

Research Article

The Complexity of Interaction between Executive Board Gender Diversity and Financial Performance: A Panel Analysis Approach Based on Random Effects

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This study examined the influence of the executive board of directors' gender diversity on the financial performance of listed companies on the Bucharest Stock Exchange, for the period 2011 to 2019. The analysis of the composition and different characteristics of the board and the executive directors proved to be effective tools for corporate governance in countries with an emerging capital market. Therefore, a disclosure index on directors' characteristics was used to moderate the interaction between gender diversity and financial performance, based on the theoretical framework provided by upper echelon theory. The study contributes to the enrichment of the literature both by using the composite indicator built by applying the multiway PCA method on panel data to express financial performance and by designing the ten EGLS panel models involving five financial indicators and two proxies for gender diversity. The results showed that there is a positive impact of the proportion of women on the executive board of directors on financial performance, measured through the composite index, ROA, ROE, and SOL. A statistically significant impact of gender diversity on financial performance was found only for SOL, in the case of the Blau index. Also, using the random-effects model to perform the panel data analysis, the results showed that a higher executive board size can be associated with better financial performance measured through the composite index, ROA, ROE, and EPS. Practical implications are significant for the board of executives' composition, the complexity of the relationship with the board, and reshaping governance practices.

1. Introduction

Diversity in the board and various senior management structures of entities is today one of the intensely debated and investigated topics. Among the aspects pursued both in practice and in research, gender diversity examined in correlation with various indicators of financial or nonfinancial performance occupies a central place and generates different research directions in the context of achieving the objectives of sustainability and sustainable development. Today, in the EU only 7.5% of chairpersons and 7.7% of CEOs are women. Consequently, it is necessary to take concrete action to increase the more balanced representation of women and men in decision-making roles, including the boards of directors and the management teams. About 33%

of the executives' positions in Romanian publicly listed companies are occupied by women, according to Eurostat data for 2021 [1], and the share of female board executives was above the reported EU average. The National Strategy 2018–2021, adopted by the Romanian Government for the Promotion of Equal Opportunities and Treatment for Women and Men, included in the general objectives the encouragement of women's participation in decision-making, and between the major areas of intervention, the balanced participation in decision-making and gender mainstreaming. A recent study entitled Gender Economic Inequalities in Romania, published in late 2021 by Guga and Sindrestean [2], and conducted under Friedrich-Ebert-Stiftung Romania, showed that gender inequalities in Romania are among the largest in Europe.

Unfortunately, the situation has not improved significantly in the last decade, despite regulations adopted in recent years [3–5]. The study points out that in the labor market, women generally occupy inferior positions to men, being paid less and being more vulnerable to changes in business cycles. Despite significant economic growth and a theoretically very good economic period before the pandemic, women's participation in the labor market remained at very low levels, both compared with men and historically [2]. When it comes to the type of work performed by women, there are huge differences between the sectors of activity, and in the feminized sectors, the tendency is for women to occupy inferior positions to men.

Numerous empirical studies have shown that women can behave differently than men [6–10], being more open to collaboration, with more emphasis on morality and ethics, and a more participatory decision-making process, which leads to a reduction in management conflicts that improves the participatory decision-making process [11, 12]. Female directors are less thirsty for power, more diligent in overseeing and controlling certain processes, and more concerned with the quality of financial reporting [13, 14]. As Adams et al. [15] and Amin et al. [16] pointed out, from the perspective of investors the presence of women managers and their independence on the board are factors that enhance the future performance of the business. Elliott and Smith [6] showed that women on the board are more likely to push for more women to lead, and Adusei et al. [17] demonstrated the positive and statistically significant relationship between the board gender diversity and management gender diversity.

Board gender diversity refers to the presence of women on boards of directors [18, 19], whereas management gender diversity targets the female representation in the management team of companies [20, 21]. Terjesen and Singh [22] have shown that greater representation of women on boards increases the likelihood of women being represented in senior management and generates more equal proportions of salaries for men and women, whereas Adusei et al. [17] found that board gender diversity positively predicts management gender diversity and demonstrated that 50% or higher diversity in either board or management is the threshold at which gender diversity is productive to microfinance institutions. The former explains that a female representation of 50% or more, both in the board of directors and in the management committee, can result in a very high financial performance and conclude that too much pressure to increase female representation in the management of companies can have side effects and a lot of caution and tact is needed.

This study is consistent with the growing interest in examining gender diversity of boards and executive management structures in the context of sustainable business development and aimed to examine the impact of gender diversity and the size of the executive board of directors of selected listed companies on BSE, on financial performance. For this purpose, only companies that had continuity in the BSE listing for the period 2011–2019 and for which it was possible to collect and curate the data were included in the

sample. We also considered several financial indicators and a composite one for the expression of performance and two proxies for gender diversity, the disclosure degree of characteristics related to CEOs was defined as the mediation variable, and the corporate governance report and audit report were used as control variables. To achieve these objectives, the study follows in the next section a brief description of the research theoretical framework, a structured review of corporate governance, gender diversity, and business performance prior works and the hypothesis development, Section 3 reports on the data, Sections 4 and 5 describe the general methodology and the way the performance composite index was designed, results were revealed and discussed in Section 6, and the last part of the study conclusions can be found and further research paths may be followed to continue developing the current research direction.

2. Literature Review and Hypothesis Development

The abundance of empirical studies on the impact of gender diversity on a company's performance shows that the interest of researchers and stakeholders in analyzing disclosed information about corporate governance is similar to that of financial information [23]. In this context, for the theoretical substantiation of the empirical study, our scientific approach to reviewing the most relevant papers follows a route that contains three stops. First, we stopped to select and briefly describe the main theories that can form the theoretical framework of empirical analysis, then we considered it necessary to briefly present a selection of works that focused on the analysis of Romanian corporate governance in relation or not to business performance, and in the last station of this section, we analyzed some of the previous studies that examined the correlation between gender diversity, size, the composition of board and management structures, and financial performance of companies to develop the research hypotheses.

2.1. Research Theoretical Framework/Theories

2.1.1. Agency Theory. Agency conflicts that arise in various organizations from the contractual relationship between principals and agents are the central concern of agency theory. Information asymmetry and incomplete contract information can create conflicts between owners and those mandated to run the business. From the perspective of this theory, the composition of boards has been analyzed extensively, often from an agency perspective, and focused on the characteristic of independence [24] and the idea that greater diversity in leadership positions can increase performance. The board of directors is a key governance device that can harmonize the interests of managers and owners, and it is important to note that higher agency costs that adversely affect the company's performance are frequently the result of poor governance [25]. As Hillman and Dalziel [26] pointed out, a fairly effective mechanism for reducing

agency costs is the independence of the board but also of gender diversity, justifying reasoning by the greater heterogeneity of opinions that can lead to more robust control over final decisions.

Gender diversity of the company's boards of directors, especially the personality traits of women directors who consider intolerant the opportunistic behavior of managers, violates the code and ethical principles, and they have a greater inclination towards quality communication and disclosure, and transparent governance reduces agency conflicts that exist from the separation of management and business owners [27–32]. Also, companies with a higher share of women on the boards of directors have proven to have more outstanding performance in terms of disclosure on corporate social responsibility practices, and fewer irregularities in financial reporting and fewer weaknesses and deficiencies in the internal control system can be found [33–36]. Women have a higher risk aversion when making financial decisions [7, 9, 37], and CEOs are directly involved in achieving goals and influencing financial reporting outcomes [38]. Francoeur et al. [8] point out that they have a more complex approach to situations and are more conscientious and cautious, traits that allow them to correct information biases in strategy formulation and problem-solving, whereas Francis et al. [39] showed the rise of accounting conservatism when a female director joins the management team.

2.1.2. Resource Dependence Theory. Resource dependence theory is one of the strongest theoretical justifications for the diversity of the board and management. The existence of diversity increases the likelihood that the information provided by the board to managers will be of high quality and prepared with high responsibility due to the unique information held by various directors. The company is perceived according to resource dependence theory as an open system permanently connected and shaped by changes in the external environment, whose goal is to reduce as much as possible dependence on limited resources, as Pfeffer and Salancik argued [40]. Thus, this theory becomes, through those established and emphasized by Pfeffer and Salancik [40], a framework for examining and understanding how boards of directors influence the performance of companies. In the opinion of Carter et al. [41], gender and ethnic differences will most likely produce unique categories of information available to management for better decision-making.

The extended resource dependence theory of Hillman et al. [42] suggested that different types of executives will provide different types of resources to companies. Moreover, women executives have certain relationship skills, and being more receptive to emotions and empathy, they gain certain advantages and more easily develop relationships with employed women but also with clients, and thus, in the opinion of the Liu et al. [43], a greater gender diversity improves business relationships. In the letter and spirit of the same theory, greater gender diversity means a stronger commitment to social responsibility, development of

connections with stakeholders, and adoption of strategies to optimize the company's performance [44, 45]. Therefore, as an outcome, a more diverse board will assure more valuable resources that should produce better performance. Hillman et al. [46], Gabrielson and Huse [47], Peterson and Philpot [48], and Carter et al. [41] argued that due to human capital and different external links with the environment, women on board will not have the same effect on the board functions and company performance.

