

Non-linear Effects of Board Structure on Firm Performance Evidence from Romania

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Abstract. *The paper centers on the non-linear effects of selected Corporate Governance variables, board size and selected board diversity characteristics, on the financial performance of Romanian companies. We highlight the importance of the context of an emerging market like Romania, characterized by high ownership concentration, relatively small size of the companies and specific corporate governance standards. The study uses a balanced panel dataset consisting of Romanian listed companies and covering the period 2017–2025. We examine whether board size and selected diversity characteristics influence financial performance, as measured by the Price-to-Book ratio. The analysis uses as hypothesis and tests for non-linear relationships in order to capture and reflect market specific constraints. The results indicate a non-linear influence of the board size on firms' financial performance, while diversity variables reflect an inverted U-shaped relationship. These findings support that context and market characteristics are important and that improving analyzed corporate governance variables have linear effects only within specific ranges. It also highlights the importance of understanding the corporate context specific to Romania and possibly to other emerging markets.*

Keywords: Corporate Governance, Corporate Performance, Board Structure, Board diversity, Age Diversity, Gender Diversity.

Introduction

The study contributes to the extension of the body of knowledge relating to the influence of Corporate Governance on the performance of Romanian corporates. While it has a limited contribution to developing existing research methodologies, its main objective and contribution reside in analyzing and understanding if the existing body of knowledge, which generally refer to corporations in developed countries like the US and UK, is applicable to the Romanian case. As we will present further, Romania has a specific context, which could be specific to other emerging markets. The study highlights the main differences and similarities, analyses and explains them.

Previous studies published by the author, also applicable to Romania, cover some of the main corporate governance variables: presence of the large shareholders, board size, board independence or board diversity. As presented in the Literature Review, findings are consistent with the general corporate governance literature. Variables like the shares holdings of institutional investors or the number of independent directors have a linear effect on performance. Other variables, like the board size or the age and gender of the directors, show a non-linear relationship to financial performance, measured by Price to Book value. The focus of this study is on these variables and on found non-linearity.

Understanding the context and the environment in which the companies operate is important. The Romanian market has a set of particularities, assumed to have a direct impact on how boards are constructed and on their effectiveness. One of the most important is the presence of the dominant shareholders for most of the companies listed on Bucharest Stock Exchange (BSE). A large majority of shares are under control of individuals (Medlife, Aquila, TTS, DIGI), foreign

corporations (SNP, BRD) or of the Romanian Government (H2O, SNG, SNN, TGN). We also mention the provisions of the Bucharest Stock Exchange Corporate Governance Guide, which includes recommendations for the proportion of non-executives and independent directors, and for the separation of Chairman and CEO roles. Romania's context is a particular one and can also be relevant for the governance research in other similar countries. The capital market has a relatively short history, an increasing but limited number of listed companies, and a high concentration of ownership. The context is an important constraint influencing the observable variation in governance structures, challenging the applicability of governance theories confirmed for the developed markets. As a result, models that link governance to corporate performance in a linear relationship, without considering the effect of the environment, often fail to capture the potential non-linear effects.

Understanding the context and its effects requires the engagement of additional theories, supplementary to the Corporate Governance ones. Choosing the appropriate lenses provided by the theories represents itself a challenge. Diversity Theories were used to explain how board diversity influences board effectiveness, while Complexity Theories were used to explain the ability of Board Directors to solve wicked problems. In the current paper we employ the Contingency Theories, as a lens intended to clarify why the analyzed variables show a non-linear relationship. The theory, through the *interaction approach* and the *systems approach*, underlines that not only organizational characteristics are important. Contextual conditions, which in the case of emerging markets are significantly different than the ones in the developed markets, have an important role. The effect of a given variable depends on its level *and on the environment*. This explains why a corporate governance variable could have a linear effect on the firm's performance in a developed market, but have a non-linear effect in an emerging one.

Literature review

Corporate governance can be analyzed through multiple theoretical lenses, each of them explaining the different perspectives and the complexity of directing and controlling companies. Initially, the problems generated by the separation of ownership and control were in focus and the studies highlighted the relationship between shareholders and managers. The scope of the corporate governance research was further expanded to include the stakeholder's perspective, considering also social and environmental elements, as captured by the ESG framework. The importance of board structure and effectiveness, director remuneration and collective decision making processes, was also recognized.

