

Research Article

Impact of Corporate Governance on Intellectual Capital of DSE-listed Banks in Bangladesh

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Abstract: The research aims to find the association between Corporate Governance (CG) and Intellectual Capital (IC) and the impact of CG on IC of DSE-listed Commercial Banks in Bangladesh. Data was collected from annual reports of 28 Banks from 2012 to 2021—a total of 280 observations comprised and arranged strongly balanced panel data. VAIC Methodology was applied to determine intellectual capital efficiency (ICE). Pooled-OLS regression result was used to prove the research hypotheses. The Pearson Correlation found that Independent Director and Audit Committee Size are positively associated with IC performance. In contrast, the Board Size, Executive Committee and Risk Committee were negatively associated with the same. Regression results documented that the Audit Committee Size and Independent Director positively and significantly influenced IC performance. However, the Board Size, Risk Committee, and Executive Committee negatively influenced IC's performance. The study will help policymakers, bank executives, government, owners, and investors to make adequate decisions for the future.

Keywords: Bangladesh; Commercial Bank; Corporate Governance; Intellectual Capital.

I. INTRODUCTION

Intellectual capital is the foundation upon which invention and efficiency are built. The capacity of intellectual capital to constantly evolve expands the institution's position within a constantly shifting market. Intellectual capital is a vital resource when it comes to banking companies. The term “intellectual capital” does not fit a widely acknowledged definition, and it is highly challenging to define and measure. In order to get a more comprehensive comprehension, it is broken down into three distinct components: the human, the structural, and the relational (Soriya & Kumar, 2022; Rana & Hossain, 2023). The intricate connection between corporate governance and intellectual capital calls for extensive study to fully understand it. To efficiently manage and harness intellectual capital to improve the performance of industrial organizations and foster innovation, it is necessary to have a corporate governance structure that is both efficient and effective.

A comprehensive investigation of this connection is urgently required, with the expectation that it would provide direction for arrant governance approaches geared towards enhancing intellectual capital to achieve organizational success (Islam et al., 2024). The findings obtained from such research can be of great use to policymakers, corporate executives, and academics interested in elucidating the affinity between corporate governance and IC in banking companies. IC and CG are two of the most imperative issues to consider when striving to improve a company's performance in the developed world. On the other hand, practitioners in deprived nations like Bangladesh must give more attention to these essential components. Contemporary periods have seen a significant increase in the focus placed on intellectual capital. This is evidenced by the growing prevalence of the phrase among practitioners, researchers, and professionals in management.

Bad loans are the biggest issue in the banking sector today. Bangladesh Bank reports that 9.93 per cent of loans are bad, with above 20% in 9 institutions (Bangladesh Bank, 2023). Although the world encourages single ownership or concentration of ownership for strong corporate governance, the “Banking Companies Amendment Act 2018” expanded director tenure from 6 years (established under the Banking Companies Act, 1991) to 9 years. It was raised to 12 years in the 2023 amendment, promoting family-centered occupation and tyranny. In addition, the 2018 amendment increased the number of directors from the same family from two to four, but the 2023 amendment lowered it to three amid criticism (Polash, 2024). This reveals how powerful parties have impacted central bank policy to retain family and commercial dominance. Our financial system has regressed due to these actions. Bangladesh Bank's significant policies have unfairly benefited industry groupings due to banks' inadequate compliance. These include the maximum lending limit to a single individual or entity, up to 25% of the capital (funded credit) for cash funds and 10% for non-financed funds (Polash, 2024). Many banks and financial institutions violate this restriction. Thus, the financial system and depositors' funds are threatened. These issues are aligned with efficiently utilizing organizational resources, e.g., visible and intellectual resources.



