

CORPORATE GOVERNANCE AND SOCIAL NETWORKS: THE RELATIONSHIP BETWEEN THE BOARD OF DIRECTORS AND EARNINGS MANAGEMENT

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Abstract

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In this paper, we examine a set of Greek Listed Companies with respect to the interconnections between their Boards of Directors (BoD's). Our main objective is to examine if and to what extent these Directors are interlocked, and if this possible interlocking may affect the course of economic or financial decisions through the information content of announced earnings, including implications on the current financial crisis in Greece. For this purpose, we use two different modes of research methodology, namely social network analysis and OLS methodology (panel analysis). The results of this study indicate the existence of a highly connected and interdependent network between companies and the people constitute the BoD's. Also, the results show that in their entirety the companies are related and there is a high degree of interaction. These results lead to interesting theoretical and policy implications: could such a high interconnection lead to an extreme risk of total failure of the system in periods of hard times? To what extent should the state through its regulatory instruments (laws, market observers) try to affect the actual forming of Listed Companies BoD's? Has this interlocking played its role in the Greek Economic Crisis, etc.?

Keywords: Social Network Analysis, Dynamic Network Analysis, Corporate Governance, Ownership Structure of Enterprises

1. INTRODUCTION

In this paper, we examine an important part of the total Greek economy, which consists of Greek Listed companies and their subsidiaries and affiliates. We analyse the composition of their Boards of Directors, trying to outline any conclusions in the relation between the mobility of those members and the creation of the financial crisis.

The results of this study are very important to outline any conclusions and also give us a clearer perspective, in relation to the directions which may be attributed shares responsibility for the phenomenon of crisis. We stood on it because the constant degradation of the Greek economy has prevented the influx of capital from prospective investors. In order to achieve a flow of investments, a significant volume of data and information (qualitative and quantitative) need to be available as open sources. The adoption of International Financial Reporting Standards plays a key role in the

achievement of high levels of disclosure requirements (Athianos & Dimitras, 2017).

Therefore, the mobility and duality of members of boards of directors should be disclosed to any potential investor of the companies were listed in Athens Stock Exchange (Buch-Hansen, 2014). Any lack of disclosure will probably create a considerable suspicion that the people of the Board manipulate the relative data and information to mislead the investing public (Jensen, 2001; Stout, 2012).

The remainder of the paper is set out as follows. In section 2 we briefly review the relevant literature on corporate governance and in social network analysis. In section 3, we describe the dataset and define the variables. The employed methodology also presented in this section. Research analysis and results are presented in the 4th section, while discussion on the results including implications for further research together with limitations, is provided in section 5. The final section concludes.

2. LITERATURE REVIEW

2.1. Basic concepts in social network analysis

The Analysis of Social Networks (Social Network Analysis) is a basic methodology of the social sciences which aims its efforts in the interpretation of human interaction (Marlow, 2004). The social life is developed mainly through interpersonal relationships and the patterns formed by these relationships, an assumption that is also the starting point of the analysis (Marin & Wellman, 2014). The main objective of the methodology is to identify the key factors (age, sex, socioeconomic status, education), the roles and relationships that hold within the network (Krackhardt, 1996), the properties of relations (type, intensity, frequency relation) (Chau & Xu, 2008) as well as the flow of knowledge within it. An "organizational radiography" means the total of the networks is the manner in which these relationships are therefore easily distinguishable to the observer - analyser.

A social network analysis paves the way around the concepts of nodes and links. The nodes consist of social factors and may be composed of individuals, groups, organizations, nations, communities, companies, blogs etc. The links are communication channels between nodes (Martino & Spoto, 2006).

During the analysis, the methodology identifies the nodes and actions as interdependent units, the bonds between them are recognizable, as well as the creation of channels for transfer or flow of resources to eventually lead to individual action opportunities or obstacles (Wasserman & Faust, 1994).

Also refers to the export of a number of important information, which contributes a detailed study of a network, relevant social force that can hold a part or the entire network. Because the force is a consequence of modelling the relationships, the amount of energy in social structures can vary. In a system containing very loosely (low density) cannot be exercised much power, in contrast, in high-density systems, it is possible to put more power. The amount of energy in a system and how this allocated are factors that directly related.

Deepening the analysis, two systems can have an equal amount of energy, but can be equally distributed to one system and unequally to the other. The power of the social networks may describe relations between operators or describe the entire population. This is characterized by the type of study of the network, i.e. if the study is microscopic or macroscopic.

Some analysts often describe the way an agent network is embedded in a relational network or as a way of imposing restrictions on this factor or that the opportunities offered. Factors that face fewer restrictions, and have more opportunities than others, are in favourable structural positions. Having a favoured position, and may mean that an agent has access to better opportunities and exchanges, probably have a greater influence, thus this factor will be on the centre of attention and respect from those in less favoured positions.

The representation of a social network can be

realized in three different ways: the first of these is a simple list consisting of a plurality of social factors (factors), as well as a list of pairs of social coefficients associated with some form of social relationship. The second way is a matrix. If two coefficients i and j are related, this relation equals to 1 (i, j), otherwise equals to 0. The third way consists of the description of a social network in the form of a graph, where the coefficients are represented by nodes, and the links between nodes, and edges. The nodes can be individuals, groups, companies, organizations, nations, communities, neighbourhoods, sections within organizations, journal articles, websites, blogs (Martino & Spoto, 2006; Quan-Haase & Wellman, 2006; Watts, 1999).

If the shape of the graph tends to be directed, then each interaction is described by a one-way relationship between the coefficients. In this case, the inner - degree of a node is the number of incoming links and the outdegree is the number of outgoing links. Particularly important is considered the approach to the theory of graphs, as it gives us the opportunity to analyse the structural properties of the network and simultaneously provides a tool to measure and quantify the properties of the network (Marlow, 2004; Martino & Spoto, 2006).

The methodology of the social network analysis technique has been widely used to study many aspects of organizational behaviour. The use of this methodology for the extraction of a network enables us to uncover a wealth of structural motifs that may have a major impact.

2.2. Introduction to the concept of corporate governance

Corporate governance (corporate governance) is the cornerstone for the organization of effective internal control systems in modern undertakings. The impact of the failure or success of the companies in economies that worked was particularly significant and negative and positive implications for those related directly or indirectly to these (stakeholders).

Specifically, negatively affected mainly shareholders (shareholders), and the other having interests in these companies as suppliers, customers, creditors, employees and the governments of the countries operating the above-mentioned companies (a common feature of the above legitimate interest in the orderly and efficient operation of these companies). The financial performance of the companies is mainly due to the adequacy of their members of Board of Directors and the lack of effectiveness of their organisational control mechanisms (failure of 'Corporate Governance Systems').

In this section, we analyse the generally accepted definition of the corporate governance system, with significant reference to the rights and obligations of shareholders and to the role that board of directors should play on stock markets in accordance with internationally accepted good practices of corporate governance.