Agency Theory provides an important lens for corporate governance analysis, which centers on the conflicts of interest between *principals* and *agents*. In their study, Jensen and Meckling (1976) show that, in their actions, managers are influenced by personal interest, and their actions reduce firm value when ownership and control are separated, thus generating agency costs. The board of directors plays a pivotal role in reducing these costs and theories provide possible solutions like internal and external audits, formal control systems, budgetary constraints, and/or incentives schemes offered to managers. Further, Fama and Jensen (1983) consider that shareholders are residual beneficiaries in the company, being rewarded only after all other stakeholders, like employees (salaries) or the State (taxes) have been paid. The important role of the board of directors in the corporate governance framework is underlined, the board being responsible for the control of the management, thus assuring a mechanism that separates management from control.

Resource Dependence Theory provides a complementary lens by viewing the board as a provider of critical resources, like access to vital raw materials, skills and experience or information. In his study, Pfeffer (1972) states that board composition is dependent on the need to access resources or to manage external dependencies. This can be achieved through mechanisms like cooptation, which assumes appointing board directors that represent partners providing such critical resources, like banks or raw material producers. Such mechanisms can reduce risks and enhance organizational performance. The study concludes that deviations from the optimal structure may weaken governance effectiveness.

According to Resource Dependence perspective, *board size* and *board diversity* are seen as main corporate governance characteristics. Prior studies show that smaller boards benefit from a better capacity to communicate and achieve alignment (Lipton & Lorsch, 1992; Yermack, 1996), while larger boards have better access to resources. However, the studies centered on board size show mixed and context dependent results, particularly in *emerging markets*. Countries like Romania and the European market in general, present a high ownership concentration and relatively smaller companies, thus providing a different context. Research on board diversity reveals potential benefits and but also potential costs. Harrison and Klein (2007) explain that the previous mixed results provided by the literature are explained by the multiple possible meanings of diversity, such as *variety*, *separation*, and *disparity*. They show that different forms of diversity may affect board effectiveness in different ways. There is increasing evidence that supports non-linear relationships, suggesting that moderate levels of diversity enhance performance, while low or excessive diversity can weaken cohesion and alter decision making capacity. These perspectives support a *contingent* view of corporate governance. Board effectiveness depends on board structures that maximize the performance of the directors as a team, rather than the maximization of individual performance.

We searched for literature that would consider a contextual approach and explain the non-linear correlation between corporate governance variables and firm performance. We found that *Contingency Theory* provides an extended perspective which we consider important in understanding why organizational structures do not perform similarly, irrespective of context. The theory explains why there is no optimal board (or organization) structure, sustaining that board effectiveness depends on the convergence between board structure and contextual/market conditions (Donaldson, 2001). As a conclusion, the organizational performance is dependent on how well internal structures, like the board structure, *fit* the context characterized by factors such as firm size, complexity, and the external environment. This perspective includes in focus company structure, as well as structure appropriateness. Within the contingency theory, Van de Ven and Drazin (1985) introduces the concept of “*fit*” and analyzed the limitations of the linear models, which are generally used in empirical research. They argue that firm performance is best captured by a system approach, in which performance reflects the alignment of multiple parameters, internal or external to the company, rather than the effect of individual variables. The ideal model is assumed to be the one that *fits* the parameters within the system, thus generating performance. Deviations from the ideal model generate lower performance, while optimal solutions exist within ranges that change as the system parameters change.

Contingency theory is at the base of the *equifinality* concept. The concept states that potential different solutions that fit the context can lead to similar performance (Van de Ven & Drazin, 1985). This explains how performance can be achieved with different board sizes or diversity, within different contexts. It also challenges the linear approach to organizational effectiveness and provides the base for non-linear relationships between corporate governance