2.1.3. Upper Echelon Theory. Hambrick and Mason [49] emphasized that the essence of upper echelon theory is that managers make decisions and act in the development, review, and application of business strategies based on personalized interpretations of the situations, events, and circumstances they encounter. How the top management team influences the process of choices and strategic decisions at the level of the business organization that implicitly lead to different levels of financial performance is explained by upper echelon theory [49, 50]. Thus, the influence of women on boards on financial performance includes the direct impact of women on boards and the financial effects of corporate strategies that are estimated by the top management team [51]. Also, the study and analysis of the characteristics of the entire management team of the company will predict more accurately the organizational behavior on the performance line compared with the analysis only of the features of the executive managers.

The theoretical framework frequently used in previous studies to explain the connection between the presence of women on the board and the financial performance of companies refers to the upper echelon theory [52]. Behavioral differences between women and men directors are related to the essence of this theory and regardless of their psychological, cognitive nature, or system of values and beliefs will determine the characteristics of the boards and the executives' directors. Thus, women leaders care more about others by showing much empathy and a weaker desire for power, which may predict that a multi-women board and executive committee would seek to consider the interests of all stakeholders, which would lead to decisions harmonized with this behavior [13, 53]. Based on this theory, the group of executives should be more closely examined and analyzed because its members act as a bridge between the organization and the external environment and their choices and decisions are likely to influence the policies and strategies of performance and sustainable development [54–56]. Consequently, the architecture of the senior management team and its composition is expected to have a significant impact on strategic decisions; so, from the perspective of upper echelon theory, the traits and particularities of the executives' board deserve to be analyzed concerning the performance of the organization.

Another perspective on the same theory that considered various external environmental factors to the business organization, as well as the history of managers, is presented by Carpenter et al. [57] and involves an adjustment of the existing theory to the coordinates of the contemporary

business environment. The proposed model emphasizes the existing guidelines in research on the characteristics of top management related to organizational performance. The described model also introduces moderating and mediating variables as the central structure of the theory and takes into account the following: power, discretion, incentives, integration, and team processes. Thus, the results can be stratified according to the type of strategy and performance objectives pursued, with the analysis of system feedback.

2.2. Corporate Governance and Business Performance in Romania. Studies conducted on Romanian companies were initiated based on the analysis of the positive effects of the characteristics of the board of directors and executives on the performance of companies [11, 58–63], which proved that these are mainly generated by gender diversity, the duality of CEOs, and female CEOs. However, the results are not robust enough; in some works, they are even contradictory. Hence, among recent studies examining the influence of nonexecutive board members on the financial performance of Romanian companies listed on the BSE is Mihail and Micu's work [64], which analyzes the importance of directors' independence in corporate governance and shows that the higher share of independent board members is associated with a higher ROE indicator yield. Along with similar studies [23, 64–67] conducted on Romanian companies listed on BSE, our study is distinguished by (i) a more generous period covered by the analysis, 2011–2019, and the fragmented period before and after the transition to the international IFRS financial reporting framework; (ii) examining the link between the gender diversity of board executive managers and financial performance, the former expressed by 4 indicators (3 of profitability and one of liquidity), and also measured through a composite performance index; and (iii) measuring the average degree of disclosure of nonfinancial information about managers traits using scorecard variables.

Recent concerns of researchers related to the context of the Romanian business environment and companies are focused on the analysis of corporate governance or the influence of corporate governance on performance and in particular on financial performance [23, 68–72]. A significant effect of the Romanian corporate governance practices on the financial performance measured by ROE, EVA, and TSR cannot be proven, as Pintea et al. [68] found, but a significant and positive link was revealed in the case of the financial performance measured by Tobin's Q factor. Suciu et al. [53] in a dynamic comparative analysis aimed to examine how the gender diversity of boards of directors affects the financial performance of financial companies in France and Romania. The data analysis was performed between 2017 and 2019 on the sampled listed companies, using ROA and Tobin Q, to measure financial performance. Also, two metrics of female representation were used, the female proportion and the female presence for Romania, and the female presence at least equal to 40%, the quota imposed in the case of France. The results provide no evidence of a link between the gender diversity of boards of directors and the financial performance of companies.

Since 2016, companies listed on the BSE are required to disclose information on corporate governance through specific statements as proper reporting of governance practices significantly increases investor confidence [73]. The Corporate Governance Statement contains information on compliance with the provisions of the Corporate Governance Code and also presents an explanation of the deviations from them. BSE regularly monitors the degree of compliance with the provisions of the code by conducting regular surveys. Bogdan and Dumitrescu [69] in their investigation oriented on the analysis of the compliance degree with the Corporate Governance Code principles and provisions, of 61 listed companies on BSE, revealed that the total mean of the scores regarding the level of compliance is 77.14 points, out of 99, which can be interpreted as a fairly high degree of compliance with the corporate governance regulations. Concerned with the analysis of best practices in corporate governance in correlation with business performance, Achim et al. [23] in a study conducted on companies listed on BSE showed that there is a positive correlation between the quality of governance practices and the market value of companies. Their results proved to be robust only for one year, the correlation was found positive but not significant, and the performance was measured by Tobin's Q. The composition, structure, but also functions of the board of directors can vary from one country to another, from one governance model to another. On the other hand, it is relevant to mention that some countries have a unitary system of corporate governance, others have a dual system, and some, such as Romania, allow companies to choose between the two systems [53]. Most Romanian companies have opted for a two-tier model.

2.3. Gender Diversity and Financial Performance—Former Studies. Despite global efforts to achieve SDG5 targets, there is still a low level of representation of women in management positions in listed companies. However, Terjesen et al. [74] note that there is a significant gap in the representation of women on boards of directors, whereas Pucheta-Martínez [75] observed that developed countries adopt gender equality regulations to ensure greater participation of women in the management of organizations. Reguera-Alvarado et al. [24] analyzing the implications of Quota Laws on Spanish companies found that a higher representation of women on board is positively related to better financial results.

Several recent studies [8, 76–79] have shown that a higher number of women directors on board have an impact on corporate governance resulting in more responsible monitoring of business practices and more consistent encouragement of management to identify strategies to increase performance in the interest of shareholders. Even though some authors [18, 24, 32, 59, 80–84] consider that practices related to the integration of women in management positions can be an engine of improving the corporate governance of companies with a favorable impact on performance, others [85–89] demonstrate that the impact of board diversity on a company's financial performance can be

positive, negative, or neutral, depending on socioeconomic status, political characteristics, and cultural values of the analyzed country or region. In the case of emerging markets, other authors [90] considered that female managers only create value for companies when particularities of different sectors of activity are taken into consideration.

2.3.1. Board Size and Performance. Consequently, given the above, this study aimed to analyze the impact of gender diversity on the financial performance of Romanian companies listed on BSE, based on the theoretical framework provided by resource dependence, agency, and upper echelon theories. Gender diversity in our study considers the gender diversity of CEOs. Directors include the executive director, chief financial officer, human resource director, marketing and communication director, general manager, and other executive directors. So, in the study, we followed Carpenter's [54] and Papadakis and Barwise's [56] definition of top management teams and we included in our analysis the senior managers involved in the strategic decision-making and we focused our gender diversity investigation on CEOs. The management board regularly reports to the board of directors on all relevant aspects related to the activity, implementation strategy, risk profile, and risk management in the company. In addition, the management board ensures compliance with the provisions of the legislation in force regarding the capital market and its application by the company. The management board also ensures the implementation and operation of the accounting system, the risk management system, and the internal control system, which meet the requirements of the company.

