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Insights from the Dhaka Stock Exchange on CEO Duality and Its Impact on Performance in Bangladesh's Manufacturing Firms

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Abstract

This research uses a dynamic panel data method and two-step System Generalised Method of Moments (SGMM) techniques to examine how CEO duality affects the performance of 109 manufacturing companies listed on the Dhaka Stock Limited in Bangladesh from 2014 to 2023. The results indicate that CEO duality impacts firm performance in different ways. Specifically, CEO duality does not significantly affect ROA, suggesting that when a CEO also serves as chairman, they might make biased choices related to internal and external financing and overall decision-making. CEO duality positively impacts ROE, allowing the CEO to resolve conflicts of interest and corporate governance issues, thereby enhancing long-term profitability. CEO duality negatively affects Tobin's Q, indicating that much power is focused in one place. This reduces how well the board can oversee and manage the actions of the CEO. It allows the CEO to focus more on personal or immediate benefits rather than long-term company growth, which results in a decrease in market value as indicated by Tobin's Q. As a result, policymakers and corporate boards should evaluate the trade-offs associated with CEO duality, such as increasing board independence or restricting CEO power concentration. We used the Two-Step Difference GMM Model as a robustness check, which yielded the same findings as the Two-Step System GMM.

Keywords Corporate Firm Performance, CEO Duality, System GMM, Tobin's Q, Return on Equity, Return on Assets, Stock Exchange.

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1 Introduction

Companies in the contemporary global economy face agency issues because ownership and control are different entities. From (Yu, 2023), CEO duality refers to the situation where the CEO also serve as the chair of the board. This combination of roles is significant in corporate governance. This paper explores how having the CEO occupy both positions may improve a company's performance, especially for firms that emphasise operational management and strategic planning. It is pertinent to use this theoretical frame. CEO duality is essential in increasing rationalised decision-making as the decisions are centralised and coordinated by the same person, strengthening organisational leadership (Mubeen et al., 2021). The decision-making process has been substantial, and the speed and time are competitive tools for manufacturing firms in realising customer shifts and demands. In addition, CEO duality provides a straightforward strategic view that a company wanting to grow globally and automate requires due to the unity created by the CEO. Still, it is argued that CEO duality may negatively impact the corporate structure, where the CEO may require supervision, primarily when the firm invests in capital-intensive projects. Saying so, Mohammadi, Basir and Lööf (2015) and Duru et al. (2016) mentioned that the CEO's actions need to be supervised by the Board of Directors. Therefore, if the CEO is the chair, the board cannot effectively hold the CEO accountable for their actions. Moreover, conflicts of interest are created, imposing constraints on the board and granting decision-making autonomy, mainly when the investment implies unchecked high-risk business strategies. The following research objectives have been developed to fulfil the above-stated research objectives: This study will examine how CEO duality affects performance by examining agency and stewardship theories in manufacturing companies in Bangladesh. This study adds to the current research by using CEO duality analysis while focusing on the unique characteristics of firms in developing economies, particularly those in Bangladesh. Second, the current studies on how CEO dualism affects company performance show varied results. This is a significant research area that mainly looks at developed nations. We applied this in our latest data analysis of 109 companies listed in Bangladesh.

We focused on the manufacturing companies on the Dhaka Stock Exchange because of their importance. First, the lion's share of Bangladesh's GDP, employment, and export revenues are generated from the manufacturing sector. Second, the concept of manufacturing firms can be defined very broadly. This study examines how having the CEO also serve as the chairperson impacts the performance of various manufacturing firms. Thirdly, CEO duality here explains how these organisations address leadership tasks and their impact on productivity. The challenges include competitiveness, efficiency of the production system, and constant increase in the standards for manufacturing facilities in Bangladesh. Much academic attention has been paid to CEO duality and how it affects performance in global manufacturing companies. This has led to several empirical research studies. Earlier research was also found ambiguous since it suggested that CEO duality and performance were contingent and invariant with organisational form. The process splits the supervisory activity carried out by the board from the executive activity in the organisation. The perspective in Bangladesh contrasts with that of Europe; the board of directors resembles a management board and organisationally fulfils its functions with non-executive directors alongside executives performing their responsibilities. According to Rashid (2010), sponsor-shareholders are mostly family-based in Bangladesh, where the father is the chairperson, and the son or someone from his family is the CEO.

With these aims, we look at how having two CEOs affects the performance of manufacturing firms in Bangladesh listed on the Dhaka Stock Exchange. We will explore CEO duality alongside other elements of the board structure that influence company performance, using ideas from agency and stewardship theories. In our study, CEO duality is the main focus. This focus has two options: either there is CEO duality, or there isn't (Ali et al., 2022; Duru et al., 2016; Yu, 2023). This research adds to current understanding by analysing factors like board size and the independence of board members. The audit committee's composition and CEO tenure are control variables and macroeconomic factors like GDP growth and inflation rate, which many authors have not investigated. This paper uses the GMM model, demonstrating

enhanced computational efficiency relative to 2SLS and OLS estimators within a mixed regressive and spatial autoregressive framework. This model exhibits consistency and adheres to a standard distribution over time. The method uses dynamic panel data with the system GMM estimator to deal with endogeneity issues and hidden variations. This study contributes to academic and sensible discourse by means of addressing giant studies gaps, inclusive of the impact of CEO duality innovations on company performance. It academically fills a wonderful void inside the contemporary literature by supplying facts from a rising economic system, where corporate governance demanding situations differ markedly from the ones in industrialised international locations. The consequences might also assist policymakers and regulators in Bangladesh in improving company governance structures, which can be important for attracting worldwide investment and guaranteeing lengthy-time period corporation fulfilment and monetary quarter sustainability. The research examines firms' performance on the Dhaka Stock Exchange. It shows that having the CEO as chair can harm performance, which concerns policymakers and investors. Furthermore, this focus expands the framework to explore governance concepts and suggests ways to enhance organisational performance through appropriate governance strategies.

