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ADJUSTMENTS OF BOARD COMPOSITION DURING COVID-19 CRISIS: ANALYSIS OF THE MACEDONIAN COMPANIES

ABSTRACT

The aim of this paper is to make an analysis of the reported changes in the boards' composition of the Macedonian stock exchange -listed companies during the Covid-19 crisis. In order to achieve this objective, secondary data of the companies reports published on the Macedonian stock exchange website were used. The sample consists of 80 companies, and firstly we performed qualitative analysis on the companies' reports regarding boards' composition changes (over 30 companies reported changes). Afterwards, in order to increase the understanding of the factors that determine boards' composition in Macedonian joint-stock companies, we designed a model to examine the relation of company characteristics, industry characteristics and market perception of company value with board size, board independence and board diversity. The results from our analyses show that during the Covid-19 period a substantial number of companies from the sample have made changes in board composition and only 9.38% of the companies that reported change (over 30) decided to reappoint the same members. However, this does not mean that the Covid-19 crisis has been the only factor influencing the changes. Furthermore, one of our conclusions from the presented results in the study is that most of the variations in board/boards size can be explained by the differences in firm characteristics (in particular operating revenues and chosen boards structure), while the variations in board independence can be explained by firm characteristics (in particular operating revenues and chosen board structure) and industry characteristics.

Keywords: *board composition, board size, board diversity, Covid-19 crisis, listed companies*

JEL: *M10, M12, M14, G34*

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1. INTRODUCTION

COVID-19 pandemic created unprecedented turmoil in every industry and it nevertheless represents a "true crisis for nearly every board of directors today" (Deloitte, 2020). During the COVID-19 era, the dimensions of the inward-facing governance of any single company are crucial for the company's ability to cope with the challenges and to implement the required changes as soon as possible. It can be noted that in this kind of situation the procedural and behavioural governance is highly important. This crisis one more time affirmed that corporate governance is a central aspect of business (Dibra, 2016) since the proper strategic direction and management was critical for the company's survival and boards had no other choice than to step in. Consequently, boards' effectiveness in the turbulent times during COVID-19 pandemic significantly depended on boards' members' readiness and willingness for implementing changes in their operating models. Hence, it is expected that many companies' board/boards composition during this crisis is going to change.

As the analysis of corporate governance literature of the past few decades shows, the number of studies focused on the corporate governance structures is dramatically increasing after every crisis. During this period the corporate world faced two major crises: the first one shook the US corporations at the beginning of this century (in which one of the most popular episodes was the Enrons' failure) and the second one was the 2007-2008 financial crisis. In fact, through these two crises, the failure in different dimensions of corporate governance was noted. Namely, the first crisis showed the consequences of the constant neglecting of procedural and behavioural governance of any single company, while the second one manifested the weaknesses in the systematic dimension of governance which "refers to the interlinking relationships between separate companies that form an economic or sectoral structure" (Bloomfield, 2013, p. 153). Therefore, it is expected that this crisis created by the COVID-19 pandemic is going to also increase the research regarding corporate governance structures, their role in the period of crises and how did their composition (size, independence, diversity) relate to organizational survival.

Most of the studies published recently on topics regarding boards during the COVID-19 pandemic analyzed the boards' roles during the crisis (Deloitte, 2020; Benson-Rea et al, 2021) and the boards functioning during this period (SpencerStuart, 2020; McKinsey&Company,2021; Kaur et al. 2021). Others give recommendations regarding the most important research areas in the following period and they distinct board composition as one of them (Eklund, 2021, Kaur et al. 2021). Thus, having in mind the existent gap of the research in this segment in the Macedonian context, the aim of this paper is to make an analysis of the reported changes in boards' composition of the Macedonian stock exchange-listed companies during COVID-19 crisis and the determinants of the board composition characteristics in the period 2020-2021.

2. Literature review

in order to better elaborate the importance of board's composition, in this section, we are going to make a brief overview of the corporate governance theories and their perspective on board's composition issues. Afterwards, we are going to examine the empirical studies investigating the determinants of board/boards size, independence and diversity, in order to define the most appropriate methodological approach for analyzing the Macedonian context.

According to Jansen and Fama (1983), the separation of ownership and control leads to the agency problems. Jensen and Fama (1983) main hypothesis is that "the contract structures of all of these organizations separate the ratification and monitoring of decisions from initiation and implementation of the decisions" (p.302). In these terms, decision management includes decision initiation and implementation and these two steps of the decision process are typically allocated to the same agents, while decision control includes ratification and monitoring. Concerning the board composition, Jensen (1993) argues that boards with more than seven or eight members (oversized boards) are less likely to function effectively and are easier for the CEO to control (p. 865). Additionally, Kiel и Nicholson (2003) explain that agency theory leads to two normative suggestions: 1. the majority of board members should be outside or independent directors, and 2. it is necessary to avoid CEO duality (p.190). Agency theorists suggest that boards should be more independent from top management teams, smaller and accountable and with an independent board chair (Dubbin и Jung, 2007, p. 30/31).