parameters and performance. As the corporate governance parameters deviate from their *fit*, performance declines irrespective if the parameters improve or deteriorate, as considered by the individual perspective. Donaldson (2001) and Van de Ven and Drazin (1985) provide the theoretical base that explains non-linear and context dependent models applicable in corporate governance research. The contingency theory provides two complementary perspectives relevant for our study: *the interaction approach* and *the systems approach* (Van de Ven & Drazin, 1985). The interaction approach explains performance as the result of the relationship between internal corporate setup and the characteristics of the external environment. It states that the effect of a given corporate governance parameter on performance depends on the level of the parameter *and the environment*. The systems approach increases the complexity of the model by considering organizations as systems characterized by a set of parameters, in which performance depends on the structure of the parameters and the environment. Deviations from an ideal structure or pattern to higher or lower values of the parameters of the system will generate lower performance. This generates non-linear relationships between board structure and performance, with best performance at the configuration that best fits the system. As a result, U-shaped or inverted-U relationships provide an empirical explanation for the trade-offs and balance, as stated by the contingency theory.

We analyze the linearity of the relationship between the corporate governance variables that the authors approached in the previous studies and we found two groups. One group that manifests a linear relationship includes the presence of institutional investors or the number of independent directors. The second one includes mainly variety variables that manifest a non-linear relationship to performance.

A study centered on *institutional investors activism* analyses the effects of their presence in the shareholders structure of the companies (Szilagyi, 2025a) and shows it is positively correlated with financial performance. Even if the relationship reflects some short-term price effects generated by share acquisitions, the relationship operates through longer-term governance mechanisms. Pension funds, which were considered as a proxy for institutional investors, have a long and stable investment horizon and act as activists in monitoring managers, supporting long term value adding strategies. As they are engaged in monitoring own investments, their role is not limited to capital provision but is extended to appointing board directors and influencing governance practices. Through activism and influence, large shareholders contribute to more effective oversight and strategic alignment. Improved corporate governance contributes to creating and developing a growth corporate culture and improves reputation. These intangible assets represent an important part of the corporate value, as an add-on to pure financial metrics. The findings support the view that ownership structure has a positive influence on company value primarily through its impact on governance quality rather than short term market effects. Another study, centered on the presence of *independent directors* (Szilagyi, 2025b) confirms a significant linear and negative effect of the presence of independent directors, supporting evidence that links high board independence to lower performance. The presence of one or two independent directors has a positive effect on board effectiveness, while additional number of directors have a marginal or negative effect on performance. A limited presence of independent members improves control and reduces agency costs, as the negative impact of diluting industry knowledge or reducing board cohesion is minimized. Additional independent directors contribute marginally to the board effectiveness, or the director's independence is questionable, considering the influence of dominant shareholders. The findings also underline that the fit should also consider monitoring benefits and coordination or information costs.

With reference to the second group of variables, one analysis (Szilagyi, 2025c) found that board size affects performance only within a limited range and does not exhibit a linear effect. The boards of the companies analyzed are relatively small and vary from 5 to 9 directors, reflecting both the size and the complexity of the firms. This places most of the Romanian analyzed boards within an effective range. As a result, the small differences in the number of directors are less likely to generate statistically relevant effects on performance. This does not mean that board size has no influence on performance but explains that the impact is reduced when the boards operate within an efficient range. In such a context, board characteristics other than board size may be more relevant. Studies (Szilagyi, 2025b) indicate that the relationship between other board corporate governance parameters, like director's age, and firm performance is non-linear. Performance improves as directors' age increases, reflecting their improved experience and the benefits of accumulated knowledge, judgment, and ability to solve complex problems. Higher average age can also be associated with declining performance, which can be explained by *separation*, as a measure of diversity, but also by a lower risk appetite or adaptation to the firm's context. A similar pattern was found for age dispersion within boards. A moderate level of dispersion, which excludes a high disparity, was found to be supportive of performance, through improved debate quality and increased cohesion. In contrast, increased age dispersion may decrease cohesion and slow the decision process. These findings support the view that both experience and diversity positively contribute to board effectiveness only if they remain in a balance range. Regarding gender, studies (Szilagyi, 2025b) suggest that gender diversity on boards is associated with firm performance also in a non-linear manner. The study found two company groups. The performance of the boards that are not gender diversified is not statistically better or worse than the one of the diversified boards. However, if we consider the gender diversified group, the effect of female presence is statistically significant and confirms the influence on board dynamics. Up to moderate levels of gender diversity the board effectiveness is improved, while as the diversity further increases, the marginal results are negative. Similar to the other studies mentioned, maximization of gender diversity is not a solution. Balanced board composition, reflected by a Blau's Index in the interval between 0.3 and 0.35, appears to be a proper fit for the Romanian companies. When analyzing the diversity parameters together – board size, age and gender - the study (Szilagyi, 2025b) emphasizes the importance of interpreting board characteristics as part of an integrated configuration, rather than in isolation, as the effects attributed to individual variables decrease. This supports that board independence, age and diversity are both overlapping but also subject to a solution that fits the system, allowing for multiple solutions that improve board effectiveness.

