BOARD CHARACTERISTICS AND FIRM PERFORMANCE: THE CASE OF JORDANIAN NON-FINANCIAL INSTITUTIONS

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Abstract

The study aims to examine the impact of board characteristics on firm performance of non-financial institutions in Jordan. The study employs the random effects regression model to analyze the panel data of 77 non-financial institutions of the industrial and services sector over the period 2008–2019. Firm performance is measured by return on assets ROA. While board characteristics were explained by board size, CEO duality, CEO tenure, non-executive directors (NEDs), and a number of board meetings. Firm age and firm size were added to our model as control variables. Our results reveal that board size, CEO tenure, non-executive directors (NEDs), firm age, and firm size have a positive significant impact on firm performance, whereas the CEO duality and a number of board meetings have a negative significant impact on firm performance. This paper will contribute to the ongoing debate on the relationship between the board characteristics and firm performance. Therefore, the current study extends previous literature by providing empirical evidence about the relationship between board characteristics and a firm performance. Particularly in developing countries, there is relatively a little researched area. Jordanian firms are needed to consider the significance of the board characteristics especially, for the non-financial institutions that can help them in designing the board strategies to enhance their performance. Therefore, Jordanian data will offer new empirical evidence in an emerging market, which will provide a better understanding of the relationship between board characteristics and firm performance.

Keywords: Non-Financial Institutions, Board Characteristics, Firm Performance, Jordan, Panel Data Analysis

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1. INTRODUCTION

There is a great deal of interest in the effect of corporate governance on firm performance (Nekhili & Gatfaoui, 2013). In particular, there is much academic analysis of the composition of the board of directors, given the fundamental role it plays in decision-making, the roles and functions of a board, its performance, and as a result the financial performance of a firm (Wirtz, 2011, Gordini & Rancati, 2017). Frequently used to analyse this issue, agency theory suggests that when separating ownership from control the interests of owners and controlling managers are also separated (Jensen & Meckling, 1976). Therefore, a board of directors must take on a crucial new role of monitoring the actions and decisions of management in order to protect shareholders' interests (Fama & Jensen, 1983) in addition to devising corporate policy, agreeing on strategic plans, and consenting to trade in other securities. They are responsible for the appointment dismissal of senior management and remunerations as well as to guide and support managers. Regarding the board itself, members must define the size of boards and bring in new members conditional on the endorsement of shareholders (Hermalin & Weisbach, 1988). A board must thwart adverse management practices, which risk corporate failure and scandals and furthermore guarantee opportunities to increase shareholder value. To appreciate how a board functions, it is important to see it as a group of individuals, who bring together their skills and abilities as social capital to more effectively govern the firm (Carpenter & Westphal, 2001; Tejerina-Gaite & Fernández-Temprano, 2020).

Whilst the importance of the board has long been understood, most of the research has been conducted in the most developed countries and there are key interrelations between culture and corporate governance which mean that studies cannot be generalised, and specifically tailored research is needed for other countries (Haniffa & Hudaib, 2006; Arora & Sharma, 2016; García Martín & Herrero, 2018). Jordan is an emerging economy with significant weaknesses in its financial institutions, laws, and regulations, as well as instability in the political and economic life of the country impacting directly on financial troubles (Khataybeh, Abdulaziz, & Marashdeh, 2019; Marashdeh, Alomari, Khataybeh, & Alkhataybeh, 2021). In recent years, companies both large and small have struggled with major losses; over 21 companies have faced compulsory liquidation (ASE, n.d., https://www.ase.com.jo/en; the Jordanian e-Government, n.d). The level of experience, skills, and trustworthiness of board members is likely to play a significant role in such losses. There is often little understanding of the risks in the market, or credit and liquidity risks of publicly listed companies. Company strategies and policies do not reflect such crucial risks, nor do they consider the changing economic environment, such as the global financial crisis or the financial consequences of political events such as the Arab Spring. Fundamentally, traditional practices such as favouritism and nepotism remain prevalent, even the norm, and limit the usefulness of government regulation (Marashdeh, 2014; Saidat, Bani-Khalid, Al-Haddad, & Marashdeh, 2020).

There are several key aspects of board structure and composition, which are generally studied for their impact on firm performance, though the current literature does not offer conclusive findings across all companies and conditions (Hsu & Wu, 2014; Achim, Borlea, & Mare, 2016). This study hopes to improve understanding and the predictability of firm performance for some of the board characteristics previously used; board size, CEO duality, CEO tenure, non-executive directors (NEDs), and a number of board meetings for non-financial institutions listed on the Amman Stock Exchange (ASE). An examination of such board characteristics can introduce new methods to understand their impact on firm performance for both researchers and regulators. Thus, our research question: *What is the impact of board characteristics on firm performance of non-financial institutions listed on the ASE?*

The rest of the study contains a literature review in Section 2, an explanation of the study methodology in Section 3, empirical findings, and an overall discussion in Section 4 and conclusion in Section 5.

