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Board of Directors Independence and Firm Value: Empirical Evidence Based on the Bucharest Stock Exchange Listed Companies

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ABSTRACT: This paper examines the influence and causal relationship between board of directors independence, CEO duality, and firm value. By estimating multivariate regression models for panel data, unbalanced, for a sample of companies listed on the Bucharest Stock Exchange, there resulted a positive influence of the percentage of independent directors on firm value, but down to a threshold of their representation of 47.23 percent, whereupon their influence becomes negative. When we employed fixed-effects models, the relationship previously mentioned was not statistically validated. However, the results provide support for a lack of statistically significant relationship between the percentage of non-executive directors and firm value. Besides, by estimating fixed-effects models we found a positive influence of CEO duality on industry-adjusted Tobin's Q ratio, but not statistically significant when estimating models without cross-sectional effects. The causal relationships between board independence and firm value identified based on Granger causality are not robust.

Keywords: independent directors; non-executive directors; firm value; panel data regression models; Granger causality; vector autoregression
JEL Classifications: G32; G34

1. Introduction

Corporate governance covers all the procedures which ensure the fact that management operates in order to satisfy shareholders' interests (Kanagaretnam et al., 2007). Thereby, based on its importance within modern corporations, board of directors as internal mechanism of corporate governance was slightly disputed (Iwasaki, 2008; Jensen, 1993), but widely researched and criticized within the pale of specific literature (Adams et al., 2010; Ezzamel, 2005). Agency theory reflects the prevailing approach as regards the investigation towards the relationship between board independence and firm value. This prevalent theory suggests that information asymmetry, as well different aims between principals (shareholders) and agents (management) impose costs on principals when an agent holding discretionary authority pursues his objectives rather than shareholders' interests. Bebchuk and Fried (2003) noticed that there are not a priori reasons in order to assume the fact that managers' aim is shareholders' wealth maximization. According to Byrd and Hickman (1992) and Fama and Jensen (1983), the companies are mitigating their agency costs through implementing an appropriate monitoring system such as efficient oversight of managers by board members. Furthermore, Fama and Jensen (1983) underlined the efficiency towards managers' monitoring when corporate boards are dominated by outside independent members. Besides, Hossain et al. (2000) mentioned that the value of outside members among boards is determined through their ability against the assessment of corporate performance, whereas insiders cannot often own this virtue. As much, we ascertain a narrowed efficiency of insiders as corporate monitors.

The aim of this research consists in the empirical investigation of the influence and causal relationship between board of directors independence assessed through the percentage of independent directors, as well the percentage of non-executive directors and firm value. Moreover, we will investigate the impact and causal relationship between CEO duality and industry-adjusted Tobin's Q ratio employed as proxy for firm value. This study is important since it provides the first empirical results for a sample of companies listed on the Bucharest Stock Exchange (BSE) over 2007-2011. The novelty of this study is depicted by the examination of board independence based on a sample of companies listed on the Romanian Stock Exchange. Notwithstanding, Romania is acknowledged as post-communist country from Eastern Europe, nevertheless scanty regulated concering corporate governance. With respect to the privatisation process, Boycko et al. (1996) advocated the postive effects of this course, respectively the decline of agency problems and the growth of efficiency by way of improvement the monitoring systems. Thus there are provided the required incentives to the agents in order to act properly. Besides, the privatisation process of Romanian companies owned by the State during the communist regime, initiated after 1990, was not entirely accomplished. Likewise, the act of privatisation is endless litigated and bounded to corruption. According to Stulz (2006), when State behaves improper the individuals who control the State actuate in own interests rather than enforcing property rights and facilitating contracting among private parties.

The remainder of this paper is organized as follows. Section two presents the regulations towards board independence within the companies listed on the Bucharest Stock Exchange. Section three reviews the literature on the relationship between board independence and firm value and shows the research hypotheses. The research sample alongside all the employed variables and empirical methods are described in Section four, whilst Section five provides the empirical results. Last section concludes the paper.

2. Board Independence Regulations within the Bucharest Stock Exchange Listed Companies

We emphasize the prevalence of unitary boards within the companies listed on the BSE. Besides, Law 31/1990 on trading companies points out that corporate boards of directors shall have the following main competencies that may not be delegated to directors: to establish the main directions of activity and development of the company; to establish the accounting and financial control system and to approve the financial planning; to nominate and dismiss directors and to establish their remuneration; to supervise directors' activity; to prepare the annual report, to organise the General Meeting of Shareholders and to implement its decisions; to introduce the request for opening the insolvency proceedings of the company according to the law on insolvency proceedings. However, directors shall be nominated by the Ordinary General Meeting of Shareholders, except for the first directors which are appointed through the Constitutive Act. The nominees for the positions of directors shall be appointed by the current members of the board or by the shareholders. Moreover, for the duration of the term of office, directors may not conclude an employment contract with the company. If directors were nominated among the employees of the company therefore the individual employment contract shall be suspended over the term of office.

In Romania, Corporate Governance principles and recommendations are expressed within the Bucharest Stock Exchange Corporate Governance Code (2008). Thus, the companies admitted to trading on the regulated market of the BSE shall adopt and comply with the provisions out of the Romanian Corporate Governance Code, but on a voluntary basis. It is mentioned that the board structure of the companies should ensure a balance of executive and non-executive directors or independent directors in a flawless framework, insofar that no individual or small group of individuals can dominate the board's decision making process. Consequently, an adequate number of non-executive directors shall be independent by considering the fact that they do not maintain, nor have recently maintained, directly or indirectly, any business relationships with the issuer or persons linked to the issuer, of such significance as to influence their autonomous judgment.