2 Literature review

2.2 Theoretical Perspective and Empirical Evidence

2.2.1 Agency Theory

Agency theory states that CEO duality occurs when one person holds both the CEO and chairperson positions. This setup weakens the board's power to oversee the CEO properly. Yu (2023) notes that numerous policymakers support separating these roles. Merging the positions of CEO and chairperson can reduce the board’s independence, as the CEO may act in ways that do not benefit shareholders, which could negatively affect the company's performance (Alves, 2020; Hsu et al., 2021). As stated by Wijethilake and Ekanayake (2019), compensation paid to the CEO of the board can be linked to the goal of the corporate business so that the interest of the shareholders will always be achieved irrespective of what the CEO of the corporation does. When the CEO's compensation plan is aligned with the firm's objectives, it prevents the CEO from acting like Eudyptula Minor, prioritising immediate self-interest (Alves, 2020; Eklund, 2024). While the above strategy might eliminate some agency problems, it strengthens the counterchecks and threats associated with CEO duality.

The CEIDO-D parameter for a CEO duality leadership setup is mainly based on the company's size, internal operations, and the industry setting. CEO duality is compelling in companies with centralised governance since the CEO can make most decisions, especially in firms that require significant capital investment. This dual role can improve firm performance by speeding up decision-making and providing quick leadership (Mubeen et al., 2021; Yu, 2023). Duru et al. (2016) have pointed out that organisations in the manufacturing sector with strong internal controls and governance structures may not need CEO duality because they experience events like audits frequently that can address any risks the CEO might decide to take for the organisation's benefit. This should only be recommended for companies with regular governance systems because it could hurt their performance and productivity.

2.2.2 Stewardship Theory

However, according to this theory, it proves that it allows a strong leadership on the one hand, because when CEO and chairperson are one person, they can more easily make better decisions and coordinate better strategies to rise the firm's performance. In addition, it indicates that the issues in communication and costs arising from information sharing between the manager and shareholders are reduced when the CEO executes both duties (Hassan et al., 2023; Hsu et al., 2021; Yu, 2023). The stewardship theory views manufacturing firms as being strong with lots of capital and with long term plans. The scope of these firms includes regulatory rules, technology changes, global growth, and demand variations. Sjostrand and

Svensson (2022) argue that the theory pays attention to the many benefits of CEO duality -- focusing on one leadership structure, with one leadership making long term decisions and investments, while executives (that's the chairperson) lead the execution. Separating responsibility allows leaders to stay focused on being a leader and work on the path of the company while balancing short and long term goals. This arrangement combines the CEO and the chairperson roles in the same leader, leading to the ever stability in leadership with incorporation of the innovation and managerial performance enhancement in a manufacturing firm (Alves, 2020; Wijethilake & Ekanayake, 2019). According to the theory, the addition of one person in both roles nullifies conflicts and increase productivity as decisions can be made more efficiently. A single person in charge leads to no misalignment of resources with the company's vision. The theory, however, has come under fire for critics, mostly its proponents who advocate agency theory. According to critics, a CEO, who also serves as the Chair of the board, may put priorities of personal interests above the company goals (Hassan et al., 2023). In manufacturing companies that make complex strategic and operational choices, and in which many decisions are needed in one afternoon, being CEO and simultaneously a simple majority independent director on the board is necessary for effective decision making. It says that this can help manufacturing firms in particular, and those with centralised leadership in particular. It pushes for long term growth and operational efficiency (Le et al., 2023; Pham & Pham, 2020).

Therefore, the issues between the two theories result in two hypotheses. Second, agency theory posits that the board should assume autonomy in decision making and implies that Implication is that the performance of a company may fall (Duru et al., 2016) when the CEO is both the board chair and the employee. By contrast, stewardship theory holds that shareholders should be prioritised in a joint leadership structure. Duru et al. (2016) suggest that being an opportunist is not the premise of stewardship theory, indeed CEOs take pride in non-monetary rewards like reputation, and respect to lead the company's resources effectively. Using Pham and Pham (2020) as an example, these effect of the CEO duality on company performance has been investigated. Within the context of the life cycle theory we examined data of 442 publicly traded Vietnamese firm from 2012 to 2018 using Tobin's Q. Duru et al. (2016) find that CEO duality improves business performance during growth phases as measured by the generalised method of moments (GMM), but deteriorates its performance when a business matures.

The researchers also used GMM to estimate the effect of CEO duality on firms' performance using ROS, ROE, and ROA as the performance measure and board independence as a moderator. The data suggests that the corporate performance is negatively affected by CEO duality. In Mubeen et al. (2021), the relationship between CEO dualism and business performance is investigated. Hsu et al. (2021) examine the influence of CEO duality on the performance, highlighting that information costs serves as a moderating factor in this dynamic, particularly in Taiwan where elevated information costs sustainably determined ROA and Tobin's Q. Debnath et al. (2021) employ panel data regression analysis and report mixed results: The CEO dualism is seen to negatively affect market capitalisation and positively impact return on assets (ROA).

In fact, in their study of 204 companies that are listed on the Istanbul stock exchange between the periods of 2009 and 2010, Doğan et al. (2013) found that CEO duality significantly impacts performance metrics such as ROA, ROE, and Tobin's Q and they did so for both odds ratios and regression coefficients. CEO duality negatively affects performance in the form of Tobin's Q and ROE in India, as shown by Shrivastav (2016). On the other hand, Mohammadi, Basir and Lööf (2015) scrutinised 11,000 Swedish companies and discovered that CEO duality had a positive effect on performance, such as Balagobei and Udayakumara (2017) in Sri Lanka.