When it comes to making significant decisions on investments, corporate governance is a highly crucial factor. Research concerning the effect of CG on several kinds, such as IC, has been carried out throughout the years (Alizadeh et al., 2014; Dey & Hossain, 2020). According to Barrett (2002), corporate governance comprises how firms manage their organizational structures regarding policies, culture, strategies, and means of interacting with various participants. According to the findings of several earlier studies (La Rocca et al., 2008; Safieddine et al., 2009; Hasan & Hossain, 2013; Rashid et al., 2022, 2023; Rashid & Hossain, 2022; Keenan & Aggestam, 2001), it is essential to have an understanding of the function that CG plays in the process of building and preserving IC that is attributed to business organizations. Weimer and Pape (1999) stated that CG guarantees that choices made by managers are formed from the perspective of enhancing the interests of shareholders through the effective utilization of information technology. Dzinkowski (2000) argued that IC management is challenging because of the organization's complexity and variety. Keenan and Aggestam (2001) stated that IC is responsible for making appropriate investments, and this duty lies in corporate governance.

Even with the reality that CG enhances IC performance and provides value to an organization as a deliberate resource, most businesses scuffle with its administration and control owing to the complexity of the asset. As a consequence of this, recent studies have brought to light the relevance of understanding the role that corporations play in efficiently implementing, managing, and maintaining the intellectual capital of their organizations (Smriti and Das, 2021; Nadeem et al., 2019; Vetchagool, 2022). Thus, the present study explores the affinity between CG and IC and the effects of CG on IC of DSE-listed commercial banks in Bangladesh.

The remaining portion of this study is structured in the following manner. The second section presents the theoretical underpinning and a review of prior research that has been done, as well as outlines the hypothesis. Section three presents the study plans. The empirical results are presented and discussed in the fourth part of the article, followed by the conclusions and suggestions presented in the fifth section.

II. THEORETICAL UNDERPINNING AND PRIOR LITERATURE REVIEW

The ability of a firm to attract and keep the best employees, adopt cutting-edge technology infrastructure, and cultivate favorable contacts with suppliers, lenders, and other stakeholders is improved by good CG in an economy focused on the accumulation of information. Effective corporate governance standards would also push firms to reduce information asymmetry and agency problems by giving decision-makers relevant information (Mousa & Abdelmohsen, 2012; Al-Sartawi, 2017). This would be accomplished by providing those decision-makers with relevant information. Shleifer and Vishny (1997) and Bhaumik et al. (2019) state that excellent corporate governance guarantees that all parties participating in the operations of a firm, such as investors, executives, suppliers, local authorities, and customers, will get fair remuneration for their efforts. This includes ensuring that all stakeholders receive fair pay for their contributions. According to Haniffa and Cooke (2002) and Brennan and Solomon (2008), corporate governance impacts several aspects of firms, including accountability, performance, and culture. Examples of these aspects include accountability and performance. On the other hand, our research will use agency theory to analyze the relationship between and the impact of corporate governance on IC.

According to Jensen and Meckling (1976), agency theory (AT) provides a background that can be utilized to investigate the connection between CG and IC in organizational settings. According to Cerbioni and Parbonetti (2007) and Nyberg et al. (2010), agency theory has evolved beyond its original domain in economics to encompass other subjects such as accounting and organizational management. AT focuses on the liaison that exists between managers and owners, and it investigates the challenges that are encountered by organizations when many parties jointly hold ownership and control. Previous studies have revealed conflicting findings about the impact of CG on IC. This research has considered many board properties. The research by Lari Dashtbayaz et al. (2020) indicates a negative correlation between relational capital and board independence. The relationship between RC, audit committee, and board independence is positive and significant. The research indicated a positive correlation between human capital and board independence. The results revealed a positive link between structural capital and the audit committee. Conversely, a study conducted by Aslam and Haron (2020) involving 129 Islamic banks revealed that corporate governance factors, including board size and the inclusion of non-executive directors, positively influenced the efficacy of intellectual capital. Conversely, Shariah boards, CEO duality, and audit committees are all strongly associated with a negative influence on the efficacy of intellectual capital. The authors found a correlation between foreign ownership and IC efficiency.