Any references to boards of directors can mainly concern listed companies on the Stock Exchange, but the adoption of good operating practices of the BoD should be an objective also of

non-listed companies on the Stock Exchange in order to enhance the control environment. After this, we make a distinction between executive and non-executive members of the Board and the role that they can play in the effective implementation of legislation (where applicable) and good corporate governance practices. On these frames will also examine the role of audit committees as an empowering tool of BoD and as an effective instrument of the financial activities of the company, its risk management procedures and internal control system, as well as the activities of internal and external auditors.

However, the most important reason for applying effective corporate governance practices is the need to include the specific interests of the individual stakeholders (shareholders - members of the Board of Directors and directors) in the general interest of the company and consequently of its shareholders and other legitimate interests in (stakeholders). Corporate Governance is mainly exercised by the Boards of Companies, but whose operations should be "limited" by those who have a direct or indirect interest in the company. The importance of the views of those interested in the company depends on the content of the acts proposed or imposed by the Boards of Directors of the companies.

The modern concept of corporate governance was heavily influenced by the Agency Theory (the conflict of interest between the owners and managers of an enterprise).

The problem lies in the fact that in several cases business executives do not work for various reasons in the interests of business owners. Moreover, according to modern corporate governance theories, business decisions taken by managers may not work in the interest of all those with legitimate interests in the business.

The public debate on corporate governance began in the 1970s as a result of the disclosure of financial scandals and the bankruptcies of businesses characterized by such scandals. These developments produced views and proposals on the organization of business in terms of strength, which usually aims to balance the power between management and shareholders.

This equilibrium was initially pursued through transparency rules (Tricker, 1994). The separation of ownership and control developed by Berle and Means (1959) laid the foundation for discussion on corporate governance. This separation led to the difference between the ownership and the control bodies of the company as a key issue and made it clear that these two organizations shared different interests, a factor that seemed to create a conflict between them (Sheikh & Chatterjee, 1995). In practice, however, power has shifted to the control body so that business owners no longer retain any substantial power within the company's business. The existence of "power without property" (Berle, 1959) creates the new reasons for discussing how to promote the activities of a business. On the other hand, the law accepts the rights of shareholders

without taking into account this substantial shift in the way that the power is exercised in a business.

The responsibility for the management of the business concerns only the Board of Directors, which ensures that the business activities are in favor only of the stakeholders. The establishment of any system of corporate governance presupposes to making policy choices. In general, corporate governance applies a particular philosophy, while at the same time highlighting perspectives on authority and how it is conducted. It evaluates the various organizations that are part of this power and tries to establish the boundaries of their relationships in order to achieve a certain goal, where the operation of the enterprise is the basis. The goal may vary according to the adopted system, i.e. the philosophy that corporate governance would, as a concept, express. Similarly, any attempt to define corporate governance as a concept can only refer to policy choices.

Based on the above, corporate governance could include the whole system of rights, procedures, and controls established internally and externally in concern of management of an enterprise that aims to protect the interests of all legitimate stakeholders. These rights may be of a legislative, regulatory or contractual nature. In addition to exercising rights, these processes form the mechanisms for influence in administration, such as trade unions. Audits are presented as mechanisms, such as internal control, through which stakeholders are informed about the business activities.

3. RESEARCH METHODOLOGY

3.1. Collection and data processing

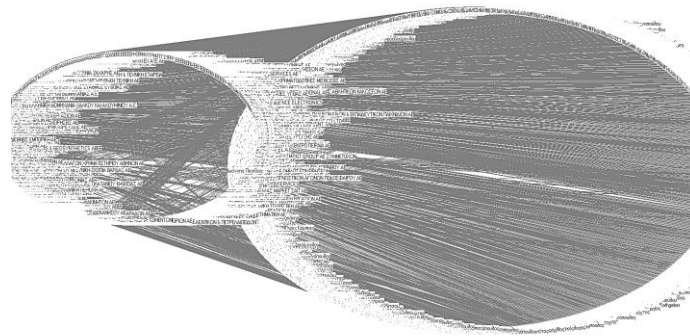
The sample constituted by 64 listed companies in Athens Stock Exchange. The selection of companies based on the composition of General Index of ASE. More specific 64 are parent companies during the examination period. Those companies are the biggest in ASE in terms of capitalization. However, the total sample includes 64 parent companies and their subsidiaries and affiliates count totally 400 companies.

The majority of the selected companies classified to the following industries, banking, construction, financial, healthcare industry, trade, services, food, and drink.

Continuing the formation of the sample, a number of the persons that constitute the BoD are also selected. The above data extracted from Athens Stock Exchange and companies' annual reports. The data frequency span from 2013 to 2016.

Finally, we formed a bipartite graph of companies and their respective BoD's and afterward extracted two one-mode networks, namely the BoD's network and the companies' network. We applied Pajek (2007), to form these networks and Pajek and Network to calculate our metrics.

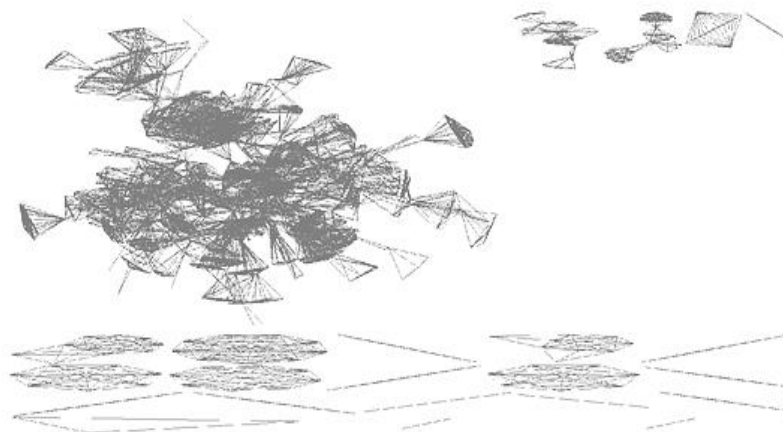
Figure 1. Total graph generated network



Then, according to the theory of bipartite graph, we create two separate networks. First display a network of members of BoD's and the respective relationships. As a relationship between

persons, we define the joint service in more than one company at the same time during the examined period (2013-2014).

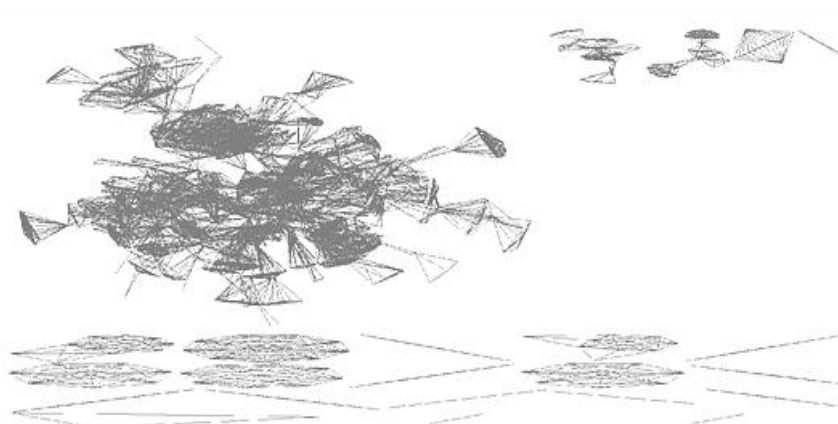
Figure 2. BoD's relationships



The second generated network represents the companies' relationships. This connection depends on whether they have even one person on the Board which joint serving simultaneously in another

company. This item can connect too many companies together and give us the following illustration.