Wijethilake and Ekanayake (2019) detected a negative impact on performance in 212 publicly listed Sri Lankan firms. Chen et al. (2008) examine ownership concentration and performance in Hong Kong firms, starting a negative impact of CEO duality using Tobin's Q with no significant relationship using ROA or ROE analysis Chinese firms, finding no significant link relationship with CEO duality and performance from 2000-2001, but a positive link from 2002- 2003. However, several studies (Baliga et al., 1996; Chen

et al., 2008; Elsayed, 2007; Rechner & Dalton, 1989; Yan Lam & Kam Lee, 2008) indicate no significance of CEO duality on firms' performance. Dahya (2005) demonstrates that splitting the CEO and Chair of the Board titles among UK corporations is not associated with improved corporate performance. In Bangladesh, Rashid (2010) employs a two-stage least square regression (2SLS) methodology based on an observation of 825 firm years. Results show that CEO duality and business performance, as determined by Tobin's Q and return on assets, have a negative (non-significant) relationship.

2.2.3 Research Hypothesis

Based on the analysis in the previous subsections, we propose the following hypotheses:

H1: CEO's duality positively impacts a firm's performance.

H2: Companies do less well when the CEO and board chair have dual responsibilities.

3 Methodology

3.1 Collection of data and sample design

The "ex post facto" research design is applied in this examination. Secondary data of 109 manufacturing firms registered on the Dhaka Stock Exchange Limited from 2014 to 2023, representing ten fiscal years as the source of panel data needed to analyse the study, are obtained from the chosen firms' yearly financial reports and the DSE's pricing list. The study's sample is drawn using convenience sampling. The selection criteria for the manufacturing enterprises were based on data availability, capitalisation, and economic significance in Bangladesh. These factors ensure that the sample is representative and provides insight into how characteristics of CEO dualism affect firm performance in the country. To enhance the robustness of the analysis, any missing data for institutions were excluded throughout the study period. There are a total of 1090 observations. Data on macroeconomic factors were collected from the World Bank's database. The chosen industries represent 28 textiles, five cement companies, three ceramic companies, 19 engineering companies, nine foods and allied companies, 15 fuel and power generating companies, and 17 pharmaceuticals and chemicals companies. Moreover, this investigation comprises the selection of two paper and printing companies, four tanneries, and seven miscellaneous companies from the industries above. All (i) financial institutions, (ii) corporate bonds, (iii) debentures, (iv) mutual funds, and (iv) treasury bonds issued by existing corporations and governments are excluded due to their non-manufacturing nature.

Table 1 Summary of The Selected Firms and Percentage of Samples

Name of Sector	No. of Firms listed	No. of Firms Used	Percentage of Sample Selected
Cement	7	5	71.4
Ceramic	5	3	60
Pharmaceuticals& Chemicals	33	17	51.5
Fuel & Power	23	15	65.3
Food & Allied	21	9	43
Textiles	58	28	48.24
Paper & Printing	6	2	33.33
Tannery	6	4	66.67
Miscellaneous	15	7	46.67
Total	216	109	50.47

Notes: Source of the table: DSE at 2024

3.2 Variables Measurement

3.2.1 Dependent Variables

The performance of companies was analysed by Duru et al. (2016), Hsu et al. (2021), Javeed et al. (2020), and Mubeen et al. (2021) using modern metrics such as return on equity (ROE), return on assets (ROA), and Tobin's Q. Return on assets (ROA) measures a company's profitability about its total assets, indicating how effectively a business operates. Return on equity (ROE) is another important measure of a company's performance to rate the company's performance relative to shareholders' equity. Thus, it goes without saying that in this research the primary measures used to determine the company performance are return on equity as well as assets. Also, Tobin's Q is a market connected metric such that it is used to test the price of future current cash flows on the basis of actual and projected data (Singh et al., 2018).

3.2.2 Explanatory Factor

The independent variable of this study was CEO dualism, and its impact on operational performance of manufacturing firms was analysed. When the CEO also serves as the board chair, this variable is set to 1 (Mubeen et al., 2021; Wang et al., 2019) and otherwise it is 0. Among its influencing factors, audit committee size, CEO tenure, board size and board independence (Duru et al. 2016). A company's board is typically five to sixteen people. Access to more affordable sources of resources through larger boards and independent board members is believed to improve performance (Duru et al., 2016). CEO tenure (Chen et al., 2017; Hu et al., 2015) is an executive's tenure. The number of the subgroups in a company's board that monitor financial reporting and transparency determines the number of members in the audit committee. Additional control variables include the debt-to-assets ratio (Leverage), the sales growth rate (the percentage change in current year sales compared to the prior year's sales), and the company size determined by the natural logarithm of total assets. This study examines GDP growth and inflation rates to analyse their effects on the firm's macroeconomic environment. This analysis shows a favourable correlation between GDP growth and corporate performance. Inflation drives production costs, impacting laws, supply chains, and consumer demand. It also suggests that corporate performance and inflation rate are negatively correlated.