The relationship between the size of the board of directors and the financial performance of companies is explained by the theory of resource dependence [91]. Thus, proponents of this theory argue that a larger number of board members will lead to a greater accumulation of resources [92]. However, opinions are divided and so we find that some support the idea that larger councils are more likely to impact performance indicators favorably [93–97] and argue that smaller boards are more efficient and enhance the performance of companies. Based on these records from previous research and assuming the connection between the size of the boards of directors and that of the management team and the average size of the management board for Romanian companies, we expect that:

H1: the size of the management board is positively associated with the financial performance of listed Romanian companies

2.3.2. Gender Diversity and Financial Performance. In the scientific endeavor, we took into account the premises provided by the Romanian governance system that offers less shareholder protection [98] being more oriented towards meeting the needs of stakeholders and studies conducted by Campbell and Mínguez-Vera [59], Carter et al. [18], Erhardt et al. [83], and Reguera-Alvarado et al. [24], which showed that the membership of the women's board of directors is

positively correlated with the performance of the companies. Controversy over gender diversity in the management of organizations stems from issues of independence, monitoring, and control, diminished cohesion among members of management and poor interaction, and syncope in communication if women directors are under-represented [96, 99, 100]. The results obtained by Gordini and Rancati [101] highlighted that the presence of at least one woman on board does not, alone, impact the financial performance of the company, but also gender diversity on a board does have a positive and significant effect on the company's financial performance. The authors' opinion is that Italian listed companies should concentrate on finding the optimum balance between women and men on boards and not just on the presence of women in the highest positions on boards and management teams. In companies with weaker shareholder protection, gender diversity positively affects performance, but in well-run companies, additional monitoring has been shown to have a negative impact, as Adams and Ferreira [29] proved and found a negative relationship between gender diversity and Tobin's Q, as well as ROA. As Anderson et al. [102] noted, the impact of diversity on financial performance differs depending on the company characteristics, and the diversity of the board of directors positively influences the performance of more complex companies but negatively impacts less complex organizations. Not only do the characteristics of the companies matter but also the business and social-cultural environment. Thus, in an analysis performed on Italian listed companies Rossi et al. [103] showed that there is a significant positive relationship between financial performance and the composition of the board, but in the study considering Polish listed companies, Kompa and Witkowska [104] observed that no significant correlation was found between the presence of women on board and ROE dynamics as an indicator of measuring financial performance.

The integration of women directors in the functioning of boards determines the increase in performance, as shown by Green and Homroy [105], but most studies estimate the effect of female representation and not participation, which may partially explain the neutral or negative impact on the company's performance of the representation of women on board. Green and Homroy [105] demonstrated a statistically positive and significant association between female representation and company performance, although the effect of the performance is modest. Thus, a change with a standard deviation of women's representation is equivalent to the entry of two women directors into the board, and the associated change in ROA is approximately 0.2%. Noja et al. [106] in their empirical study that used modeling structural equations and network analysis with Gaussian graphical models revealed that optimal board size, developed and improved management skills, greater participation of women in board leadership, and a structure at two-tier/levels of boards (a separate board of directors and a separate supervisory board) are significant management strategies that can facilitate the increase in financial performance indicators for companies and enhance the sustainable development of business. Our study followed Bennouri et al.

[107] work, which examined the relationship between female management, ROA, and ROE profitability indicators, for French companies, and showed that female management significantly increases profitability indicators for the analyzed companies.

In light of the above, we expect that:

H2: management board gender diversity has a significant impact on the financial performance composite index (FPindex)

H2a: management board gender diversity has a significant impact on EPS

H2b: management board gender diversity has a significant impact on ROA

H2c: management board gender diversity has a significant impact on ROE

H2d: management board gender diversity has a significant impact on SOL

3. Data Collection and Descriptive Statistics

Data were collected manually for the years 2011–2019 using the annual reports and financial statements of listed companies. We have selected 57 listed companies on the Bucharest Stock Exchange (BSE) according to the following criteria: online publication of annual reports and financial statements for the entire period, continuity of listing on the main market of BSE for the investigated period, and continuity of the activity in the same private sector of the economy. The total companies examined covered eight industries, from which 68.42% represent the manufacturing industry, and the others are companies in the trade, transport, and storage, construction, extractive, electricity and gas production, and professional and scientific-technical industries. Data on financial indicators were collected from the annual reports and refer to accounting-based profitability indicators, earnings per share (EPS), return on assets (ROA), return on equity (ROE), and a liquidity indicator, general solvency (SOL). The information collected on managers was also collected by reading the annual reports and looking for each year for the total number of managers, the distribution of managers by gender, and data on the number of male and female managers and scoring the disclosure degree on characteristics, such as studies, professional qualifications, work experience, training, previous managerial experience, complementary professional skills, and competencies, personality traits, and motivations, incentives, and bonuses.

As regarding executive managers' gender distribution in total selected listed companies, 75% of managers are male and 25% are female. The most balanced industries in terms of managers' gender distribution are the hospitality industry (51%–49%) and the professional, scientific, and technical activities (41%–59%), and the most unbalanced industry is the trade industry (97%–3%) (Figure 1).

If we analyze the evolution of gender distribution by industries from 2011 to 2019, we can observe that in the transport and storage industry an increase in the share of women managers is recorded from 16% in 2011 to 33% in

2019, and also, in the hotel and restaurant industry the increase in women managers in total is significant from 29% in 2011 to 46% in 2019. At the level of the most recent year analyzed, the following industries present extreme situations: in the construction industry and wholesale and retail trade industry, all reported managers are male, but in the professional, scientific, and technical activities the reported number of female managers is higher than male managers (71%). We also looked at the share of women managers in the total number of managers at the beginning and end of the period, and we found a 20% increase in the share of women managers in total, from 25% in 2011 to 30% in 2019 (see Figure 2).

The determination of the selected indicators for measuring the financial performance for the entire period was performed by own calculations using data collected from the annual reports of the analyzed companies. The most consistent source of data gathering was the financial statements included in the annual reports published on companies' websites. For all the nine years analyzed, the data on the selected financial indicators (EPS, ROA, ROE, and SOL) were centralized and verified, by companies and industries. Earnings per share (EPS) is among the most important indicators used when the aim is to determine a company's profitability on an absolute basis. The indicator expresses how much money a company earns for each share and is a widely used proxy for estimating corporate value. Thus, a higher EPS indicates a higher value, because investors will pay more for the shares of a company if they believe that the company has higher profits relating to the price of its shares. Earnings per share (EPS) was calculated by relating a company's net profit to the average number of its ordinary shares outstanding for the year reported. Therefore, we used the basic EPS indicator, following IAS 33. Return on assets (ROA) is another useful indicator for investors indicating how profitable a business relating to its assets, which is used by investors for a better understanding of a company's financial performance and strength. ROA is calculated by dividing a company's net profit by its total assets. Thus, if a company has a higher net profit than a competitor, it could claim that the company performs better. However, if the other company has a significantly higher ROA, that company uses its capital and assets more efficiently than the first company and may outperform it in the future. One of the most commonly used indicators for measuring financial performance is the return on equity (ROE). It is also one of the frequently selected indicators in studies that examine board management gender distribution of companies and financial performance. ROE is a measure of financial performance calculated by dividing net profit by equity, a financial expression of a corporation's profitability, and how effective it is in generating profits. The choice of the indicator regarding the global solvency (SOL), expressed as a ratio between the total assets and total liabilities, was made out of the desire to follow a liquidity indicator frequently used by Romanian companies. Therefore, the selection of financial indicators was made because they allow comparative analyses to be performed within the same industry for a certain period and

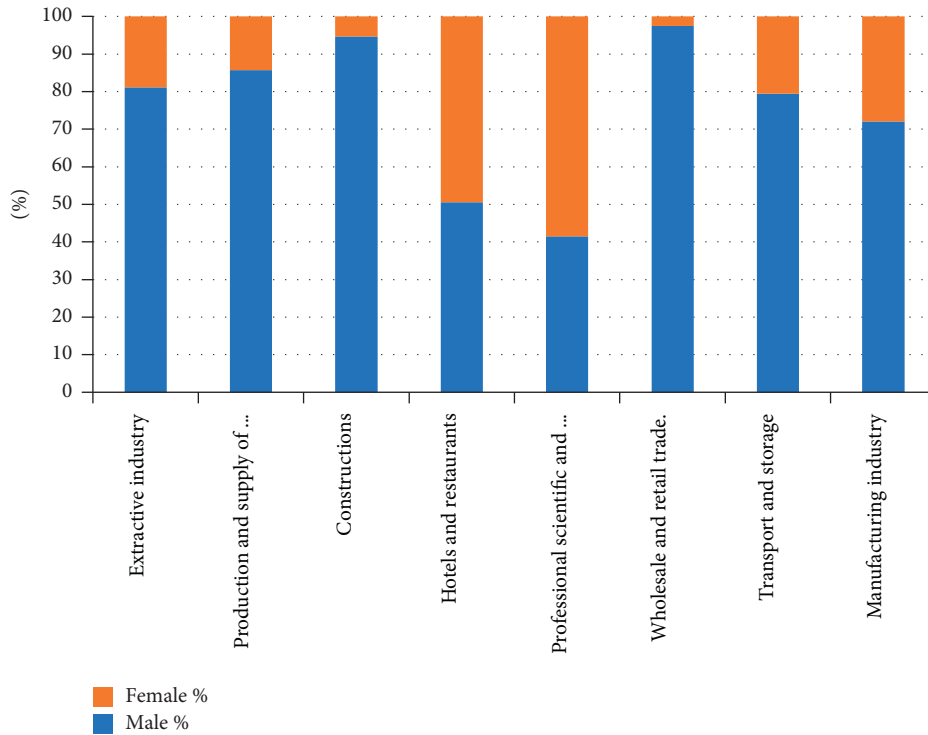


FIGURE 1: Managers’ gender distribution by industries.