2. LITERATURE REVIEW

The literature on corporate governance broadly supports the argument that the board director characteristics considers as tools for monitor managers' behavior (Daoud, Ismail, & Lode, 2014). For example, Conger, Finegold, and Lawler (1998) stated that the optimal size of a board is a function of how effectively it works as a team to improve firm performance (Conger et al., 1998), but this optimal size is yet to be identified in the research. Yermack (1996) found an inverse relationship between board size and firm value with Tobin's Q to represent market valuation. Small board size demonstrated better financial performance and controls over the CEO via compensation or potential dismissal. Small board size is argued to exhibit less bureaucracy, and more practical management support and oversight (Lipton & Lorsch, 1992). Difficulties in coordination, delay, and ineffective monitoring may be other disadvantages of large board size. However, a meta-analysis technique employed by Dalton, Daily, Johnson, and Ellstrand (1999) associated larger board size with improved corporate financial performance regardless of the type of firm or the measure of financial performance used. Likewise, studies have found that large board size was correlated to better monitoring and value creation for a firm (De Andres & Vallelado, 2008), as well as improvements to firm ROA (Shukeri, Shin, & Shaari, 2012). In terms of CEO duality, there is conflicting evidence and opinion on the efficacy of CEO duality. Studies by Lipton and Lorsch (1992) and Carlsson (2001) do not support it due to the conflict of interest potentially damaging the monitoring and power of a board over a CEO. Rechner and Dalton (1991) provided evidence of consistently superior firm performance where there was no CEO duality. In contrast, CEO duality is supported by arguments for the unified approach it offers, with clearer and more complete authority residing in the position of a chair (Anderson & Anthony, 1986; Donaldson & Davis, 1991). Boyd (1994) provided evidence that duality guided improved performance in US companies.

Furthermore, several studies used CEO tenure as a proxy for power. For instance, CEO tenure was analysed by Adams, Almeida, and Ferreira (2005) alongside stock returns and shown to have an insignificant correlation. A longer tenure would suggest increasing power, particularly in terms of information access, communication, and networking inside and outside the organisation and influencing their capital structure decisions (Hartnell, Kinicki, Lambert, Fugate, & Doyle Corner, 2016). CEO tenure length influences decision-making and, therefore, shareholders' wealth. Related to the NEDs the Jordanian corporate governance code number (15) recommends that members of the board directors of all listed companies should be included at least three members where independent (SDC, 2020). Other studies find that NEDs monitor both the CEO and the executive directors on behalf of shareholders, as well as lending greater skills and expertise to a board (Weir & Laing, 2001; Abdullah, 2004). Awan (2012) and Dehaene, De Vuyst, and Ooghe (2001) identified that NEDs and the firm performance had a positive correlation against return on asset (ROA) and return on equity (ROE) measures. This supports the idea that independence is of value when monitoring a company in the interest of the shareholders. Other studies identified disadvantages likely to outweigh the positive impact of NEDs. NEDs are part-time so lack the commitment to and understanding of the business, not having enough information to inform effective decision-making (Weir & Liang, 2001; Abdel-Azim & Soliman, 2020). A study conducted by Abdullah (2004) on Malaysian listed companies in the 1990s provided no evidence of a difference in firm performance in relation to the independence of the board. Similarly, Haniffa and Hudaib (2006) found that NEDs did not correlate with firm performance. However, another evidence provided by Vafeas (1999) confirms that the number or frequency of board meetings is used as a measure of board activity the implication being that directors who meet frequently are acting in the interests of shareholders and better able to discuss and understand the company, set strategy and monitor management. On this basis, directors who do not meet or have multiple directorships with too many responsibilities are criticised as not effectively monitoring management (Lipton & Lorsch, 1992; Jensen, 1993). Board meetings also carry some expenses, such as managerial time, expenses for directors, and travel (Vafeas, 1999). Jensen (1993) proposed that boards should not be proactive but only reactive when presented with a problem. However, from the perspective of agency theory, a conscientious board will increase the level of oversight by the board, so they should be given time to discuss and understand issues in-depth and frequently review the financial performance and risks of their company (Letendre, 2004). Such effective monitoring of management and the company would be understood to improve firm performance. Previous studies have suggested that company age and size may affect company performance since the length of time a firm has been in operation is a key determinant of the size, structure, and activities of a firm, with financial growth cycles and capital structures changing as firm age (Berger & Udell, 1998; Gregory, Rutherford, Oswald, & Gardiner, 2005; Boone, Field, Karpoff, &

Raheja, 2007). Boone et al. (2007) identified growth in boards corresponding to the growth of the firm itself, with an increasing need for monitoring and specialisation by board members. Earnings will be small for a new firm, and their relative costs will be higher (Lipczynski & Wilson, 2001). At some point, a firm may be too old and approaching the end of its productive life cycle. Boone et al. (2007) further suggest that complexity is a function of age. As there are multiple conflicting relationships between firm age and board characteristics this study will control for firm age, measured as years since incorporation. As with age, the larger a firm, the larger the board becomes. Equally, with size comes greater complexity and diversification. Therefore, firm size is a proxy for firm complexity and greater board complexity and involvement (Fama & Jensen, 1983; Booth & Deli, 1996; Boone et al., 2007). For small firms, Dalton, Daily, Ellstrand, and Johnson (1998) identified that board size has more impact than for large firms. Whilst board size is positively correlated to firm size, it is negatively correlated with growth opportunities (Lehn, Patro, & Zhao, 2009). As with firm age, the size and complexity of a large firm obscure correlations with board characteristics and firm performance, agency costs increase with size as managerial discretion and opportunism increases, in turn increasing monitoring (Jensen & Meckling, 1976), which is generally seen in large firms in the form of investment in greater internal control mechanisms.

To sum up, the lack of effective protection and the weak institutional framework for investors in emerging markets in general and in the Jordanian context specifically place pressure on the board of directors to improve their performance, which means that the board characteristics play an important role in corporate governance. However, the characteristics and the attributes of effective boards are still inconclusive. Based on the above literature and in line with the agency theory perspective, this main hypothesizes of this study:

H1: There is a relationship between the board characteristics and the performance of industrial and services companies that listed on the ASE from 2008 to 2019.