The independence of non-executive directors shall be evaluated based on the following criteria: a non-executive director is not an executive director of the company or of an entity controlled by it and has not been in such a position for the previous five years; he is not an employee of the company or of an entity controlled by it and has not been in such a position for the previous five years; he does not receive and has not received significant additional remuneration from the company or of an entity controlled by it, apart from a fee received as non-executive director; he is not and does not

represent in any way a significant shareholder of the company; he does not have and has not had within the last financial year a significant business relationship with the company or of an entity controlled by it, either directly or as a partner, shareholder, director, or employee of a body having such a relationship; he is not and has not been within the last three years a partner or an employee of the present or former external auditor of the company or of an entity controlled by it; is not an executive director in another company in which an executive director of the company is a non-executive director; he has not served on the board as a non-executive director for more than three terms; he is not a close family member of an executive director or of persons in the situations above mentioned. The Guide for implementing Corporate Governance Code (2010) notice the fact that at least half of the total number of directors should be non-executive and at least a quarter of them shall be independent. Usually, the Chairman of the board is independent.

3. Literature Review and Hypotheses Development

Although the relationship between the monitoring function related to corporate boards of directors and firm value has been extensively researched (Berle and Means, 1932; Jensen and Meckling, 1976; Fama and Jensen, 1985), there are not congruent points of view towards the sense of relation between the monitoring role exerted by outside directors and its effect on firm value (Hermalin and Weisbach, 2003; Denis and McConnell, 2003). Thereby, Morck et al. (1988), Hermalin and Weisbach (1991), Mehran (1995), and Klein (1998) reported a lack of a statistically significant relationship between board independence and firm performance, whereas Agrawal and Knoeber (1996) and Bhagat and Black (2001) concluded a negative relationship. Contrariwise, Rosenstein and Wyatt (1990) noticed positive share-price reactions at director appointments on board.

However, whilst insiders are an important source of company-specific information for boards, we distinguish different aims against shareholders' wealth maximization due to the private benefits and lack of independence towards CEO (Raheja, 2005). As opposed Raheja (2005), outside directors confer an independent monitoring, but they own reduced information as regards the constraints and opportunities of the companies. Therefore, as benefits (costs) of monitoring rise, the boards will perform a better (lower) monitoring through the rise (reduction) of outside members. Hermalin and Weisbach (1988) suggested that outside directors are potential sources of counselling, thus being able to enhance the proficiency and expertise of boards. Likewise, Mariolis (1975), Koenig et al. (1979), and Mace (1986) mentioned that outside directors can serve as source of prestige by offering new business contacts. We notice two competing theories regarding board characteristics emphasized by Boone et al. (2007). The inefficient board hypothesis highlights the inefficient organization of boards unless regulations force them to a more efficient size and composition. In fact, boards may be structured either haphazardly or perversely. Unfortunately, if boards are perversely inefficient, its structure will not increase firm value, but will facilitate the extraction of private benefits by managers at shareholders' expenses. The economic hypothesis or the efficient board hypothesis emphasizes that board structure is endogenous driven by unique specific characteristics to every company and the tradeoff between costs and benefits. Besides, Boone et al. (2007) notice that board structure is endogenous, being required its adjustment according to the characteristics of the environment where the company operates.

By investigating the forces that drive board size and composition, Boone et al. (2007) established three non-mutually exclusive testable hypotheses. Thus, the views of Fama and Jensen (1983), Coles et al. (2008a), and Lehn et al. (2009) are reflected through the scope of operations hypothesis which involves that board structure is driven by the scope and complexity of the firm's operations. The measures of firm scope and complexity including firm size, age, and number of business segments are positively related to board size and the proportion of independent outside directors. As the companies are growing, its boards of directors are extending due to the net benefits of monitoring and specialization by board members. The monitoring hypothesis defined out of research employed by Demsetz and Lehn (1985), Raheja (2005), Gillan et al. (2011), and Harris and Raviv (2008) emphasizes that board size and composition are positively related to private benefits of managers and negatively related to the cost of monitoring. Thereby, board size implies a tradeoff between the benefits and costs of monitoring. From the studies of Hermalin and Weisbach (1998) and Baker and Gompers (2003) was developed the negotiation hypothesis according to which board

composition emerges from a negotiation between the CEO of the company and its outside board members.

According to Duchin et al. (2010), we highlight three broad views concerning the way how boards operate. Thereby, window-dressing view supported by Romano (2005), also called co-option (Coles et al., 2008b), shows the establishment of numerical targets as regards independent directors through the medium of regulations. However, this circumstance will not improve corporate governance since managers can select directors that meet the criteria of independence according to regulatory definitions, but are still excessively congenial to management. Bhagat and Black (2001) reported that low-profitability companies decide to increase the independence of boards, but there is no evidence that this strategy works. Entrenchment view advocates that managers dislike independent boards and look for their dismissal from oversight. Optimization view shows that managers trade off the strengths and weaknesses of inside and outside directors towards counselling and monitoring in order to maximize shareholders' wealth.

Based on these considerations, we draw the first and the second hypotheses which will be tested within current study:

H1: The percentage of independent directors has a positive influence on the value of listed companies on the Bucharest Stock Exchange.

H2: The percentage of non-executive directors has a positive influence on the value of listed companies on the Bucharest Stock Exchange.