Figure 3. Companies' relationships



According to the above graphs, we find that most companies as well as individuals who serve have shown that a large degree of binding. At the same time perceived the existence of some "islands" and some isolated nodes, but there is a very limited extent and not mislead our original conclusion.

3.2. Corporate governance analysis. Data selection

This section describes the sample, data sources, and the ownership structures of companies in the sample. Then, we examine the hypothesis developed in the previous section by analysing the relationship between corporate ownership structure and the information content of earnings.

For this section of the analysis, data were obtained from the Athens Stock Exchange (ASE). From our sample, we exclude companies with negative book value.

Most previous studies on ownership structures focus on direct property - ordinary shares are owned directly by individuals or organizations. Direct property is not sufficient to characterize the structure of ownership and control of Greek companies since these companies generally associated with complex indirect ownership. For the data selection, Claessens, Djankov and Lang (2000), the methodology was employed, identifying major shareholders of listed companies in the Greek market, with their shares, cash flow, and voting rights. Moreover, the process of determining the major shareholders is quite similar to that used by La Porta, Lopez-De-Silanes and Shleifer (2000).

As a major shareholder defined one who has the largest percentage of the total of the voting rights of the company and who is not controlled by anyone else. If a company has not a major shareholder, is classified as broad ownership. For the purposes of research, the level of the major shareholder voting power is set to 50% and will not be considered when the level exceeds 50%.

In case of a company have more than one major shareholder; we will focus on the largest. That was based to our assumption that ownership is based on control of both cash flow and voting rights. Moreover, specific corporate information on pyramid structures and cross placements used to make the distinction between cash flow and voting rights. To facilitate the measurement of the separation of cash flow and voting rights, the maximum privilege level cash flows associated with any major shareholder is also set to 50%. However, there is no minimum cut-off level for the rights of the cash flows.

Our sample, for this section of analysis, consisted of 254 firms. Firms, whose largest

absolute owners have less than 20% of the voting rights, were excluded. This restriction allows us to focus on companies controlled by shareholders and is expected to increase the strength of our control since the entrenchment and arguments of information is more applicable to large shareholders, who have already secured effective control. La Porta, Lopez-De-Silanes and Shleifer (2000), also using the 20% cut-off level to define the controlling interest. The Bradley and Kim (1985) found interesting offers (for acquisition of the company) rarely occur in companies with controlling the level of 20%.

The above data obtained from HELLASTAT database. Data frequency span from 2013 to 2016.

Moreover, we assume that the structures of ownership and control of companies have not changed substantially during this period. This is a reasonable assumption since the economic and political conditions were unstable for companies to move to change the composition of their capital during the year due to the economic crisis.

3.3. Methodology

The methodology of least squares (panel data analysis) applied in order to determine the key relationships between stock returns and profits on Greek listed companies:

$$CAR_{it} = a_0 + a_1NI_{it} + (Fixed_effects) + u_{it} \quad (1)$$

Where:

CAR_{it} = the cumulative net-of-market twelve-month stock returns at year t ;

NI_{it} = the net earnings at year t divided by the market value of equity at the beginning of year t ;

$Fixed\ effects$ = dummy variables controlling for fixed effects of calendar years and/or economies;

u_{it} = error term at year t .

The above Eq. (1) is estimated from year to year, as well as collectively. Furthermore, to avoid econometric problems such as heteroscedasticity, we applied the control of white - adjusted t-statistics, for all the coefficients of determination of the model. Also, the fixed effects of calendar years and/or economies, where appropriate, are included as dummy intercepts in regressions. For simplicity, these are not listed in the table. The estimated coefficient of earnings (NI) is positive and statistically significant in all these years and economies, suggesting that earnings have an information role in Greece.

According to the above, we test the information content of reported earnings, on the ownership structure, using the following regression model:

$$CAR_{it} = a_0 + a_1NI_{it} + a_2NI_{it}SIZE_{it} + a_3NI_{it}Q_{it} + a_4NI_{it}LEV_{it} + a_5NI_{it}SEG_i + a_6NI_{it}V_i + a_7NI_{it}CV_i + (Fixed_effects) + u_{it} \quad (2)$$

Where:

CAR_{it} = the cumulative net-of-market twelve-month stock returns at year t ;

NI_{it} = the net earnings at year t divided by the market value of equity at the beginning of year t ;

$SIZE_{it}$ = the natural logarithm of the market value of equity in millions of € at the beginning of

year t ;

Q_{it} = the market value of equity divided by the book value of total assets at the beginning of year t ;

LEV_{it} = the total liability divided by total assets at the beginning of year t ;

SEG_i = the number of industry segment(s) in which the firm operates;

V_i = the voting rights level of the largest ultimate owner;

CV_i = the ratio of cash flow rights over voting rights of the largest ultimate owner;

Fixed effects = dummy variables controlling for fixed effects of calendar years and economies;

u_{it} = error term at year t .

The above analysis includes the ratio of market value of equity to the book value of total assets, to control for the effects of growth on the relationship between profits and shareholder return. Opportunities for growth are likely to be positively correlated with future levels of earnings and/or the continuation of earnings (Collins & Kothari, 1989; Vazakides & Athianos, 2014). The higher the market-to-book assets, the greater the expected increase in profit and/or continuation of gains, the stronger the relationship between profit and stock returns.

On the other hand, the market to book ratio can also be affected by corporate risk. High-growth companies may be riskier, which weakens the relationship between profit and stock returns. Also, fast-growing companies are likely to be new enterprises with a lower level of information content in earnings announcements. Given these countervailing effects, the net effect of the increase in relative earnings and shareholder return, we think that therefore constitute an empirical question. Also within our model, we incorporate leverage funds. Leverage could be an indication of the risk of debt or bankruptcy (Dhaliwal, Lee & Fargher, 1991). The high-level operations associated with high risk and therefore the relationship between profit-efficiency is reduced. On the other hand, Smith and Watts (1992) show that leverage can lead a company to an investment opportunity. Established companies with low growth potential generally have high leverage and are likely to press their profits to contain high-grade information. Therefore, companies with high leverage may have higher sensitivity profits and stock returns for companies with low leverage. While taking into account the risk and impact of the development, the net effect of leverage on the relationship between profit and stock returns should be determined by the model. Moreover, as another control, we include the number of sectors in which each sample company operates. Conglomerate companies because of the relatively complicated process profit-production, may have weaker relationships earnings and stock returns relative to companies operating in a single industry.