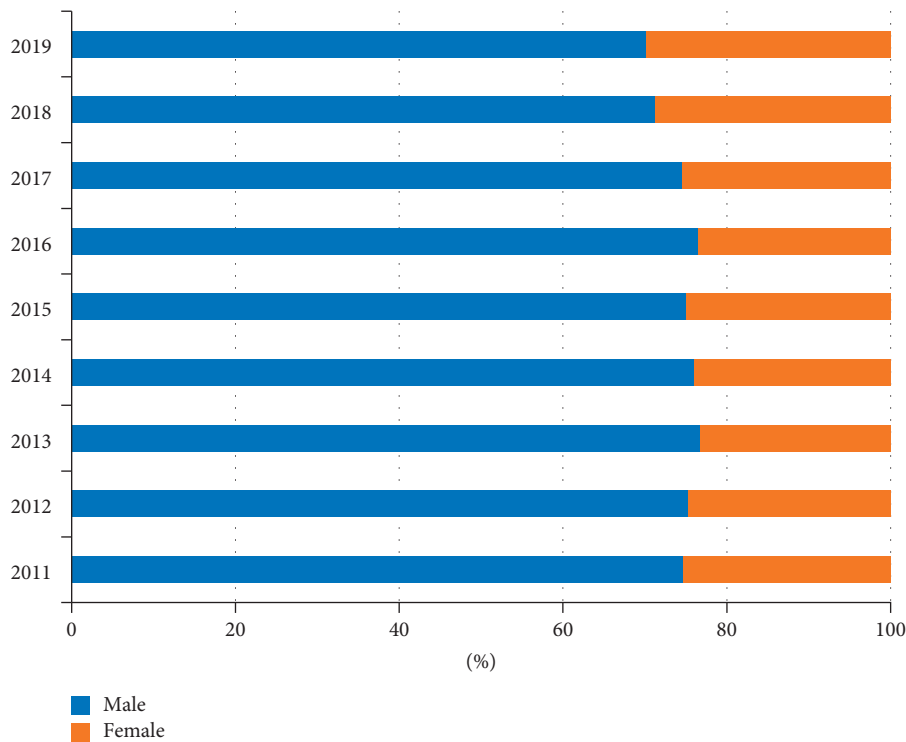


FIGURE 2: Evolution of managers’ gender distribution in the period 2011–2019.

facilitate interpretation of the evolution of a company compared with competitors in the industry. The figure (Figure 3) shows the evolution of the average values of EPS, ROA, ROE, and SOL, by years and industries. The evolution of the financial performance indicators of sampled

companies during the analyzed period 2011–2019 showed improvements after 2015. This favorable development can be explained by the advantages of applying the international financial reporting framework starting with 2013, for which the results are felt at the earliest next year.

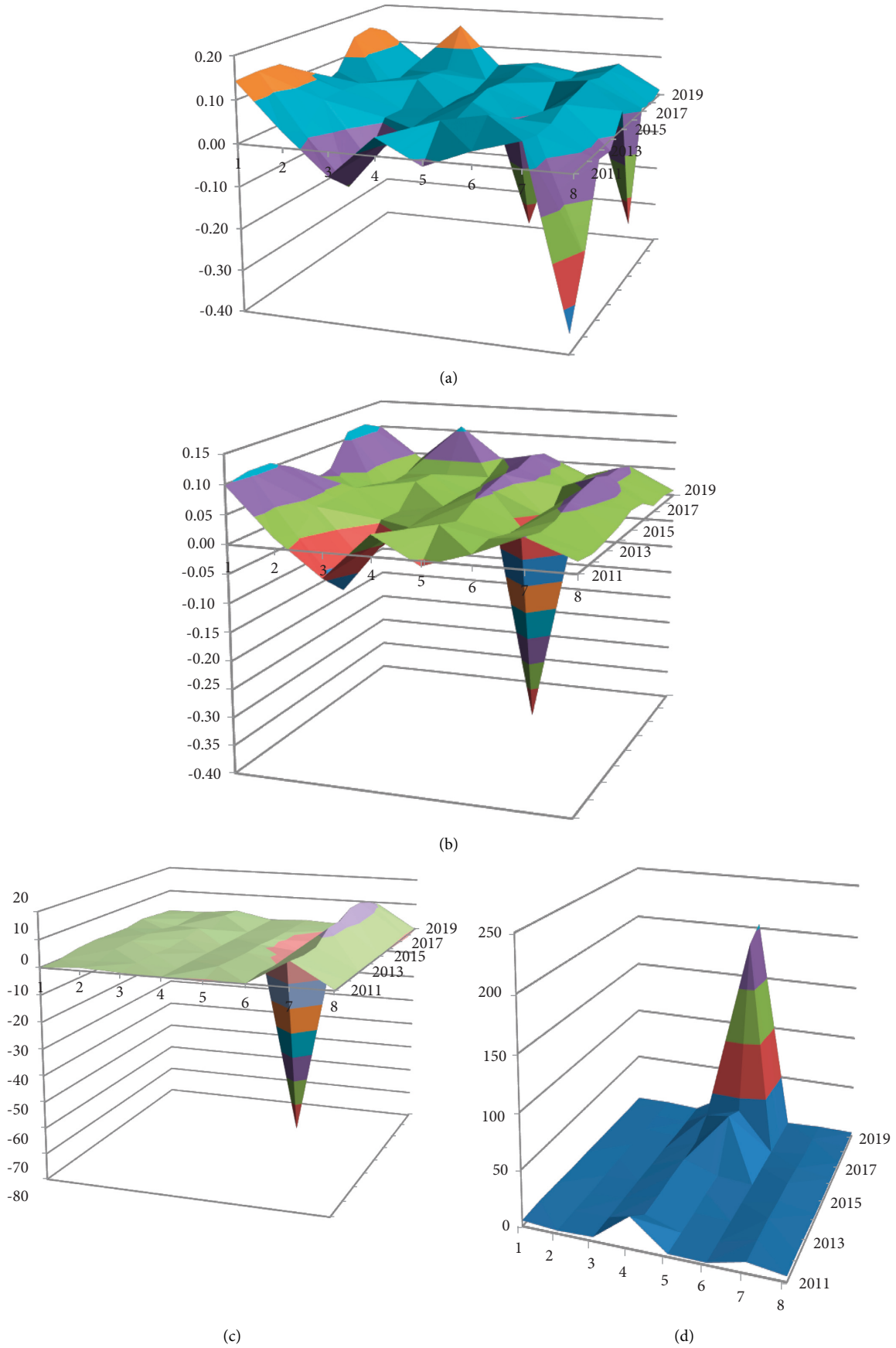


FIGURE 3: Mean of financial indicators for each industry, during the period 2011–2019. (a) ROE. (b) ROA. (c) EPS. (d) SOL.

4. Methodology

The paper aims to analyze the relationship between executive board gender diversity and financial performance and to examine the influence of gender diversity on performance, with a particular interest in measuring the disclosure index on specific managers' information and measuring the financial performance through a composite index. The study covered a sample of 57 companies listed at BSE grouped in eight industries, analyzed for the period 2011–2019. In line and consistent with previous studies, for financial performance, we have used 4 proxies: EPS, ROA, ROE, and SOL, and as a novelty, we designed a synthetic measure called the composite index of financial performance. To obtain such a composite measure, we have applied the multivariate principal component analysis (MPCA) method based on panel data. Brahma et al. [108] highlighted the advantages of using ROA as a proxy for financial performance, facilitating as shown above the comparisons between companies in the same industry and their classification according to the level of performance obtained in a weaker, good, or very good class. As recommended by Orlitzky et al. [109] and followed by Margolis et al. [110] and Wang et al. [111], ROE is employed as an alternate indicator of financial success. Therefore, using various techniques specific to panel data analysis, we have analyzed the effect of women's diversity on the financial performance of Romanian companies adding and using as an interaction variable, the disclosure index on managers' characteristics. For quantifying the extent of disclosure, the following score has been attributed: a score of 2 for detailed information, a score of 1.5 for existing but not detailed information, a score of 1 for poor information, and a score of 0 for no information.

Within the analysis, as already Arora [112] pointed out, board gender diversity is computed as the ratio of women directors dividing the total number of women directors by the total board size. As control variables, we have used two potential variables: the existence of an audit report for which the given score was 0 for no published report, score 1 for the opinion of other auditors than Big4, and score 2 for the opinion of Big4 auditors, and the existence of corporate governance report for which we have allocated score 0 for no report published, score 1 for one report published, and score 2 allocated for those cases where more information on governance than just one report was disclosed. The management board size was measured by the number of top manager members in the board executive management. According to Wang et al. [113], a large board can be more flexible and efficient and it is associated with fewer bureaucratic problems. Further on, we created two specific dummy variables: Big4 equals 1 if the firm audited their reports from Big4 otherwise equal to zero and detailed governance information equals 1 if there is more information on governance than just one report and 0 otherwise. We considered also industry dummy variables for each of the eight industries, having an industry as a benchmark to avoid dummy variable trap and year dummy variables for each year from 2011 to 2019. One-year dummy (2019) is treated as the benchmark to avoid the dummy variable trap.