The main assumption of the stewardship theory is that "the model of man is based on a steward whose behaviour is ordered such that pro-organizational, collectivistic behaviours have a higher utility than individualistic, self-serving behaviours" (Davis et al, 1997, p.24). This theory is based on the assumptions in organizational psychology and organizational sociology and argues that executives as stewards are motivated to act in the best interests of their principals (Davis et al, 1997). When CEOs act like stewards "their pro-organizational actions are best facilitated when the corporate governance structures give them high authority and discretion" (Davis et al, 1997, p.26). According to stewardship theory CEO duality and the preponderance of executive directors among the board can increase boards' effectiveness and consequently lead to higher corporate financial performance (Donaldson, 1990, p.377). The authors of stewardship theory do not support the concept of board independence, which has gained a significant popularity in the last few decades in the USA.

The resource dependence theory points out that "the key to organizational survival is the ability to acquire and maintain resources" (Pfeffer and Salancik, 2003, p.2) and therefore organizations continually seek to manage their dependence on the environment (Pfeffer, 1972).

According to the resource dependence theory, the board is considered as an instrument for dealing with the organization's environment through which they coopt, or partially absorb, important external organizations with which they are interdependent (Pfeffer, 1972, p.222). In addition, these theorists reason that the requirement for a large board undoubtedly increases as the size of the organization itself increases and that the organizations with greater requirements for external financing are expected to have a smaller percentage of inside directors on their boards (Pfeffer, 1972, p. 221-222). Furthermore, according to this theory postulates "…more diverse board will provide more valuable resources, which should produce better firm performance." (Carter et al 2010, p.398).

"The contingency approach may be seen as covering two areas of analysis: first, leadership theory and the 'micro' problems of motivation and productivity in the workgroup; and secondly, organization theory with its more 'macro' problems of designing organization structures and systems" (Redding, 1976, p. 199). In the past decade, this approach was used in studies focused on researching which contingencies have an impact on the effectiveness of corporate governance practices. According to Aguilera et al (2008) "contingencies thus imply that the role of corporate governance is likely to differ in ways contingent on both external and internal resources, which are critical within the context of the firms' organizational, market, sectoral, regulatory, or institutional environment" (p. 481).

In addition to this review of board roles from a theoretical perspective and their implication for board's composition issues, it can be also noted that some authors have given comprehensive systematization of boards crucial activities during the COVID-19 crisis. According to Benson-Rea et al. (2021), the board had three most important roles in the COVID-19 pandemic period:

1. ***Boards as a communication hub*** – responsible for the communication with the internal and external stakeholders;
2. ***Board as a strategic change agent and the crisis as a strategic opportunity*** – which means that boards had to get involved in the discussion together with the management about the future of the business and to make decisions for implementing radical strategic change to the operational model.
3. ***Board as an organizational guardian*** – which means that the boards were responsible for the survival of the organization.

Over the last few decades, numerous empirical studies, using the assumption from various theoretical approaches, are trying to examine the determinants of board size, independence and diversity. These studies differ significantly in the following areas: scope, methodology and results.

It is important to notice that most of them cover data from the companies from the USA. In the following section, we are going to analyse some of their results.

The study of Hermalin and Weisbach (1988), on a sample of 142 companies, indicates that weak organizational performance, firm participation in various product markets and CEO succession processes have an impact on board composition. Pearce III and Zahra (1992), on a sample of 119 companies, have found that board composition is determined by the influences from the organizational environment, the corporate strategy and the past organizational performance. Bathala and Rao (1995), are suggesting that "…the proportion of outside directors on the board is inversely related to the managerial ownership of equity, the use of debt leverage in the firm, and the dividend payout policy"(p. 62). In addition, this study shows a positive relation between the proportion of outside directors and the percent of equity ownership by the institutional investors which is consistent with the assumption of the agency theory.

Bhagat and Black (2002) have noted that there is a strong negative correlation between past organizational performance and board independence. Kiel and Nicholson (2003) have found that "…large companies have larger boards and greater proportion of outside directors, more interlocked boards and are more likely to separate the roles of chairman and CEO" (p.201). Davidson III and Rowe (2004) report that the relationship between organizational performance and board composition differs as a result of the differences in methodology. Boone et al. (2007) in their research on the determinants of board size and independence drew the following three conclusions: Larger more seasoned, and more diverse firms tend to have larger and more independent boards; firms in which managers' opportunities to consume private benefits are large, or in which the cost of monitoring managers is small, have larger boards; and firms in which managers have substantial influence and in which the constraints to managerial influence are weak, have less independent boards" (p.90).

Guest (2008) on a research sample of UK firms, have found that "board size and outsider proportion are positively impacted by greater advising needs and negatively impacted by CEO influence, and that outsider proportion is not related to monitoring costs or benefits" (p.22). The results of the Coles et al. (2008) indicate that complex firms have larger boards with more outside directors (p.329).