Finally, we include company size, based on market capitalization as a control for other factors that are missing and which affect the relationship between profit and shareholder return. For example, the previous literature on the U.S. case (Atiase, 1985) has documented that disclosure and the private development of information not related to the announced increase profit functions associated with the size of companies. Therefore, we will use the method of least squares, posing as the dependent

variable the cumulative abnormal returns (Cumulative Abnormal Returns-CAR) with the level of voting rights (V), the degree of separation between cash flow and voting rights (CV), and the aforementioned variables identification and control. According to the above methodology, we construct the following research hypotheses:

H_1 : the net earnings affect cumulative stock returns?

H_2 : the market value of equity affects cumulative stock returns?

H_3 : the amount of total liabilities affects cumulative stock returns?

H_4 : the number of industry segment(s) in which the firm operates affects cumulative stock returns?

H_5 : the voting rights level of the largest ultimate owner affects cumulative stock returns?

4. RESULTS

4.1. Analysis of networks

According to network analysis, centrality notions consists an important metric of nodes. During network analysis, it is useful to use and compare three different measures of centrality in relation to the degree, closeness, and betweenness, which can easily be explained as follows (Kydros et al., 2011)

i) The *degree of centrality* is the number of each node's neighbours. When a node is involved in many interactions, then the significance of the node is increased and he plays a key role in the network. However, this type of centrality focuses on the local view of the immediate vicinity and therefore is likely to lead us to misleading perceptions (Kydros et al., 2013).

ii) The *centrality* in relation to the *closeness* of one node is a cumulative measurement of the distance from this node to all other nodes. The number of other vertices is divided by the sum of all distances between the initial node and all the rest. In conclusion, smaller distances to other vertices must represent a higher ranking in terms of proximity. To facilitate interpretation, we can reverse the distances, so that a higher metric means greater importance (Kydros et al., 2013).

iii) The *betweenness centrality* of a node v is calculated when we divide the total number of geodesic distances between pairs of vertices that "pass through" the v . The more you use a hub for the transfer and sharing of information between many pairs, the higher the rating. Nodes with high values regarding this measurement act as brokers in communication (Kydros et al., 2013).

4.2. Statistical analysis of networks

According to network-oriented, the sample separated in "People" and "Companies", and their main results are shown in the table below.

Table 1. Numerical results and statistical analysis of networks

<i>People</i>	<i>Companies</i>
Size N = 1354	Size N = 374
Size L = 9142	Size L = 3070
Loops = 978	Loops = 308
Density: 0.009	Density: 0,041
Average Degree: 13.5	Average Degree:16,4
<i>Distribution of Distances</i> Number of unreachable pairs: 530058 Average distance between reachable pairs: 4.88509 The most distant vertices: Constantine Haitoglou (202) and Jean-Louis Tourne (979). Distance is 12.	<i>Distribution of Distances</i> Number of unreachable pairs: 29480 Average distance between reachable pairs: 4.30694 The most distant vertices Management VIPATHE SA (50) and PIRAEUS WEALTH MANAGEMENT AE (254). Distance is 11.
<i>Weak Components</i> Number of components: 23 Size of largest component: 1140 vertices (84.195%).	<i>Weak Components</i> Number of components: 23 Size of largest component: 332 vertices (88.770%).

Reasonably, the number of edges in the network of people is much greater due to the existence of many more nodes in the people's network. Regarding the number of loops for the first network it is Loops = 978 while for the second Loops = 308. This means that we have identified 978 cases of persons present in more than one company and those companies in which the above persons serve simultaneously are 308. The density of the people's network is 0.009, while the company's network is slightly larger 0,041. The average degree for the network of people is 13.5 and that means that each node interacts with 13.5 others. The minimum value of the degree is 1 and the maximum 76. For the network of companies, the average degree is 16.4 while the minimum and maximum values are 0 and 63 respectively.

An interesting result is an average distance. The values of 4.88 and 4.30 respectively for the two networks fulfil the famous six-degree separation principle in real-life networks (Watts & Strogatz, 1998). The diameters of the networks are 12 for the network of people and 11 for the network of companies. The longest geodesic path (the longest shortest path) is quite large for networks of these cardinalities. The paths that achieve the highest values emerge from Constantine Haitoglou and end at Jean-Luis-Tourne (regarding the people's network)

and for the respective companies it starts from Management VIPATHE SA and ends at BANK WEALTH MANAGEMENT. The most important statistic is the one that determines the overall association of operators of networks, i.e. the total connectivity of these networks. Our results show that the 84.19% of people are connected in one large component (1140 out of a total of 1354 nodes. For the companies network companies, this value is almost at the same level, 88,77% (i.e. 332 nodes of a total of 374). With these values, we can say that the overall connectivity of the network is extremely high, and definitely higher a random network.

Then we move to the analysis of individual networks of persons and companies (Tables 2 and 3). We will focus on the first ten nodes of the networks and the value we get for the three measures of centrality, as mentioned above. The most important node is Basil Fourlis, who appears first in all three measurements. Although the companies he is involved, are not highly ranked on the list of the network of companies, his high scores emanate for the fact that he is a member of the Board of Piraeus Bank (probably the largest Bank in Greece. His position yields the greatest degree of proximities has significant control flow information and is the most central point of the network to monitor the bulk information.

Table 2. Centrality results of the network of people

<i>A/A</i>	<i>NODE</i>	<i>DEGREE</i>	<i>NODE</i>	<i>CLOSENESS</i>	<i>NODE</i>	<i>BETWEENNESS</i>
1	Basil Fourlis	76	Basil Fourlis	0,2545	Basil Fourlis	0,1148
2	Leonidas Bompolas	70	James Georganas	0,2525	James Georganas	0,0903
3	Demetrius Koutras	68	Demetrius Papalexopoulos	0,2522	Odyseus Athanasiou	0,0896
4	Anastasios Kalintsantsis	62	Nicholaos Karamouzis	0,2514	Anastasios Kalintsantsis	0,0795
5	Odyseus Athanasiou	59	Odyseus Kyriakopoulos	0,2505	Demetrius Hadzigrigoriadis	0,0696
6	James Georganas	58	Odyseus Athanasiou	0,2490	Demetrius Klonis	0,0600
7	Nicholaos Karamouzis	58	Spiridon Theodoropoulos	0,2450	Nicholaos Karamouzis	0,0569
8	Andreas Vgenopoulos	58	Spiridon Pantelias	0,2450	Theodore Pantalakis	0,0520
9	Demetrius Klonis	55	Eftixios Vassilakis	0,2431	Spiridon Theodoropoulos	0,0503
10	Spiridon Pantelias	53	Artemis Theodoridis	0,2413	Spiridon Pantelias	0,0490

The Bobolas, Koutras, Kallitsantsis nodes exhibit a very important set of interactions since they participate in the Boards of several companies which are in the top ten of the respective network, but the importance of these nodes is limited as they have no presence in the final table, beyond that of Kallitsantsis, who is in the fourth (4th) position

regarding betweenness. Odyseus Athanasiou, James Georganas, Nicholaos Karamouzis and Spiridon Pantelias are considerably interesting in relation to the results, as they are shown in the top ten in three measures of centrality. Their degrees of closeness are close together, and the values of closeness are almost equal. In measuring betweenness, the

Georganas and Athanasiou are in higher positions, almost double those of Karamouzis and Pantelias. These nodes have partnerships with the top two companies in the respective list of betweenness and four in the whole list. Andreas Vgenopoulos appears in the top ten of measuring the degree and this is due to his presence on the Board of many companies from different sectors. We also point out nodes Demetrius Papalexopoulos, Odysseus Kyriakopoulos, Eftixios Vassilakis and Artemis Theodoridis, as they relate to a large number of companies. Finally, Demetrius Hadzigrigoriadis and Theodore Pantalakis are present in the betweenness list but are not present in the other two ranking. Their joint presence in a large number of different Boards, gives them their important role in the network of people, and therefore the increasing possibilities for them to come into contact with a wide range of information and simultaneously contribute to the promotion of their companies.

