

# The Impact of Leadership Structure Characteristics on Performance Indicators within the Technology Sector of S&P 500 Component Companies

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## Abstract

*Corporate governance is becoming increasingly important. This is evidenced by the various issues of major companies coming to light as people pay more attention to CSR concepts. Scandals such as those arising from questionable practices of large companies like Wells Fargo, Equifax, Enron, and many others have raised questions about the effectiveness of corporate governance mechanisms. This has led to stricter laws and the introduction of new regulations aimed at improving these mechanisms. Thus, the purpose of the study is to analyse the influence that leadership structure characteristics have on financial performance. The empirical analysis is based on 39 technology companies, components of the S&P 500 Index. The research relies on panel data analysis over a period of 12 years (2011-2022). The results show that the characteristics of leadership structures impact the economic and financial profitability rates of technology companies within the S&P 500 Index.*

**Keywords:** CEO duality, gender diversity, board size, independency, compensation committee, leverage, ROA, ROE, technology sector, USA, S&P 500

**JEL classification:** C4, G34, H32, N22

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## ➤ Introduction

Over time, corporate governance has been characterized by continuous evolution in response to economic and social challenges. From eighteenth-century trading companies to modern global corporations, the importance of corporate governance has significantly increased, reflecting the ongoing need for transparency, accountability, and ethical practices in the business environment.

In today's business world, corporate governance has begun to play a crucial role in ensuring the long-term success of companies. This concept primarily refers to the system by which companies are directed and controlled, based on a set of rules, practices, and processes aimed at balancing the interests of all stakeholders (shareholders, managers, customers, suppliers, creditors, etc.). Thus, corporate governance primarily focuses on promoting transparency, accountability, and integrity within an organization.

Given past events involving companies like Wells Fargo, Equifax, and Enron, which highlighted the need for serious reforms, the importance of corporate governance cannot be underestimated, as it has a direct impact

on financial performance. A solid corporate governance structure not only contributes to better decision-making but also reduces the risks of fraud and abuse and improves investor relations. All these factors lead to enhanced reputation, increased shareholder value, and long-term performance improvements.

The purpose of this study is to analyse the influence that leadership structure characteristics have on the financial performance of technology companies within the S&P 500 Index. The sample contains observations from 2011 to 2022. Our choice of the S&P Index and the technology sector was motivated by its global recognition and the growing interest in technology companies, which are increasingly featured in scientific and media articles.

I selected ROE and ROA as dependent variables, as these are the most commonly used performance indicators. As independent variables, we chose CEO duality, board size, the proportion of women on the board, and the independence of the remuneration committee. The motivation behind this study and the choice of these variables was to understand the role that these corporate governance variables play in the long-term performance of firms and to deepen knowledge in the field. This work is addressed to both the academic and business communities.

In summary, I found the following relationships: gender diversity has a direct impact on performance rates, while the independence of the remuneration committee has a direct and statistically significant impact only on ROA. CEO duality has a negative effect on both ROA and ROE, and there is no statistically significant relationship between board size and profitability rates.

Regarding the structure of the study, Chapter 1 presents the US Corporate Governance Code, Commonsense Principles 2.0, a key element that must be understood from the outset to interpret and analyse the obtained results. Chapter 2 consists of a review of the relevant literature, summarizing scientific research in the field to provide a starting point and comparison for our own findings. In Chapter 3, we describe the database used, its descriptive statistics, and the methodology employed. Chapter 4 presents the results and their interpretation, while Chapter 5 consists of conclusions and potential ways to improve the study.

## **1. US Corporate Governance Code**

The US Corporate Governance Code, Commonsense Principle 2.0, was last updated on 18th October 2018 and consists of eight chapters in which the corporate governance standards that every company listed on US exchanges must adhere to are laid out explicitly.

The first chapter is the longest because it contains recommendation with regards to the board of directors. Thus, it is desirable to exist a significant majority of independent members and the audit, nominalisation, and compensations committees to be independent as well. Also, the board has to be diversified to ensure a variety of perspectives. There are no recommendations regarding the board rotation or the retirement age.