3. RESEARCH METHODOLOGY

3.1. Target population and sample size

ASE lists 145 financial and non-financial companies divided into three main sectors: 1) a financial sector, 2) an industrial sector, and 3) a service sector. We have excluded all financial companies (57 companies) from the initial sample, due to their unique characteristics, specific regulatory framework, and disclosing requirements. In addition, 11 companies were deleted out of 88 non-financial companies listed on the ASE due to the unavailability of information of these companies. Therefore, the final sample consists of 924 observations for 77 non-financial institutions of the industrial and services sector for the period 2008–2019. Since no quarterly data are available, this study employed annual secondary data for non-financial institutions, which were collected from companies' annual reports listed on the ASE. Thus, this study will be utilizing the panel data.

3.2. Variables measurements

Net income divided by total assets (*ROA*) is taken as an indicator for firm performance and used as a dependent variable in this study. Board characteristics (i.e., *board size, CEO duality, CEO*

tenure, NEDs, and *a number of board meetings*) are used as the explanatory variables and set as independent variables. Whereas that the proxies of *firm age* and *firm size* are employed as control variables as shown below in Table 1.

Table 1. The variables measurements

	Variables	*Measures*
Firm performance	*ROA*	Net income divided by total assets
Board characteristics	*BSIZE*	The total number of directors on the board.
	CEODU	CEO duality"1" in case CEO is also chairman, otherwise "0"
	CEO tenure	The fiscal year minus the year the CEO has joined the board of directors.
	NEDs	The number of the NEDs on the board to the total number of directors on the board.
	NOBM	The number of annual meetings held by the directors on the board.
Control variables	*Firm age*	The number of years since the firm was established.
	Firm size	The natural logarithm of total assets.

Sources: Author's elaboration based on ASE data and companies' annual reports.

3.3. Model specification

Based on literature review, this study constructs an empirical regression model below:

$$ROA_{it} = \alpha_i + \sum_{j=1}^{k} B_j X_{it} + U_{it} \qquad (1)$$

where, *ROA* is the firm performance, X_{it} is the independent variables for a firm *i* at time *t*, α is constant, β is the coefficient of *j* independent variables, and *U* is the error term.

According to Baltagi (1995), the most common advantage of panel data analysis it allows examining a large number of observations with heterogeneous information and produces less data multicollinearity among the explanatory variables. Moreover, it allows using more data and can keep track of each unit of observation. On the other hand, the data become more complex and heterogeneity appears and is not properly treated. If the properties of the institutions are not observable, then the errors will be correlated with the observations, and the OLS estimators are inconsistent. Accordingly, this study will determine which of the two models (fixed effect (FE) and random effect (RE)) is the best fit after conducting the Hausman test for random effects.

Refer to equation (1), each firm *i* has *n* observations over time *t*. The term of FE is due to the fact that the intercept may differ across firms, but it does not vary over time, to determine the behavior of each institution independently. Whereas the FE for each firm is the most important as it allows the existence of heterogeneity or individuality among firms allowing it to have its own intercept value.

Several kinds of fixed effects differ in the assumptions about the intercept and the slope coefficients. Introducing a dummy variable is the simplest method of isolating individual or time-specific effects to avoid the problem of multi-collinearity in a regression model (Greene, 2002). The individual effect is picked up by the dummy variable D_{mi} where (*m = n-1*). The least-squares method is then used to estimate the model. This method is called the least-squares dummy-variables model (LSDV). Allison (2009) says, "In a fixed-effects model, the unobserved variables are allowed to have any associations whatever with the observed variables" (p. 3). By adding

the phantom variables to equation (1), the FE model becomes as follows:

$$ROA_{it} = \alpha_i + \sum_{j=1}^{k} \alpha_d D_{mi} + \sum_{j=1}^{k} B_j X_{it} + \varepsilon_{it} \qquad (2)$$

where, the section $\alpha_1 + \sum_{d=2}^{n} \alpha_d D_{mi}$ refers to the change of the intercept for each *i* firm. In the FE model, it is assumed that the error ε_{it} takes the form of a normal distribution with a mean equals zero and a constant and a homoscedastic variance is σ^2 in order to produce unbiased estimators.

The RE model is appropriate in estimating coefficients if the above assumptions are not completed (Baltagi, 2005). This model captures the intercept as a random variable that takes a weight equal to μ as the following equation:

$$\alpha_i = \mu + v_i \qquad (3)$$

where, the intercept α_i can be decomposed into two parts: a fixed part v_i that remains constant for each firm, and a random part μ that meets the requirements of OLS.

The RE model has the same specification as the fixed effects except that the term v_i, rather than being fixed for each firm and constant over time is a random variable with mean $E[v_i]$ and variance $(v_i) \neq 0$, where the RE model contains a compound error consisting of $(v_i + \varepsilon_{it})$. Quoting Allison (2009), "In a random-effects model, the unobserved variables are assumed to be uncorrelated with all the observed variables" (p. 9), thus, the RE model is given by:

$$ROA_{it} = \mu + \sum_{j=1}^{k} B_j X_{it} + v_i + \varepsilon_{it} \qquad (4)$$

where, v_i is a random term. Noting that the RE model is more efficient but less consistent than FE because it contains a compound error. Thus, the RE model uses the generalized least squares (GLS) method to estimate the coefficients of the model. The GLS method assumes the homoscedastic variance, and white error (Baltagi, 2005).

In order to determine which of the two previous models is suitable for the panel data analysis, the Hausman test is conducted. The null hypothesis

(*H0*) indicating the acceptance of the RE model versus the alternative hypothesis (*H1*) indicating the acceptance of the fixed effect. Whereas the Hausman test takes the following formula:

$$H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})[var\hat{\beta}_{FE} - var\hat{\beta}_{RE}]^{-1}(\hat{\beta}_{FE} - \hat{\beta}_{RE}) \quad (5)$$

The Hausman statistic takes the distribution of a Chi-squared x^2 with a degree of freedom equal to K.