Turning then to the analysis of the network of companies (Table 3), we provide the list of the top ten companies that emerged from our data processing. We note that node ELLAKTOR SA seems

to be the most important, as shown in the three measurements of centrality. The values for degree and closeness are maximum, 63 and 0.2901 respectively, which gives the largest number of neighbouring nodes and greater flow control. Regarding betweenness it has the last but one position in the list, the ninth, with a value 0.0738, a result that can be explained from the fact that this company belongs to the Constructions' Sector and therefore cannot be "in the middle" of many interactions as, for example, a Banking organization. Particularly noteworthy in this table is that the measurements of centrality in the degree and closeness, nodes occupying 85% (17 of 20) belong to ELLAKTOR SA and its subsidiaries, which significantly affects the independence of the network. The lists are supplemented by two other companies also in the construction industry, METROPOLITAN CENTER OF PIRAEUS SA and LAMDA DEVELOPMENT SA, and one financial, GREEK EXCHANGES SA. This result can be explained by the fact that during our time-window, this Sector was at its peaks in the overall Greek Economic environment.

Table 3. Centrality results of the network of companies

A/A	NODE	DEGREE	NODE	CLOSENESS	NODE	BETWEENNESS
1	ELLAKTOR SA	63	ELLAKTOR SA	0,2901	PIRAEUS BANK SA	0,1307
2	AKTOR TC SA	59	METROPOLITAN CENTER OF PIRAEUS SA	0,2842	METROPOLITAN CENTER OF PIRAEUS SA	0,1142
3	ILEKTOR SA	58	LAMDA DEVELOPMENT SA	0,2833	ALPHA LEASING SA	0,1126
4	GREEK ENERGY & DEVELOPMENT SA	57	KANTZA TRADING SA	0,2764	KEKROPS SA	0,1012
5	ELTECH WIND SA	56	KANTZA SA	0,2764	GREEK PETROLEUM SA	0,0918
6	BIOSAR ENERGY SA	55	INTERNATIONAL ALKI SA	0,2764	GREEK EXCHANGES SA	0,0844
7	AKTOR CONCESSIONS SA	55	GREEK ENERGY & DEVELOPMENT SA	0,2756	PPCR - TERNA ENERGY SA	0,0813
8	AKTOR FM SA	54	GREEK EXCHANGES SA	0,2746	PPCR GREEK TECHNODOMIKI TC SA	0,0802
9	REDS SA	53	ILEKTOR SA	0,2731	ELLAKTOR SA	0,0738
10	GREEK ENERGY & DEVELOPMENT-RENEWABLE	51	ELTECH WIND SA	0,2726	LAMDA DEVELOPMENT SA	0,0711

We will close with a discussion of the results of centrality in relation to betweenness for the network of companies. These measurements give us very important and special insights. There is a considerable difference regarding the other two measurements, regarding 'heterogeneity' on the industry to which these companies belong. More specifically, two companies of the banking sector are highly ranked on this list, PIRAEUS BANK SA (1st) and ALPHA LEASING SA (3h), with values 0.1307 and 0.1126 respectively. We also see an oil company, GREEK PETROLEUM SA (5th) with a value of 0.0918, a financial company GREEK EXCHANGES SA (6th), 0.0844 and to a greater extent the presence of companies in the construction industry, METROPOLITAN CENTER OF PIRAEUS SA (2nd), 0.1142, KEKROPS SA (4th), 0,1012, PPCR - Terna Energy SA (7th), 0,0813, PPCR GREEK TECHNODOMIKI TEB SA (8th) with value 0.0802, ELLAKTOR SA (9th) and value 0.0738 and finally LAMDA DEVELOPMENT SA (10th) with value 0.0711. Obviously, betweenness centrality yields more important results in terms of explaining the importance of different sectors in the Greek Environment.

4.3. OLS results

Table 4 lists the results of descriptive statistics of the variables determining the model. From these results, we conclude that the set of model variables, dependent and independent, have good statistical distribution (normality).

Table 4. Descriptive statistics

Variables	Mean	Median	Min	Max	Std. Error
CAR (%)	-1.12	-6.96	-62.53	147.49	33.46
NI (%)	7.27	6.31	45.20	461.7	8.32
SIZE	12.03	11.99	7.13	17.05	1.37
Q	1.09	0.83	0.02	7.98	0.95
LEV (%)	46.83	44.16	0.08	259.95	23.57
SEG	2.55	2.00	1.00	9.00	1.16
V (%)	29.93	30.00	20.00	50.00	10.37
CV	0.85	1.00	0.13	1.00	0.22

Table 5 presents the results of the regression model. This model was evaluated in two sets of regressions. In the first equation, we used all the observations of the sample, excluding the observations of variable determining V (the major

shareholder voting rights) of <20%. In the second equation, we used all the observations of the sample, excluding the observations of variable determining V (the major shareholder voting rights) to > 50%. The first equation is numbered as (1) and second (2).

Table 5. Analysis of the ownership structure of firms

Fixing model: $CAR_{it} = a_0 + a_1NI_{it} + a_2NI_{it} * SIZE_{it} + a_3NI_{it} * Q_{it} + a_4NI_{it} * LEV_{it} + a_5NI_{it} * SEG_i + a_6NI_{it} * V_i + a_7NI_{it} * CV_i + (Fixed\ effects) + u_{it}$		
	Equation (1)	Equation (2)
Intercept	-0.18*** (-10.39)	-0.17*** (-9.09)
NI	-0.59 (-1.17)	-0.99 (-1.79)
NI*SIZE	0.10*** (2.67)	0.12*** (2.89)
NI*Q	-0.00 (-0.05)	-0.03 (-0.34)
NI*LEV	1.03*** (4.09)	0.99*** (3.71)
NI*SEG	-0.09*** (-2.71)	-0.11*** (-2.83)
NI*V	-1.20** (2.47)	-0.21 (-0.29)
NI*CV	0.69*** (3.49)	0.74*** (3.44)
Adj-R ²	0.27	0.26

Note: *** Significance level of 1% (2-tailed)

** Significance level of 5% (2-tailed)

* Significance level of 10% (2-tailed)

Regarding the test pattern determining variables are: where CAR_{it} net accumulated equity returns of the firm i in year on year at the time t . The annual returns are based on a continuous monthly recapitalization, until the announcement at the annual outturn statement. NI_{it} relates to net earnings in year t divided by the market value for year t for firm i . $SIZE_{it}$ is the natural logarithm of the market value of the firm at the beginning of year t for firm i . Where Q_{it} the market value of the company divided the book value of total assets at the beginning of year t for firm i . LEV_{it} total liabilities divided by total assets at the beginning of year t for firm i . Where SEG_i is the number of parts of the industry where the company develops i . V_i terms of voting rights of major shareholders (shareholders with significant stakes) of company i . Finally, where CV_i represents the ratio of voting rights to receive cash flows mainly shareholders i .