Within the second chapter are presented the board responsibilities regarding communication with third parties and setting the main points of discussion during meetings, such as future business decisions, CEO's performance evaluation, value creation for shareholders, potential and significant risks, performance standards, and shareholders' main concerns. To ensure an open and free discussion it is recommended that it take place in the absence of the CEO and other managers.

The third chapter highlights the shareholders rights. Thus, it is recommended that all the shareholders to be treated equally and, in order to prevent any potential abuses of power from minority shareholders, it is suggested to establish a minimum number of acquired stocks.

The fourth chapter refers to public reporting taking into consideration the importance the transparency with regards to quarterly financial results and forecasted numbers. Also, the long-term goals must be presented and explained in such a manner that allows their evaluation and measurement.

The role of the management functions of the board of directors are highlighted in the fifth chapter. There are two common structures for independent board leadership in US: Chairman and Lead independent director. This board decides whether it is appropriate that both roles of Chairman and CEO to be combined or separated. If they are combined, then the company shall have a Lead independent director and a strong governance structure. The responsibilities of both, Chairman and Lead independent director, must be well defined, agreed by the board, and presented to shareholders.

The sixth chapter presents the way that the plan to achieve the company's goals is evaluated. The senior managers may be evaluated by the board members and shareholders based on an evaluation of key employees, this direct exposure being useful for the evaluation. The companies must present the board's plan for achieving the goals shareholders and must also have a back-up plan in case of emergency or unforeseen situations.

Recommendation with regards to management compensations are exhibited in the seventh chapter. Therefore, it should be done according to both the industry and the nature of the business. Also, it is necessary that the remuneration to have continuity and to ensure an alignment with long-term performance. Another recommendation would be that the salary have a long-term and a short-term component, taking also into consideration remuneration with shares and similar instruments. It is also mentioned that the companies shall maintain a clawback policy for both cash and equity component.

The last chapter presents the role if institutional investors in corporate governance. Thus, institutional investors must exercise their right to vote carefully in the context of obtaining long-term performance and actively participate with management and the board in managing the business, as well as evaluate the performance of directors. Institutional investors should also alert the company about critical issues as quickly as possible in a constructive and proactive manner, creating a bond of trust between shareholders and the company. Finally, it is very clearly stated that they must make public the vote of the general meetings of shareholders.

Therefore, following the presentation of this code, the conclusion is that, in the United States of America, corporate governance emphasizes the well-being of shareholders, who are the most important stakeholders, the creation of long-term value and the very important role of institutional investors in regarding corporate governance aspects.

## **2. Literature review**

Corporate governance is becoming increasingly important. This is evidenced by the various problems of large companies that come to light as people pay more and more attention to the concepts of CSR (corporate social responsibility). Scandals such as those that occurred due to the questionable practices of large companies such as Wells Fargo, Equifax, Enron, and many others have raised a number of questions regarding the effectiveness of corporate governance mechanisms. This led to a tightening of laws and the introduction of new regulations that aimed to improve these mechanisms. Two of these efforts are the Sarbanes Oxley Act, of 2002, and the Dodd-Frank Act, of 2010.

However, many research papers conducted in the field of corporate governance these days does not focus on the problems faced by corporations in this aspect, but on the impact of corporate governance variables on financial performance.

In the knowledge stage, we will briefly analyse the conclusions of such research papers using the specialized literature. All the research covered in this chapter used either ROA, ROE, Tobin's Q, or a combination of these as performance indicators.

Over the years, CEO duality was the target of many articles, being one of the most important variables of corporate governance.

According to [Cullinan et al. \(2012\)](#), CEO duality occurs when both the function of CEO and the function of Chairman of board of directors are occupied by the same individual. In some countries (e.g. UK), CEO duality is not considered optimum looking from a good corporative governance point of view. On the other way, this is still a common practice in USA.