Lehn et al. (2009) on a sample of 82 US companies that survived in the period 1935-2000 have found that the companies' size, the opportunities for growth, merger activity, and geographical expansion are determinants of board size and composition, but they did not find a robust relationship between and that firm performance and these board characteristics. Similarly, on a sample of Australian companies, Wang (2009) has shown that organizational performances in the recent past do not have a significant impact on board independence.

The results of Chouchene (2010), on a sample of French companies, imply that the presence of independent directors is positively related firm size and that board independence is strongly negatively related to the coalition between top management and dominant shareholders. Furthermore, their research shows that institutional investors are positively related to board independence.

Ferreira and Kirchmaier (2013) investigated the determinants of recent changes in board size, board independence and board gender diversity in the joint-stock companies from different countries and their research implies that firm size, organizational performances (profitability) and the accepted board system (one-tier or two-tier) has a statistically significant influence on board size. Furthermore, they note that company size, profitability and market valuation of the company are politely related to board independence, and that profitability is a determinant of the board gender diversity in European boards.

Min (2017) on a sample of Korean-listed companies has found that board size is related to the firm complexity and the power of the controlling shareholders.

As for the empirical evidence related to the determinants of board gender diversity, it can be outlined that several studies have reported a positive association between company size and board diversity (Hyland and Marcellino (2002), Saaed et al (2016), Arnegger et al (2014). Additionally, Esteban-Salvador (2011), suggest that in the Spanish context "four variables contribute significantly to predicting the presence of women on the corporate board or a single woman if she is the CEO or chair: firms not listed on the continuous market but obliged to present an ACGR to the CNMV; firms from the consumer service sector; firms from the real estate sector; and firms that have a board with a high participation in the capital" (p.324). De Jonge (2014) also found a relation between women directors and industry sector in the research on a sample of corporations from China and India. Oyotode-Adebile and Ujah (2020), have argued that firms headquartered in high social capital counties have higher diversity in their corporate board. The overall conclusion of the analyzed empirical studies include:

- A significant number of studies have implied that board size is related to the company size (Pearce III and Zahra, 1992; Denis and Sarin, 1999; Kiel and Nicholson, 2003; Boone et al., 2007; Lehn et al. 2009; Ferreira and Kirchmaier, 2013; Alnaif, 2014). Furthermore, board size is also related to organizational performances (Pearce III and Zahra (1992); Ferreira and Kirchmaier (2013).
- Positive and significant relation between board independence and company size is found in several research papers (Pearce III и Zahra, 1992; Denis и Sarin, 1999; Kiel и Nicholson, 2003; Boone et al., 2007; Guest,

2008; Chouchene, 2010; Ferreira и Kirchmaier, 2013). However, in regard to the impact on organizational performances to the board independence the findings are different: Hermalin and Weisbach (1988), Pearce III and Zahra (1992) and Bhagat and Black (2002) found negative and significant relation, while Denis and Sarin (1999) and Ferreira and Kirchmaier (2013) report a positive and significant relation between board independence and organizational performances. Wang (2009) has noted that organizational performances in the recent past do not have a significant relation to the board independence. The studies from the end of the previous and the beginning of the ongoing century, usually measure board independence as a percentage of outside directors (Hermalin and Weisbach, 1988; Pearce III and Zahra, 1992; Bathala and Rao 1995; Denis and Sarin, 1999; Guest, 2008). This is a result of the fact that board independence is more actualized after the scandals of the beginning of this century. This remark is important since Davidson III и Rowe (2004) have found that the measurement of board independence can significantly influence the research results;

- As for the empirical evidence related to the determinants of board gender diversity, it can be outlined that several studies have reported a positive relationship between company size and board gender diversity (Hyland and Marcellino (2002), Saaed et al (2016)). Additionally, Esteban-Salvador (2011) suggests that women membership in corporate boards in Spain is related to several variables and that the sector in which the company competes is one of them.

3. Methodology

3.1. Sample and Data

The data were collected during July 2021 from the Macedonian Stock exchange website. Namely, we used secondary data available at the Macedonian Stock exchange web site. Companies listed on the Macedonian Stock Exchange are obligated by Macedonian laws to report any change in board composition, as well as to publish their Annual report and summary of financial statements quarterly. To collect the data, we used all the reports available. The data for the profitability measures, the operating revenues, the market-to-book ratio from the last year available (2020), while the data regarding board size, independence and diversity are including the changes made until the last day of data collection.