Methodology

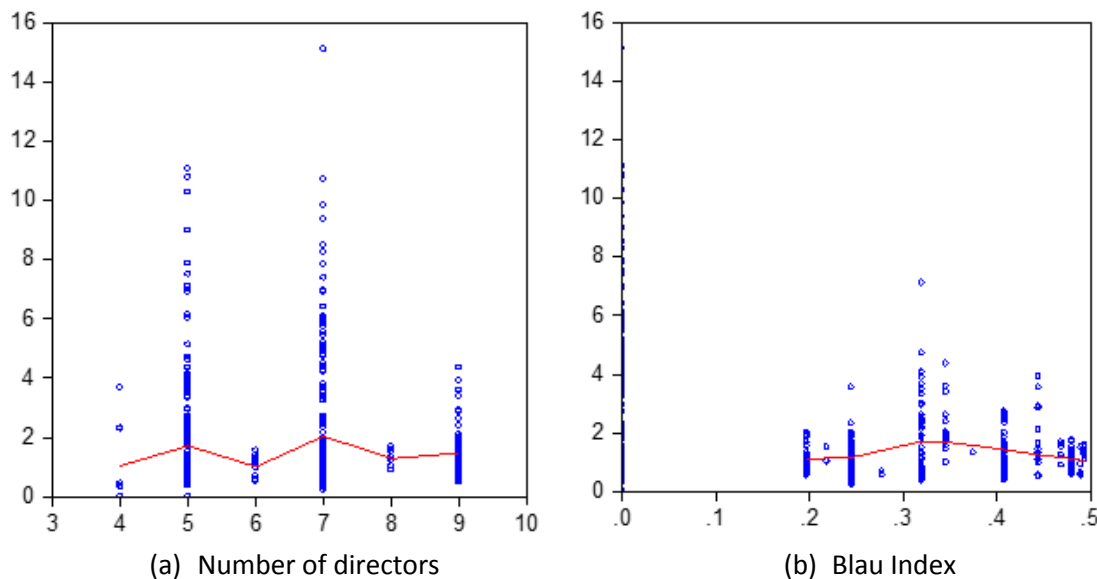
In order to analyze the linearity of the relationship between the selected variables and performance, we use conceptual and empirical analysis. In the first step we will visually analyze the relevant scatter charts that also include a *best fit line*. Graphical/visual inspection is used to support the interpretation of the estimated relationships. In the second step, we employ regression analysis, testing which of the employed models – linear or quadratic – provides the best results. Starting from the corporate governance and contingency theory literature, the hypothesis that assumes a non-linear relationship between board structure variables and performance is formulated. The hypothesis is tested using panel least squares models, which includes quadratic specifications in order to capture potential non-linear effects. Statistical data processing and model estimation are conducted using EViews.

The analysis is based on a balanced panel of 18 Romanian companies listed on the Bucharest Stock Exchange and included in the BET or BET-XT indices. The selected firms represent the largest and most liquid companies on the Romanian market. Sample selection focused on maximizing the number of data points, considering the constraints raised by the short period of time since the listing of the Romanian companies. As a result, the sample covers the period from the fourth quarter of 2017 to the first quarter of 2025, resulting in 540 firm-quarter observations. We use *Price-to-Book* ratio as a measure of long-term firm performance. We also found it to be the most consistent and reliable sets of data available for selected companies. Board structure variables include *board size*, *directors' age* and *gender diversity*, measured using Blau's Index.

One of the model's limitations comes from the scarcity and lack of consistency of the publicly available data. This makes data collection difficult, and the use of additional corporate governance parameters introduces a significant risk into the model. For further research, the authors consider using an unbalanced panel, which extends the list of selected companies and increases the number of data points. The data used within the model included what we considered to be reliable sources, as follows: Bloomberg, Bucharest Stock Exchange reports, selected companies' annual reports.