[Finkelstein and D'Aveni \(1994\)](#) suggested that CEO duality is like a two-edged sword, having opposite effect that the board must balance them so that power of management does not adversely affect the interests of stockholders.

[Falaye \(2007\)](#) examined the relationship between CEO duality and firm performance. His results suggest that CEO duality is beneficial only for some firms, this being a function of their characteristics. From another perspective, [Rutledge et al. \(2016\)](#) concluded that CEO duality has negative effects on the performance of NASDAQ-100 Index companies.

Regarding the number of board members, [Campion and Higgs \(1995\)](#) argue that a board should contain the smallest number of members who bring the necessary resources and who are able to complete the necessary tasks – with the smaller the board, the better (assuming it is not short-staffed).

In their research on the impact of the board of directors on a firm's performance, [McIntyre et al. \(2007\)](#) found a positive relationship between the number of members on a board of directors and firm performance. Therefore, as the number of board members increases, financial performance tends to increase. Also, another study, by [Chaganti et al. \(1985\)](#), examined the relationship between financial performance and board size by comparing pairs of 21 retail firms that either went bankrupt or not. The results show that firms that did not go bankrupt had a higher number of board members.

From another perspective, [Evans and Dion \(1991\)](#) concluded that a board of directors is more cohesive, with a positive correlation between membership group cohesion and financial performance.

One thing that is becoming increasingly important these days is the gender diversity of boards of directors. In retrospect, women were excluded in most cultures from formal education. Because of this, the lack of competitive female human capital is the main argument that has been used to explain gender imbalances in boards of directors ([Terjesen et al., 2009](#)). Later, the question arose as to whether the presence of women in the boards of directors leads to the improvement of performance indicators. In this sense, numerous studies have been conducted that analysed whether and to what extent the specific character traits of women on the board influence a company's performance.

One of these is the one carried out by [Herrera-Cano and Gonzalez-Perez \(2019\)](#), which involved the compilation of 80 studies on this subject and their processing using meta-analytic techniques and systematic review. The conclusion reached is that, although positive, the correlation between the number of women on boards and financial performance is not statistically significant.

The independence of the compensation committee is necessary to ensure good and transparent corporate governance in a company. When this board is not independent, we cannot ensure that remuneration is set in an objective and fair manner, as members are influenced by personal monetary interest.

In a study analysing the independence of this committee and its influence on financial performance, [Cybinski and Windsor \(2013\)](#) suggest that firm size is an important factor in determining the alignment of CEO compensation with financial performance. For example, large firms tend to do this while small firms do not, and this implicitly affects financial performance.

Another study, by [Appiah and Chizema \(2015\)](#), examines whether the remuneration committee has a significant positive correlation with corporate failure. They used 1,835 annual observations of 98 UK non-financial firms that failed and 269 that did not, using cross-sectional, fixed data and Logit models. They found that there is a negative correlation between the independence of compensation committee's director and company failure.

### 3. Database and research methodology

For this research, we collected and analysed annual data from 2011 to 2022 for 39 technology companies included in the S&P 500 Index. This selection was made due to data availability constraints. The data encompassed CEO duality, board size, gender diversity, and the independence of the compensation committee. The dependent variables selected were the performance metrics ROA and ROE. To ensure the stationarity of the variables, we conducted unit root tests, which indicated that all variables were stationary, leading to the acceptance of the alternative hypothesis. However, given the presence of substantial outliers in the data series for the proportion of women on boards and financial leverage, we applied a 10% winsorization procedure. This resulted in a panel dataset comprising 406 observations.