Hossain and Rana (2024) researched to explore the affinity between ownership structure and intellectual capital in 31 DSE-listed banks in Bangladesh from 2017 to 2021. They used the MVAIC method to determine the ICE. The robust FE regression model reflected that the sponsor director owner was negatively related to IC, while institutional, foreign, and public ownership was positively related. Regression results showed that all ownership structures positively and significantly influenced MVAIC. Soriya and Kumar (2022) performed a study during 2012-2018 utilizing panel data regression analysis to assess the affinity between CG and IC in 116 distinct businesses. The research findings demonstrate that the board size

negatively correlates with intellectual capital and its constituent components. The existence of a dual CEO needs to be demonstrated to correlate with the performance of intellectual capital. This study indicates a negative association between the performance of intellectual capital and the efficiency of human capital, alongside the existence of sponsor directors, institutional ownership, and foreign ownership. Tran et al. (2020) considered many corporate governance features, including independent directors, board size, board remuneration, ownership concentration, and CEO duality. The researchers assessed intellectual capital utilizing the MVAIC model for 45 publicly traded Vietnamese enterprises from 2011 to 2018. The researchers discovered the insignificant positive influence of board remuneration on IC. However, the board size, independent directors, ownership concentration, and CEO duality assisted in declining IC performance.

Sohel Rana and Hossain (2023) studied 69 nonfinancial companies in Bangladesh from 2017 to 2020 to find the effect of IC on firm performance, sustainable growth, and firm value. The study documented that IC, SCE, and HCE positively influenced ROA and ROE. However, RCE is negatively related to this. Regression results confirm that ICE, HCE, and CEE significantly enhance firm financial performance. However, RCE exhibits an adverse effect on sustainability and firm value. Rodrigues et al. (2016) studied 15 publicly listed Portuguese companies from 2007 to 2011 to see how their boards of directors affected the disclosures of IC. IC disclosures correlate positively with strategy, processes, innovation, customer, human capital, board size, and board activity. While adversely correlated with the independent directors, CEO duality, and ownership concentration. Their regression result revealed that Board size, board activity, firm size, and sustainability report significantly and positively influenced IC disclosure. However, independent directors, CEO duality, and gender negatively influenced the same.

Rana and Hossain (2024) researched the 100 companies comprised of 21 service, 31 banking, and 48 manufacturing firms over 2017-2021 listed on the Dhaka Stock Exchange Ltd. Using STATA software and applying a robust RE regression model, the research documented that IC, HCE, RCE, and CEE positively connected with ROA and ROE, while SCE exhibited the adverse results. Findings from regression analysis ensured that only the overall IC, HC and CE performance strived to uplift firm performance significantly. RC and HC performance enhanced the same but insignificantly. Based on 30 service organizations in Australia were studied by Ranjith and Bhuyan (2015) to determine the relationships between intellectual capital, corporate governance, and the years 2004–2013. They investigated these links using multiple regression analysis. The composition of the board of directors, the CEO's duality function, and the remuneration committee are all significantly correlated with IC. It has been demonstrated that the efficacy of the IC was unaffected by the size of the board of directors or the membership of the audit committee.

Companies listed on the Karachi Stock Exchange between 2005 and 2009 were the subjects of study by Makki and Lodhi (2014), who sought to establish a correlation between corporate governance and intellectual capital. The article postulated a positive impact of good corporate governance on intellectual capital. A study by Wahid and colleagues (2013) looked into the relationship between intellectual capital and governance techniques in educational institutions in Malaysia. They found that corporate governance is an important component in IC determination. Furthermore, in 147 Gulf Cooperation Council banks operating between 2008 and 2010, Al-Musalli and Ismail (2012) studied the correlation between the board of directors' traits and intellectual capital. The study's most noteworthy finding is that independent directors negatively correlate with the board's performance. Based on the above discussion and theoretical aspect, the following research hypotheses have been drawn:

- H1: Board size positively affected IC performance;**
- H2: Independent directors positively affected IC performance;**
- H3: Audit committee size positively affected IC performance;**
- H4: Executive directors positively affected IC performance;**
- H5: The Risk management committee positively affected IC performance.**

III. STUDY METHODOLOGY

A) Sample

The companies that are the focus of this research are those listed on the Dhaka Stock Exchange Ltd. in Bangladesh. This study aims to ascertain the affinity between and impact of corporate governance components and intellectual capital performance. The research investigated the policies and practices of corporate governance and the performance of intellectual capital over an extended period. The ten-year period covered by this includes all banking companies that were publicly traded between 2012 and 2021. Currently, 36 DSE-listed commercial banks operate in Bangladesh. Out of these, 28 banking companies make up the sample for the study due to their availability of required data. Thus, this study's total number of observations is 280, and a strongly balanced panel dataset was used for regression analysis. The annual reports, which provide extensive information about corporate governance frameworks, financial performance, and intellectual capital components, were the source of the information obtained.