The sample consists of 80 companies that are listed on the Macedonian Stock exchange on three different segments: super listing, exchange listing and mandatory listing. The super listing includes 1 enterprise, the exchange listing includes 25 enterprises, and the mandatory listing includes 71 enterprises. From them we exclude the banks (7 entities) and insurance companies (2 entities) since they are regulated with the Banking Law[3] and Law on Insurance Supervision[4]. Furthermore, one (1) company organized as a limited partnership with stocks was excluded. Additionally, the companies that were under suspension from the mandatory listing in the analysed period (4 entities) were not also excluded, as well as several companies with ongoing corporate governance issues (some of them on the Observation List by on the Macedonian Stock Exchange).

To give a more holistic review of the companies included in the sample, we would emphasize that most of these companies were founded in the socialist system that was based on public ownership (also known as collective or common ownership) of the means of production. These companies underwent the process of privatization which started in 1990/91 and for most of the companies ended in 1995. Meanwhile, these companies had to reorganise and adapt to the values of the new system, in an extraordinary turbulent economic and political environment. Some of them successfully maintained their operation and continued to be leaders in the industries where they compete, while others had to implement turnaround strategies and focus on selective products and make market pruning in order to maintain profitability. Consequently, the companies from the second group significantly decreased in terms of assets, revenues and/or the number of employees. However, most of them managed to reorganise. The third group of these companies decided to continue its growth by implementing a strategy of conglomerating diversification. And finally, some of them transformed into holding companies.

Additionally, to increase the understanding of the context in which the companies are operating, we would mention that join-stock companies in our country have the legal possibility to choose between one-tier and two-tier board structures (Article 342 of the Macedonian Company Law). This practice is not unusual and according to Ferreira and Kirchmaier (2013), 9 of the 28 European countries they analyzed have this kind of legal framework. Furthermore, according to Article 367 of the Macedonian Company Law, the number of members on the board of directors should be in the range between 3 and 15.

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3 Official Gazette of the Republic of Macedonia No. 67/07, 90/09, 67/10, 26/13, 15/15, 153/15, 190/16 and 7/19 and Official Gazette of the Republic of North Macedonia No. 101/19, 122/21.

4 Official Gazette of the Republic of Macedonia nos. 27/2002, 98/2002, 79/2007, 88/2008, 67/2010, 44/2011, 112/2011, 188/2013, 30/2014, 43/2014, 112/2014, 153/2015, 192/2015, 23/2016 and 83/2018.

Furthermore, the number of independent directors must be at least ¼ of the number of appointed non-executive directors. As for the two-tier board system, according to Article 374 and Article 378 from Macedonian Company Law, the number of members of the management board and the supervisory board can vary from 3 to 11. As well as in the one-tier board system, the minimum number of independent directors is defined as ¼ of the members of the number of appointed directors in the supervisory board.

3.2. Methodology for examining the determinants of board composition (model and hypothesis)

To investigate the determinants of the characteristics of board composition during the COVID-19 crisis in Macedonian joint-stock companies, we use the approach implemented by Ferreira and Kirchmaier (2013) that used the method of linear regression. The reason for such a decision is in the fact that their study on the characteristics of board composition in the European countries should provide the most suitable measures for the analyzed parameters that are applicable in the Macedonian context. To analyze the determinants of the board size, independence and diversity in Macedonian joint-stock companies we run a hierarchical regression on each of the four independent variables: number of board members, the proportion of independent directors, the proportion of female directors and female CEOs. The research model is presented in the Figure below.

The hypotheses in this model are as follows:

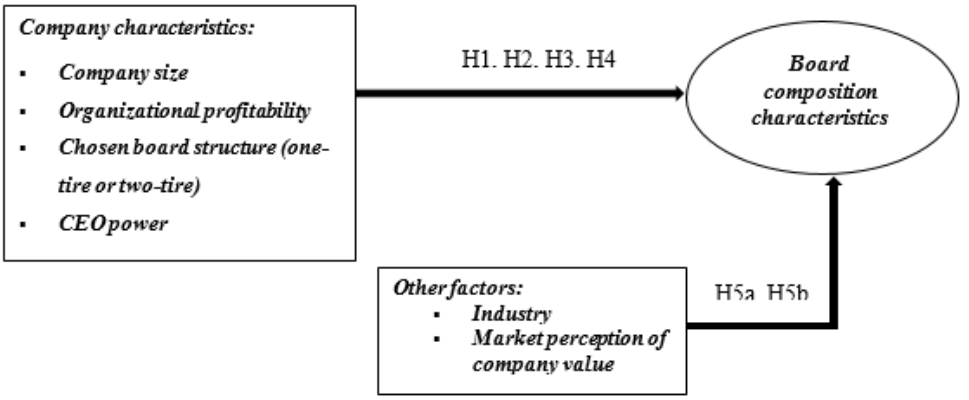
H1: Company size is related to board size, board independence and board gender diversity.

H2: Organizational profitability is related to board size, board independence and board gender diversity.

H3: Chosen board structure (according to the Macedonian Company Law companies can choose between one-tier and two-tier board systems) is related to board size, board independence and board gender diversity.

H4: CEO power is related to board size, board independence and board gender diversity.