Therefore, the description of the variables used is as follows:

- **Return on assets (ROA).** Because it is an indicator that helps us evaluate how efficiently a company generates profit with the assets it has available, it is most useful when comparing companies within the same industry. This is due to the fact that the assets required for conducting business are similar across companies in the same sector.
- **Return on equity (ROE).** It is one of the most important indicators for measuring a company’s performance, estimating the earnings per unit of invested capital. Similar to ROA, ROE is very useful when comparing companies within the same industry, as it varies from one sector to another.
- **CEO duality.** In the study, this indicator was represented as a dummy variable: it takes the value of 1 if the roles of CEO and Chairman of the board are held by the same person, and 0 otherwise.
- **Board size.** Represents the total number of board members.
- **Board gender diversity.** It is the proportion of women in board.
- **Compensation committee independence.** Represents the proportion of independent members within the compensation committee.
- **Leverage.** Although the sample consists solely of companies in the technology industry, the specific characteristics of their boards of directors might pose challenges for interpreting the results. To address this issue, we included leverage, defined as the ratio of debt to equity

Table 1. Variables used

Variables	Unit measure	Notion	Source	Expected effect
<b>✓ Dependent</b>				
Return on assets	%	ROA	LSEG – Refinitiv	
Return on equity	%	ROE	LSEG – Refinitiv	
<b>✓ Independent</b>				
CEO duality	Dummy (1/0)	CEO_D	LSEG – Refinitiv	Negative
Board size	Coefficient	BS	LSEG – Refinitiv	Positive
Board gender diversity	%	BGD_WIN	LSEG – Refinitiv	Positive
Compensation committee independence	%	CCI	LSEG – Refinitiv	Positive
<b>✓ Control</b>				
Leverage	%	D_E_WIN	LSEG – Refinitiv	

Source: Author’s analysis.

The table below showcases the descriptive statistics for the variables employed in the econometric models, along with the correlation matrix.

Table 2. Descriptive statistics

	BGD_WIN	BS	D_E_WIN	CCI	CEO_D
Mean	0.20917	10.25616	0.67896	0.99229	0.53695
Median	0.20000	10.00000	0.43000	1.00000	1.00000
Maximum	0.38460	15.00000	2.67900	1.00000	1.00000
Minimum	0.07140	4.00000	0.00000	0.75000	0.00000
Standard deviation	0.07952	1.97350	0.71922	0.03883	0.49925
Skewness	0.17147	-0.17722	1.67083	-5.02019	-0.14819
Kurtosis	2.06818	2.98974	4.97113	27.13350	1.02196
Jarque-Bera	16.67817	2.12691	254.63030	11,558.06000	67.67482
Probability	0.00024	0.34526	0.00000	0.00000	0.00000
Sum	84.92460	4,164.00000	275.65700	402.87120	218.00000
Sum of squared deviation	2.56089	1,577.36000	209.49480	0.61052	100.94580
Observations	406	406	406	406	406

Source: Author’s analysis in EViews.

As observed, for the variable BS, the Skewness value is negative and close to 0, while the Kurtosis value is close to 3, indicating a nearly normal distribution of this dataset. This is further confirmed by the Jarque-Bera test probability, which is higher than 5%.

Regarding the variables CEO\_D and CCI, we also notice a negative Skewness, indicating negative skewness for both datasets, and both are platykurtic, with Kurtosis being less than 3. Thus, the datasets for these variables do not follow a normal distribution.

The datasets for both variables BGD\_WIN and D\_E\_WIN are not normally distributed either, as they exhibit positive skewness, with the former showing platykurtosis and the latter leptokurtosis.

Table 3. Correlation matrix

	BGD_WIN	CEO_D	BS	D_E_WIN	CCI
BGD_WIN	1				
CEO_D	0.17267	1			
BS	0.07718	-0.02309	1		
D_E_WIN	-0.08647	-0.06026	-0.07160	1	
CCI	0.12067	0.32618	-0.08585	0.09299	1

Source: Author’s analysis in EViews.

Using the correlation matrix, we examined multicollinearity. Thus, variables showing strong correlation would not have been included in the model, with the reference value being +/-0.4. Since none of the correlation coefficients exceed the reference threshold, all variables were eligible for inclusion in the regression.

To accomplish this study, we constructed two econometric models based on a panel dataset and employed the Least Squares (LS) method to investigate the impact of board characteristics on financial performance, specifically ROA and ROE.