Specifically, we found that the reporting of profits by the big companies (large base of the cap) containing further information as determined by the statistically significant and positive coefficient of NI*SIZE, with a degree of significance for $p < 1\%$. Instead, the rate NI*Q have a non- statistically significant suggesting that the risk and impact of development offset from one another. The estimated coefficient of NI*LEV is statistically significant at level $p < 1\%$ and is consistent with the view that firms particularly high borrowing (Leveraged) tend to be mature businesses that provide a high degree of information through the reported profits. The coefficient of NI*SEG presented negatively also statistically significant for $p < 1\%$, suggesting that corporate groups conveying less information via their profits.

This gives us evidence that despite the adoption of the International Accounting Standards,

members of the BoD's of the Greek listed companies in the stock market has not achieved full compliance with the standards and disclosure requirements imposed, in respect of intra-corporate transactions. Instead, the NI rate is negative but statistically insignificant.

This does not mean that profits do not provide information because the regressions indicate that stock returns are significantly related positively to profits. The relationship becomes insignificant in equation (1) because the inclusion of additional independent variables can be tested for the bulk of the change in NI, reducing the interpretive power. The intercept is also negative and statistically significant, which (the minus sign) that might be due to the omission of expected profits.

In particular, when included in a model with lagged earnings as expected earnings and replacing net income by the change in profits (earnings minus current year earnings lagged divided by the market value of the company hysteresis) in a regression model, the effect size of intercept reduced to more than half.

Certainly, the focus of the analysis in Table 5 and 6 is the role of the ownership structure of listed companies. The results of the model (1) show that the coefficient of determination NI*V is negative and statistically significant at the level of $p < 5\%$. This result is consistent with the effect of information that the concentration of units with large voting rights associated with privacy and low-level information content in earnings press releases. The result also shows that the impact of information, there is the incentive alignment, which provides that an additional concentration of ownership beyond the minimum level of effective control increases the information content of earnings.

To better understand the economic importance of the result, we tested the model of regression (1), using the average of all variables by calculating the change in the cumulative abnormal return (CAR) that will be caused by the effect of an increase in standard deviation units of variable voting rights (V). The results show that when the variable V increased from its mean, which is 30%, by one standard deviation at 40%, the level of cumulative yields abnormally (CAR) is reduced by 1%, which corresponds to a change equal 9% compared with the previous level.

Furthermore, we tested the effect level caused the transfer of information through profits from the separation of an ownership share in the company cash flow and voting rights. The relationship of the index holdings in cash CV, by definition, is inversely proportional to the deviation of the voting rights based on equity. Therefore, to be consistent with the effect of vesting and/or the impact of information, there should be a very positive, statistically significant estimate of the coefficient CV. Consistent with our conjecture above, the coefficient of determination CV is positive and statistically significant at level $p < 1\%$. The above result expressed in terms of economic significance indicates that when all independent variables are measured based on their instruments; a reduced rate of CV from the medium (85%) by one standard deviation in 63% associated with 1% reduction in the level the cumulative abnormal returns (CAR), which

represents 11% decrease from the previous level.

In short, when the owners and major shareholders effectively control their business levels voting rights are negatively related to the information content of reported earnings. This suggests that the effect of information dominates over the incentive alignment of ownership. We also found that, after reaching the level of control of voting rights, the voting rights arising from shares held in the capital, weaken significantly the information content of reported earnings. This result is consistent with the phenomenon of the effect of entrenchment of rights. Simultaneously, it is consistent and the phenomenon of channelling information provided that the owners hold major shares control, tend to use multiple operators or pyramidal ownership structures for the protection of the information associated with other gainful activities. Their strategy was confirmed by the first level of analysis of this study, which concludes the existence of the same persons in positions other board business, either as a parent-subsidiary (a group of companies) or as independents.

Respectively the results are listed in Table 6. Specifically, we observe that the variables NI*SIZE, NI*Q, NI*LEV and NI*SEG, show variations in terms of their statistical significance per year, which characterizes the high level of volatility in the economic environment of our country.

Table 6. Regressions results in interaction with the ownership structure

Model specification: $CAR_{it} = a_0 + a_1NI_{it} + a_2NI_{it} * SIZE_{it} + a_3NI_{it} * Q_{it} + a_4NI_{it} * LEV_{it} + a_5NI_{it} * SEG_{it} + a_6NI_{it} * V_{it} + a_7NI_{it} * CV_{it} + (Fixed\ effects) + u_{it}$				
	2013	2014	2015	2016
Intercept	-0.26*** (-7.51)	-0.01 (-0.28)	-0.27*** (-8.35)	-0.25*** (-10.97)
NI	-1.28 (-1.03)	1.25 (1.05)	-2.61** (-2.08)	0.24 (0.23)
NI*SIZE	0.29*** (3.39)	-0.18* (-1.94)	0.33*** (3.61)	-0.01 (-0.12)
NI*Q	-0.32 (-1.43)	-0.13 (-0.61)	-0.22 (-1.22)	0.26* (1.79)
NI*LEV	0.44 (1.09)	1.46** (2.13)	-0.10 (-0.19)	1.54*** (3.42)
NI*SEG	-0.14* (-1.87)	-0.06 (-0.67)	-0.12* (-1.77)	0.04 (0.55)
NI*V	-3.14*** (-3.26)	-0.07 (-0.06)	-0.85 (-0.76)	-2.30** (-2.42)
NI*CV	0.99** (2.17)	1.13** (2.19)	0.88* (1.89)	0.77* (1.72)
Adj-R ²	0.21	0.16	0.19	0.20

Note: *** Significance level of 1% (2-tailed)

** Significance level of 5% (2-tailed)

* Significance level of 10% (2-tailed)

Also, as already mentioned above, in the determination of the variables under consideration, or are divided by market value, which varies strongly due to the economic crisis, either by total assets, which also varies considerably.

Regarding the variables determining the ownership structure of firms, we observe that although NI*V is negative and statistically significant only in the years 2013 and 2016 for p <1% and p <5%, but this does not negate the negative impact as to the percentage of accumulated abnormal returns (CAR%). Also, the coefficient of determination NI*CV remains positive and statistically significant for the

whole period under consideration (2013-2016) and at levels p <5% and p <10% for the 2013-2014 and 2015-2016 respectively.