Starting from the observation of Arora [112], to examine the female board representation impact on companies' performance, the following model can be estimated:

$$FP_{it} = \beta_0 + \beta_1 \cdot RWD_{it} + \beta_2 \cdot BS_{it} + \sum_{j=1}^2 \beta_j \cdot CV_{it} + \sum_{t=2011}^{2019} \gamma_t \cdot (\text{year})_t + \text{industrydummies} + \mu_i + \varepsilon_{it}, \quad (1)$$

where RWD is the ratio of women managers on the board from the year 2011 to 2019; BS is the executives' board size, and as control variables (CV), we have considered the existence of audit reports and the existence of corporate governance reports; μ is unobserved fixed effect for the firm I , φ is assumed to be zero, and ε represents the remaining disturbance term.

The second model treating the effect of the disclosure index on managers' information on the financial performance of Romanian companies can be written as the following:

$$FP_{it} = \beta_0 + \beta_1 \cdot Dindex_{MNit} + \beta_2 \cdot BS_{it} + \sum_{j=1}^2 \beta_j \cdot CV_{it} + \sum_{t=2011}^{2019} \gamma_t \cdot (\text{year})_t + \text{industrydummies} + \mu_i + \varepsilon_{it}, \quad (2)$$

where $Dindex_{MN}$ is the disclosure index on managers' information.

The robustness check relies on using an alternative measure of boardroom gender diversity (the Blau index) apart from the proportion of female managers and different measures for the company performance (the financial performance composite index, ROA, ROE, EPS, and SOL), and additionally, we have taken into account the firm size (measured by the natural log of total assets). To capture the interaction role (between women board diversity and financial performance of companies) of the disclosure index on managers' information, the following model has been developed:

$$FP_{it} = \beta_0 + \beta_1 \cdot Dindex_{MNit} + \beta_2 \cdot RWD_{it} + \beta_3 \cdot Dindex_{MNit} \cdot RWD_{it} + \beta_4 \cdot BS_{it} + \sum_{j=1}^2 \beta_j \cdot CV_{it} + \sum_{t=2011}^{2019} \gamma_t \cdot (\text{year})_t + \text{industrydummies} + \mu_i + \varepsilon_{it}, \quad (3)$$

where $Dindex_{MN} \cdot RWD$ is the interaction term; i = observation (firm); and t = year of observation.

As potential robustness tests, we have used alternative measures of board gender diversity and alternative measures for the company performance and we have analyzed also the endogeneity problem. As observed by Brahma et al. [108], in

the literature that develops this topic of gender diversity in correlation with business performance, most empirical studies used three measures of gender diversity, namely percentage of female directors, gender dummy, and Blau index. According to Molla et al. [114], Blau's heterogeneity index is an appropriate measure of heterogeneity [115], but it is also the most favorable measure to capture diversification within a group of individuals in an organization [116]. The Blau index is the superior measure of board gender diversity if compared to the proportion of female directors [117]. Starting from the papers of Jiang et al. [118] and Wang et al. [113], the Blau index (BI) is computed as follows:

$$BI_i = 1 - \sum_{i=1}^n P_i^2, \quad (4)$$

where P_i is a percentage of women and men on the board and n is 2 describing the number of categories (women and male).

Multicollinearity refers to a high degree of correlation between independent variables, which can inflate regression findings [119]. The correlation matrix and variance inflation factor (VIF) can offer valuable information about the presence of multicollinearity. In the multiple regression model, for analyzing the panel data, the heteroscedasticity problem is a major concern, as it can invalidate the efficiency of statistical results [114, 120, 121]. Therefore, the statistical test of Breusch and Pagan [122] has been used to detect heteroscedasticity. Autocorrelation is the issue of error components being correlated across time due to high similarities. Further, a test for autocorrelation in panel data is used to detect serial or first-order autocorrelation. Cross-sectional dependence also known as contemporaneous correlation refers to the correlation of the residuals across entities. Pesaran's test is the appropriate test to explore whether the data have a cross-sectional dependence problem. Also, the Hausman test is employed to decide whether a fixed or random-effects model is suitable for this study. Table 1 summarizes the variables and measurements used in this study.

5. The Architecture of the Financial Performance Composite Index

One of the objectives pursued in the first stage of this work was the construction of the composite indicator to express financial performance and, in this respect, four ratios were considered: return on equity, return on assets, earnings per share, and overall solvency. For this purpose, the multiway PCA method was applied, which is a generalization of the main component analysis method, but applied to panel data. The empirical results showed the existence of two main components that recover using Kaiser's criterion, approximately 69% of the variant of financial indicators. Thus, if the first component recovers 44% of the original variable variant, the second component explains another 25%, both summing up 69% of the total variant (Table 2).

Based on the varimax method, the components were rotated to allow easy interpretation of components (Table 3).

Thus, the first component is defined in terms of return on assets, whereas the second component can be defined in terms of global solvency.

The accuracy of the results is validated with the help of the Bartlett test and the Kaiser–Meyer–Olkin (KMO) statistics (Table 4), the results highlighting viable results.

Based on the variant recovered by each component, the total variant recovered as weights of the factor scores, and the nonstandard composite index of the financial performance of the companies during the period 2011–2019 is constructed as presented as follows:

$$Non_{std_{fin_{perf}_{index}}} = \frac{44}{69.05} * PC1 + \frac{25.04}{69.05} * PC2. \quad (5)$$

The final value given for each observation for each year is rescaled using the percentile rank. Thus, the financial performance index will indicate how a company performed in one year compared with another company in another year at its level. The index will take values between 0 (lowest financial performance) and 100 (highest financial performance). Therefore, a value of 50 represents an average level of financial performance.

Following the analysis of the financial performance index at the level of sampled companies in the period 2011–2019 (Figure 4), two clusters of companies can be observed: companies with good financial performance for the entire period (OMV Petrom, Turism Felix, Electrica, Conpet, Transgaz, SOCEP, Aerostar, Cemacon, IAR, Turbomecanica, Zentiva) and companies that marked performance improvements during the analyzed period (Electrica, Biofarm, Cemacon, IAR, Turbomecanica, Zentiva). Also, during the examined period (2011–2019), there are fluctuations in the average financial performance of selected companies, with increases in 2016 and 2018, but also decreases in 2017 and 2019, respectively (Figure 5).

Analyzing the average values of the composite financial performance index, we can conclude that the first placed companies in the top ranking by financial performance were occupied by Transgaz, Romgaz, Conpet, Biofarm, Casa de Bucovina-Club de Munte, and Zentiva, with scores over 80 points, whereas at the opposite pole Petrol export–import, Electroputere, and Armatuara were situated, with average scores below 12 units.

6. Results and Discussion

Descriptive statistics of the dependent variable, the independent variables, the control variables, and the interaction variable used in this study are presented in Table 5. The dependent variable in our case is the financial performance of companies captured either individually using different indicators (ROE, ROA, EPS, or SOL) or in a synthetic manner through the designed composite index. The independent variable is the proportion of female managers and the disclosure index has an interaction role, whereas board size, disclosure of corporate governance, and audit reports are the control variables. Company financial performance measured through the synthetic indicator varies from low 0.19 to 100 with an average of 50.09. The average proportion

TABLE 1: Summary of variables.

Variables description	Abbreviation of variables	Measurement
Return on equity	ROE	Net profit/equity
Return on assets	ROA	Net profit/total assets
Earnings per share	EPS	Net profit/average number of ordinary shares outstanding for the reported year
Solvability	SOL	Total assets/total liabilities
Financial performance index	FP_index	Composite indicator built by applying MPCA based on panel data
Disclosure index	D_index	$DI_{\text{managers}} = \sum_{i=1}^n x_i/n$, where x_i = scores given according to the disclosure degree of the information on managers' characteristics and n = number of characteristics
Blau index	BI	$BI_i = 1 - \sum_{i=1}^n P_i^2$, where P_i is the percentage of women and men on the board and n is 2 describing the number of categories (women and men)
Women on board	RWD	The proportion of women on the executive board of directors
Board size	BS	Number of top executive managers on the management board
Corporate governance report	GOV_R	Publication of the governance report within the annual report of the analyzed companies
Audit report	Big4_R	Publication of the audit report prepared by Big4 within the annual report of the selected companies
Industry	Ind dummy	Industry dummy variables for each of the eight industries, having an industry as a benchmark to avoid dummy variable trap and year dummy variables for each year from 2011 to 2019.

TABLE 2: Total variance explained.