Thus, the equations for our regression models are as follows:

$$ROA = \beta_0 + \beta_1 \times BGD\_WIN + \beta_2 \times CEO\_D + \beta_3 \times BS + \beta_4 \times CCI + \beta_5 \times D\_E\_WIN \quad (1)$$

$$ROE = \beta_0 + \beta_1 \times BGD\_WIN + \beta_2 \times CEO\_D + \beta_3 \times BS + \beta_4 \times CCI + \beta_5 \times D\_E\_WIN \quad (2)$$

To construct the models, we opted not to apply fixed or random effects because, for both ROA and ROE, the data are not normally distributed. This could potentially distort the accuracy of estimations generated by models with fixed and random effects.

#### 4. Presentation and interpretation of the results

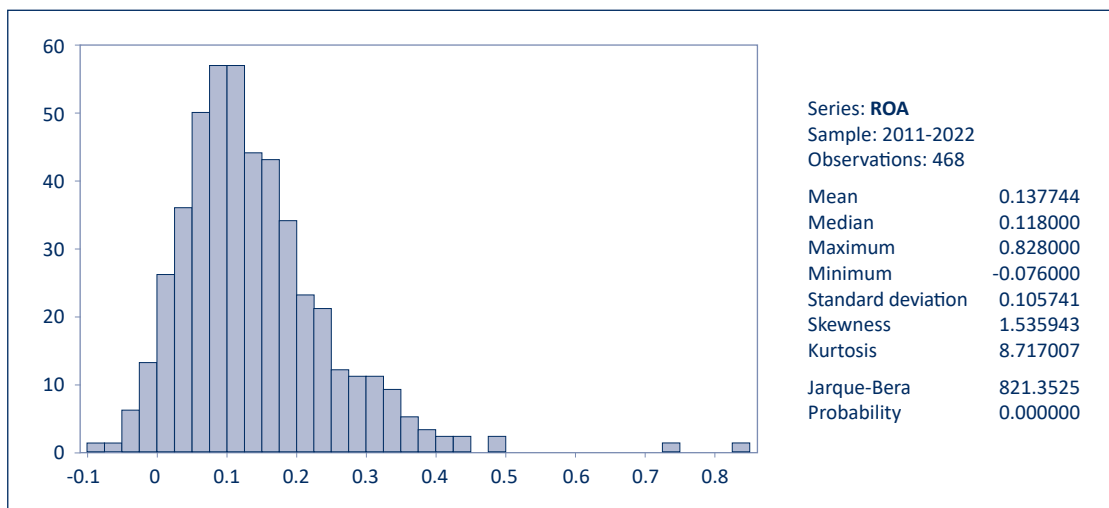


Figure 1. Distribution of ROA dataset

Source: Author's analysis in EViews.