Figure 1:



Source: *authors' construction*

H5: Other factors are related to board size, board independence and board gender diversity.

H5.a.: The industry in which the company competes is related to the board size, board independence and board gender diversity.

H5.b.: Market perception of company value is related to the board size, board independence and board gender diversity.

In the table below we are going to explain each of the variables used in the model.

Table 1: Description of the variables

Variable	Explanation
Board size	Measured by the number of directors on the board or boards.
Board independence	Measured by the proportion (percentage) of independent directors in the total number of board members.
Board gender diversity	Measured by proportion (percentage) of female directors in the total number of board members. Additionally, we designed separate measure for female CEO (model).
Company size	Measured by total operating revues (log of), as used in other research papers.
Organizational profitability	Measured by return of assets (ROA) and return of equity (ROE).
Board structure	One variable with two values: 0 is for two-tier board system and 1 is for one-tier board system.
CEO power	One variable that indicates whether the CEO is on this position more than 4 years (one tenure is usually 4 years).
Industry	For the analysis of industry, we used 3 so called industry dummies: one of manufacturing firms, one for trade and one for services.
Market perception of company value	Measured by the ratio Market-to-Book.

Source: *authors' construction*

4. Results

Firstly, we are going to overview the changes in board/boards in the COVID-19 period, basically from April 2020 to July 2021. In this section, we have a qualitative analysis of the changes in board characteristics in the analysed period, and afterwards in the following part, we examine the results from the hierarchical regression implemented to detect the determinants of board composition characteristics in the Macedonian context.

4.1. Qualitative analysis of the adjustments of board/boards composition during the COVID-19 period

During the COVID-19 period, or in the period between April 2020 and July 2021 over 30 companies have reported changes in their board/boards. The data shows regarding the type of changes in the governing structures made by the companies are presented in Table 2 below. From the table, it can be noted that only 9.38% of these companies decided to reappoint the same board/boards without making any change. The biggest proportion of these companies (37.50%) decided to make changes only in the appointment of non-executive members or in the members of the Supervisory Boards.

Table 2: Changes in board/boards composition during Covid 19 (between April 2020 and July 2021)

Type of change	% of companies	Is there is at least one change in favour of women between new appointments?	Is there at least one change in favour of minority between new appointments?
Reappointing the same members with no changes	9.38%	/	/
Inceasing board/board size (appointing new members)	3.13%	No	Yes (in 1 company)
Decreasing board/boards size (cutting the number of members)	3.13%	/	/
Change in the non-executive members (or SB) only	37.50%	Yes (in 5 companies)	Yes (in 1 company)
Change in the executive members (or MB) only	12.50%	Yes (in 1 company)	No
Changes in the executives and non-executive members (or SB and MB, some of the old members remain)	/	/	/
Changes in the non-executives/executive members (SB/MB) and change of CEO (some of the old members remain)	21.88%	Yes (in 4 companies, although this means at least one in any of the members, executive or non-executive)	No
The tenure of some of the non-executive/executive boards members finished or they have given resignation, but the appointment of new members was not yet executed	12.50%	/	

Source: *Authors' analysis of the reports for changes in governing structures and decision from the general assembles of the companies in the sample.*

4.2. Results of the analysis of the board's composition determinants Board size

In our study, we used hierarchical regression in order to understand the determinants of board's size in our country. The results from the model are presented in Table 4.

As can be seen in the table above, the two variables that have a statistically significant impact on board size are companies' size measured by operating revenues (log) ($p<0.05$) and the chosen board structure ($p<0.01$). The analysis of the coefficients of all models, Model 1, Model 2 and Model 3, shows that companies with greater operating revenues have a larger number of members on the board/boards. Also, companies that have chosen two tier-board structures have larger board/boards size (B in all of the models is negative, and we code one-tier board structure with 1 and two-tier board structures with 0). Also, it can be noted that Model 1 explains a sizable part of the variation in the board size among analysed companies, with an adjusted R^2 of 43.3 per cent. However, by adding the additional two variables the adjusted R^2 of the models does not increase. Therefore, it can be concluded that few firm characteristics explain much of the variations in board size in our country.

Table 3: Results of hierarchical regression analysis with board/boards size as dependent variable

Independent variables	Dependent Variable: Board size					
	Model 1		Model 2		Model 3	
	B	Sig	B	Sig	B	Sig
STEP 1						
Operating Revenues (log)	0.842	0.004	1.002	0.002	0.974	0.003
ROA	0.010	0.547	0.007	0.679	0.007	0.697
ROE	-0.005	0.482	-0.004	0.595	-0.004	0.589
One-tier board structure	-3.274	0.000	-3.368	0.000	-3.391	0.000
CEO power	-0.346	0.453	-0.184	0.713	-0.132	0.796
STEP 2						
Industry manufactory			0.393	0.587	0.363	0.619
Industry trade			1.020	0.290	1.001	0.302
Industry services			1.254	0.171	1.149	0.221
STEP 3						
Market-to-book						
R2		0.469		0.487		0.489
Change in R2		0.469		0.018		0.002
Adjusted R2		0.433		0.429		0.424
Durbin-Watson						2.121

Source: *authors' analysis*

Board independence

To analyse the determinants of the board independence we used the proportion (percentage) of appointed independent directors from the total number board/boards members. It is also important to mention that due to missing data in the companies' report, the sample for these three models consists of 49 observations. The results are presented in Table 5.