Comp.	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	1.760	44.008	44.008	1.760	44.008	44.008	1.751	43.773	43.773
2	1.002	25.049	69.057	1.002	25.049	69.057	1.011	25.285	69.057
3	0.910	22.760	91.817						
4	0.327	8.183	100.000						

Note. Extraction method: principal component analysis.

TABLE 3: Rotated component matrix.

	Component	
	1	2
Z score: earnings per share (EPS)	0.864	-0.079
Z score: return on assets (ROA)	0.904	0.034
Z score: return on equity (ROE)	0.433	0.268
Z score: global solvency (SOL)	0.006	0.966

TABLE 4: KMO and Bartlett's test.

Kaiser-Meyer-Olkin measure of sampling adequacy	0.511
Bartlett's test of sphericity approx. chi-square	327.965
df	6
Sig	0.000

of female managers is 0.25, whereas the Blau index varies from -0.0625 to 0.500, with an average of 0.218. The management board size ranges from 1 to 37, with an average of 5 members.

In Table 6, the correlation matrix is presented. For studying multicollinearity, an implicit assumption that is made when using the pooled regression method is that the explanatory variables are not correlated with one another. In effect, the correlation between explanatory variables will be nonzero; however, a problem occurs when the explanatory

variables are very highly correlated with each other. By looking at the correlation matrix (Table 6), all correlation coefficients are lower than the threshold level of 0.5. Hence, no multicollinearity problem can affect findings.

In the statistical testing process, we used the ordinary least-squares method both cross section and period fixed-effects models for our estimations. The temporal effects included in the models were aimed at capturing, over time, the financial performance that is common to all Romanian companies. Testing of redundant fixed effects was used to decide which of these models is suitable for modeling our data set (fixed effects, periodic effects, cross-sectional effects, or both). The Hausman test was then used to identify whether a fixed-effects model (FEM) or a random-effects model (REM) is more appropriate. A low probability in the Hausman test suggests the use of fixed-effects models (FEMs), whereas a high probability in the test emphasizes REM (if there are reasons to assume that differences between entities have some influence on the dependent variable, then random effects should be used. Random effects assume that the entity's error term is not correlated with predictors that allow time-invariant variables to play a role of explanatory variables) (random-effects models). Cross-sectional dependence also known as contemporaneous correlation refers to the correlation of the residuals across entities. Therefore, Pesaran's test is the appropriate test to explore whether the

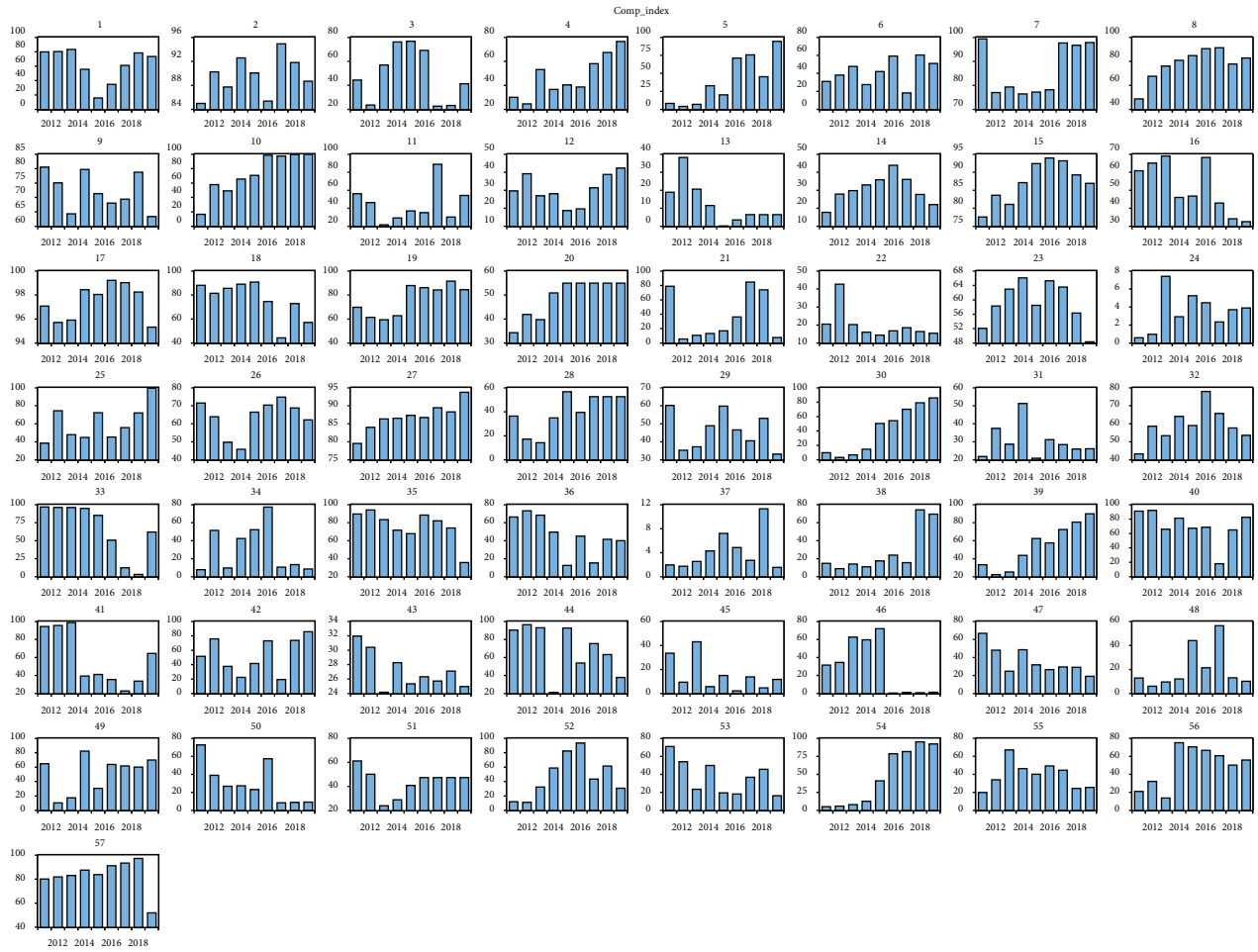


FIGURE 4: Performance composite index of each selected company.

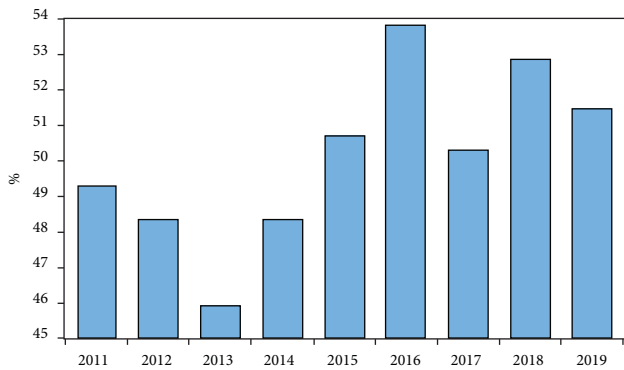


FIGURE 5: Composite index along the period 2011–2019.

data have a cross-sectional dependence problem. It is the most appropriate test for the panel data that have large cross-sectional units and small-time series [123]. The test is applied to the model and confirmed the existence of cross-sectional dependence in the model. The cross-sectional dependence was tested using three tests: Breusch–Pagan LM, Pesaran scaled LM, and Pesaran CD, whereas the homoscedasticity has been tested using the panel heteroscedasticity LR test, and the normality of residuals with the Jarque–Bera test. The

type of model depends on the potential correlation of the explanatory variables with the unobservable effects (if the unobservable effects are uncorrelated with all the explanatory variables, it is recommended to use models with REM effects). The empirical results of the Hausman test together with the results of the Lagrange multiplier random-effects test showed that the random-effects estimator is consistent, with a probability very close to 1 in all specifications of our models. Therefore, different specifications of the model were estimated by assuming fixed effects, using the panel estimated generalized least-squares (EGLS) method.

The problem of cross-sectional heteroscedasticity was addressed using standard corrected heteroscedasticity errors based on the improvement of standard estimator errors, without changing the values of the coefficients. The Durbin–Watson statistics were used to test for the presence of residual autocorrelation. The goodness of fit of the models has been evaluated using adjusted R^2 , root-mean-square error (RMSE), and the standard error of the model, whereas the validity of the models has been tested using the Fisher test. All proposed econometric models were estimated using the EViews 12 software package. However, the potential econometric problems of heteroscedasticity and cross-sectional dependence are found in the data. Random-effects

TABLE 5: Descriptive statistics.