Visual analysis

The visual analysis is based on scatter plot charts which include discrete explanatory values and smoothed fitted lines. They provide an intuitive assessment of the relationship between board characteristics and firm performance, confirming the presence of non-linear relationships.



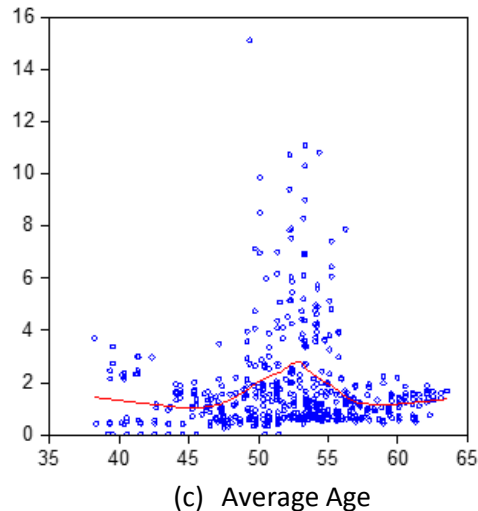


Figure 1. Correlation between Price to Book value and selected variables

Source: Authors own calculations based on data available in annual reports.

The visual analysis indicates that board size is associated with firm performance in a non-linear manner. Performance does not increase as the number of directors increases. It appears to improve up to a moderate number of directors and then stabilizes or declines. The oscillatory movement comes from the fact that an even number of directors is less usual (considering the negative impact on the voting mechanism) and rather explained by temporary vacancies. We also detect a concentration of observations around five and seven directors. We add that the Corporate Governance Code of the Bucharest Stock Exchange recommends a minimum number of five directors. Thus, there are no smaller boards to allow the analysis of their performance, even if the size of the company would suggest that a smaller board could be effective. Therefore, the non-linearity is analyzed within the boundaries set by minimum legal limit and a natural maximum limit, given the size of the selected companies.

Gender diversity also displays a non-linear pattern. The graphs show a visible difference between the two groups: diversified and non-diversified boards. Once the board is diversified, we observe a positive correlation with performance. Performance increases up to a medium level of diversity and decreases after this level. The pattern confirms the non-linear relationship, indicating that a moderate level of diversity is associated with higher performance. Very low or very high diversity has a negative impact on performance.

Age diversity also displays a non-linear relationship with performance. The graphical analysis confirms that the best financial performance is reached by boards with an average age between approximately 50 and 55 years. Boards with significantly lower or higher average ages show weaker performance. This indicates that experience and maturity contribute positively to firm performance up to an optimal level. Above this level, other traits of the older directors, like potentially increased risk aversion, have a negative effect on performance.

Overall, the visual evidence is consistent and supports the existence of non-linear relationships, suggesting that models that analyze optimal ranges provide a better fit than the linear ones.

Data model

To capture potential non-linear effects, we extend the linear panel specification by including quadratic terms for selected board characteristics.

$$\text{Performance}_{it} = \alpha + \beta_1 * X_{it} + \beta_2 * X_{it}^2 + \varepsilon_{it}, \quad (1)$$

Where:

X = average age, gender diversity, number of directors
i – company
t - quarter
 β_1 = linear coefficient
 β_2 = quadratic coefficient

Following contingency theory, governance mechanisms are expected to affect performance only within bounded ranges, as long as they are fit for the context in which the company operates. This motivates the use of quadratic specifications to capture potential non-linear relationships. The results of the regression analysis are presented in detail in the Appendix, and a summary is provided in Table 1, below.

Table 1. Regression analysis results

Variable	β_1	β_2	T-statistic β_1/β_2	Probability β_1/β_2	R-squared
Average age	1.007	-0.009	4.60/-4.56	0.00/0.00	0.039
Blau Index	21.75	-31.36	2.45/-2.44	0.015/0.015	0.107
Board size	1.405	-0.104	2.54/-2.55	0.01/0.01	0.012

Results and discussions

The empirical analysis confirms the assumed hypothesis and shows that the relationship between selected variables and financial performance is non-linear. In line with *the systems approach*, the model finds *best fit values* for the analyzed explanatory variables. Consistent with the theory, the deviations from the best fit values, positive or negative, have a negative impact on performance, thus explaining the U-shape relationship. This is confirmed by the statistically relevant β_2 coefficients for all three variables analyzed. We observe the negative values of the coefficients, confirming the existence of a maximum value for each of the functions.