Model 1 shows that on the level of board independence statistically significant influence in our sample has the chosen board structure by the company ($p<0.01$) and CEO power ($p<0.1$). In Model 2 the variable ROE and Industry manufactory also have a statistically significant association with board independence ($p<0.1$). Finally, Model 3 shows that chosen board structure by the company ($p<0.01$), CEO power ($p<0.05$) and manufactory industry ($p<0.05$) and ROE ($p<0.1$) have statistically significant association with the level of board independence in the analysed companies. Furthermore, the results imply that board independence is positively related to the one-tier board system and negatively related to the CEO power, as expected. Besides, according to the coefficient in Table 5, manufactory industry is positively related to percentage of independent directors.

Table 4: Results of hierarchical regression analysis with board/boards independence as dependent variable

Independent variables	Dependent Variable: Board independence					
	Model 1		Model 2		Model 3	
	B	Sig	B	Sig	B	Sig
STEP 1						
Operating Revenues (log)	0.003	0.831	0.003	0.803	0.005	0.688
ROA	0.000	0.428	0.000	0.555	0.000	0.593
ROE	-0.001	0.216	-0.001	0.072	-0.002	0.061
One-tier board structure	0.100	0.000	0.096	0.000	0.098	0.000
CEO power	-0.037	0.074	-0.047	0.032	-0.050	0.022
STEP 2						
Industry manufactory			0.055	0.055	0.060	0.038
Industry trade			0.022	0.598	0.025	0.555
Industry service			0.004	0.928	0.016	0.695
STEP 3						
Market-to-book					-0.007	0.175
R2		0.452		0.524		0.546
Change in R2		0.452		0.072		0.022
Adjusted R2		0.388		0.428		0.441
Durbin-Watson						1.959

Source: *authors' analysis*

The Adjusted R^2 is increasing from 38.8 per cent in Model 1, to 42.8 per cent in Model 2 and 44.1 per cent in Model 3. Consequently, it can be noted that several variables explain significant per cent of the variations in the percentage of independent directors appointed on the board/boards.

Board diversity

Gender diversity significantly improved in the past years and as discussed above in the analyses of the new appointments, significant numbers of them are in favour of females. Also, it is important to be mentioned that in our country there is no mandatory requirement regarding the appointment of women on board/boards.

In table 6, we present the results of the hierarchical regression where the dependent variable is the proportion (percentage) of female directors in the total number of members of the board/boards. The number of observations in this regression is 80, as it was in the analysis of board size.

Table 5: Results of hierarchical regression analysis with percentage of female directors as dependent variable

Independent variables	Dependent Variable: Percentage of female directors					
	Model 1		Model 2		Model 3	
	B	Sig	B	Sig	B	Sig
STEP 1						
Operating Revenues (log)	-0.097	0.001	-0.105	0.001	-0.097	0.002
ROA	0.002	0.199	0.002	0.175	0.002	0.151
ROE	0.000	0.717	0.000	0.705	0.000	0.728
One-tier board structure	0.034	0.509	0.070	0.174	0.077	0.132
CEO power	-0.032	0.507	-0.050	0.296	-0.006	0.177
STEP 2						
Industry manufactory			-0.204	0.004	-0.195	0.006
Industry trade			-0.162	0.083	-0.156	0.090
Industry service			-0.247	0.006	-0.216	0.016
STEP 3						
Market-to-book					0.025	0.094
R2		0.163		0.268		0.296
Change in R2		0.163		0.105		0.029
Adjusted R2		0.106		0.185		0.206
Durbin-Watson						1.666

Source: *authors' analysis*

Model 1 shows that only operating revenues (log) have a statistically significant relationship with the percentage of female directors ($p<0.05$). In Model 2, where we added industry dummies it can be noted that all of them are statistically significant relation with the percentage of female directors ($p<0.05$ and $p<0.1$), together with the already defined relation with the operating revenues (log) ($p<0.05$). Also, the adjusted R^2 in Model 1 is only 10.6 per cent and increase to 18.5 per cent in Model 2.

Model 3 shows that operating revenues (log) have a statistically significant relationship with the percentage of female directors ($p<0.05$), as well as industry manufactory ($p<0.05$), industry trade ($p<0.1$), industry service ($p<0.05$) and market-to-book ($p<0.1$). The explanatory power of this model is only 20.6 per cent (adjusted R^2 0.206). This means that the model explains a small part of the variations in the percentage of female directors. However, it can be concluded that the percentage of female directors is negatively related to operating revenues (log) (B= -0.097), which means that there are more female directors in companies with smaller revenues and positively related to the market-to-book ratio (which means that companies with higher market-to-book ratio have a larger number of female directors). The impact of the industry on the percentage of female directors is statistically significant, but it should be examined further and maybe with different methods.