Table 2 ***Catalogue of the variables***

Variable	Mnemonics	Role	Measurement
Return on Asset	ROA	Dependent	Net Income / Total Assets.
Return on Equity	ROE	Dependent	Net Income / Total Equity.
Tobin's Q	TQ	Dependent	Market Value of Firm/ Replacement Cost of Firm
CEO Duality	CEOD	Independent	"If the company's CEO is also the chairperson of the governance board, the variable is set to 1. If not, it is set to 0."
Board Size	BS	Control	Total Membership of the Board of Directors. External Directors / General Directors.
Board Independence	BI	Control	Percentage of Independent directors
CEO Tenure	CEOTEN	Control	The total number of years an executive has held the CEO office.
Audit Committee Size	AUCS	Control	Number of Members of the Audit Committee
Firm Size	SZ	Control	Natural Logarithm of the Whole Asset

Leverage	LV	Control	Total Debt / Total Assets
Sales Growth	SGR	Control	Current year sales- Base year sales/ Base year sales
GDP Growth Rate	GDPR	Control	GDP Rate Current Year- GDP Rate Base Year/ GDP Rate Base Year
Inflation Rate	INF	Control	The Rate of Annual Inflation

3.2.3 Model Specification

Our study used GMM based on recent research and some logical factors (Duru et al., 2016; Mubeen et al., 2021). We used a panel dataset to examine the relationship between CEO dualism and company performance. Other research indicates that endogeneity issues are common in panel datasets, leading to unreliable and erroneous findings (Javeed et al., 2020; Mubeen et al., 2021). Second, CEO selections may be linked to error terms arising from possible causes in OLS regressions with missing data, autocorrelation issues, and measurement errors (Adams et al., 2010). Third, endogeneity problems could arise from the dual responsibilities of chairman and CEO, linked to certain of the company's hidden traits (Kang & Zardkoohi, 2005; Mubeen et al., 2021). Last but not least, the OLS model has limitations when used with panel datasets because unobserved variability may create biassed results and render them useless (Bae et al., 2018; Duru et al., 2016; Fralich & Fan, 2018; Javeed et al., 2020; Mubeen et al., 2021). As a result, internal issues need to be considered when conducting a CEO duality study. This study examined the connection between CEO dualism and business performance using the GMM approach to solve this internal issue. This issue might be resolved by a secondary technique that uses the robust command in fixed effects models to regulate heterogeneity under strict exo-geneity. However, when a company's sustainability efforts from the prior year impact its present performance, strict exogeneity is broken. (Molla et al., 2023). Furthermore, GMM is appropriate for panel data characterised by a shorter time dimension and a larger cross-sectional dimension, as observed in this study (Yilmaz et al., 2023). In addition, the fixed effect model does not sufficiently account for endogeneity bias and autocorrelation. Furthermore, we may use the robust command to implement the random effect model. Nevertheless, the dilemma of heteroscedasticity can be resolved, whereas autocorrelation and endogeneity remain unresolved. Thus, instrumental variable estimation is necessary to address panel data endogeneity, autocorrelation, and heteroskedasticity. The Generalised Method of Moments (GMM), created by Arellano and Bond (1991), helps with dynamics endogeneity by using past values of dependent variables as tools. This approach addresses biases arising from autocorrelation, unobserved heterogeneity, and simultaneity, ensuring consistent and reliable estimates. In this study, dynamic panel data with System GMM estimation (Roodman, 2009) has been used. While requiring more resources, however, this approach is more efficient than the various GMM methods. For the panel, we used the two step robust command to test for autocorrelation and heteroskedasticity. Two step GMM yields better result than one step methods by using the covariance matrix. The Hansen J test was used to verify over-identifying restrictions and the Arellano-Bond AR (2) test was used to evaluate the instruments validity in the GMM analysis of autocorrelation. We also will consider using our explanatory variables that include dynamic relationships. The GMM technique used in this study improves findings accuracy and dependability by revealing correlation and relationship between audit committee attributes and firm performance that standard econometric technique might not be able to explain (Al-Jaifi, 2020; Wooldridge, 2019).

In this setting, the following equation can be derived:

$$CF_{it} = \alpha_0 + \delta CF_{it-1} + \beta_{it} CEOD + X n_{it} + \mu_{it} + \epsilon_{it} \quad [i]$$

For intercept, symbol α, slope, symbol, β, and error term, ε.
Application of ROA in this research represents CF because it represents the firm's corporate performance. ROE and TQ. The primary factor that is CFit, is the corporate performance of the prior year's firm.
We denote the variable of CEO Duality associated with regressor by βit CEOD, and X unit represents control with firm specific fixed effects of ± μ it, error term of ∈ it and individual firm read by i and time period by t. Because this study considers 4 dependent variables (i.e. ROA, leverage, and cash retention rates) which are potentially related, estimation of multivariate regression models has been used.
Equation (i) can also be rewritten as Equations (1), to measure the firm's corporate performance, ROE and TQ. (2) and (3).
The first equation (1) of the model is given below:

$$ROA_{it} = \alpha_{0+} \delta_1 ROA_{it-1} + \beta_2 CEOD_{it} + \beta_3 BS_{it+} \beta_4 BI_{it} + \beta_5 CEOTEN_{it} + \beta_6 AUCS_{it} + \beta_7 SZ_{it} + \beta_8 LV_{it} + \beta_9 SGR_{it} + \beta_{10} GDPR_{it} + \beta_{11} INF_{it} + \in_{it} \quad [1]$$

The second equation (2) of the model is given below:

$$ROE_{it} = \alpha_{0+} \delta_1 ROE_{it-1} + \beta_2 CEOD_{it} + \beta_3 BS_{it+} \beta_4 BI_{it} + \beta_5 CEOTEN_{it} + \beta_6 AUCS_{it} + \beta_7 SZ_{it} + \beta_8 LV_{it} + \beta_9 SGR_{it} + \beta_{10} GDPR_{it} + \beta_{11} INF_{it} + \in_{it} \quad [2]$$

The third equation (3) of the model is given below:

$$TQ_{it} = \alpha_{0+} \delta_1 TQ_{it-1} + \beta_2 CEOD_{it} + \beta_3 BS_{it+} \beta_4 BI_{it} + \beta_5 CEOTEN_{it} + \beta_6 AUCS_{it} + \beta_7 SZ_{it} + \beta_8 LV_{it} + \beta_9 SGR_{it} + \beta_{10} GDPR_{it} + \beta_{11} INF_{it} + \in_{it} \quad [3]$$

When looking at the chosen representatives and using the data model, the influence of CEO duality on how manufacturing companies perform can be analysed.