CEO duality occurs when the same person holds the functions of CEO and Chairman of the board of directors (Rechner and Dalton, 1991). Therefore, the Cadbury Report (1992), titled Financial Aspects of Corporate Governance emphasized the concentration of power when the roles of CEO and Chairman are combined in one person. Anyway, the Cadbury Report (1992) recommended a division of responsabilities at the head of the company in order to ensure a balance of power and authority, such that no one individual has sovereign powers of decision. Agency theory supports the negative effect of CEO duality due to the limitations of CEOs' towards the settlement of decisions in shareholders' interests (Jensen and Meckling, 1976; Fama and Jensen, 1983), whereas stewardship theory maintains the positive effect related to CEO duality and argues the improvement of organizational efficiency thereupon shareholders' wealth (Miller and Friesen, 1977; Stoeberl and Sherony, 1985; Anderson and Anthony, 1986; Donaldson and Davis, 1991; Finkelstein and D'Aveni, 1994; Dahya et al., 1996; Brickley et al., 1997; Bhagat and Black, 2001). According to Berg and Smith (1978), the CEOs which hold the position of Chairman of the board can select board members among the individuals with a similar attitude. Thus, Jensen (1993) argued that CEO duality provides an excessive power to the CEO as against decision taking process, as well the possibility to accomplish their own aims. Iyengar and Zampelli (2009) mentioned that CEO can lower the monitoring power related to the board, following the fulfillment of his objectives without taking in account the costs bore by shareholders. On the contrary, Miller and Friesen (1977) stressed the ability of the companies towards the quick act at outside events, respectively the efficiency of decision taking system if both functions are held by a single person. Likewise, Finkelstein and D'Aveni (1994) promoted the unification of CEO and Chairman roles in order to avoid confusions or ambiguities related to multiple authorities.

On the basis of these considerations we state the third hypothesis which will be tested within current study:

H3: The separation of roles related to the CEO and Chairman of the board has a positive influence on the value of listed companies on the Bucharest Stock Exchange.

4. Data and Research Methodology

4.1 Sample selection and variables description

Our initial sample comprised all the companies listed on the Bucharest Stock Exchange on all three tiers between 2007-2011. Subsequently, we removed from our sample the companies from financial intermediation sector (eleven companies) including credit institutions (three banks), financial investment companies (five SIFs), and financial investment services companies (three SSIFs), since these companies are regulated by specific rules. Likewise, we dropped from the initial sample the companies out of 'Unlisted' tier (twenty five companies) and the companies out of 'International' tier (two companies). Therefore, our final sample shows the following distribution: 63 companies in 2007,

67 companies in 2008, and 68 companies between 2009-2011, counting 334 statistical observations. The industry membership of selected sample is sundry as following: wholesale/retail, construction, pharmaceuticals, manufacturing, plastics, machinery and equipment, metalurgy, food, chemicals, basic resources, transportation and storage, tourism, and utilities.

Table 1 describes all the variables employed in the empirical research.

Table 1. Description of variables

Variable	Definition
Variable regarding firm value	
QAdj	Industry-adjusted Tobin's Q ratio. Tobin's Q ratio was computed as the market value of assets divided by the book value of assets, where the market value of assets equals the book value of assets plus the market value of common equity less the sum of the book value of common equity.
Variables regarding corporate board of directors independence	
IND	The ratio between the number of independent directors on corporate board of directors and the total number of directors on board (%).
IND^2	The percentage of independent directors on corporate board of directors squared (%).
NED	The ratio between the number of non-executive directors on corporate board of directors and the total number of directors on board (%).
NED^2	The percentage of non-executive directors on corporate board of directors squared (%).
Variable regarding CEO duality	
CEODual	Dummy variable If the CEO holds simultaneously the positions of CEO and Chairman = 1; If the CEO does not hold simultaneously the position of CEO and Chairman = 0.
Control variables	
FS	Firm Size, as the annual total assets (logarithmic values).
Lev	Leverage, computed as debt/book value of assets.
SGrowth	Sales Growth, as the relative increase of sales from the previous year (%).
Listing	The number of years since listing on the BSE (logarithmic values).

Source: Author's processing.

All data was hand collected, besides the source of it being represented by the annual reports disclosed by the companies. The value of selected companies will be measured through Tobin's Q ratio, but industry-adjusted, similar Eisenberg et al. (1998), in order to account for the varied industry membership. Thereby, we employed the method described by Kaplan and Zingales (1997), Gompers et al. (2003), and Bebchuk et al. (2009). Nevertheless, we have not considered the market value of debt at the numerator, respectively the replacement cost of assets at denominator. Further, after we have computed Tobin's Q ratio for each company, we have adjusted it according to industry membership. Thus, the difference between Tobin's Q ratio of a certain company and industry' median Tobin's Q ratio is ΔQ, while industry-adjusted measure of Tobin's Q ratio (QAdj) is defined as follows: $QAdj = sign(\Delta Q)*sqrt(|\Delta Q|)$, where $sign(\Delta Q)$ is the sign of difference between Tobin's Q ratio of a certain company and industry' median corresponding to Tobin's Q ratio, whereas $sqrt(|\Delta Q|)$ is the square root of absolute value of ΔQ. We decided to use median instead of mean because our data did not follow a normal distribution.

The annual total assets (logarithmic values) will be employed as proxy for firm size. In fact, large companies require an additional managerial effort and a multifarious expertise, thus registering a higher size and independence related to corporate board of directors. Therewith, large companies benefit of more outside contractual relationships (Booth and Deli, 1996) than small companies, being emphasized a higher degree of transparency within these types of organizations (Lang and Lundholm, 1993; King et al., 1992). According to Coles et al. (2008a), Guest (2008), and Linck et al. (2008), board size and independence are positively related to several firm characteristics as indebtedness level, the age of the company, and industrial diversification. There is showed that highly leveraged companies with a long history and significant diversification are more complex and request superior experience and skills (Fama and Jensen, 1983; Guest, 2008). We will employ debt/book value of assets in order to control for the indebtedness level, considering the use of debt in order to restrict managerial discretion by reducing the size of cash-flow. The growth opportunities are proxied by the relative increase of sales from the previous year. The cost related to managers' monitoring increases

with growth opportunities (Smith and Watts, 1992; Gaver and Gaver, 1993), being argued the fact that faster-growing companies will record a reduced size of boards and a higher percentage of insiders due to higher monitoring costs (Lehn et al., 2005). This circumstance is confirmed by Linck et al. (2008), who identifed that faster-growing companies registered a reduced size of board, as well a lower board independence. Moreover, we will use the logarithmic values as regards the number of years since listing on the BSE. Black et al. (2006) and Balasubramanian et al. (2010) mentioned that younger firms are likely to be faster-growing and perhaps more intangible asset intensive which can lead to higher Tobin's Q ratio.