B) Variables descriptions

a. Dependent variable

This section outlines the methodology used to evaluate and substitute the variable in this study. The VAIC methodology is frequently utilized in academic research to determine adequate intellectual capital (Pulic, 2000). The research considered intellectual capital efficiency (ICE) as the dependent variable. ICE is the combination of human capital efficiency and structural capital efficiency.

$$ICE = HCE + SCE$$

b. Independent variable

The research adopted different corporate governance variables as independent variables. The board size is determined by the total number of directors involved in the board. Ranjith and Bhuyan (2015), Faisal et al. (2016), and Cerbioni and Parbonetti (2007) used this variable in their research. The number of board members appointed as independent directors is treated as ID. Boullay and Hamdan (2019) and Rodrigues et al. (2016) deployed this variable in their research. The board member responsible for operating regular business action is appointed as the executive committee. Audit committee size is the number of persons from the director panel acting in the internal audit purposes. The risk management committee is crucial for minimizing corporate risk and utilizing organizational resources effectively. The risk committee consists of the total member of the board for risk minimization purposes.

c. Control Variables

Bank size (TA), which is found by taking total assets and dividing by their natural logarithm, and Leverage (LEV), which is the ratio of total debt to total equity, as our control variables (Al-Sartawi, 2017; Sohail Rana & Hossain, 2023). This study takes advantage of both of these factors.

IV. RESULTS AND DISCUSSION

A) Descriptive Statistics

Table 1 summarizes the descriptive statistics, whereas Table 2 offers a Pearson correlation matrix for the dependent, independent and control variables. The average ICE valuation of listed Bangladeshi banking companies from 2012 to 2021 was 3.9508. According to this statistic, Bangladeshi banking companies have made better use of intellectual resources than other international studies. On the other hand, there are an average of 3.02 SMEs in China (Xu & Li, 2019), 2.73 average in ASEAN countries (Nimtrakoon, 2015), and 2.94 in Australia's service sector (Ranjith & Bhuyan, 2015). The average Board Size (BS) is 13.7464 (around 14), according to the board size index, which ranged from 5 to 23 members. This aligns with management practice, allowing for the formation of strategic choices that facilitate the effective practice of the firm's resources. Finding a consensus becomes increasingly difficult as the number of people involved in making a decision increases.

The average number of independent directors (ID) is 2.3893, which suggests that almost two and a half of the members might be causing conflicts of interest or detrimental to transparency and disclosure. According to these numbers, several individuals or non-governmental groups control the bulk of publicly listed banks in Bangladesh. However, the executive committee has an average of 5.8036, ranging from 2 to 10 people acting to execute operational activities. The results show that over four persons are responsible for internal audits; an average of four are appointed as risk management committees in Bangladeshi banking companies.

Table 1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
ICE	280	.84	8.21	3.9508	.98044	1.084	3.270
BS	280	5.00	23.00	13.7464	4.02011	.017	-.649
ID	280	1.00	5.00	2.3893	.86046	.687	.642
EC	280	2.00	10.00	5.8036	1.65284	-.307	-.768
AC	280	3.00	6.00	4.3571	.98061	-.100	-1.133
RC	280	.00	7.00	4.0500	1.70104	-1.130	.878
TA	280	4.91	5.82	5.3769	.19069	-.152	-.572
LEV	280	6.25	38.36	12.9419	4.08177	2.174	8.670

Sources: Authors calculation based on SPSS

B) Correlation Analysis

To implement the study's first objective, we analyzed the data in Table 2. Results confirmed a negative and insignificant relationship between the company's board size and intellectual capital efficiency. Although a large number of independent directors play a positive role in increasing the intellectual efficiency of the organization, it is very insignificant. The presence of a large executive committee is unable to increase the intellectual efficiency of the organization, although it is insignificant. The audit committee has increased the intellectual efficiency of the organization, but insignificantly. There is a significant

negative relationship between the risk committee and intellectual efficiency. That is, the appointment of a large number of members of the risk committee has hindered the organization's use of intangible assets.

