example a study of Khatab et al. (2011) has shown insignificant relationship between the two aforementioned variables.

As far as the occurrence of a major economic crisis is concerned, the results from the dummy variable that depicts a global systemic shock indicate a negative and significant relationship with the dependent variable. In addition to the above results, the results are in line with a research conducted by Opler and Titman (1994) who also have indications about a negative and significant relationship between firm performance and financial distress.

Finally, the coefficient of determination or R^2 extracted for this model is examined and takes the value of about 7%. The low percentage, while it could indicate the inadequacy that describes the goodness of fit of the model to the data, possibly due to the peculiarity of the Greek economy and the companies that compose it as well as its situation in the midst of the economic crisis. Additionally, a comprehensive table will follow below which includes the research hypotheses one by one as well as whether they were accepted after the research or not depending on the reported result.

Table 9: Hypothesis Status for RoA

No. of Hypothesis	Independent Variable	Description	Status
1	Leverage Ratio	There is a significant relationship between leverage ratio and firm's performance	Accepted
2	CEO Duality	There is a significant relationship between CEO-Chairman role duality and firm's performance	Rejected
3	Big 4 Audit firm	There is a significant relationship between Big 4 audit firms' presence and firm performance	Rejected
4	Board of Directors' size	There is a relationship between Board of Directors' size and firm's performance	Rejected
5	Corporation size	There is a relationship between corporate size and firm's performance	Accepted
6	Global Systemic Shock	An impact is detected on performance indicators when a major crisis occurs	Rejected

Note: Table 9 and 10 report the Hypothesis status for Return of Assets and Equity respectively whether they are accepted or rejected, based on the regression results.

Table 10: Hypothesis Status for RoE

No. of Hypothesis	Independent Variable	Description	Status
1	Leverage Ratio	There is a significant relationship between leverage ratio and firm's performance	Accepted
2	CEO Duality	There is a significant relationship between CEO-Chairman role duality and firm's performance	Accepted
3	Big 4 Audit firm	There is a significant relationship between Big 4 audit firms' presence and firm performance	Rejected
4	Board of Directors' size	There is a relationship between Board of Directors' size and firm's performance	Rejected
5	Corporation size	There is a relationship between corporate size and firm's performance	Accepted
6	Global Systemic Shock	An impact is detected on performance indicators when a major crisis occurs	Accepted

5. Conclusion & Discussion

5.1 Summary

Based on data collected from balance sheets of 70 Greek listed firms, in this study we analyzed how different aspects of corporate governance and business mechanisms affect economic outcomes or performance of a firm given the fact that a major crisis occurs. Corporate Governance and financial mechanisms factors were combined in order to produce a model to understand the impact on economic outcomes in uncertain times.

Panel data regression analyses were used for testing and modeling. Each regression model had a firm performance measure, Return on Assets and Return on Equity respectively, and both models had the same independent variables in order to examine the existent relationships for each measure. Because the 2 aforementioned measurements examine the efficiency of the company from a different perspective, the use of all explanatory variables is an important condition.

More specifically, the results indicate that leverage ratio and corporate size positively affect firm economic outcomes when a major crisis is present. Otherwise, the above can be captured in detail while describing the fact that leverage can be a proxy for investment opportunities and thus high leverage and firm performance can demonstrate a positive relationship as Tsuruta (2017) has stated.

At the second part of the analysis, the results highlight the existence of significant relationship of an additional variable which is the CEO duality status of a firm administration. In response to such findings, Baptista et al. as well as Peng et al. (2007) found a positive relationship between duality and firm performance, which could be an indicator of each firm's characteristics.

Notably, in our study, the characteristics of Board of Directors, specifically the size, did not play a significant role in influencing the financial performance of the company in question. A fact that arouses curiosity is because the majority of the literature and research findings on the size of the board tend to prefer a limited number of people to make it up. Regarding Jensen's study of board size (1993), he argued that the preference for smaller board size originates from technological and organizational alterations which will subsequently lead to cost cutting. Furthermore, when a Board of Directors consists of an excessive number of people, then phenomena of mismanagement inevitably occur, as well as agency problems and free-rider actions. Although in the present study between the two variables is statistically insignificant,

we can maintain that the final sign of the coefficient is negative and therefore confirms the prevailing theory of the size of the board of directors of a company.