4.2 Empirical framework

The hypotheses stated within Section three will be empirically tested by estimating multivariate regression models for panel data, unbalanced, both without cross-sectional effects and fixed-effects models. Besides, in order to detect potential nonlinear relationships we will estimate several polynomial regression models. Similar Baltagi (2005), we consider the following general form of panel data regression model without cross-sectional effects:

$$y_{it} = \alpha + X'_{it}\beta + u_{it} \quad i = 1, ..., N, \; t = 1, ..., T \qquad (1)$$

where y is the dependent variable (industry-adjusted Tobin's Q ratio), X is the vector of explanatory variables (variables regarding board of directors independence and CEO duality, as well control variables), the i subscript denotes the cross-section dimension, respectively the companies listed on the BSE, whereas t subscript denotes time, respectively the period 2007-2011. According to Baltagi (2005), most of the panel data applications employ a one-way error component model for the disturbances as following: $u_{it} = \mu_i + \upsilon_{it}$, where μ_i shows the unobservable individual-specific effect, whilst υ_{it} shows the remainder disturbance. As well, we will consider the following general form of the fixed-effects model, where μ_i are assumed to be fixed parameters to be estimated, whereas the remainder disturbances stochastic υ_{it} independent and identically distributed IID(0, σ_v^2):

$$y_{it} = (\alpha + \mu_i) + X'_{it}\beta + \upsilon_{it} \quad i = 1, ..., N, \; t = 1, ..., T \qquad (2)$$

The causal relationship between board independence and firm value, employing additionally CEO duality, will be investigated by the instrumentality of Granger (1969) approach. Thus, by considering two time series X and Y, it is said that X Granger-cause Y if a prediction of Y based on a set of information which comprises the history of X is better than a prediction which disregards the history of X. There will be estimated the following regression equations:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \ldots + \alpha_i y_{t-i} + \beta_1 x_{t-1} + \ldots + \beta_i x_{t-i} + \varepsilon_t \qquad (3)$$

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \ldots + \alpha_i x_{t-i} + \beta_1 y_{t-1} + \ldots + \beta_i y_{t-i} + u_t \qquad (4)$$

The null hypothesis stipulates that H_0: $\beta_1 = \beta_2 = ... = \beta_i = 0$, respectively X does not Granger-cause Y in the first equation, whereas Y does not Grager-cause X in the second equation.

In order to test for stationarity related to selected time series we will employ the test of Dickey-Fuller (1979) by estimating the following regression model:

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta y_{t-i+1} + \varepsilon_t \qquad (5)$$

As well, we will perform the test of Phillips-Perron (1988) by estimating the following regression model: $\Delta y_t = \gamma y_{t-1} + u_t$, because it corrects for serial correlations and heteroskedasticity in the errors. The null hypothesis considers that time series are non-stationary H_0: $\gamma = 0$, while the alternative hypothesis states that time series are stationary H_1: $\gamma < 0$.

Subsequently, we will employ the vector autoregressive technique (VAR). Therefore, by considering y_t the vector of studied variables and ε_t the vector of innovations, we will estimate a VAR(p) model as following: $y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + Bx_t + \varepsilon_t$. Moreover, the model VAR(p) can be represented as following: $\Delta y_t = \prod y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + Bx_t + \varepsilon_t$, by considering that $\prod = \sum_{i=1}^{p-1} A_i - I$, whereas $\Gamma_i = -\sum_{j=i+1}^{p} A_j$. The potential long-term connections will be empirically tested by employing Johansen (1991) cointegration test. This procedure consists in estimating the matrix Π out of an unrestricted VAR model, respectively testing if the restrictions required by the reduction of the matrix Π rank can be rejected.

5. Empirical Results

5.1 Descriptive statistics

Table 2 shows descriptive statistics regarding all the variables employed within empirical research. The mean percentage of independent directors is only 13.77 percent. In fact, we notice that the recommendation out of the Guide for implementing Corporate Governance Code (2010) which states that at least a quarter of the total number of directors shall be independent is not followed. Moreover, the mean percentage of non-executive directors (54.43 percent) highlights that the balance between executive and non-executive members recommended by the Bucharest Stock Exchange Corporate Governance Code (2008) is accomplished.

Table 2. Summary statistics

Variable	N	Mean	Median	Min	Max	Std. Dev.
QAdj	334	0.08928	0.00000	-0.81178	1.87060	0.570688
IND	334	0.137700	0.000000	0.000000	0.800000	0.174208
NED	334	0.544390	0.600000	0.200000	0.888890	0.176366
CEODual	334	0.389221	0.000000	0.000000	1.000000	0.488305
FS	334	8.241298	8.193217	6.977173	10.52934	0.610849
Lev	334	0.387540	0.353737	0.006916	1.940834	0.285651
SGrowth	334	0.070588	0.045353	-0.913607	2.503076	0.356558
Listing	334	0.968339	1.041393	0.000000	1.204120	0.253036

Source: Author's calculations. Description of the variables is provided in Table 1

Table 3 exhibits the frequency table of the percentage of independent directors and non-executive directors, while Table 4 shows the frequency table of CEO duality for the companies listed on the BSE.For independent directors we remark that the threshold of 50 percent is almost not exceeded, whereas the percentage of non-executive directors registers the highest frequency between 30 percent and 40 percent. Likewise, in average, within 60.95 percent out of the selected companies, the roles of CEO and Chairman of the board are performed by different persons. By comparison, De Andres et al. (2005) reported the following average values as regards the percentage of outside directors on corporate boards of directors: UK (48 percent), USA (79 percent), Canada (74 percent), Belgium (76 percent), Spain (75 percent), France (81 percent), Italy (74 percent), Switzerland (90 percent).