Table 2: Pearson Correlation matrix

Variables	ICE	BS	ID	EC	AC	RC	TA	LEV
ICE	1							
BS	-.023	1						
ID	.065	.241***	1					
EC	-.020	.710***	.308***	1				
AC	.060	.429***	.060	.448***	1			
RC	-.148**	.308***	.209***	.298***	.314***	1		
TA	-.030	-.064	.120**	-.037	-.110*	.245***	1	
LEV	-.343***	-.194***	-.165***	-.153**	-.236***	.009	.287***	1

Note: *, **, and *** indicate 1%, 5%, and 10% significance levels, respectively.

C) Assumptions and Diagnostics Tests

Before performing the regression analysis, we performed several assumption and diagnostic tests on our panel data set before performing the regression analysis. From Table 1, we get a detailed idea about the normality of the data set. The table's results show that the skewness statistic is generally limited to -0.152 to 1.084. Only in the case of the leverage variable does it show a value greater than two, i.e. 2.174. In the case of normality, this coefficient is usually limited to -2 to +2. Thus, we can consider the data set as normal. In the case of volatility, the volatility rate is usually between -7 and +7 for large data sets. For the kurtosis coefficient, except for the leverage variable, all the others are limited to the minimum value of -0.768 and the maximum value of 3.27. That is, the data set used in the study is a normal data set.

Table 2 demonstrates that all of the independent variables had correlations lower than 0.429, according to the results of the Pearson correlation matrix. These results show that multicollinearity is not an issue for this study (Ranjith & Bhuyan, 2015). The variance inflation factor (VIF) is also used to determine how to evaluate the multicollinearity issue of independent variables. If the VIF is more than 10, the multicollinearity problem becomes apparent (Gujarati, 2003). Results from this study do not exhibit any signs of multicollinearity as, as indicated in Table 5, the VIF values for each independent variable are less than 10, i.e VIF value ranged from 1.196 to 2.239.

Through the Durbin-Watson test, we checked whether there was an autocorrelation problem in the distribution, and since its value is 0.593, we confirmed that it had severe autocorrelation problems. We performed an F-test to see whether the model used for the regression analysis has model fitness. Since the test result was significant, Table 4 showed that the F statistic is 7.283, p-value < 0.01. We confirmed that the model was suitable for analysis. From Table 3, we get the adjusted R-square value of 13.6%, which ensures that the independent variables used in the model affect the dependent variable by about 14%.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.397 ^a	.158	.136	.91125	.158	7.283	7	272	.000	.593

a. Predictors: (Constant), BS, ID, AC, EC, RC, TA, LEV

b. Dependent Variable: ICE

Table 4: Analysis of Variance (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	42.332	7	6.047	7.283	.000 ^b
Residual	225.861	272	.830		
Total	268.193	279			

a. Predictors: (Constant), BS, ID, AC, EC, RC, TA, LEV

b. Dependent Variable: ICE

D) Regression Results Analysis and Discussions

Research has confirmed that CG significantly affects IC (Faisal et al., 2016; Buallay & Hamdan, 2019; Rodrigues et al., 2016; Haris et al., 2019). On the other hand, developing countries like Bangladesh have mostly ignored the problem. This research aims to determine how IC is influenced by corporate governance (as shown by factors like independent directors,

board size, audit committee, risk committee, executive committee, etc.). This inquiry is set up based on the VAIC model and agency theory. The study's empirical results show that a large board of directors negatively and insignificantly influenced ICE, $B = -0.014$, $t\text{-value} = -0.688$, $p\text{-value} > 0.10$. These results reject research hypothesis one.