3.3 Diagnostic Tests

Several diagnostics examinations were made to ensure the actual studies were accurate. This includes the use of tests such as Levin, Lin & Chu and ADF-Fisher to determine unit roots to be sure that data has a unit root at the given level of significant 1%. Testing for multicollinearity: correlation analysis also was conducted, with the VIF values all being less than 5.00; tolerance values also indicated that multicollinearity was not significant problems (Gujarati & Porter, 2010). Heteroscedasticity was tested for using White's test and the Breusch–Pagan/Cook–Weisberg tests while autocorrelation was assessed using the Wooldridge test. Since we identified heteroscedasticity and autocorrelation, GMM model was used because this method is efficient in resolving those issues. This method increases the reliability of the estimates and ensures that the results provide a reliable picture on the consequences of the CEO duality characteristics on firm performance.

4 Results & Discussion

4.1 Descriptive Statistics

Table 3 Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
ROA	1090	5.829	3.012	-8.9	18.28
ROE	1090	6.329	2.503	-8.4	18.23
TQ	1090	2.774	.995	.78	155.6
CEOD	1090	.495	.500	0	1
BS	1090	11.71	4.457	4	27
BI	1090	.167	.06	0	.57
CEOTEN	1090	12.061	9.132	1	48
AUCS	1090	3.788	.888	3	9
SZ	1090	9.714	.655	7.2	11.654
LV	1090	1.826	1.398	.013	9.186

SGR	1090	11.771	47.866	-8.99	1234
RGDP	1090	6.5	1.151	3.45	7.88
INF	1090	6.051	.663	5.51	7.53

Notes: The table summarizes data from 109 Bangladeshi manufacturing enterprises. The final study sample includes 1,090 firm-year data from 2014 to 2023, resulting in a balanced panel. This comprises CEO Duality, Corporate Governance Variables, business performance, and control variables.

Table 3 presents summary stats from the variable review. CEO Duality has a mean of .495 and a standard deviation of 50. The table also details descriptive stats for the variables. It indicates that CEO dualism is common, with an average of 47%. The typical board consists of about 12 members, with a minimum of 4 and a maximum of 27 directors. The typical board consists of about 12 members, with a minimum of 4 and a maximum of 27 directors. The average board independence is 16.7%, from 0 to 57%. The average CEO tenure is 12.061, and the Audit Committee size is 3.788, ranging from three to nine members. The average value leverage is 1.83, with the firm's size and sales growth rate being 9.71 and 11.77, respectively. The macroeconomic control variable's average GDP growth and inflation rates are 6.5 and 6.051, respectively. The average performance variable control variable for Return on Asset (ROA) is 5.82 per cent, ranging from -8.9 per cent to 18.28 per cent. The Return on Equity (ROE) is 6.32%, ranging from -8.4% to 19.34%. The average profitability variable for Tobin's Q is 2.774 per cent, ranging from 0.78 to 155.6 per cent. ROA, ROE, and Tobin's Q indicate differing performance outcomes, reflecting the diversity in the financial health and governance practices of the sample.

4.2 Correlation Matrix and Multi-collinearity

Table 4 Pairwise Correlation Metrix

Variables	ROA	ROE	TQ	CEOD	BS	BI	CEOTEN	AUCS	SZ	LV	SGR	RGDP	INF
ROA	1												
ROE	0.18***	1											
TQ	-0.04	-0.13***	1										
CEOD	0.04	0.02	0.001	1									
BS	0.11***	0.09***	-0.02	-0.01	1								
BI	-0.09***	-0.07**	0.05*	0.01	-0.08***	1							
CEOTEN	0.05*	0.01	-0.003	0.03	0.18***	0.01	1						
AUCS	0.02	0.01	0.05	0.03	0.07**	-0.04	-0.16***	1					
SZ	-0.06**	-0.001	0.05*	-0.01	0.07***	-0.01	-0.1***	0.12***	1				
LV	0.01	0.001	0.02	-0.01	0.09***	-0.04	0.01	0.01	-0.09***	1			
SGR	0.05	0.033	-0.03	0.01	0.04	-0.01	0.09***	0.02	-0.02	-0.03	1		
RGDP	-0.02	-0.024	-0.02	-0.05*	0.03	0.02	0.02	0.01	-0.00	-0.01	0.05	1	
INF	0.04	-0.025	-0.07**	0.01	-0.56***	0.03	-0.09***	-0.11***	-0.12***	-0.01	-0.03	-0.09***	1

*Notes: The table shows the Pearson correlations for the variables identified in the study. The proxies for company performance are ROA, ROE, and TQ, with CEOD as the primary independent variable. The control variables for the firm include BI, BS, CEOTEN, AUCS, SZ, LV, SGR, RGDP, and INF. The correlation matrix shows how strong the links are between the variables. P values are displayed in parenthesis, with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively.*

Table 4 indicates that the Pearson correlation matrix demonstrates a significant relationship among performance metrics, CEO duality, board characteristics, and the control variables employed in this study. The matrix indicates a correlation of 0.177 among the firm's performance measures, such as ROA and ROE. CEO dualism is positively linked with ROA, ROE, and TQ, which affect company performance. The average variation inflation factor (VIF) for all explanatory variables is under 10 (see **Table 5**), indicating no multi-collinearity among the variables presented. This ensures the reliability of the regression results in future studies. The mean VIF of 1.13 indicates that multicollinearity is not a concern in this study (Salmerón-Gómez, Rodríguez-Sánchez, and García-García 2020; Tamura et al., 2019).