Table 3. Frequency table as regards the percentage of independent directors and non-executive directors for the companies listed on the Bucharest Stock Exchange

Variable	2007		2008		2009		2010		2011	
	N	%	N	%	N	%	N	%	N	%
0%<=IND<=10%	33	52.3809	34	50.7462	36	52.94118	36	52.9411	36	52.9411
10%<IND<=20%	16	25.3968	17	25.3731	17	25.00000	17	25.0000	16	23.5294
20%<IND<=30%	3	4.76190	3	4.47761	2	2.94118	2	2.94118	2	2.94118
30%<IND<=40%	6	9.52381	7	10.4477	7	10.29412	7	10.2941	8	11.7647
40%<IND<=50%	4	6.34921	4	5.97015	4	5.88235	4	5.88235	4	5.88235
50%<IND<=60%	1	1.58730	1	1.49254	1	1.47059	1	1.47059	1	1.47059
60%<IND<=70%	0	0.00000	0	0.00000	0	0.00000	0	0.00000	0	0.00000
70%<IND<=80%	0	0.00000	1	1.49254	1	1.47059	1	1.47059	1	1.47059
80%<IND<=90%	0	0.00000	0	0.00000	0	0.00000	0	0.00000	0	0.00000
90%<IND<=100%	0	0.00000	0	0.00000	0	0.00000	0	0.00000	0	0.00000
0%<=NED<=10%	0	0.00000	0	0.00000	0	0.00000	0	0.00000	0	0.00000
10%<NED<=20%	1	1.58730	1	1.49254	1	1.47059	0	0.00000	1	1.47059
20%<NED<=30%	3	4.76190	3	4.47761	2	2.94118	2	2.94118	2	2.94118
30%<NED<=40%	20	31.7460	21	31.3432	22	32.35294	23	33.8235	22	32.3529
40%<NED<=50%	1	1.58730	1	1.49254	1	1.47059	1	1.47059	3	4.41176
50%<NED<=60%	17	26.9841	22	32.8358	20	29.41176	20	29.4117	19	27.9411
60%<NED<=70%	7	11.1111	6	8.95522	6	8.82353	6	8.82353	7	10.2941
70%<NED<=80%	12	19.0476	11	16.4179	14	20.58824	15	22.0588	13	19.1176
80%<NED<=90%	2	3.17460	2	2.98507	2	2.94118	1	1.47059	1	1.47059
90%<NED<=100	0	0.00000	0	0.00000	0	0.00000	0	0.00000	0	0.00000

Source: Author's calculations. Description of the variables is provided in Table 1.

Table 4 shows the frequency table of CEO duality for the companies listed on the BSE.For independent directors we remark that the threshold of 50 percent is almost not exceeded, whereas the percentage of non-executive directors registers the highest frequency between 30 percent and 40 percent. Likewise, in average, within 60.95 percent out of the selected companies, the roles of CEO and Chairman of the board are performed by different persons. By comparison, De Andres et al. (2005) reported the following average values as regards the percentage of outside directors on corporate boards of directors: UK (48 percent), USA (79 percent), Canada (74 percent), Belgium (76 percent), Spain (75 percent), France (81 percent), Italy (74 percent), Switzerland (90 percent).

Table 4. Frequency table of CEO duality within the companies listed on the Bucharest Stock Exchange

CEODual	2007		2008		2009		2010		2011	
	N	%	N	%	N	%	N	%	N	%
No	33	52.38095	40	59.70149	43	63.2352	44	64.70588	44	64.7058
Yes	30	47.61905	27	40.29851	25	36.7647	24	35.29412	24	35.2941

Source: Author's calculations. Description of the variables is provided in Table 1.

Table 5 provides the Pearson correlation coefficient matrix. Thereby, the values related to the correlation coefficients does not show strong correlations between the independent variables used in the empirical investigation.

Table 5. Pearson correlation coefficient matrix

Variable	QAdj	IND	NED	CEODual	FS	Lev	SGrowth	Listing
QAdj	1	**.129*** (.018)	-.018 (.737)	.019 (.725)	.054 (.326)	**.321**** (.000)	.072 (.187)	-.021 (.701)
IND	**.129*** (.018)	1	**.202**** (.000)	-.086 (.115)	**.479**** (.000)	-.070 (.199)	.004 (.942)	**-.150**** (.006)
NED	-.018 (.737)	**.202**** (.000)	1	**-.222**** (.000)	**.255**** (.000)	**-.142**** (.009)	.060 (.276)	-.028 (.616)
CEODual	.019 (.725)	-.086 (.115)	**-.222**** (.000)	1	-.050 (.360)	.010 (.855)	-.011 (.845)	.013 (.814)
FS	.054 (.326)	**.479**** (.000)	**.255**** (.000)	-.050 (.360)	1	.076 (.167)	.055 (.320)	**-.110*** (.045)
Lev	**.321**** (.000)	-.070 (.199)	**-.142**** (.009)	.010 (.855)	.076 (.167)	1	.082 (.134)	.047 (.387)
SGrowth	.072 (.187)	.004 (.942)	.060 (.276)	-.011 (.845)	.055 (.320)	.082 (.134)	1	.009 (.865)
Listing	-.021 (.701)	**-.150**** (.006)	-.028 (.616)	.013 (.814)	**-.110*** (.045)	.047 (.387)	.009 (.865)	1

Source: Author's calculations. Description of the variables is provided in Table 1.
Notes: **Significant at 1% level; *significant at 5% level.

Also, the results of empirical study are not affected by the multicollinearity phenomenon which involve higher variances and covariances of the regression coefficients' estimators, higher confidence intervals of the estimators due to higher standard deviations, the distortion of results related to Student's t-test due to higher standard deviations, a higher coefficient of determination, the instability of estimators and its standard deviations at small changes of data.