	FPindex	ROE	ROA	EPS	SOL	PropFemMN	Blau index	D index	GOV R	AUD R	Board size
Mean	50.09741	-0.042579	0.023437	0.319117	5.822055	0.250853	0.218005	0.281433	1.265107	1.337232	4.920078
Median	50.10000	0.046100	0.027246	0.035700	3.132500	0.200000	0.244898	0.125000	1.000000	1.000000	4.000000
Maximum	100.0000	0.938900	0.905445	50.49880	204.1725	1.000000	0.500000	1.000000	2.000000	2.000000	37.00000
Minimum	0.190000	-12.00570	-1.468100	-281.6263	0.308003	0.000000	-0.062500	0.000000	0.000000	0.000000	1.000000
Std. Dev.	28.89586	0.771555	0.111884	13.77002	13.93999	0.278919	0.217600	0.315637	0.475874	0.505166	4.729339
Skewness	1.65E-06	-12.31542	-4.859498	-16.40757	10.92190	0.881731	0.102079	0.761310	0.620950	0.320571	3.779433
Kurtosis	1.800028	173.6248	77.48867	345.3846	145.0232	2.901986	1.186228	2.171000	2.452811	1.944077	22.30297
Obs.	513	513	513	513	513	513	513	513	513	513	513

models with heteroscedasticity cannot be efficiently estimated with ordinary least-squares (OLS). To solve the above issues, we have applied OLS with heteroscedastic panel-corrected standard errors (OLS-cross sectional panel-corrected standard errors—PCSEs). The estimator choice is based on the discussion provided by Molla et al. [114]. The PCSE estimate is robust not only to unit heteroscedasticity but also against possible contemporaneous correlation across the units [77, 124].

In Table 7, ten different models have been estimated using panel EGLS using five proxies for firm performance (ROA, ROE, EPS, SOL, and the composite index of financial performance) and two proxies for gender management board diversity (proportion of female managers and Blau's index). The empirical results pointed out a positive impact of the proportion of women on the executive board, leading to a better financial performance in four of five measures of financial performance (composite index, ROA, ROE, and SOL), with only the exception of EPS for which the result is insignificant. In the case of the second proxy of gender management board diversity, the Blau index, the impact is not so relevant, capturing only the statistically significant impact of gender diversity on financial performance only in the case of global solvability. The board size is found to be positively associated with most of the financial performance measures (composite index, ROA, ROE, and EPS), implying that a higher management board size can be associated with better firm performance. Also, the results of the impact of gender management board diversity on financial performance are presented in Table 6 testing hypothesis 2 with its components H2a to H2d, according to which the percentage of women in the executive board leads to better firm performance.

Further on, we followed the influence of board gender diversity on financial performance, given that the proportion of women on the executive board exceeds the 50% threshold. Thus, we have created a dummy variable considering the threshold of more than 50% of women proportion on the executive board and we have explored the influence of this variable on the financial performance of the companies. The empirical results presented in Table 8 highlighted that in most of the cases the impact continues to remain positive, pointing out that an overwhelming proportion of women managers increases the financial performance of the companies, except for the EPS indicator for which the impact is negative. A possible explanation for the negative impact that

the majority proportion of women managers have on the financial performance of companies expressed by EPS would highlight the feature of women managers in Romania who are inclined towards less risky business strategies, more cautious behavior, and a tendency towards strengthening company status. However, looking at the situation from the perspective of the external environment, this result could express the lack of confidence of investors in the ability of women to make managerial decisions, where companies are predominantly led by women.

We can mention that female board diversity may lead to better accounting performance as suggested by Carter et al. [18], Erhardt et al. [83], Chen et al. [125], Kılıç and Kuzey [126], Arora [112], and Brahma et al. [108]. Therefore, putting together all information, the empirical results partially validated hypotheses H2, H2b, H2c, and H2d in the case of the proportion of female managers and invalidated the hypotheses H2, H2a, H2b, and H2c, in the case of Blau index. The hypothesis H2d is the only one that has been fully validated, confirming that management gender diversity captured by two proxies leads to a boost in the global solvability of the companies. Among control variables, audit report capturing if the company audited their reports from Big4 and detailed governance information, if there is more information on governance than just one report does not exhibit a common statistical impact, the effect being in most of the cases insignificant to conclude. However, from the few significant influences, we can point out a positive impact of Big4 on ROA and EPS leading to an increase in financial performance, as well as a negative impact of detailed governance information on the company performance.

Different measures of financial performance are positively correlated with the proportion of female directors on the board of executives. It indicates that having female executive directors on the board brings a variety of thinking to the table and that complicated circumstances may be handled more strategically with various skill sets, values and beliefs, and problem-solving abilities. This might be linked to increased board productivity and problem-solving abilities, resulting in improved corporate success. The findings also suggest that having more than one woman on a board of directors can improve a company's performance by bringing in a range of perspectives to the boardroom [112]. Also, the paper of Jiang et al. [118] confirmed that a female director has a positive effect on the company's financial performance being in line also with other studies reflecting a similar

TABLE 6: Correlation matrix.

Probability	Comp_index	ROE	ROA	EPS	Correlation <i>t</i> -statistic									
					Blau index	Disclosure index	GOV R	Big4 R	Board size					
FPinindex	1.000000	—	—	—	—	—	—	—	—	—	—	—	—	—
ROE	0.287154	1.000000	—	—	—	—	—	—	—	—	—	—	—	—
ROA	6.776593	—	1.000000	—	—	—	—	—	—	—	—	—	—	—
EPS	0.0000	—	—	1.000000	—	—	—	—	—	—	—	—	—	—
SOL	0.600458	0.270508	1.000000	—	—	—	—	—	—	—	—	—	—	—
Blau index	16.97421	6.351722	—	—	1.000000	—	—	—	—	—	—	—	—	—
Disclosure index	0.0000	0.0000	—	—	—	1.000000	—	—	—	—	—	—	—	—
GOV R	0.216443	0.118805	0.653260	1.000000	—	—	—	—	—	—	—	—	—	—
Big4 R	5.011571	2.704789	19.50403	—	—	—	—	—	—	—	—	—	—	—
Board size	0.0000	0.0071	0.0000	—	—	—	—	—	—	—	—	—	—	—
Probability	0.308530	0.040945	0.057245	0.018326	1.000000	—	—	—	—	—	—	—	—	—
Comp_index	7.332129	0.926361	1.296166	0.414345	—	—	—	—	—	—	—	—	—	—
ROE	0.0000	0.3547	0.1955	0.6788	—	—	—	—	—	—	—	—	—	—
ROA	0.213855	0.077191	0.107147	0.035638	0.197575	1.000000	—	—	—	—	—	—	—	—
EPS	4.948754	1.750137	2.436111	0.806119	4.556052	—	—	—	—	—	—	—	—	—
SOL	0.0000	0.0807	0.0152	0.4205	0.0000	—	—	—	—	—	—	—	—	—
Blau index	0.163245	0.061417	0.069311	0.076494	0.126394	0.647608	1.000000	—	—	—	—	—	—	—
Disclosure index	3.740367	1.390972	1.570581	1.734251	2.880281	19.21244	—	—	—	—	—	—	—	—
GOV R	0.0002	0.1648	0.1169	0.0835	0.0041	0.0000	—	—	—	—	—	—	—	—
Big4 R	0.035131	0.077769	0.105707	0.028737	0.043209	-0.042997	0.000447	1.000000	—	—	—	—	—	—
Board size	0.794630	1.763332	2.403009	0.649874	0.977671	-0.972860	0.010108	—	—	—	—	—	—	—
Probability	0.4272	0.0784	0.0166	0.5161	0.3287	0.3311	0.9919	—	—	—	—	—	—	—
Comp_index	-0.070881	-0.156265	-0.052695	-0.027142	-0.084453	0.089285	0.099236	0.062255	1.000000	—	—	—	—	—
ROE	-1.606317	-3.576365	-1.192835	-0.613784	-1.915930	2.026415	2.254393	1.410024	—	—	—	—	—	—
ROA	0.1088	0.0004	0.2335	0.5396	0.0559	0.0432	0.0246	0.1591	—	—	—	—	—	—
EPS	0.077571	0.075761	0.153421	0.166042	-0.006305	0.100101	0.121524	0.087271	0.098604	1.000000	—	—	—	—
SOL	1.758817	1.717547	3.509691	3.806272	-0.142521	2.274246	2.767598	1.980347	2.239895	—	—	—	—	—
Blau index	0.0792	0.0865	0.0005	0.0002	0.8867	0.0234	0.0059	0.0482	0.0255	—	—	—	—	—
Disclosure index	0.319363	0.091396	0.193720	0.323505	0.016792	0.021985	0.186040	-0.018676	-0.050448	0.087332	1.000000	—	—	—
GOV R	7.618261	2.074723	4.463668	7.728522	0.379634	0.497093	4.280225	-0.422247	-1.141843	1.981742	—	—	—	—
Big4 R	0.0000	0.0385	0.0000	0.0000	0.7044	0.6193	0.0000	0.6730	0.2541	0.0480	—	—	—	—
Board size	0.0000	0.0385	0.0000	0.0000	0.7044	0.6193	0.0000	0.6730	0.2541	0.0480	—	—	—	—

Note. The table shows the correlations, the value of the *t*-test, and its probability.