3.3.1. Descriptive statistics

Table 2 below presents the descriptive statistic of all variables. As can be perceived from Table 2, the overall mean for *ROA* was 2.10%. It implies that asset 2.10% return gained using the total asset. *The board size* range between 3 and 23 with a mean value of 8. This indicates that the selected firms have on average 8 members on board.

Table 2. Descriptive statistics

	ROA	BSIZE	CEODU	CEO tenure	NEDs	NOBM	FAGE	FSIZE
Mean	2.10	8.14	0.77	12.43	7.39	8.45	28.92	7.25
Maximum	99.48	23.00	1.00	47.00	23.00	23.00	78.00	9.08
Minimum	-195.29	3.00	0.00	1.00	1.00	4.00	3.00	4.29
Std. Dev.	23.80	2.62	0.41	7.28	2.56	3.08	12.82	0.67
Unbalanced observations	681	681	681	681	681	681	681	681

Sources: Author's elaboration based on ASE data and companies' annual reports.

The results also show that 77% of the Jordanian firms' chairman who also acts as CEO. Moreover, the range of *CEO tenure* is observed to be from 1 to 47 years, with an average of 12.43 years served in the current firm meaning that Jordanian firms are more likely to hire CEO for longer periods. The statistics also show the average percentage of *NEDs* on boards is 7.39, ranging from 1 to 23. The average frequency of *board meetings* in the year is 8.45 ranging between 4 and 23 times in the year. It seems that the selected firms are more likely to hold 2 meetings in each quarter of the year. Finally, in term of control variables, the mean values of *firm age* and *firm size* is 28.92 years and 7.25 respectively.

3.3.2. Testing stationary problem

The unit root test is used to check the stationarity of the study's variables. In this study, three-unit root tests (ADF, PP, and LLC) are applied to check the order of integration of the variables and ensure their stability. The null hypothesis (*H0*) for these tests indicates the existence of unit root (instability) in the variables. Noting that the LCC test assumes a common unit root process where it considers an appropriate test in a small sample, and both tests ADF and PP assume individual unit root process (Asteriou & Hall, 2007). The results of the unit root tests are given in Table 3.

Table 3. Unit root tests

	Variables	ROA	BSIZE	CEODU	CEO tenure	NEDs	NOBM	FAGE	FSIZE
ADF	Chi-squared	422.71	145.02	30.85	343.80	257.71	188.58	243.24	249.57
	Probability	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Stationary	Level*	Level*	Level*	Level*	Level*	Level*	Level*	Level*
PP	Chi-squared	486.24	217.15	31.98	366.94	339.25	186.49	298.02	412.01
	Probability	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Stationary	Level*	Level*	Level*	Level*	Level*	Level*	Level*	Level*
LLC	t-statistic	-52.45	-9.36	-2.78	-2.83	-12.54	-10.93	-19.87	-23.47
	Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Stationary	Level*	Level*	Level*	Level*	Level*	Level*	Level*	Level*

*Note: * stationary with individual effects and individual linear trends.*

According to the probability of Chi-squared and t-statistic values of the unit root tests, the results show that all variables are stationary in their level that means reject *H0* and there is no unit root in the model's variables.

3.3.3. Testing correlation problem

The study employed the Spearman rank-order to test the correlation between the explanatory variables. It assesses how well the relationship between two variables can be described using a monotonic function.

The Spearman correlation between two variables will be high when observations have a similar rank between the two variables and low when observations have a dissimilar rank between the two variables. The results are presented in Table 4.

Correlation coefficients in Table 4 indicate that no correlation problem between the independent variables, in turn, reveals any of the independent variables included in this study is not explained by the other. Hence, all variables can be retained in the model of this study.

Table 4. Correlation matrix

	BSIZE	CEODU	CEOEX	NED	NOBM	FAGE	FSIZE
BSIZE	1						
CEODU	-0.05	1					
CEO tenure	0.01	-0.05	1				
NED	0.11	-0.12	0.05	1			
NOBM	0.06	0.02	0.05	-0.01	1		
FAGE	0.01	0.00	0.16	0.18	0.17	1	
FSIZE	0.09	-0.01	0.01	0.01	0.05	0.02	1

Source: Author's elaboration using EViews 10.

3.3.4. Testing serial correlation and cross-sectional dependence

Researchers need to identify serial correlation in the idiosyncratic error term in a panel data model, whereas serial correlation in linear panel data models biases the standard errors and causes the results to be less efficient. This study testing the first-order serial correlation using the Durbin-Watson (DW) statistic. The DW statistic measures the linear association ($\rho = 0$) between adjacent residuals from a regression model as in equation (6):

$$u_{it} = \rho u_{it-1} + \varepsilon_{it} \qquad (6)$$

If there is no serial correlation, the DW statistic will be around 2. A rule of thumb is that test statistic values in the range of 1.5 to 2.5 are relatively normal. The results show that the DW statistic in our model equals 1.89, which means DW is relatively normal and there is no serial correlation.

For testing cross-sectional dependence, Pesaran (2021) showed that under *H0* of no cross-sectional dependence, the CD statistic has a mean at exactly zero for fixed values of T and N, under a wide range of panel data models, including homogeneous/ heterogeneous dynamic models and nonstationary models. For homogeneous and heterogeneous dynamic models, the standard FE and RE estimators are biased (Nickell, 1981; Pesaran & Smith, 1995). However, the CD test is still valid because, despite the small sample bias of the parameter estimates, the FE/RE residuals will have exactly mean zero even for fixed T, provided that, the disturbances are symmetrically distributed (De Hoyos & Sarafidis, 2006). The results of the CD test are presented in Table 5.

Table 5. Cross-sectional dependence test

Test	CD statistic	Probability
Pesaran CD	-0.58	0.55

Source: Author's elaboration using EViews 10.