5.2 Empirical evidence towards board independence influence on firm value

Table 6 shows the coefficients of the multivariate regression models without cross-sectional effects. Therefore, the results of the first econometric model provide support for a positive influence related to the percentage of independent directors out of the boards of the companies listed on the BSE on firm value. Notwithstanding, by estimating a polynomial regression model (model 2), there resulted a nonlinear relationship between the percentage of independent directors and firm value. However, even if the percentage of independent directors within the companies listed on the BSE is lower, we notice a negative influence related to the percentage of independent directors on industry-adjusted

Tobin's Q ratio beyond the threshold of 47.23 percent[1]. Furthermore, by considering the percentage of non-executive directors (models 3 and 4) and CEO duality (models 1-6), there resulted the lack of a statistically significant relationship related to firm value. Thus, by estimating several multivariate regression models without cross-sectional effects, the first hypothesis H1 is partly statistically validated, whereas the second and the third hypotheses, H2 and H3, are rejected. Likewise, the influence of control variables on firm value was acknowledged only for the debt/book value of assets which positively influences industry-adjusted Tobin's Q ratio in all the estimated models.

Table 6. Regressions' results of board independence and CEO duality on firm value (models without cross-sectional effects)

Variable	1	2	3	4
Intercept	0.242085 (0.522456)	0.474713 (0.989534)	-0.284445 (-0.652395)	-0.455872 (-0.834738)
IND	**0.596345**** (3.053351)	**1.307014**** (2.956517)		
IND^2		**-1.383417**† (-1.790468)		
NED			0.077472 (0.425673)	0.674659 (0.582686)
NED^2				-0.553895 (-0.522283)
CEODual	0.034274 (0.567098)	0.023953 (0.395862)	0.027191 (0.434171)	0.027622 (0.440526)
FS	-0.057699 (-1.041336)	-0.083975 (-1.469639)	0.017280 (0.337702)	0.020600 (0.399092)
Lev	**0.669913***** (6.417735)	**0.689100***** (6.588911)	**0.641299***** (6.007786)	**0.644406***** (6.020855)
SGrowth	0.076714 (0.925994)	0.073595 (0.891144)	0.070623 (0.839339)	0.068950 (0.817949)
Listing	-0.039011 (-0.331343)	-0.089668 (-0.742875)	-0.077403 (-0.652012)	-0.078404 (-0.659619)
F-statistic	**8.308296*****	**7.627402*****	**6.601074*****	**5.684449*****
R-sq	0.132280	0.140730	0.108035	0.108781
Adj R-sq	0.116359	0.122279	0.091669	0.089644
Observations	334	334	334	334

Source: Author's calculations. Description of the variables is provided in Table 1.
Notes: †p < .10; *p < .05; **p < .01; ***p < .001.
The t-statistic for each coefficient is reported in parentheses.

Table 7 reports the results of multivariate fixed-effects regression models. Although the coefficients of model 2 confirm the nonlinear relationship between the percentage of independent directors and firm value validated in the second model out of Table 6 the relationship was not statistically validated based on the significance level associated to Student's t test. By considering the percentage of non-executive directors (models 3 and 4), the lack of impact on firm value was recognized. Unlike the results out of Table 6, we notice a positive influence of CEO duality on industry-adjusted Tobin's Q ratio (models 1-6). Thus, by estimating several multivariate fixed-effects regression models, the first and the second hypotheses, H1 and H2, are rejected, whilst the third hypothesis H3 is accepted. In addition, we confirm the positive influence related to the indebtedness level on firm value, as well the negative impact of the number of years since listing on the BSE (logarithmic values) on firm value, in all the estimated models.

[1] We consider the following notations: Y = firm value, X = the total number of independent directors on corporate board, X^2 is the total number of independent directors on corporate board, but squared. By considering the coefficients associated to X and X^2, then: $Y = 1.307014*X + (-1.383417)*X^2$
$dY/dX = 1.307014 + 2*(-1.383417)*X = 1.307014 - 2.766834*X$
$1.307014 - 2.766834*X = 0 \rightarrow 2.766834*X = 1.307014 \rightarrow X = 47.23\%$

Table 7. Regressions' results of board independence and CEO duality on firm value (fixed-effects models)

Variable	1	2	3	4
Intercept	0.658033 (0.361315)	0.600001 (0.329279)	0.626741 (0.342389)	0.591805 (0.307597)
IND	0.665710 (0.610848)	3.866536 (1.140401)		
IND^2		-8.633518 (-0.996962)		
NED			0.262287 (0.419396)	0.437010 (0.146918)
NED^2				-0.171400 (-0.060089)
CEODual	**0.190465**† (1.760239)	**0.181374**† (1.670287)	**0.193264**† (1.755121)	**0.192100**† (1.714937)
FS	-0.012710 (-0.056215)	-0.006975 (-0.030839)	-0.015154 (-0.066816)	-0.015462 (-0.068025)
Lev	**1.066094***** (5.974708)	**1.060821***** (5.942475)	**1.063455***** (5.955224)	**1.061446***** (5.831675)
SGrowth	0.079992 (1.030637)	0.079987 (1.030567)	0.078572 (1.011081)	0.078739 (1.010643)
Listing	**-1.082889***** (-4.139537)	**-1.082347***** (-4.137407)	**-1.082531***** (-4.136008)	**-1.082855***** (-4.128440)
F-statistic	**3.900389*****	**3.861023*****	**3.894736*****	**3.827429*****
R-sq	0.522698	0.524523	0.522336	0.522343
Adj R-sq	0.388686	0.388672	0.388223	0.385869
Observations	334	334	334	334

Source: Author's calculations. Description of the variables is provided in Table 1.
Notes: †p < .10; *p < .05; **p < .01; ***p < .001.
The t-statistic for each coefficient is reported in parentheses.