Table 5 Variance Inflation Factor

Variables	VIF	1/VIF
BS	1.531	.653
INF	1.507	.663
CEOTEN	1.115	.897
SZ	1.073	.932
AUCS	1.056	.947
LV	1.024	.977
RGDP	1.014	.986
SGR	1.013	.987
BI	1.01	.99
CEOD	1.005	.995
Mean VIF	1.135	

Notes: This table displays the multicollinearity statistics for corporate governance characteristics and firm control variables. A VIF less than 10 indicates that there are no multi-collinearity issues among the variables.

4.3 Unit Root Test

In the regression analysis, the basic measurement unit was established to confirm the location of the change. As seen in **table 6**, the results of the Levin-Lin-Chu (LLC) and Augmented Dickey-Fuller Fisher (ADF-Fisher) tests show that all variables exhibit a position of 1% significance. This shows that this information is necessary for further financial analysis since the lack of living space is not a problem.

Table 6 LLC, ADF-Fisher, Test

	LLC		ADF-Fisher	
	Statistic	P	Statistic	p
ROA	-4.39	.0000***	12.34	.000***
ROE	-6.56	.00001***	14.56	.0002***
TQ	-5.34	.000***	-3.45	.0004***
CEOD	-1.00	.000***	-1.00	.0000***
BS	-4.56	.0002***	-3.4	.0006***
BI	-8.56	.00001***	-7.8	.0002***
CEOTEN	-3.6	.0000***	-9.3	.0000***
AUCS	-5.6	.0000***	7.8	.0005***
SZ	-12.3	.00001***	4.5	.0003***
LV	-7.8	.0000***	6.3	.0005***
SGR	-5.9	.0003***	3.9	.0000***

GDPR	-12.3	.0000***	-6.3	.0000***
Inflation Rate	-13.09	.0000***	-11.4	.0001***

*Notes: The symbol *** represents importance at the 1% level. Both the Levin-Lin-Chu and Augmented Dickey-Fuller-Fisher tests are carried out at the level.*

4.4 Heteroscedasticity

Heteroscedasticity changed into assessed through White's test, the Breusch–Pagan/cook–Weisberg take a look at, and the changed Wald test. The findings in **table 7** exhibit that the statistics exhibit heteroscedasticity, with p-values for the chi-square statistics falling below 0.05 in maximum tests. This suggests that the variance of the error phrases varies across observations, thereby necessitating the software of sturdy estimation techniques, which includes GMM, to rectify this difficulty and reap reliable consequences.

Table 7 White, BPCW, MW Test for Heteroscedasticity

	White test		Breusch–Pagan/ Cook–Weisberg test		Modified Wald test	
	Chi2	Prob>chi2	Chi2	Prob>chi2	Chi2	Prob>chi2
Model 1 (ROA)	192.29	0.0000	.3418	.90	3.4e+0.5	0.0000
Model 2 (ROE)	227.04	0.0000	6.30	.0123	1.3e+0.5	0.0000
Model 3(Tobin's Q)	193.52	0.0000	4.14	0.0000	1203.19	0.0000

4.5 Autocorrelation

The Breusch-Godfrey LM take a look at, the Durbin-Watson statistic, and the Wooldridge take a look at had been employed to evaluate autocorrelation. The findings presented in desk eight indicate that first-order autocorrelation exists within the facts set. Autocorrelation suggests that residuals from one-time period are associated with the ones from earlier periods, highlighting the need for GMM to address this trouble and obtain independent estimates (see **Table 8**).

Table 8 BGLM, DW, and Wooldridge Test

	Breusch–Godfrey LM		Durbin–Watson test	Wooldridge test	
	Chi2	Prob>chi2	D-W Statistic	F(1, 108)	Prob>chi2
Model 1 (ROA)	4.567	.0000	1.756	382.612	0.0000
Model 2 (ROE)	13.89	.0034	1.83	97.404	0.0000
Model 3(Tobin's Q)	6.78	.2345	2.056	115.604	0.0000

4.6 Regression Result

The Hausman specification take a look at turned into used to check the discrepancies between fixed business enterprise results and random reservoir consequences. desk nine gives an assessment of the fixed-effects version which is appropriate given the sturdy evidence against the null of consistent random results at $p<0.05$ for both the ROA, ROE, and Tobin's Q models. however, because the mistakes have been heteroscedastic, auto-correlated and the regressors might be endogenous, the 2- step gadget GMM estimator changed into employed to offer constant and efficient estimates and effects which rather suit the research objectives of this study (see **Table 9**)

Table 9 Hausman specification

	Chi-square test value (Coef)	P
Model 1 (ROA)	54.4	0.000
Model 2 (ROE)	66.8	0.000
Model 3(Tobin's Q)	14.6	0.000

Table 10 offers GMM outcomes from a -step method related to CEO duality and company overall performance. every version suggests a clean hyperlink between current overall performance and the performance from the 12 months previous. This result is constant with the work of Duru et al. (2016). it is counseled that company performance functions be analysed based on the version's dynamic nature. key tests for machine GMM estimation are the Arellano-Bond test, which looks for 2d-order serial correlation in first differenced residuals, and the Hansen over-identity test, which assessments the validity of the devices. All assessments have to no longer reject the null hypotheses for the version specification to be considered dependable.