The result of the Pesaran CD test reveals no cross-sectional dependence.

4. REGRESSION ANALYSIS

To determine which model, FE or RE, is appropriate to the study's regression analysis, the Hausman test was conducted as shown in Table 6.

Table 6. Hausman test for random effects

H0: RE is an appropriate model.	x^2	Degree of freedom	Probability
	11.91	8	0.15

According to Chi-squared statistic 11.91 and its probability of 0.15, the Hausman test shows that RE is appropriate for the regression model. The results of regression analysis are in Table 7.

Table 7. Panel-RE model regression results

Variables	Coefficient	t-statistic	p-value
Constant	-1.00	-4.02	0.00*
BSIZE	0.02	4.32	0.00*
CEODU	-0.13	-1.92	0.05**
CEO tenure	-0.02	-2.54	0.00*
NED	0.03	3.58	0.00*
NOBM	-0.02	-1.75	0.07**
FAGE	0.16	2.43	0.00*
FSIZE	0.07	3.24	0.00*
R-squared	0.63	DW statistic	1.89
F-statistic	14.39 (0.00)	Observation (unbalanced)	681

*Note: *, ** indicates significance level at 5%, 10% respectively. ( ) indicates for probability.*

The regression results in Table 7 show the relationship between board characteristics and non-financial institutions performance in Jordan measured by ROA. The results in Table 7 show that board size has a positive and significant effect on firm performance. This means that large boards are associated with a better firm performance, which is in line with resource dependency theory. It seems that board members in large boards are in a better position to link with external resources and thereby access to new markets and new technologies. Furthermore, large boards permit board members to share experience and discuss ideas resulting in better firm performance (Alanazi, 2019; Fania, Yan, Kuyon, Sesay, & Ntsama, 2020; Vitolla, Raimo, & Rubino, 2020; Marashdeh et al., 2021)

Our results also show a negative and significant relationship between CEO duality and firm performance. Our results are consistent with the agency theory perspective, which supports the notion of separating the roles of the CEO and chairman. Meaning that separating the roles of the CEO and chairman will increase the board independence from management which allows better overseeing and monitoring leading to improve firm performance. In other words, CEO duality will lead to inefficient control over the management due to opportunistic behavior resulting in increasing agency problems and thereby lowering firm performance (Fama & Jensen, 1983; Haniffa & Cooke, 2002; Berbou & Sadqi, 2020).

In addition, our results show long CEO tenure is having a negative impact on a firm performance. Our result is consistent with agency theory and in line with Morck, Shleifer, and Vishny (1988) and Luo, Kanuri, and Andrews (2013). Long tenure might lead to CEO entrenchment; this is because of his strong connections and links with board members, which will reduce the ability of the board members to evaluate the fairness of the CEO. Thereby, it is difficult to penalize him for his bad performance. In other words, long CEO tenure allow him to build power over the board because of staying on the board for long years which will reduce the possibility to be integrated by board members and as a result impact the firm performance negatively.

Furthermore, our results report a positive and significant relationship between NEDs and firm performance. Our results are consistent with agency theory and in line with previous studies by Gafoor, Mariappan, and Thiyagarajan (2018), Karkowska and Acedański (2019), Fama and Jensen (1983), and Shleifer and Vishny (1997). NEDs are essentially beneficial for the board of directors due to their monitoring service, providing advisory functions, reputation, and expert knowledge, and providing the firm with independent judgments and decisions, which will result in reducing the conflict of interest between shareholders and managers leading to better firm performance.

The results concerning the board meetings are quite interesting; our results show a negative and significant relationship between board meetings and firm performance. It seems that frequent meetings might lead to waste in managerial time, energy and increase of travelling expenses and increase in allowances distributed to board members leading to less productive activities (Lipton & Lorsch, 1992; Vafeas, 1999; Ilaboya & Obaretin, 2015; Agarwal & Singh, 2020).

Moreover, firm age is found to be positive and statistically significant with firm performance. This means that older firms have more diversified activities, are more experienced and skilled, and have better disclosure leading to earning more profit than younger ones because they are more experienced in the market (Lipczynski & Wilson, 2001; Claessens, Djankov, Fan, & Lang, 2002). Firm size is found to be positive and statistically significant with firm performance. This result is consistent with previous studies (Fama & Jensen, 1983, Booth & Deli, 1996; Boone et al., 2007). This means that large firms are in a better position to benefit from economies of scale and generate funds relying on internal and external resources, which will result in improving the firm performance. In other words, large firms are associated with complex operations to pursue firm strategies more efficiently.

The results in Table 7 show that the value of R-squared 63% is acceptable; meaning 63% of the institutions performance variation of the non-financial institutions in Jordan is explained by the independent variables. The Durbin-Watson coefficient (DW = 1.89) is close to 2, meaning that there is no evidence of autocorrelation between the residuals as a role of thumb. Moreover, F-statistic and its probability show that the overall regression model is statistically significant. Under these circumstances, the RE model seems to be appropriate for this study.