5.3 Empirical evidence towards the causal relationship between board independence and firm value

Table 8 shows the results of Granger causality test. We distinguish the fact that industry-adjusted Tobin's Q ratio does not Granger cause the percentage of independent directors, as well the percentage of independent directors does not Granger cause firm value. Besides, the industry-adjusted Tobin's Q ratio Granger causes the percentage of non-executive directors by considering the third lag, although the inverse causal relationship was not confirmed. Likewise, CEO duality Granger cause industry-adjusted Tobin's Q ratio by considering the second lag, but the inverse causal relationship was not evidenced.

Table 8. Granger causality test

Null hypothesis	Lag 1			Lag 2			Lag 3		
	N	F-Statistic	Prob	N	F-statistic	Prob	N	F-statistic	Prob
QAdj does not Granger cause IND	266	0.05351	0.8172	198	0.76220	0.4680	130	0.14995	0.9295
IND does not Granger cause QAdj		1.08423	0.2987		0.79687	0.4522		0.99243	0.3988
QAdj does not Granger cause NED	266	0.64241	0.4236	198	0.19147	0.8259	130	**2.67096**	**0.0505**
NED does not Granger cause QAdj		1.58032	0.2098		0.45800	0.6332		0.55417	0.6463
QAdj does not Granger cause CEODual	266	0.01408	0.9056	198	0.34282	0.7102	130	0.00983	0.9987
CEODual does not Granger cause QAdj		0.49681	0.4815		**2.56980**	**0.0792**		0.79265	0.5002

Source: Author's calculations. Description of the variables is provided in Table 1.

Table 9 reports the results of the tests for time series stationarity, respectively Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP). Therefore, by analysing the results of the employed tests we notice that industry-adjusted Tobin's Q ratio is stationary, both for level data and for the first difference data. On the contrary, the percentage of independent directors, as well the percentage of non-executive directors are first-difference stationary. However, the methodology of vector autoregressive model suggests the fact that all the employed variables shall be stationary. Nevertheless, we will follow Harvey (1990) according to which the traditional approach of VAR enthusiasts is to work on level, even if some of the series are non-stationary.

Table 9. Investigating the stationarity of time series

Method	QAdj		IND		NED	
	I(0)		I(0)		I(0)	
	Statistic	Prob.**	Statistic	Prob.**	Statistic	Prob.**
ADF - Fisher Chi-square	**406.323**	**0.0000**	51.1905	0.9101	100.331	0.9905
PP - Fisher Chi-square	**402.288**	**0.0000**	15.1393	0.3687	29.4827	0.2896
Method	I(1)		I(1)		I(1)	
	Statistic	Prob.**	Statistic	Prob.**	Statistic	Prob.**
ADF - Fisher Chi-square	**654.235**	**0.0000**	19.6560	0.1414	**43.8674**	**0.0079**
PP - Fisher Chi-square	**667.814**	**0.0000**	**16.8834**	**0.0770**	**41.0948**	**0.0036**

Source: Author's calculations. Description of the variables is provided in Table 1.
Notes: ** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution.

Table 10 reports the selection criteria as regards the VAR lag order. Thus, based on the five selection criteria (LR, FPE, AIC, SC and HQ), for three theoretical lags is recommended only one lag for the VAR model 'QAdj-IND-NED'.

Table 10. VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1.066049	NA	0.000207	0.029753	0.095927	0.056642
1	606.0168	1172.674	**2.16e-**	**-9.138720***	**-8.874024***	**-9.031165***
2	607.4290	2.672415	2.42e-08	-9.021985	-8.558768	-8.833764
3	620.5957	**24.30771***	2.27e-08	-9.086088	-8.424349	-8.817201

Source: Author's calculations. Description of the variables is provided in Table 1
Notes: * indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion.

Table 11 provides the estimation for the VAR model 'QAdj-IND-NED', as well the roots of characteristic polynomial based on which we will verify the stability condition of the estimated model. We notice that the VAR model 'QAdj-IND-NED' is stable since all roots are subunitary. As much, the estimated VAR model could be employed in order to describe the autoregressive relationships between board of directors independence and firm value.

Table 11. The estimation of VAR model 'QAdj-IND-NED' and roots of characteristic polynomial

Variable	QAdj	IND	NED	Roots	Modulus
QAdj(-1)	0.321172	0.000783	-0.004382	0.997491	0.997491
	(0.04854)	(0.00253)	(0.00451)	0.958454	0.958454
	[6.61656]	[0.30991]	[-0.97156]	0.319238	0.319238
IND (-1)	0.218961	0.988958	0.016650		
	(0.16648)	(0.00867)	(0.01547)		
	[1.31520]	[114.061]	[1.07622]		
NED(-1)	-0.240345	0.017064	0.965054		
	(0.16112)	(0.00839)	(0.01497)		
	[-1.49170]	[2.03353]	[64.4550]		
Intercept	0.042985	-0.008202	0.017741		
	(0.09084)	(0.00473)	(0.00844)		
	[0.47319]	[-1.73375]	[2.10158]		

Source: Author's calculations. Description of the variables is provided in Table 1.
Notes: Standard errors in ( ) & t-statistics in [ ].

Table 12 reports the results of unrestricted cointegration rank tests (trace and maximum eigenvalue). The procedure of cointegration developed by Johansen (1991) shows the lack of a long-term relationship between board independence and firm value. Both trace test and max-eigenvalue test indicates no cointegration at the 0.05 level.