Table 10 Two-Step System GMM Model Output

Variables	Model 1 (Return on Asset)	Model 2 (Return on Equity)	Model 3 (Tobin's Q)
Return on Asset$_{(t-1)}$	.558***(0.09)		
Return on Equity$_{(t-1)}$		.742***(0.004)	
Tobin's Q$_{(t-1)}$			.89***(0.24)
CEO Duality	-.022(.439)	.524**(.307)	-.0328**(.064)
Board Size	-.076***(.022)	.016(.019)	-.020**(.011)
Board Independence	-2.01***(1.02)	-.595**(.725)	1.86***(.811)
CEO Tenure	.001(.009)	-.028**(.033)	.002(.005)
Audit Committee Size	.005(.080)	-.076(.079)	.022(.027)
Firm Size	-.065(.134)	-.077(.11)	.034(.038)
Leverage	.026(.047)	.025(.034)	-.001(0.018)

Sales Growth Rate	.005(.004)	.001***(.0005)	.0003(0.0004)
GDP Growth Rate	.002(.057)	-.023(.039)	-.047***(.022)
Inflation Rate	.470***(.117)	-.0322(.076)	-.111**(.063)
Constant	.441(1.63)	2.94**(1.51)	.800(.864)
Sargen test (p-value)	8.59***(.014)	.83(.134)	2.97*(0.06)
Hansen Test (p value)	4.14(.126)	.75(.456)	5.49(.498)
AR (1) Test (p-value)	-4.61***(0.00)	-3.84***(0.00)	-2.20**(0.028)
AR (2) Test (p-value)	-1.09(.275)	.20(0.567)	-.86(.389)
Groups/ instruments	109/14	109/15	109/24
Number of observations	981	981	981
Year effects	Yes	Yes	Yes
Prob > F	0.00	0.00	0.00

*Notes: The above table displays the double-step system GMM valuation results. Standard robustness inaccuracies are denoted by brackets around the coefficient values. At the 1%, 5%, and 10% significant levels, ***, **, and * indicate statistically significant results.*

Here, CEO Duality has no significant effect on ROA at model 1, which indicates that when the CEO performs the same duty as the chairperson, some biased actions in favour of the Chairperson regarding internal and external financing and decision-making do not influence the firm's performance, which is comparable to that of others. (Baliga et al., 1996; Chen et al., 2008; Elsayed, 2007; Rechner and Dalton, 1989; Yan Lam and Kam Lee, 2008). For control variables related to corporate governance, ROA negatively significantly impacts board size and board independence. (Model 1), increasing the board size cannot effectively manage the firm, which means that more non-executive directors in Bangladeshi enterprises do not generate profitability. For the other control variable, only the ROA positively and significantly affects the inflation rate. Therefore, the outcome exclusively supports hypothesis three: CEO Duality neutral influences firm performance. In model 2, CEO Duality shows a positive and significant impact on ROE. This means that when the CEO also serves as the board's chairperson, the CEO can make better decisions by eliminating conflicts of interest in the audit committee, reducing corporate governance issues, and fostering long-term company value, ultimately boosting the firm's profitability. This finding is supported by the previous research of Mohammadi, Basir, and Loof (2015), who discovered that CEO Duality improves company success. This finding confirms our premise that CEO Duality has a favourable impact on business performance. Only board independence and audit committee size hurt ROE among the governance control factors, demonstrating that independent directors do not benefit the firm. Among the other control variables, only sales growth positively influences ROE. Therefore, the results confirm that our first hypothesis about CEO Duality's significant impact on firm performance is supported.

Model 2 results support stewardship theory. Stewardship theory says that having two roles on boards combines functional and oversight duties, which boosts shareholder accountability (Finkelstein and D'Aveni et al., 1994). This approach helps align goals between the CEO and the board since the chairperson brings together the board and management (Baliga et al., 1996). Additionally, CEO duality reduces rivalry between the CEO and chairperson, avoiding power issues in decision-making (Singh et al., 2018).
In Model 3, CEO Duality significantly negatively impacts Tobin's Q, indicating a lack of power balance. This diminishes the board's ability to oversee and manage executive actions. Earlier studies back that up. Studies show that a company with only one CEO and chairperson is bad for performance (Hsu et al., 2021f; Shrivastav, 2016; (Doğan, 2013). This supports the second hypothesis: Firm performance is affected negatively due to a CEO duality. When the CEO is also the chairman the board's ability to supervise and to function independently declines. With those larger boards comes lower Tobin's Q. And in this scenario, the CEO may be more focused on personal gain and less focused on an enterprise's long term value and success which would cause a drop in Tobin's Q. However, higher board independence is associated with improvements in Tobin's Q. In other words, more effective board, less conflicts of interest and more shareholder alignment — which is an indication of independent board. As a result, this greater independence can enhance the company's financial performance. The results of Model 3 corroborate the agency theory premise. Fama (1983) asserts that CEO duality adversely affects business performance due to increased agency costs, as posited by agency theory. The claim that dual leadership gives the CEO too much power in decision-making complicates the board's capacity to carry out one of its primary responsibilities: supervising the CEO. This leads to agency issues, notably conflicts of interest, when the CEO's interests and judgments differ from those of the shareholders.

Another control variable, only the GDP growth rate and inflation rate, negatively affects Tobin's Q. Therefore, the outcome exclusively supports hypothesis two: CEO dualism adversely impacts corporate performance. Ultimately, the dynamic regression model results indicate that CEO duality substantially impacts corporate performance. The instrument is also lower than the group. This observation highlights the test's validity. The model exhibits statistical validity by utilizing the AR (1) and AR (2) tests. A result of $p < .05$, which is less than the significance level for the AR (1) test, indicates that the residuals lack significant autocorrelation. Acquiring precise estimates is strictly dependent on this condition. Additionally, there is no evidence of over-identification, as the Hansen test demonstrates that the model's specifications are precise ($p > .05$). As the highly significant Chi-squared value attests, the system is suitably specified.

4.7 Robustness check

In this research, we conducted a robustness check with the dynamic two-step difference generalized method of moments (GMM) regression to validate and ensure the reliability of the regression findings. Leamer (1983) argued that the "fragility" of regression coefficient estimates indicates a potential specification error and that performing sensitivity analysis, or robustness tests, is necessary to help identify any misspecification issues.