As observed in both cases the results are consistent with the literature, making clear that while there is a high concentration of voting rights via shares, so weakened the informational role of reported earnings.

5. DISCUSSION

The results of this study indicate the existence of a highly connected and interdependent network between companies and the people constitute the BoD's. Also, the results show that in their entirety the companies are related and there is a high degree of interaction. In this key role played by the simultaneous presence of persons who make up their Boards of Directors, we may support with certainty that there is a significant degree of interdependence and interaction in the overall network effect.

We also expected that the joint service of persons in more than one company will give us important data. This hypothesis was confirmed by the analysis of the network of people, as we realized that this is a network with a high degree of concentration, with a significant number of persons linked together, to interact, to be recipients of large amounts of information and play a very important role in manipulating and disseminating them. It's also worth noting the existence of very small and isolated systems, which interact only internally and not associated directly or indirectly with the bulk of the network.

Similarly, the network of companies, we found equally, that this is a highly interdependent network. There is a significant concentration of information and interaction effect covering our initial goals. One of the main objectives of the study was confirmed as the final form of the network of companies, appears to interact heavily with the majority of the number of selected companies in the sample, correlate and creates a common information network.

Based on these results, we believe that the study met its objective and demonstrated that a very important part of all business information, processes and routed respectively, largely associated individuals and companies.

The economic crisis in the Greek economy since 2013, led us to investigate whether the level of publication of financial data of listed companies in the Greek stock market is sufficient. Although this problem should have been solved in 2005 by the mandatory adoption of International Financial Reporting Standards, the results show that the Greek supervisory authorities and the Greek companies have "eased" significantly observance of the necessary disclosures as provided by the standards (Athianos et al., 2005).

However, there are some research limitations related to the shortness of the examination period. We believe that a longer time period of ten years will be better suited to the above-employed methodology, avoiding some econometric problems. Moreover, an expanded data set of companies may give us more applicable results.

On the contrary, the above research limitation

could be a further research opportunity in order to generalize the results. More specific, an expansion of data set to companies belonging to different countries would be useful in order to compare the effect of corporate governance in disseminating information to stakeholders. Finally, the use of population as a data set will be helpful in order to avoid econometric problems.

6. CONCLUSION

This research was based on the development of five basic research hypotheses. The objective of this paper was to test the information content of reported earnings, on the ownership structure. More specifically, we found that the reporting of profits by the big companies (large base of the cap) containing further information as determined by the statistically significant and positive coefficient of NI*SIZE, with a degree of significance for $p < 1\%$. This result confirms the H1 research hypothesis. Moreover, the estimated coefficient of NI*LEV is also statistically significant at level $p < 1\%$ and is consistent with the view that firms particularly high borrowing (Leveraged) tend to be mature businesses that provide a high degree of information through the reported profits, conforming, also research hypothesis H3. Instead, the rate NI*Q have a non-statistically significant suggesting that the risk and impact of development offset from one another, rejected the H2. The coefficient of NI*SEG presented negatively also statistically significant for $p < 1\%$, suggesting that corporate groups conveying less information via their profits.

Finally, the results show that the coefficient of determination NI*V is negative and statistically significant at the level of $p < 5\%$. This result is

consistent with the effect of information that the concentration of units with large voting rights associated with privacy and low-level information content in earnings press releases. The result also shows that the impact of information, there is the incentive alignment, which provides that an additional concentration of ownership beyond the minimum level of effective control increases the information content of earnings.

Moreover, in this research, we hypothesized that high level of ownership concentration, while the high degree of separation of ownership and control, which is common for the Greek market, weakens the information content of reported earnings to investors. Two explanations are provided.

The first explanation is based on the control rights of the owners. The reliability of earnings weakened because the minority expects the ownership structure gives major shareholders the ability to control both the ability and the incentive to manipulate earnings either to their final elimination or reference publications that do not involve information on earnings, aiming to avoid detection of activities erase profits.

The second explanation relates to proprietary information. As speculative activities are widespread and highly profitable in this field, it is in the interests of speculators, who seek the high concentration of ownership of firms by making rights, so that their activity may not be obvious to potential competitors and the investing public. The argument concerning the effect of information provides that the high concentration of ownership associated with low levels of information on the announced earnings.

The empirical results of this study are generally consistent with the above arguments.

REFERENCES

1. Al-Matari, E. M., Al-Matari, Y. A., & Saif, S. A. (2017). Ownership structure, audit quality and firm performance moderating and direct-effect models: An empirical study. *Corporate Board: role, duties and composition*, 13(1), 28-35. <http://doi.org/10.22495/cbv13i1p3>
2. Hamdouni, A. (2010). Ownership, board structure, and corporate performance: Evidence of French VC-backed firms. *Corporate Board: role, duties and composition*, 6(3), 7-20. <http://doi.org/10.22495/cbv6i3art1>
3. Athianos, S., & Dimitras, A. (2017). Mandatory disclosure requirements according to IAS 24 and compliance. Paper presented at the *International Conference on Business & Economics* of the Hellenic Open University, Athens, April 21-23, 2017.
4. Athianos, S., Vazakidis, A., & Dritsakis, N. (2005). *Financial statement effects of adopting international accounting standards: The case of Greece*. <https://doi.org/10.2139/ssrn.1829348>
5. Atiase, R. K. (1985). Pre-disclosure information, firm capitalization, and security price behaviour around earnings announcements. *Journal of Accounting Research*, 23(1), 21-36. <https://doi.org/10.2307/2490905>
6. Berle, A. A. Jr. (1959) *Power without property. A new development in American political economy*. New York: Harcourt, Brace and Company.
7. Berle, A. A. Jr., & Means, G. (1932-1991). *The modern corporation & private property*. New Edition, Brunswick (USA) and London (U.K.): Transaction Publishers.
8. Buch-Hansen, H. (2014). Social network analysis and critical realism. *Journal for the Theory of Social Behaviour*, 44(3), 306-325. <https://doi.org/10.1111/jtsb.12044>.
9. Bradley, M., & Han Kim, E. (1985). *The tender offer as a takeover device: Its evolution, the free rider problem, and the prisoner's dilemma* (Working paper, University of Michigan, Ann Arbor, MI).
10. Chau, M., & Xu, J. (2008). Using web mining and social network analysis to study the emergence of cyber communities in blogs. In H. Chen, E. Reid, J. Sinai, A. Silke, B. Ganoz (Eds.), *Terrorism informatics: Knowledge management and data mining for homeland security* (pp. 197-220). Germany: Springer.
11. Claessens, S., Djankov, S., & Lang, L. H. P. (2000). The separation of ownership and control in East Asian corporations. *Journal of Financial Economics*, 58(1-2), 81-112. [https://doi.org/10.1016/S0304-405X\(00\)00067-2](https://doi.org/10.1016/S0304-405X(00)00067-2)
12. Collins, D. W., & Kothari, S. P. (1989). An analysis of the intertemporal and cross-sectional determinants of the earnings response coefficients. *Journal of Accounting and Economics*, 11, 143-181.
13. Dhaliwal, D., Lee, K., & Fargher, N. (1991). The association between unexpected earnings and abnormal security returns in the presence of financial leverage. *Contemporary Accounting Research*, 8(1), 20-41.