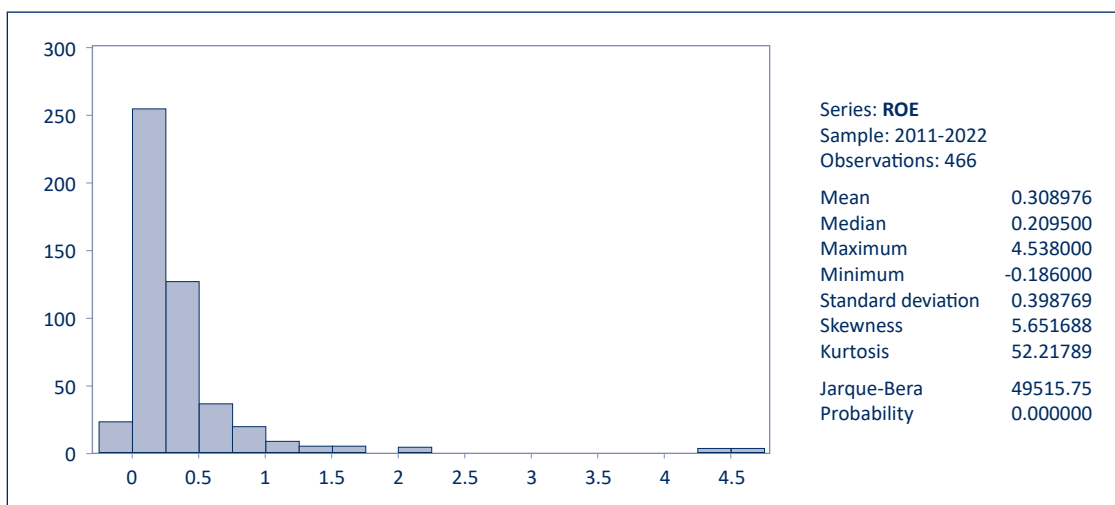


Figure 2. Distribution of ROE dataset

Source: Author's analysis in EViews.

Table 4. Obtained models

Dependent variable: ROA					Dependent variable: ROE				
Variables	Coefficient	Standard error	t-statistic	Probability	Variables	Coefficient	Standard error	t-statistic	Probability
BGD_WIN	0.31142	0.06567	4.74185	0.00000	BGD_WIN	1.25370	0.24554	5.10584	0.00000
CEO_D	-0.04055	0.01101	-3.68223	0.00030	CEO_D	-0.09705	0.04091	-2.37209	0.01820
BS	-0.00290	0.00279	-1.04252	0.29780	BS	0.01085	0.01035	1.04801	0.29530
D_E_WIN	-0.01321	0.00719	-1.83714	0.06690	D_E_WIN	0.17724	0.02673	6.63090	0.00000
CCI	0.36454	0.13410	2.71841	0.00680	CCI	0.90800	0.49767	1.82450	0.06880
C	-0.22993	0.13928	-1.65088	0.09950	C	-1.02462	0.51684	-1.98249	0.04810
R-squared				0.09554	R-squared				0.17305
Adjusted R-squared				0.08426	Adjusted R-squared				0.16272
Probability (F-statistic)				0.00000	Probability (F-statistic)				0.00000

Source: Author's analysis in EViews.

Analysing the obtained models, we can say they are successful. The first model has nearly all coefficients significant at a 5% significance level, and the F-statistic probability indicates the model's validity. The R-squared value is 0.09554, meaning that approximately 9.55% of the variation in ROA is influenced by the model.

In the case of the second model, the situation is similar, with two coefficients having probabilities higher than the 5% significance threshold, rendering them statistically insignificant and hence not interpretable. Nonetheless, the model remains significant, with the F-statistic probability being less than 0.05. Moreover, the R-squared value is higher, approximately around 17%.

Comparing the two models, can observed that the variable representing the proportion of women on boards has a direct impact on both financial performance rates. This effect can be explained by the typical differences between men and women, with the latter being more inclined towards customer and stakeholder interests, focusing more on long-term priorities. Additionally, companies with more women on boards tend to have a better reputation.

CEO duality has a negative impact on both ROA and ROE, as holding both leadership positions could compromise the board's independence, as suggested by agency theory, potentially leading to inappropriate decision-making at times.

Board size has a negative impact on ROA and a positive effect on ROE, but it is not statistically significant. However, greater diversity of opinions and knowledge could lead to more timely business decisions, as recommended in the Commonsense Principles 2.0.

The relationship between the independence of compensation committees and both profitability rates is direct, as it ensures objective, transparent, and fair compensation to stimulate performance. However, in the case of ROE, the relationship is not statistically significant at a 5% significance level.

## 5. Conclusions

Gender diversity has a direct impact on performance rates, while the independence of the compensation committee has a positive effect only on ROA. Thus, an increase in the number of women on the board and the level of independence of the remuneration committee is expected to lead to an increase in profitability rates.



CEO duality has a significant effect on both ROA and ROE, influencing the dependent variable indirectly because holding both top leadership positions by a single person can lead to flawed, unsustainable long-term management.