Table 11 Two-Step Difference GMM Model Output

Variables	Model 1 (Return on Asset)	Model 2 (Return on Equity)	Model 3 (Tobin's Q)
Return on Asset$_{(t-1)}$	.64***(0.17)		
Return on Equity$_{(t-1)}$		.69***(0.006)	
Tobin's Q$_{(t-1)}$			.84***(0.28)
CEO Duality	-.034(.39)	.456**(.35)	-.043**(.073)
Board Size	-.116***(.052)	.026(.024)	-.034**(.013)
Board Independence	-4.01***(2.02)	-.55**(.74)	3.56***(.67)

CEO Tenure	.004(.008)	-.034**(.027)	.004(.008)
Audit Committee Size	.004(.090)	-.066(.089)	.026(.034)
Firm Size	-.075(.114)	-.088(.22)	.045(.056)
Leverage	.046(.067)	.036**(.044)	-.002(0.027)
Sales Growth Rate	.007(.008)	.003***(.0008)	.0004(0.0008)
GDP Growth Rate	.012**(.06)	-.024(.049)	-.037***(.033)
Inflation Rate	.55***(.145)	-.037(.073)	-.245**(.038)
Constant	.561(1.38)	3.54**(2.61)	.5600**(.723)
Sargen test (p-value)	.98(.305)	.56**(.04)	1.98***(0.00)
Hansen Test (p value)	1.26(.567)	.84(.44)	2.43(.456)
AR (1) Test (p-value)	-3.54***(0.00)	-3.43***(0.00)	-1.01**(0.001)
AR (2) Test (p-value)	-1.89(.639)	.36(0.45)	1(.334)
Groups/ instruments	109/14	109/28	109/25
Number of observations	981	981	981
Year effects	Yes	Yes	Yes
Prob > F	0.00	0.00	0.00

*Notes: The above table displays the double-step difference GMM valuation results. Standard robustness inaccuracies are denoted by brackets around the coefficient values. Statistically significant values are indicated by the symbols ***, **, and * at the 1%, 5%, and 10% levels.*

Here, the results of the robust take a look at that is accomplished by way of two-step difference GMM are similar with regression are much like the preceding two-step gadget GMM confirmed in desk eleven, so we are able to say that our effects are loose from misspecification and bias and offer dependable and valid effects. right here, CEO duality has no vast impact on ROA in version 1; board size and board independence are negatively and drastically tormented by ROA, and the inflation price is positively and considerably suffering from ROA. The result is just like the earlier result from the two-step gadget GMM. In version 2, CEO Duality indicates a substantial nice impact on ROE. Meanwhile, board independence, financial expertise, audit committee size, and sales growth rate all negatively affect ROE. For Model 3, CEO Duality significantly negatively affects Tobin's Q, which indicates that concentrated power may reduce board effectiveness and limit checks and balances, leading to decisions favouring short-term over long-term goals. Board size negatively affects Tobin's Q. However, board independence positively affects Tobin's Q, and GDP growth rate and inflation rate negatively affect Tobin's Q. The instrument is also lower than the group. This observation highlights the test's validity. The model exhibits statistical validity using the AR (1) and AR (2) tests. A result of $p < .05$, which is less than the significance level for the AR (1) test, indicates that the residuals lack significant autocorrelation. Acquiring precise estimates is strictly dependent on this condition. Additionally, there is no evidence of over-identification, as the Hansen test demonstrates that the model's specifications are precise ($p > .05$). As the highly significant Chi-squared value attests, the system is suitably specified.

5. Conclusion

The study uses a dynamic panel statistics method, a two-step system generalized methods moments (SGMM) estimator, to research the impact of CEO duality on the overall performance of 109 manufacturing

firms indexed at the Dhaka Stock Exchange Limited in Bangladesh from 2014 to 2023. Earlier studies mainly concentrated on static analysis of duality's effects on performance. Recent research emphasises the need to examine the long-term impacts of CEO duality within a dynamic framework since board structure can evolve (Duru et al., 2016; Mubeen et al., 2021). This analysis includes the firm's past performance, recognising that leadership structure and other factors are not entirely external. The outcomes of this study align with previous literature, providing new insights into Bangladeshi firm performance and revealing that CEO duality affects performance in two distinct ways. In Model 1 of the GMM system, CEO duality does not significantly influence the return on assets (ROA). This indicates that when the CEO is the chairperson, biased decisions may favour personal interests regarding financing and decisions that do not affect firm performance. The findings from Model 2 show that that CEO duality positively affects Return on Equity (ROE) such that by holding both roles, it should resolve conflicts within the audit committee and provides the opportunity to increase long term company value, thus improving profitability. This supports stewardship theory. In Model 3, however, CEO duality negatively influences Tobin's Q, indicating that a attention of electricity can lessen the board's functionality to oversee management. This diminished independence may enable the CEO to prioritise personal or short-term goals over the company's long-term success, negatively affecting its market value, which aligns with agency theory. These findings show that CEO leadership can be beneficial and risky; it may improve some aspects of financial performance while jeopardising long-term stability. Thus, policymakers and corporate boards should carefully consider the pros and cons of CEO duality. To mitigate potential conflicts of interest and agency problems, companies could implement independent audits, separate major decision-making roles, and increase board independence. This research appends to the discussion about CEO duality, stating that having the CEO be the chairperson can either help or hurt company performance.

Limitation of the Study

Here are some limitations in our research. First, the studies is based on secondary information and quantitative records. Moreover, the study excludes certain firm-specific and macroeconomic variables and other factors influencing firm performance, such as ownership structure, industry-specific regulations, and competition levels) were not considered. The exclusion of qualitative data or insights from corporate insiders, such as interviews with CEOs or Board members, creates a new path for further research in this area. The study sample covers only ten years and the manufacturing industry. Further research could include additional financial institutions, including insurance companies, investment banks, mutual funds, and banks. Corporate governance and the effects of CEO duality can change a lot from one country to another because of different rules, business customs, and economic situations.

Conflict of Interest

There is no conflict of interest, and everyone cleared their position.

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