For better understanding of the factors affecting gender diversity of the boards, we ran additional regression with female CEO as dependent variable. This decision was made during the process of guttering the data, especially for the variable CEO power. Namely, we noted that a significant number of female CEO is not serving the board for more than one tenure or more than 4 years (or 31.25 per cent are serving more than 4 years). Therefore, we ran the hierarchical regression with female CEO as a dependent variable and the same set of independent variables, excluding only the independent variable for CEO power. The results are presented in Table 7.

Table 6: Results of hierarchical regression analysis with percentage of female directors as dependent variable

Independent variables	Dependent Variable: Female CEO					
	Model 1		Model 2		Model 3	
	B	Sig	B	Sig	B	Sig
STEP 1						
Operating Revenues (log)	-0.149	0.003	-0.157	0.004	-0.148	0.008
ROA	-0.002	0.551	-0.002	0.564	-0.002	0.567
ROE	0.004	0.004	0.004	0.005	0.004	0.004
One-tier board structure	0.170	0.056	0.188	0.044	0.194	0.038
STEP 2						
Industry manufactory			-0.102	0.414	-0.091	0.469
Industry trade			-0.095	0.563	-0.083	0.614
Industry service			-0.150	0.335	-0.112	0.485
STEP 3						
Market-to-book					-0.026	0.316
R2		0.249		0.260		0.270
Change in R2		0.249		0.010		0.010
Adjusted R2		0.209		0.188		0.188
Durbin-Watson						2.059

Source: *authors' analysis*

Model 1 presented in the table below indicates the existence of a statistically significant relation between operating revenues (log) ($p<0.05$), ROE ($p<0.05$), and one-tier board structure ($p<0.1$), with appointed female CEO.

In Model 2 and Model 3 these results are becoming even stronger ($p<0.05$ for all of three mentioned variables in Model 2 and Model 3), and the newly added variables related to industry and market value of the company do not show statistically significant association with the appointment of female CEO. From the presented coefficients it can be noted that companies with smaller operating revenues (B= -0.148) and better profitability measured by ROE (B=0.004), as well as companies that have chosen the one-tier board structure (B= 0.194), are more likely to appoint female CEO. However, the explanatory power of the models is low and according to the adjusted R2, Model 1 explains only 20.9 per cent of the variations in the dependent variable, and Model 2 and 3 only 18.8 per cent. Additionally, it can be noted that the adjusted R2 in Model 2 drops for 2 percentage points which may suggest that the industry characteristics are not that important for the research of this dependent variable, while when we add market-to-book ratio the adjusted R2 remain the same (adjusted R2 is the same for Model 2 and Model 3).

5. Limitations and further research

This paper brings some insights regarding the number of changes in board composition during the analyzed period April 2020 - July 2021. In addition, the analysis also allows deepening of the understanding of the determinants of board size, independence and gender diversity in the Macedonian context. However, this study has several limitations:

1. The number of papers researching board roles and board composition during the COVID-19 pandemic has been limited and most of them provide qualitative analysis and remarks/recommendations for future research.
2. This study uses secondary data from the reports that listed joint-stock companies submit for publishing to the Macedonian stock exchange. However, these reports do not have a standardized form and in some situations the information lacks significant elements. This leads to the need for making additional research on the previous reports in order to obtain a full understanding of the changes made in the governing structures of the companies. The problem with the data gathering has been partially facilitated by the activity of the team of the Macedonian stock exchange, which updates the information about the governing structures of ever y single company on regular basis on the brief summary prepared for every listed company.

Thus, all these circumstances additionally overwhelm the process of data gathering and having in mind that the human factor is crucial, the level of possible random errors increases.

3. As a result of the problem of missing data the total number of observations in the model that investigates the determinants of board/boards independence is lower (49 observations).
4. Regarding the qualitative analysis, it is important to note that this paper does not investigate the reasons for changes in board composition that have occurred during the analysed period.
5. In the quantitative analysis, this paper investigates the relation of several factors (companies characteristics, industry and market perception of company value) to board/boards size, independence and gender diversity in the Macedonian context. However, many other factors (such as ownership structure, organizational complexity etc.) has not been included in the model and can be a subject for further research. Furthermore, in order to investigate the relation between industry type and board/boards composition characteristics (size, independence and diversity) other methods may be used.
6. The explanatory power of the models designed to examine the determinants of board/boards gender diversity is relatively small compared to the models designed to examine the determinants of board/boards size and independence. These results are an indicator that in further research the topic of board gender diversity should be addressed separately and the impact of other factors should be analysed.