TABLE 7: Impact of executive board gender diversity on financial performance using panel data analysis (random-effects model).

Models	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
<i>Robustness tests: alternative measures of management board gender diversity and alternative measures for firm performance</i>										
Indep. Variables	Comp index	FPindex	ROE	ROA	EPS	SOL	ROE	ROA	EPS	SOL
Proportion of female MN	9.58*		0.179*	0.033*	1.09	11.81***				
Blau index		6.27					0.153	0.04	1.103	7.62*
Board size	0.98***	0.95***	0.0073*	0.003***	0.86***	0.125	0.007	0.003***	0.86***	0.09
Big4 R	2.41	2.56	0.087	0.02**	1.83**	-0.51	0.09	0.02	1.83**	-0.466
GOV R	-2.44	-2.72	-0.261**	-0.155	-0.54	-1.04	-0.26**	-0.015	-0.53	-1.07
Industry dummy	-12.45**		-0.097	-0.0003	0.141	-6.18**				-5.84
Constant	51.18***	43.86***	-0.016	-0.004	-4.82	6.94***	-0.07	-0.003	-4.65**	8.16***
Observations	513	513	513	513	513	513	513	513	513	513
F-test	3.56***	3.12**	2.58**	2.33**	7.03***	5.32***	2.85**	2.77**	8.91***	2.52***
S.E. of reg.	19.94	19.86	0.69	0.097	12.50	11.70	0.69	0.096	12.50	11.86
R ²	0.33	0.32	0.24	0.22	0.36	0.49	0.03	0.02	6.55	0.24
Jarque-Bera test	17.92 (0.00)	29.79 (0.00)	62.22 (0.00)	13.56 (0.00)	36.27 (0.00)	39.68 (0.00)	6.24 (0.00)	13.24 (0.00)	36.35 (0.00)	45.39 (0.00)
Random-effects Lagrange multiplier test	322.98 (0.000)	422.37 (0.00)	38.80 (0.00)	81.55 (0.00)	10.65 (0.00)	101.43 (0.00)	42.56 (0.00)	89.30 (0.00)	10.87 (0.00)	102.71 (0.00)
Hausman test prob.	0.156	0.1043	0.6686	0.78	0.4732	0.3048	0.7173	0.5467	0.4508	0.2334
<i>Residual cross-sectional dependence test</i>										
Breusch-Pagan LM test	2960.32 (0.00)	2877.62 (0.00)	2891.22 (0.00)	2558.86 (0.00)	2871.20 (0.00)	3382.34 (0.00)	2931.91 (0.00)	2575.12 (0.00)	2911.89 (0.00)	3222.52 (0.00)
Pesaran scaled LM test	24.14 (0.00)	22.68 (0.00)	22.92 (0.00)	17.02 (0.00)	22.57 (0.00)	31.61 (0.00)	23.64 (0.00)	17.33 (0.00)	23.29 (0.00)	27.78 (0.00)
Pesaran CD test	-0.47 (0.66)	-0.44 (0.65)	-0.76 (0.44)	0.61 (0.53)	-0.48 (0.62)	0.39 (0.69)	-0.82 (0.41)	0.75 (0.45)	-0.49 (0.61)	0.16 (0.86)
Panel cross-sectional heteroscedasticity LR test	135.84 (0.00)	149.41 (0.00)	2403.84 (0.00)	1006.06 (0.00)	4696.61 (0.00)	2140.25 (0.00)	2409.62 (0.00)	991.77 (0.00)	4660 (0.00)	2139.92 (0.00)

Note. ***, **, and * mean statistically significant at 1%, 5%, and 10%; () represents the probability.

TABLE 8: Impact of executive board gender diversity on financial performance when the proportion of women on board exceeds a threshold (over 50%).

Models	M1	M2	M3	M4	M5
Indep. variables	Comp index	ROE	ROA	EPS	SOL
Proportion of women managers $\geq 50\%$	6.85**	0.115**	0.0054	-0.639***	6.60***
Board size	1.07***	0.0096**	0.003***	0.83***	0.304*
Big4 R	1.57	-0.318***	-0.158	-32.23	7.26
GOV R	-1.36	-0.249**	-0.021***	33.36	0.292
Audit R	0.507	0.386***	0.173	-1.81***	-7.79**
Constant	43.41***	-0.211	-0.142	-4.82	9.98**
Observations	513	513	513	513	513
F-test	3.80***	2.69**	6.78**	20.90***	3.32***
S.E. of reg.	19.92	0.69	0.095	12.01	11.74
R ²	0.37	0.25	0.66	0.39	0.46
Jarque-Bera test	26.54 (0.00)	62.22 (0.00)	77.85 (0.00)	21.55 (0.00)	40.04 (0.00)
Random-effects Lagrange multiplier test	403.16 (0.000)	43.06 (0.00)	73.90 (0.00)	5.85 (0.00)	129.41 (0.00)
Hausman test prob.	0.16	0.838	0.128	0.48	0.18
Breusch-Pagan LM test	2985.655 (0.00)	2883.391 (0.00)	2638.482 (0.00)	2862.560 (0.00)	2868.142 (0.00)
Pesaran scaled LM test	24.59 (0.00)	22.78657 (0.00)	18.45 (0.00)	22.41 (0.00)	22.51 (0.00)
Pesaran CD test	-0.57 (0.56)	0.248 (0.80)	0.36 (0.71)	1.01 (0.62)	-0.49 (0.62)

Note. ***, **, and * mean statistically significant at 1%, 5%, and 10%; () represents the probability.

opinion [127–129], according to which women show better communal and ethical values through their social roles than men.

7. Conclusion, Limits, and Future Research Avenues

The influence of the size and gender diversity of a company's board and team of executives on financial performance is a common topic much debated in the literature in recent years but still of great interest due to its possibilities that allow improvement among the contradictory results and create new avenues for more in-depth research. This study conducted an empirical cross-sectional and time-series data analysis on BSE listed companies with the purpose to analyze the impact of the size and executives' board gender diversity on the financial performance of companies. Likewise, according to Vintila et al. [66], Achim et al. [23], Borlea et al. [67], Mihail and Micu [64], and Pintea et al. [68] this study focused on the influence of the board of executive directors in the context of a slow but sustained evolution of Romanian corporate governance regulations and practices. The most significant theories (agency theory, resource dependence theory, and upper echelon theory) that underpin the relationship between the composition and diversity of boards and business performance have shown that greater gender diversity among CEOs can influence performance measurement indicators. Based on the theoretical framework provided by upper echelon theory, we introduced and used in this study the disclosure index on CEOs' characteristics to moderate the interaction between gender diversity and financial performance. In this aspect, to our knowledge, our study is unique among similar investigations conducted on Romanian listed companies. Also, assessment to the impact of management gender diversity on financial performance for the years 2011–2019 was chosen not only individual indicators but also the methodology resorted to the construction of a composite indicator based on multiway PCA using panel data. After running ten models using panel EGLS, which involved five indicators of financial performance and two indicators for management gender diversity, we proved that there is a positive impact of the proportion of women in the executive board on financial performance, the former measured through the composite index, ROA, ROE, and SOL. However, in the case of the Blau index, the statistically significant impact of gender diversity on financial performance was found only for global solvability. Possible explanations for this result can be identified in the particularities of the Romanian business environment and in the greater inclination of Romanian companies to evaluate financial performance through liquidity indicators. Future research in this direction is needed to get clearer answers. It is also worth noting that SOL is an indicator with relevant results, which does not lead to errors in interpretations, unlike some return ratios, where a positive value can be obtained from the calculation; however, the indicators included in the calculation record negative values (for instance, the positive value of ROE when the net income and owners' equity are negative). The results of the panel data

analysis by the random-effects model showed that a higher management board size can be associated with better company performance measured by the composite index, ROA, ROE, and EPS.

Like any empirical study, this study has its limitations that can be recognized in terms of sampled companies, selection of variables, and the data set, which generates issues related to endogeneity. Thus, further investigation may involve improvements on data, insertion of other control variables, the extension of time, and testing of the moderating effect of nonfinancial variables. Findings of the study lead to practical but regulatory implications, as well. Therefore, looking at the top executives' team composition by gender, the board can discuss and look after an optimal balance between the members of the directors and executive board. As regulatory consequences, we can aspect that other qualitative changes in corporate governance rules or practices may shape the outcomes of further similar empirical endeavors.

Data Availability

The research uses only publicly available data, disclosed in the annual reports of selected companies, as mentioned in Section 3 of the study. Therefore, the data regarding the analyzed financial indicators, the gender composition of executive directors, and the information related to their characteristics, for the period 2011–2019, were collected from the Bucharest Stock Exchange website (<https://bvb.ro/>) and accessing companies' websites. Further detailed information on the data can be provided upon request (vbogdan@uoradea.ro).

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this study.

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