The presence of a large number of independent directors has a positive effect on the performance of the organization's ICI, although it is insignificant. The results show that the beta coefficient of the independent director ICI performance is 0.053, with a $p\text{-value}$ of more than 10%, which is contrary to the agency. Then, our research hypothesis two failed to prove this case. As the number of executive directors in the organization increases, the ICI performance decreases, although it is insignificant (beta coefficient = -0.015, $t\text{ value} = -0.31$, $p\text{-value} = 0.757$). That is, more executive directors have become a barrier to using intangible assets for the company. These results reject our research hypothesis three.

Table 5: Regression analysis results

Dependent Variable: ICE	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.082	1.675		1.243	.215		
BS	-.014	.020	-.056	-.688	.492	.468	2.136
ID	.053	.069	.046	.7610	.447	.836	1.196
EC	-.015	.049	-.026	-.310	.757	.447	2.239
AC	.077	.067	.077	1.154	.250	.696	1.437
RC	-.105	.037	-.182	-2.868	.004	.767	1.303
TA	.603	.315	.117	1.912	.057	.824	1.214
LEV	-.087	.015	-.364	-5.974	.000	.833	1.201

Sources: Authors calculation based on SPSS

As a result of the activities of the audit committee, various financial and nonfinancial issues of the organization are continuously examined and monitored. As a result, punctuality, discipline and effectiveness increase within the organization. That is, the visible and invisible assets of the organization are used beautifully and efficiently. The present study shows that a large number of audit committees improves the IC performance of the organization, although it is insignificant in the case of banking companies in Bangladesh. The results of Table 5 show that the audit committee positively affects the IC performance of the organization, the magnitude of which is (beta coefficient = 0.077, $t\text{ value} = 1.154$, $p\text{-value} = 0.25$). These results reject the research hypothesis four. The presence of a large number of audit committees has a significant adverse effect on the IC performance of the organization (beta coefficient = -0.105, $t\text{ value} = -2.868$, $p\text{-value} = 0.004$). These results serve as evidence against the agency theory and motivate us to reject research hypothesis five.

V. CONCLUSION

With the exception of independent directors and audit committee size in the Bangladeshi setting, this study's findings show that corporate governance proxies often reduce the efficacy of IC. It is very clear that this study provides real data that helps executives better understand the effects of CG on IC, which in turn improves the efficacy of their IC. The company's leadership should prioritize information technology (IC) and make good use of it if they want to boost performance and gain a competitive advantage that will remain. When formulating rules for corporate governance, company executives should keep the aforementioned factors in mind so that shareholders' and managers' interests are balanced and the company may make the most of its competitive advantage. By doing so, they can discover the sweet spot where supervision and IC efficiency are both met. The increased operating expenditures caused by a larger number of board members will affect the IC's efficiency. That being said, think about what size board might work best. Further, for information clarity's sake, businesses should maintain the roles of chairman and chief executive officer separately. This will help remove any room for interpretation when running the business. Furthermore, non-executive members should construct functional committees and institute particular reporting to enhance their oversight role and the IC performance.

The study results show that the elements of corporate governance play a negative role in increasing the IC of the organization in most cases. That is, there is a considerable lack of qualified people among the people working in the organization. Research recommends that the board size should be reduced as much as possible. Although the people working on the audit committee can increase the IC performance, they cannot perform their role properly. Policymakers need to pay attention to this issue. The people working in the executive committee have played a negative role in increasing the IC of the organization, so it is essential to reduce their number and appoint qualified people there. The people working in an important committee like the risk committee have significantly helped to reduce the IC performance of the organization, which will challenge the future prosperity of the organization and the survival of the competitive environment. As a result, it is necessary to provide the necessary training to the directors working on this committee to increase their performance and to bring in

intellectual capacity.

The present study has been mainly conducted on the banking companies of Bangladesh, where it has been interpreted and analyzed with data from the last 10 years. The study was conducted without using data from other companies (nonfinancial). Later, better results may be obtained if the study is conducted with data from other companies and more years. In addition, using data from other countries may lead to different findings, which may be more effective and fruitful in decision-making.

Interest Conflicts

The author declares that there is no conflict of interest concerning the publishing of this paper.

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