5. CONCLUSION

Corporate boards are one of the corporate governance internal mechanisms that are expected to play an important role in improving firm performance. This study is designed to investigate the impact of board characteristics on firm performance. Board characteristics are measured by board size, CEO duality, CEO tenure, NEDs, and the number of board meetings whereas firm performance is measured by return on assets. The data were collected from the annual reports of 77 Jordanian companies of industrial and service sector that listed on the ASE

for the period 2008–2019. Based on our findings the results of the panel data regression were found mixed. Our results found that board size has a positive and significant effect on firm performance, which means that large boards are associated with external resources and as a result a better firm performance. The study also found that CEO duality has a negative and significant impact on firm performance. Meaning that CEO duality in Jordanian firms will lead to inefficient control over the management due to opportunistic behavior resulting in increasing agency problem and thereby lowering firm performance. Further, CEO tenure showed a negative impact on firm performance. This means longer CEO tenure will give them the possibility to entrench the board due to their strong connections with board members thereby, reduce their ability to evaluate their performance. The results also found that NEDs positively impact firm performance. This implies that the presence of NEDs on the board is important due to their monitoring service role and their expert knowledge and consequently reduced agency problems. In addition, board meetings showed a significant and negative impact on firm performance. Meaning that, instead of exchange ideas between board members and monitoring the CEO tasks, directors spend the time on the routine tasks that will reduce their amount of time to monitor the management. It seems the number of board meetings by itself, as a topic requires more investigation. Finally, in terms of control variable firm age and firm size report a significant and positive effect on firm performance.

This study will contribute to the ongoing debate on the relationship between board characteristics and firm performance. The results of this study offer a great opportunity for policymakers, regulators, and decision-makers to use those variables in order to improve Jordanian firm performance, which might lead to increase and attract more local and foreign investors. However, we need to keep in mind that not all developed countries corporate governance codes and practices are appropriate or applicable for developing countries. Therefore, it is recommended that every country need to develop its own corporate governance code in terms of its business environment. In other words, our results might be valid only for Jordanian firms and thereby we cannot generalized them to firms in other countries with different codes and practices. Thus, the results of this study offer important implications for policymakers and regulators. This study has some limitations. First, this study used a sample of 77 non-financial institutions of the industrial and service sector that were listed on the ASE from 2008 to 2019. Thus, it is recommended a further study to use different sectors for instance the financial and insurance sector. Second, this study has addressed some board characteristics but not all. Therefore, further study with more board characteristics, i.e., board member education, foreign directors, and board sub-committees to be examined might help to increase the effectiveness of the board to improve firm performance. Finally, it will be interesting for further research to investigate other corporate governance mechanisms such as ownership structure.

REFERENCES

1. Abdel-Azim, M. H., & Soliman, S. (2020). Board of directors' characteristics and bank performance: Evidence from the Egyptian banking sector. *Journal of Governance & Regulation, 9*(4), 116–125. https://doi.org/10.22495/jgrv9i4art10
2. Abdul Rahman, R., & Haneem Mohamed Ali, F. (2006). Board, audit committee, culture and earnings management: Malaysian evidence. *Managerial Auditing Journal, 21*(7), 783–804. https://doi.org/10.1108/02686900610680549
3. Abdullah, S. N. (2004). Board composition, CEO duality and performance among Malaysian listed companies. *Corporate Governance, 4*(4), 47–61. https://doi.org/10.1108/14720700410558871
4. Achim, M.-V., Borlea, S.-N., & Mare, C. (2016). Corporate governance and business performance: Evidence for the Romanian economy. *Journal of Business Economics and Management, 17*(3), 458–474. https://doi.org/10.3846/16111699.2013.834841
5. Adams, R. B., Almeida, H., & Ferreira, D. (2005). Powerful CEOs and their impact on corporate performance. *The Review of Financial Studies, 18*(4), 1403–1432. https://doi.org/10.1093/rfs/hhi030
6. Agarwal, S., & Singh A. (2020). Literature review on the relationship between board structure and firm performance. *International Journal of Business Ethics in Developing Economies, 9*(2), 33–43. Retrieved from https://www.researchgate.net/publication/349483017_Literature_Review_on_the_Relationship_between_Board_Structure_and_Firm_Performance
7. Alanazi, A. S. (2019). Corporate governance and the characteristics of the board of directors: Evidence from an emerging market. *Corporate Board: Role, Duties and Composition, 15*(1), 17–24. https://doi.org/10.22495/cbv15i1art2
8. Allison, P. D. (2009). *Fixed effects regression models.* https://doi.org/10.4135/9781412993869
9. Anderson, C. A., & Anthony, R. N. (1986). *The corporate director: Insights for board members and executives.* New York, NY: Wiley.
10. Arora, A., & Sharma, C. (2016). Corporate governance and firm performance in developing countries: Evidence from India. *Corporate governance, 16*(2), 420–436. https://doi.org/10.1108/CG-01-2016-0018
11. Asteriou, D., & Hall, S. G. (2007). *Applied econometrics: A modern approach (revised edition).* Retrieved from https://www.academia.edu/43196451/Applied_Econometrics_A_Modern_Approach_Using_Eviews_and_Microfit_Revised_Edition
12. Baltagi, B. H. (2008). *Econometric analysis of panel data.* Chichester, UK: John Wiley & Sons.
13. Berbou, H., & Sadqi, O. (2020). The impact of internal governance mechanisms on financial and stock market performance of listed companies: Evidence from an emerging market. *Journal of Governance & Regulation, 9*(4), 126–138. https://doi.org/10.22495/jgrv9i4art11
14. Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking & Finance, 22*(6–8), 613–673. https://doi.org/10.1016/S0378-4266(98)00038-7
15. Boone, A. L., Field, L. C., Karpoff, J. M., & Raheja, C. G. (2007). The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics, 85*(1), 66–101. https://doi.org/10.1016/j.jfineco.2006.05.004
16. Booth, J. R., & Deli, D. N. (1996). Factors affecting the number of outside directorships held by CEOs. *Journal of Financial Economics, 40*(1), 81–104. https://doi.org/10.1016/0304-405X(95)00838-6
17. Boyd, B. K. (1994). Board control and CEO compensation. *Strategic Management Journal, 15*(5), 335–344. https://doi.org/10.1002/smj.4250150502
18. Carlsson, R. H. (2001). *Ownership and value creation: Strategic corporate governance in the new economy.* Chichester, UK: John Wiley & Sons.
19. Carpenter, M. A., & Westphal, J. D. (2001). The strategic context of external network ties: Examining the impact of director appointments on board involvement in strategic decision making. *Academy of Management Journal, 44*(4), 639–660. https://doi.org/10.5465/3069408
20. Claessens, S., Djankov, S., Fan, J. P. H., & Lang, L. H. P. (2002). Disentangling the incentive and entrenchment effects of large shareholdings. *The Journal of Finance, 57*(6), 2741–2771. https://doi.org/10.1111/1540-6261.00511
21. Conger, J. A., Finegold, D., & Lawler, E. E., III. (1998). Appraising boardroom performance. *Harvard Business Review, 76,* 136–164. Retrieved from https://hbr.org/1998/01/appraising-boardroom-performance
22. Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal, 19*(3), 269–290. https://doi.org/10.1002/(SICI)1097-0266(199803)19:3%3C269::AID-SMJ950%3E3.0.CO;2-K
23. Dalton, D. R., Daily, C. M., Johnson, J. L., & Ellstrand, A. E. (1999). Number of directors and financial performance: A meta-analysis. *Academy of Management Journal, 42*(6), 674–686. https://doi.org/10.5465/256988
24. Daoud, K., Ismail, K., & Lode, N. (2014). The timeliness of financial reporting among Jordanian companies: Do company and board characteristics, and audit opinion matter? *Asian Social Science, 10*(13), 191–201. https://doi.org/10.5539/ass.v10n13p191
25. De Andres, P., & Vallelado, E. (2008). Corporate governance in banking: The role of the board of directors. *Journal of Banking & Finance, 32*(12), 2570–2580. https://doi.org/10.1016/j.jbankfin.2008.05.008
26. De Hoyos, R. E., & Sarafidis, V. (2006). Testing for cross-sectional dependence in panel-data models. *The Stata Journal, 6*(4), 482–496. https://doi.org/10.1177/1536867X0600600403
27. Dehaene, A., De Vuyst, V., & Ooghe, H. (2001). Corporate performance and board structure in Belgian companies. *Long Range Planning, 34*(3), 383–398. https://doi.org/10.1016/S0024-6301(01)00045-0
28. Donaldson, L., & Davis, J. H. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management, 16*(1), 49–64. https://doi.org/10.1177/031289629101600103
29. Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics, 26*(2), 301–325. https://doi.org/10.1086/467037
30. Fania, N., Yan, C., Kuyon, J. B., Sesay, B., & Ntsama, U. Y. O. (2020). Examining the impact of corporate governance reforms on firm performance in emerging markets: The mediating effect of board roles. *Corporate Board: Role, Duties and Composition, 16*(3), 63–81. https://doi.org/10.22495/cbv16i3art5