6. CONCLUSION

COVID-19 crisis, which came suddenly and had an unprecedented impact on every business operation, increased the attention to the board's roles and the board's ability to cope with the new reality. Although the published research papers on this topic are more explanatory, with qualitative analysis and remarks/recommendations (and in preparation), they all agree that the strategic and stewardship role of the boards is crucial for organizational survival in these changing times.

The results from our analyses show that during the COVID-19 period a substantial number of companies from the sample (over 30) have made changes in board composition and only 9.38% of the companies in which changes in governing structures occurred (over 30) decided to reappoint the same members. Although this does not mean that COVID-19 has been the only factor influencing the changes.

Some of the changes are made due to the ending of the tenure, others as a result of generational changes in the management/governing structures or as a part of the ongoing management succession process.

This impact of other factors is not excluded, too.

In regard to the analysis of the factors affecting board composition characteristics on a sample of listed companies in our country, we conclude that most of the variations on board/boards size can be explained by the differences in firm characteristics (in particular operating revenues and chosen board structure). This is similar to the findings of Ferreira and Kirchmaier (2013) about the association between revenues and board structure with boards size on a sample of European companies, although we did not found a relation between board size and profitability (measured by ROA and ROE), as they did.

Additionally, the variations in board independence can be explained by firm characteristics (in particular operating revenues and board structure) and industry characteristics. Ferreira and Kirchmaier (2013) also find an association of revenues and one-tier board structure with board independence. However, they also report that firm performance is positively related to board independence. On the other hand, the presented results in this paper indicate the existence of a negative association between CEO power and board independence as was expected.

As for gender diversity, the conclusions are not that clear, but it can be noted that firm characteristics, in particular operating revenues, had a significant association with the proportion of female directors. Furthermore, our results suggest the existence of a statistically significant relation between operating revenues (log) ($p<0.05$), ROE ($p<0.05$), and one-tier board structure ($p<0.05$), with appointed female CEO. However, these models with two different dependent variables as measures of gender diversity (proportion of female director and female CEO) have low explanatory power. Nevertheless, the need for greater gender diversity in Macedonian society has been actualized in the past few years. We strongly believe that in the forthcoming period the board's gender diversity is going to increase due to the following circumstances: the ongoing changes regarding the perception of women's roles and capabilities in our society; generational changes in the governing structures are inevitable and in a significant number of cases the successors of the leading individuals are female; the COVID-19 crisis imposed new strategic challenges and in order to adjust boards need to expand their skills and competencies. Therefore, this topic should be the subject of further research that could give broader understanding of the determinants of board/boards gender diversity in the Macedonian context.

Overall, the potential contribution of this paper is to shed light on the situation with the corporate boards in North Macedonian during the COVID-19 period and to provide a better understanding of the variables that determine the board composition characteristics in the Macedonian joint-stock companies.

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PRILAGOĐAVANJE SASTAVA ODBORA TOKOM KRIZE COVID-19: ANALIZA PREDUZEĆA U MAKEDONIJI

SAŽETAK

Cilj ovog rada je napraviti analizu prijavljenih promjena u sastavu odbora makedonskih kompanija koje kotiraju na berzi tokom krize COVID-19. Za postizanje ovog cilja korišteni su sekundarni podaci izvještaja kompanija objavljeni na web stranici makedonske berze. Uzorak se sastoji od 80 kompanija, a prvo smo izvršili kvalitativnu analizu izvještaja kompanija o promjenama sastava odbora (više od 30 kompanija prijavilo je promjene). Nakon toga, kako bismo poboljšali razumijevanje faktora koji određuju sastav odbora u makedonskim dioničkim društvima, dizajnirali smo model za ispitivanje povezanosti karakteristika kompanije, karakteristika industrije i percepcije tržišta o vrijednosti kompanije s veličinom odbora, neovisnošću odbora i raznolikost odbora. Rezultati naših analiza pokazuju da je tokom perioda Covid -19 značajan broj kompanija iz uzorka napravio promjene u sastavu odbora, a samo 9,38% kompanija koje su prijavile promjenu (više od 30) odlučilo je ponovo imenovati iste članove. Međutim, to ne znači da je kriza COVID-19 bio jedini faktor koji je utjecao na promjene. Nadalje, jedan od naših zaključaka iz prikazanih rezultata u studiji je da se većina varijacija u veličini odbora može objasniti razlikama u karakteristikama firme (posebno operativnim prihodima i izbrani sistem upravljanja - ednostepeni ili dvostepeni), dok varijacije u nezavisnosti odbora mogu se objasniti karakteristikama preduzeća (posebno operativnim prihodima i izbrani sistem upravljanja - ednostepeni ili dvostepeni) i karakteristikama industrije.

Ključne riječi: *sastav odbora, veličina odbora, raznolikost odbora, kriza COVID-19, kompanije koje kotiraju na berzi.*

JEL: *M10, M12, M14, G34*