- <https://doi.org/10.1111/j.1911-3846.1991.tb00832.x>
14. Guerra, S., & Santos, R. L. (2011). Busy boards: How does the simultaneous participation of directors in multiple companies affect the board's activities? *Corporate Board: role, duties and composition*, 7(3), 79-89. <http://doi.org/10.22495/cbv7i3art6>
 15. Jensen, M. C. (2001). Value maximization, stakeholder theory and the corporate objective function. *Journal of Applied Corporate Finance*, 14(3), 8-21. <https://doi.org/10.1111/j.1745-6622.2001.tb00434.x>
 16. Krackhardt, D. (1996). Social networks and the liability of newness for managers. In C. L. Cooper & D. M. Rousseau (Eds.), *Trends in organizational behavior* (pp. 159-173). New York: John Wiley and Sons.
 17. Kydros, D., Notopoulos, P., & Kaparis, A. (2015). A topological network analysis of Greek firms. *Journal of Computational Optimization in Economics and Finance*, 2(2).
 18. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of financial economics*, 58(1), 3-27. [https://doi.org/10.1016/S0304-405X\(00\)00065-9](https://doi.org/10.1016/S0304-405X(00)00065-9)
 19. Main, B. G. M. (2010). Corporate governance and the board's locus of control - The case of the ABI's treatment of footprints. *Corporate Board: role, duties and composition*, 6(3), 60-69. <http://doi.org/10.22495/cbv6i3art6>
 20. El Manaa, W., Khelif, W., Ingley, C., & Karoui, L. (2010). Board composition in family-influenced firms: A dynamic perspective. *Corporate Board: role, duties and composition*, 6(3), 21-30. <http://doi.org/10.22495/cbv6i3art2>
 21. Meyer, E., & de Wet, J. H. v. H. (2013). The impact of board structure on the financial performance of listed South African companies. *Corporate Board: role, duties and composition*, 9(3), 18-31. <http://doi.org/10.22495/cbv9i3art2>
 22. Soliman, M. M., Ragab, A. A., & Eldin, M. B. (2014). Corporate governance structure and firm' financial performance: Evidences from Egypt. *Corporate Board: role, duties and composition*, 10(1), 49-59. <http://doi.org/10.22495/cbv10i1art4>
 23. Basuony, M. A. K., & Mohamed, E. K. A. (2014). Board composition, ownership concentration, and voluntary internet disclosure by MSM-listed companies. *Corporate Board: role, duties and composition*, 10(1), 60-70. <http://doi.org/10.22495/cbv10i1art5>
 24. Marlow, C. (2004). Audience, structure and authority in the weblog community. *International Communication Association Conference*, 27.
 25. Martino, F., & Spoto, A. (2006). Social network analysis: A brief theoretical review and further perspectives in the study of information technology. *PsychNology Journal*, 4(1), 53-86.
 26. Marin, A., & Wellman, B. (2014). Social network analysis: an introduction. In P. Carrington, & J. Scott (Eds.), *Handbook of social network analysis*. London: Sage.
 27. Ab Razak, N. H., & Palahuddin, S. H. (2014). Corporate governance and earning management: Evidence from 200 Malaysian listed firms from the period of 2007 to 2011. *Corporate Board: role, duties and composition*, 10(1), 6-17. <http://doi.org/10.22495/cbv10i1art1>
 28. Ntoun, L. A. T., Vila Biglieri, J. E., De Oliveira, S. H. M., Benjamim, M. F., Outman, B. C., & Masárová, E. (2017). The impact of ownership structure on firm performance: The role of chairman and CEO in Portugal. *Corporate Board: role, duties and composition*, 13(2), 6-19. <http://doi.org/10.22495/cbv13i2art1>
 29. Nwafor, A. O. (2016). Examining the concept of de facto director in corporate governance. *Corporate Board: role, duties and composition*, 12(2), 12-21. <http://doi.org/10.22495/cbv12i2art2>
 30. Onamson, F. O. (2015). Devolution of corporate managerial powers: A critical analysis. *Corporate Board: role, duties and composition*, 11(3), 66-83. <http://doi.org/10.22495/cbv11i3art6>
 31. Pajek (2007). *Program for large network analysis*. Retrieved from the World Wide Web: <http://vlado.fmf.unilj.si/pub/networks/pajek/>
 32. Quan-Haase, A., & Wellman, B. (2006). Hyperconnected network: Computer-mediated community in a high-tech organization. In C. Heckscher & P. Adler (Eds.), *The firm as a collaborative community: Reconstructing trust in the knowledge economy* (pp. 281-333). New York: Oxford University Press.
 33. Sheikh, S., & Chatterjee, S. K. (1995). Perspectives on corporate governance. In S. Sheikh & W. Rees (Eds.), *Corporate governance and corporate control*. London: Cavendish publishing Ltd.
 34. Stout, L. (2012). *The shareholder value myth: How putting shareholders first harms investors corporations' and the public*. Oakland, CA: BerretKoehler Publications.
 35. Tricker, R. I. (1994). *International corporate governance: Text, cases and readings*. New Jersey: Prentice Hall.
 36. Tsene, C. (2017). Corporate governance and board of directors in Greek listed companies. *Corporate Board: role, duties and composition*, 13(2), 38-45. <http://doi.org/10.22495/cbv13i2art4>
 37. Haryono, T., Rahmawati, Purwaningsih, Y., Prabowo, M. A., & Suratman, E. (2015). Corporate control, agency problem and board composition: Evidence from Indonesia. *Corporate Board: role, duties and composition*, 11(2), 121-131. <http://doi.org/10.22495/cbv11i2art10>
 38. Vazakidis, A., & Athianos, S. (2010). Measuring investors' reaction to the adoption of international financial reporting standards in Greece, using a market-based model. *American Journal of Economics and Business Administration*, 2(1), 103-112. <https://doi.org/10.3844/ajebasp.2010.103.112>
 39. Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. UK: Cambridge University Press.
 40. Watts D. J. (1999). *Small-worlds: The dynamics of networks between order and randomness*. USA: Princeton University Press.
 41. Zhang, X., Taylor, D., Qu, W., & Wise, V. (2013). Institutional ownership, audit committee and risk disclosure - Evidence from Australian stock market. *Corporate Board: role, duties and composition*, 9(3), 66-81. <http://doi.org/10.22495/cbv9i3art6>
 42. Nulla, Y. M. (2015). Board influence and CEO power to executive compensation system in American SMEs. *Corporate Board: role, duties and composition*, 11(2), 132-145. <http://doi.org/10.22495/cbv11i2art11>