31. Gafoor, C. P. A., Mariappan, V., & Thiyagarajan, S. (2018). Board characteristics and bank performance in India. *IIMB Management Review, 30*(2), 160–167. https://doi.org/10.1016/j.iimb.2018.01.007
32. García Martín, C. J., & Herrero, B. (2018). Boards of directors: Composition and effects on the performance of the firm. *Economic research-Ekonomska Istraživanja, 31*(1), 1015–1041. https://doi.org/10.1080/1331677X.2018.1436454
33. Gordini, N., & Rancati, E. (2017). Gender diversity in the Italian boardroom and firm financial performance. *Management Research Review, 40*(1), 75–94. https://doi.org/10.1108/MRR-02-2016-0039
34. Greene, W. H. (2002). *Alternative panel data estimators for stochastic frontier models* (Working paper, Stern School of Business, New York University). Retrieved from https://www.researchgate.net/profile/William-Greene/publication/228708841_Alternative_panel_data_estimators_for_stochastic_frontier_models/links/0046 35180450c6d253000000/Alternative-panel-data-estimators-for-stochastic-frontier-models.pdf
35. Gregory, B. T., Rutherford, M. W., Oswald, S., & Gardiner, L. (2005). An empirical investigation of the growth cycle theory of small firm financing. *Journal of Small Business Management, 43*(4), 382–392. https://doi.org/10.1111/j.1540-627X.2005.00143.x
36. Haniffa, R. M., & Cooke, T. E. (2002). Culture, corporate governance, and disclosure in Malaysian corporations. *Abacus, 38*(3), 317–349. https://doi.org/10.1111/1467-6281.00112
37. Haniffa, R., & Hudaib, M. (2006). Corporate governance structure and performance of Malaysian listed companies. *Journal of Business Finance & Accounting, 33*(7–8), 1034–1062. https://doi.org/10.1111/j.1468-5957.2006.00594.x
38. Hartnell, C. A., Kinicki, A. J., Lambert, L. S., Fugate, M., & Doyle Corner, P. (2016). Do similarities or differences between CEO leadership and organizational culture have a more positive effect on firm performance? A test of competing predictions. *Journal of Applied Psychology, 101*(6), 846–861. https://doi.apa.org/doi/10.1037/apl0000083
39. Hermalin, B. E., & Weisbach, M. S. (1998). Endogenously chosen boards of directors and their monitoring of the CEO. *The American Economic Review, 88*(1), 96–118. Retrieved from https://www.jstor.org/stable/116820
40. Hsu, H.-H., & Wu, C. Y.-H. (2014). Board composition, grey directors and corporate failure in the UK. *The British Accounting Review, 46*(3), 215–227. https://doi.org/10.1016/j.bar.2013.12.002
41. Ilaboya, O. J., & Obaretin, O. (2015). Board characteristics and firm performance: Evidence from Nigerian quoted companies. *Academic Journal of Interdisciplinary Studies, 4*(1), 283. https://doi.org/10.5901/mjss.2015.v4n1p283
42. Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance, 48*(3), 831–880. https://doi.org/10.1111/j.1540-6261.1993.tb04022.x
43. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X
44. Karkowska, R., & Acedański, J. (2019). The effect of corporate board attributes on bank stability. *Portuguese Economic Journal, 19*(2), 99–137. https://doi.org/10.1007/s10258-019-00162-3
45. Khan, A., & Awan, S. H. (2012). Effect on board composition on firm performance: A case of Pakistan listed companies. *Interdisciplinary Journal of Contemporary Research in Business, 3*(10), 853–863. Retrieved from https://journal-archieves15.webs.com/853-863.pdf
46. Khataybeh, M. A., Abdulaziz, M., & Marashdeh, Z. (2019). Cross-sectional relationship between beta and realized returns in emerging markets. *Applied Economics Quarterly, 65*(2), 115–137. https://doi.org/10.3790/aeq.65.2.115
47. Lehn, K. M., Patro, S., & Zhao, M. (2009). Determinants of the size and composition of US corporate boards: 1935–2000. *Financial Management, 38*(4), 747–780. https://doi.org/10.1111/j.1755-053X.2009.01055.x
48. Letendre, L. (2004). The dynamics of the boardroom. *Academy of Management Perspectives, 18*(1), 101–104. https://doi.org/10.5465/ame.2004.12689547
49. Lipczynski, J., & Wilson, J. J. (2001). *Industrial organization: An analysis of competitive markets.* Harlow, UK: Financial Times/Prentice Hall.
50. Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. *The Business Lawyer, 48*(1), 59–77. Retrieved from https://www.jstor.org/stable/40687360
51. Lorsch, J. W., & MacIver, E. (1989). *Pawns or potentates: The reality of America's corporate boards.* Boston, MA: Harvard Business School Press.
52. Luo, X., Kanuri, V. K., & Andrews, M. (2013). Long CEO tenure can hurt performance. *Harvard Business Review, 91*(3), 26–27. Retrieved from https://hbr.org/2013/03/long-ceo-tenure-can-hurt-performance
53. Marashdeh, Z. M. S. (2014). *The effect of corporate governance on firm performance in Jordan* (Ph.D. thesis, University of Central Lancashire). Retrieved from http://clok.uclan.ac.uk/11163/1/Marasdeh%20Zyad%20Final%20e-Thesis%20(Master%20Copy).pdf
54. Marashdeh, Z., Alomari, M. W., Khataybeh, M., & Alkhataybeh, A. (2021). Female representation on the boards of directors of non-financial companies. *Journal of Governance and Regulation, 10*(2), 44–54. https://doi.org/10.22495/jgrv10i2art4
55. Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics, 20,* 293–315. https://doi.org/10.1016/0304-405X(88)90048-7
56. Nekhili, M., & Gatfaoui, H. (2013). Are demographic attributes and firm characteristics drivers of gender diversity? Investigating women's positions on French boards of directors. *Journal of Business Ethics, 118*(2), 227–249. https://doi.org/10.1007/s10551-012-1576-z
57. Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica, 49*(6), 1417–1426. https://doi.org/10.2307/1911408
58. Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics, 60,* 13–50. https://doi.org/10.1007/s00181-020-01875-7
59. Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics, 68*(1), 79–113. https://doi.org/10.1016/0304-4076(94)01644-F
60. Rechner, P. L., & Dalton, D. R. (1991). CEO duality and organizational performance: A longitudinal analysis. *Strategic Management Journal, 12*(2), 155–160. https://doi.org/10.1002/smj.4250120206
61. Saidat, Z., Bani-Khalid, T. O., Al-Haddad, L., & Marashdeh, Z. (2020). Does family CEO enhance corporate performance? The case of Jordan. *Economics & Sociology, 13*(2), 43–52. https://doi.org/10.14254/2071-789X.2020/13-2/3
62. Securities Depository Center (SDC). (2020). *Section 2: Committees formed by the board of directors.* Retrieved from https://www.sdc.com.jo/english/index.php?option=com_content&task=view&id=361

63. Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance, 52*(2), 737–783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x

64. Shukeri, S. N., Shin, O. W., & Shaari, M. S. (2012). Does board of director's characteristics affect firm performance? Evidence from Malaysian public listed companies. *International Business Research, 5*(9), 120. https://doi.org/10.5539/ibr.v5n9p120

65. Tejerina-Gaite, F. A., & Fernández-Temprano, M. A. (2020). The influence of board experience on firm performance: Does the director's role matter? *Journal of Management and Governance, 25,* 685–705. https://doi.org/10.1007/s10997-020-09520-2

66. The Jordanian e-Government (n.d.). *General information about Companies Control Department*. Retrieved from https://cutt.ly/uQYqzUR

67. Vafeas, N. (1999). Board meeting frequency and firm performance. *Journal of Financial Economics, 53*(1), 113–142. https://doi.org/10.1016/S0304-405X(99)00018-5

68. Vitolla, F., Raimo, N., & Rubino, M. (2020). Board characteristics and integrated reporting quality: An agency theory perspective. *Corporate Social Responsibility and Environmental Management, 27*(2), 1152–1163. https://doi.org/10.1002/csr.1879

69. Weir, C., & Laing, D. (2001). Governance structures, director independence and corporate performance in the UK. *European Business Review, 13*(2), 86–95. https://doi.org/10.1108/09555340110385254

70. Wirtz, P. (2011). The cognitive dimension of corporate governance in fast growing entrepreneurial firms. *European Management Journal, 29*(6), 431–447. https://doi.org/10.1016/j.emj.2011.06.004

71. Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics, 40*(2), 185–211. https://doi.org/10.1016/0304-405X(95)00844-5