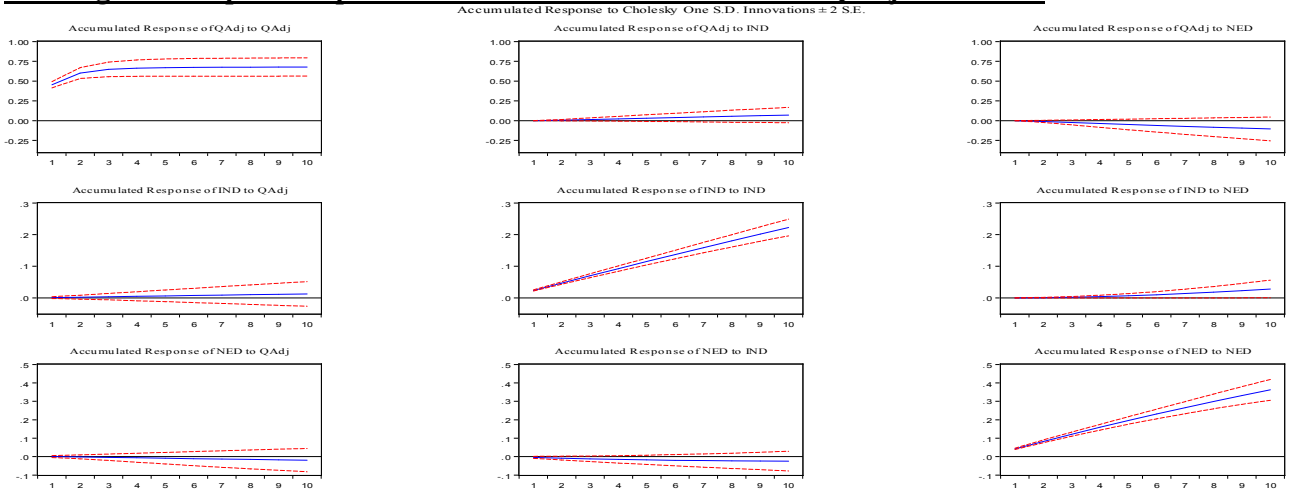
Table 12. Johansen cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.091099	26.91704	29.79707	0.1037
At most 1	0.039000	8.004320	15.49471	0.4650
At most 2	0.000644	0.127647	3.841466	0.7209
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.091099	18.91272	21.13162	0.0994
At most 1	0.039000	7.876673	14.26460	0.3913
At most 2	0.000644	0.127647	3.841466	0.7209

Source: Author's calculations. Description of the variables is provided in Table 1.
Notes: * denotes rejection of the hypothesis at the 0.05 level;
** MacKinnon-Haug-Michelis (1999) p-values.

Figure 1 provides a graphical representation of impulse response functions related to the VAR model 'QAdj-IND-NED'.

Figure 1. Impulse response functions related to VAR model 'QAdj-IND-NED'



Source: Author's calculations. Description of the variables is provided in Table 1.

Thereby, a shock of one percent in the percentage of independent directors (the middle graph out of the first row) involves an increase of industry-adjusted Tobin's Q ratio, whereas a shock of one percent in the percentage of non-executive directors (the third graph from the right side out of the first row) implies a decline of firm value. Besides, a shock of one percent in firm value causes an increase of the percentage of independent directors (the first graph from the left side out of the second row) and a reduction of the percentage of non-executive directors (the first graph from the left side out of the third row).

6. Discussion and Conclusions

Current research provides the first empirical results for a sample of companies listed on the Bucharest Stock Exchange as regards the influence and causal relationship between board of directors independence proxied by the percentage of independent directors, as well the percentage of non-executive directors and firm value measured out through industry-adjusted Tobin's Q ratio. Withal, we investigated the impact and causal relationship between CEO duality and firm value. Therefore, the employed descriptive research acknowledged the accomplishment of the balance between executive and non-executive directors. However, the balance was not fulfilled between executive and independent directors. After we estimated multivariate regression models for panel data, unbalanced, there resulted the fact that beyond the threshold of 47.23 percent, the influence of independent directors on firm value is negative, though this relationship was not statistically validated when we estimated fixed-effects models. Thereby, we emphasize the truthfulness of several doubts which stress the fact that not all independent directors are efficient towards monitoring management. Besides, with

respect to the selected sample there could be detected several cases within CEO was involved in nominating independent directors (Shivdasani and Yermack, 1999). Thus, we highlight the lack of directors' independence and management entrenchment, opposed to shareholders' expectations. Subsequently, our results provide support for a lack of statistical significance regarding the relationship between the percentage of non-executive directors and firm value, as much being confirmed previous studies (Morck et al., 1988; Hermalin and Weisbach, 1991; Mehran, 1995; Klein, 1998). Furthermore, the estimated fixed-effects models shows a positive influence of CEO duality on industry-adjusted Tobin's Q ratio, being supported stewardship theory and confirmed the arguments of its upholders (Miller and Friesen, 1977; Stoeberl and Sherony, 1985; Anderson and Anthony, 1986; Donaldson and Davis, 1991; Finkelstein and D'Aveni, 1994; Dahya et al., 1996; Brickley et al., 1997; Bhagat and Black, 2001). Likewise, the relationship between CEO duality and firm value was not statistically validated after we employed econometric models without cross-sectional effects. Not least, the causality research concludes the fact that the identified causal relationships are not robust.

The first limits of current research emerge from the reduced number of statistical observations. In fact, we are aware that this research was employed on a country characterized through a less developed capital market and implicitly reduced number of listed companies. Afterwards, we distinguish several inconveniences as regards the demarcation between independent directors and non-executive directors due to the fact that selected companies does not report a transparent board structure within the annual reports. As future research we consider the study of the influence exerted by female non-executive directors on firm value. On this line we underline the Proposal for a Directive of the European Parliament and of the Council on improving the gender balance among non-executive directors of companies listed on stock exchanges and related measures (2012). The motivation towards our future research come out from the fact that the proposed Directive sets a minimum objective of 40 percent by 2020 for members of the under-represented sex for non-executive members of the boards of publicly listed companies in Europe or 2018 for listed public undertakings, with the exception of small and medium enterprises. By taking into consideration the reduced number of independent directors on boards within the companies listed on the BSE, we recommend an increase of their representation, as well an improvement of transparency towards nominating the members out of management structures.

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