Moving on to the presence of a Big 4 audit firm, affected by crisis period, the results show a statistically insignificant relationship between the two examined variables. The sign of the rate is clearly negative in both cases, which is interesting because the majority of the literature argues that carrying out audits tends to enhance financial results mainly due to the creation of pressure and incentive for greater performance. Therefore, the negative impact may be due more to the existence of a major financial crisis than to the quality of auditors' services.

As for the size of the firm, our study goes hand in hand with the majority of the existing literature that supports the positive and proportional relationship between firm size and performance. This also applies to the transmission of information, as Sen and Bhattacharya (2001) argue the fact that information on large firms is usually more available for public and also could be obtained with lower costs compared to smaller firms. That would be important to solve the agency problem and overcome the obstacles in order to achieve a smoother operation of corporate governance mechanism.

A major case in this study, however, is whether or not the position of CEO and president of a company is held by the same person and what effect this has on the company itself. CEO duality is a key aspect of corporate governance and management structure as whole. With a recap on the literature review, agency theory disputes that separation of CEO and chairman roles can alleviate agency costs. Regarding this variable, the results and the opinions differ and this is a fact because every company in each country and in altering existing circumstances reacts differently. Our results come in line with Finkelstein and Hambrick (1990) who support the fact those powerful CEOs with dual role usually demonstrate more flexibility as there are no barriers to the channels of information flow, so they make more beneficial decisions for a business in conditions of uncertainty.

5.2 Theoretical & Practical Implications

In order to fully understand the concept of corporate governance, the meaning of the agent problem must also be understood. After all, as stated in the literature, the importance of corporate governance has its roots in the agent theory, which was widely recognized as a major determinant of the former.

The contributions of our study is that we combined three aspects in our research model, which are corporate governance features, financial mechanisms which is leverage ratio and the uncertainty factor in order to obtain their influence over the economic performance on a group of Greek listed firms for 10 years. Additionally, our results are highlighted by the main characteristic of Greek firms which is family oriented firms.

In practice, it is shown that during high uncertainty periods, especially when a major crisis occurs, both taking on the role of CEO and chairman by the same person works positively for the performance of the business because significant barriers to information loss are bypassed and time is saved. In addition, the leverage ratio is based on results is an important help in strengthening companies in order to cope with adversity.

5.3 Recommendations for Future Research & Limitations

Despite the fact that this study provides interesting findings and implications, it is vital though to underline the limitations of this research.

First of all, the applied research model can be further extended, restructured with other corporate governance variables or even analyzed in certain time periods. For instance, variables such as Liquidity Index or ownership concentration could be used for future studies in order to capture different effects. Of course, agency theory is the basis for analyzing future studies, but it can be combined with more financial criteria such as the share price of the companies in question as a result of management pressure.

Secondly, the present study uses a number of years as a field of research and does not examine the data of one year in particular. Therefore, given the current situation from the pandemic named COVID-19, which was caused by the virus SARS-CoV-2, it would be an interesting addition to this field of research if one were to consider the impact of corporate governance on company performance in the midst of a crisis, without, however, being of an economic nature. In addition, it would be equally useful to implement one of the governance indices or “Gov – Scores” created to examine the quality of corporate governance.

Thirdly, the data used for the present study were derived from the balance sheets of 70 listed companies on the Athens Stock Exchange. Therefore, knowing that financial companies have been excluded from the sample due to fundamental differences in their turnover, the number of companies covers a significant part of their total number. However, it is emphasized and encouraged that this number could be increased in a future study.

It is also important to mention that it would be good to include non-listed companies in a possible future study sample, on the other hand it should be noted that information retrieval in this case requires much more time and the results may not be complete.

Finally, in the context of corporate governance, a future study accounting for the performance of the family business in Greece could take place either in normal conditions or in conditions of high uncertainty and a comparison between them.

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