The relationship between board size and profitability rates is not statistically significant, despite the recommendation in Commonsense Principles 2.0 for greater diversification to obtain multiple perspectives contributing to value creation and company growth.

Possible improvements to this research could involve expanding the database by including more companies and conducting research across other industries and indices. Additionally, including other explanatory variables could be a significant factor in future studies on this subject.

## References

1. Appiah, K.O., Chizema, A. (2015), *Remuneration Committee and Corporate Failure*, Corporate Governance, Vol. 15, No. 5, pp. 623-640, <https://doi.org/10.1108/CG-11-2014-0129>.
2. Champion, M.A., Higgs, A.C. (1995), *Design Work Teams to Increase Productivity and Satisfaction*, HR Magazine, Vol. 40, No. 10, pp. 101-105.
3. Chaganti, R.S., Mahajan, V., Sharma, S. (1985), *Corporate Board Size, Composition and Corporate Failures in Retailing Industry*, Journal of Management Studies, Vol. 22, No. 4, pp. 400-417, <https://doi.org/10.1111/j.1467-6486.1985.tb00005.x>.
4. Cullinan, C.P., Barton Roush, P., Zheng, X. (2012), *CEO/Chair Duality in the Sarbanes-Oxley Era: Board Independence Versus Unity of Command*, in Jeffrey, C. (Editor), *Research on Professional Responsibility and Ethics in Accounting*, Vol. 16, Emerald Publishing, Leeds, pp. 167-183, [https://doi.org/10.1108/S1574-0765\(2012\)0000016009](https://doi.org/10.1108/S1574-0765(2012)0000016009).
5. Cybinski, P., Windsor, C. (2013), *Remuneration Committee Independence and CEO Remuneration for Firm Financial Performance*, Accounting Research Journal, Vol. 26, No. 3, pp. 197-221, <https://doi.org/10.1108/ARJ-08-2012-0068>.
6. Evans, C.R., Dion, K.L. (1991), *Group Cohesion and Performance: A Meta-Analysis*, Small Group Research, Vol. 22, No. 2, pp. 175-186, <http://dx.doi.org/10.1177/1046496491222002>.
7. Falaye, O. (2007), *Does One Hat Fit All?*, Journal of Management and Governance, Vol. 11, pp. 239-259, <http://hdl.handle.net/10.1007/s10997-007-9028-3>.
8. Finkelstein, S., D'Aveni, R.A. (1994), *CEO Duality as a Double-Edged Sword: How Boards of Directors Balance Entrenchment Avoidance and Unity of Command*, Academy of Management Journal, Vol. 37, pp. 1079-1108, <https://api.semanticscholar.org/CorpusID:167748043>.
9. Herrera-Cano, C., Gonzalez-Perez, M.A. (2019), *Representation of Women on Corporate Boards of Directors and Firm Financial Performance*, Diversity within Diversity Management (Advanced Series in Management, Vol. 22), Emerald Publishing, Leeds, pp. 37-60, <https://doi.org/10.1108/S1877-636120190000022003>.
10. McIntyre, M.L., Murphy, S.A., Mitchell, P. (2007), *The Top Team: Examining Board Composition and Firm Performance*, Corporate Governance, Vol. 7, No. 5, pp. 547-561, <https://doi.org/10.1108/14720700710827149>.
11. Rutledge, R.W., Karim, K.E., Lu, S. (2016), *The Effects of Board Independence and CEO Duality on Firm Performance: Evidence from the NASDAQ-100 Index with Controls for Endogeneity*, Journal of Applied Business and Economics, Vol. 18, No. 2, <https://articlegateway.com/index.php/JABE/article/view/838>.
12. Terjesen, S., Sealy, R., Singh, V. (2009), *Women Directors on Corporate Boards: A Review and Research Agenda*, Corporate Governance: An International Review, Vol. 17, No. 3, pp. 320-337, <https://doi.org/10.1111/j.1467-8683.2009.00742.x>.