There are theoretical arguments supporting the non-linear pattern found. An increase in board size, age and gender diversity can improve board effectiveness through better oversight and control capacity, an extended range of skills and experiences, or decreasing the masculinity of the boards. In contrast, when size, age or gender diversification increases beyond certain levels, communication and coordination becomes more difficult, group cohesion decreases, reducing ability to find solutions to specific company problems and thus decreasing overall effectiveness. A balance of the variables places a company in an effective area, which is usually achieved at moderate levels, deviations generating marginal costs. These results are explained and consistent both to corporate governance and diversity theories.

At the same time, there are also possible practical arguments, related to the company's unique context, as explained by the contingency theory. Increasing the values of the variables might be difficult in the context of an emerging market, where the market economy developed only recently. In Romania, there is a reduced pool of professional directors, while the corporate governance education is at the beginning. As an example, increasing the number of experienced directors or adding a female director that improves cohesion within the board, can be both difficult

and expensive. Similarly, assuming that in an emerging market the directors pool has an important component of separation or disparity, any add-on to the board generates a negative impact.

Another particularity of the Romanian and other emerging markets is the ownership concentration, exhibited by most of the companies in the sample. The model considers scenarios that do not imply the transfer of control and an increase in the number of independent directors is limited by the low free float of the listed companies. We also observe the significant weight in the sample of state-owned companies. In their case, the board selection process is influenced by political decisions. Also, the local companies are considered small or mid-caps, from the perspective of their size. Literature links the benefits of corporate governance with large companies, as the complexity of the processes, products or market mechanisms requires boards to be effective as a prerequisite for company performance. Higher values of the selected corporate governance variables could bring marginal benefits that are lower than the marginal costs, be it dollar costs or reduced effectiveness effects.

Conclusion

This study analyzes the influence of board structure on firm performance, in the context of an emerging market, with a focus on the non-linearity of the relationships. We use two corporate governance parameters as explanatory variables, the board size and board diversity, and show that both have non-linear influence on performance. We found that *board size* has a non-linear influence on performance, mainly explained by the fact that selected companies operate within an optimal range. The range is explained by the market context - a floor of 5 directors, set by the local Corporate Governance Code and a maximum observed value of 9 directors, highly influenced by the reduced size of the Romanian companies. *Age diversity* and *gender diversity* display inverted U-shaped relationships to firm performance. This initial positive correlation is in line with the corporate governance theories, which link the selected variables to improved board effectiveness. As the variables increase in value, environmental factors specific to the local context have a negative influence on how the board structure fits to them. Ownership concentration or the availability of directors fit for the specific board are such examples. Findings are consistent with the contingency theory and indicate that rather than supporting a “*more is better*” approach, effectiveness depends on achieving a *moderate* or “*appropriate*” fit between board characteristics and environment.

The Romanian capital market ecosystem has its own history and characteristics. Factors like ownership type and concentration, company size, availability and independence of professional board directors or the socio-economic traits create a particular environment, different from the developed markets one. This requires the use of non-linear corporate governance models, where effectiveness is reached within specific ranges, rather than at minimum or maximum levels. The best solution is the one that best fits the system, which is dependent on the market, environment and company’s context. By adding the lenses provided by the contingency theory to the ones provided by the corporate governance theory, the study contributes to a better understanding of boards performance drivers in emerging markets, such as Romania. The results support the perspective that board effectiveness depends on balance, moderation, and internal coherence. The study also shows that minimum or maximum levels of various corporate governance parameters are associated with low financial performance. From a practical perspective, the study supports a system approach, where corporate governance practices observed in developed markets should be adjusted to the emerging markets context.

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During the preparation of this work, the author utilized ChatGPT to enhance readability and language clarity. Following the use of this tool, the author meticulously reviewed and revised the content as necessary and assume full responsibility for the final content of the publication.

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Appendix

Table 2. List of selected companies

Company Name	Market	Ticker
Antibiotice SA	RO	ATB
BRD - Groupe Societe Generale SA	RO	BRD
Bursa de Valori Bucuresti SA	RO	BVB
Conpet SA	RO	COTE
Electrica SA	RO	EL
Evergent Investments SA	RO	EVER
Impact Developer & Contractor SA	RO	IMP
Infinity Capital Investments SA	RO	INFINITY
Lion Capital SA	RO	LION
Med Life SA	RO	M
Sphera Franchise Group	RO	SFG
Romgaz SA	RO	SNG
Nuclearelectrica SA	RO	SNN
OMV Petrom SA	RO	SNP
Transelectrica SA	RO	TEL
Transgaz SA	RO	TGN
Banca Transilvania SA	RO	TLV
Teraplast SA	RO	TRP

Source: www.bvb.ro

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Regression results - independent variable Price to Book and dependent variable Average Age (age diversity)

Dependent Variable: IPTB
Method: Panel Least Squares
Date: 01/31/26 Time: 15:17
Sample: 2017Q4 2025Q1
Periods included: 30
Cross-sections included: 18
Total panel (balanced) observations: 540

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-24.09495	5.580778	-4.317490	0.0000
AGE_AVG	1.007211	0.218605	4.607445	0.0000
AGE_AVGSQR	-0.009703	0.002128	-4.559070	0.0000
R-squared	0.038550	Mean dependent var	1.769417	
Adjusted R-squared	0.034969	S.D. dependent var	1.873157	
S.E. of regression	1.840114	Akaike info criterion	4.063072	
Sum squared resid	1818.293	Schwarz criterion	4.086914	
Log likelihood	-1094.030	Hannan-Quinn criter.	4.072397	
F-statistic	10.76555	Durbin-Watson stat	0.241406	
Prob(F-statistic)	0.000026			

Figure 2. Regression results (age as dependent variable)

Source: Authors own calculations, in E-views, based on data available in annual reports.

Regression results - independent variable Price to Book and dependent variable Blau's Index (gender diversity)

Dependent Variable: IPTB
Method: Panel Least Squares
Date: 03/01/26 Time: 15:20
Sample: 2017Q4 2025Q1
Periods included: 30
Cross-sections included: 18
Total panel (balanced) observations: 540

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.548830	0.127424	20.00276	0.0000
GEN_BLAUDUMMY	-4.687794	1.443790	-3.246868	0.0012
GEN_BLAUINDEX	21.75637	8.889573	2.447403	0.0147
GEN_BLAUSQR	-31.35891	12.83925	-2.442425	0.0149
R-squared	0.107246	Mean dependent var		1.769417
Adjusted R-squared	0.102250	S.D. dependent var		1.873157
S.E. of regression	1.774810	Akaike info criterion		3.992644
Sum squared resid	1688.373	Schwarz criterion		4.024433
Log likelihood	-1074.014	Hannan-Quinn criter.		4.005076
F-statistic	21.46321	Durbin-Watson stat		0.287024
Prob(F-statistic)	0.000000			

Figure 3. Regression results (gender diversity as dependent variable)

Source: Authors own calculations, in E-views, based on data available in annual reports.

Regression results - independent variable Price to Book and dependent variable Board Size

Dependent Variable: IPTB
Method: Panel Least Squares
Date: 01/31/26 Time: 15:19
Sample: 2017Q4 2025Q1
Periods included: 30
Cross-sections included: 18
Total panel (balanced) observations: 540

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.747415	1.796733	-1.529117	0.1268
BOD_SIZE	1.405171	0.551662	2.547159	0.0111
BOD_SIZESQR	-0.104240	0.040857	-2.551342	0.0110
R-squared	0.011991	Mean dependent var		1.769417
Adjusted R-squared	0.008312	S.D. dependent var		1.873157
S.E. of regression	1.865356	Akaike info criterion		4.090321
Sum squared resid	1868.520	Schwarz criterion		4.114163
Log likelihood	-1101.387	Hannan-Quinn criter.		4.099645
F-statistic	3.258752	Durbin-Watson stat		0.233261
Prob(F-statistic)	0.039198			

Figure 4. Regression results (board size as dependent variable)

Source: Authors own calculations, in E-views, based on data available in annual reports.