

The influence of corporate governance on intellectual capital efficiency: evidence from Islamic banks of OIC countries

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Abstract

Purpose – The purpose of this study is to examine the impact of corporate governance (CG) on intellectual capital efficiency (ICE) in Islamic banks (IBs) of Organisation of Islamic Cooperation (OIC) countries.

Design/methodology/approach – A sample of 129 IBs is drawn from the 29 OIC countries from 2008 to 2017. A two-step system of the generalised method of moments has been employed to account for the unobserved endogeneity and heteroscedasticity issue that arose due to time-variant and time-invariant variables.

Findings – The results revealed that CG measures, namely board size, non-executive directors do explain the extent and quality of ICE in the expected direction. In contrast, CEO duality, Shariah board and audit committee are negatively associated with the ICE. Moreover, the authors observed that male CEO in IBs has negative, but foreign ownership has a positive association with ICE in determining the extent of ICE in IBs. This study contributes specifically to the stakeholder theory and the literature of ICE and CG.

Research limitations/implications – The findings of the study provide insight into how a larger board can overcome skill deficiency and how making more investment in ICE would help to enhance productivity. Hence, bank managers, regulators, policymakers and shareholders have strong interest in designing the appropriate CG structure to develop ICE in banks.

Originality/value – This is one of the few studies which provide empirical evidence of CG mechanism to boost the ICE in the perspective of IBs of the OIC countries.

Keywords Corporate governance, Intellectual capital efficiency, OIC countries, 2SYS-GMM

Paper type Research paper

1. Introduction

In an era of a knowledge-based economy, intellectual capital (IC) is increasingly being recognised as an important strategic asset in the process of creating value for organisations (Appuhami and Bhuyan, 2015; Buallay, 2018). It is considered one of the most significant factors of creating knowledge, expertise relationships, creativity, innovation, information technology and interpersonal activities to gain competitive advantage among the organisations (Ahmed and Ghazali, 2013; Haris *et al.*, 2019). As a growing concern, many organisations, including the banks, pay attention to enhance their intellectual capital efficiency (ICE) as an attempt to improve their wealth (Azis and Basri, 2019; Xu and Wang, 2018).

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Since there is a global trend and demand for more beneficial and comprehensive resources to operate the organisational activities (Singh *et al.*, 2016), IC is believed to be the most strategic source for creating value and improving the performance in organisations (Azis and Basri, 2019). Appuhami and Bhuyan (2015) argued that if IC is not managed appropriately, it will be suboptimal and its capacity to create value will not be utilised entirely. Managing IC remains a crucial challenge for the organisations, owing to its multifaceted nature and assorted variety (Buallay and Hamdan, 2019). Therefore, several studies highlight the need to comprehend the role of corporate governance (CG) in successfully employing, protecting and maintaining IC of an organisation (Appuhami and Bhuyan, 2015; Saruchi *et al.*, 2019). However, Belal and Ali (2013) showed that the corporate board plays a fundamental job in managing intellect resources to boost performance. Furthermore, Andreeva and Garanina (2017) recommended that IC will require more noteworthy development, observations and adaptability in the necessary leadership procedures of the board and management level. Thus, the board of directors is seen as a significant means to influence and deal with the IC of an organisation and directly impacts their performance (Purnomo, 2018).

There are limited empirical studies which analyse how the board of directors stimulates the expansion of IC in the banking sector. In particular, fewer studies show the role of the board of directors in enhancing IC efficiency (Ahmed and Mohd Ghazali, 2013; Berezinets *et al.*, 2016; Singh *et al.*, 2016; Taliyang and Jusop, 2011). Moreover, various authors examining the resource dependence theory have suggested that boards with greater IC values are at the best position to take better decisions in enhancing the strength of an organisation (Ahmed and Mohd Ghazali, 2013; Sujan and Abeysekera, 2007; Suroso and Setyawati, 2019). However, there are limited studies that identify the role of CG in developing the IC in banks, specifically in Islamic banks (IBs). As explained by Nawaz and Haniffa (2017), IBs are unique in nature and have a great need to create innovative products parallel with the conventional banking; thus they need to encourage their intangible assets such as human capital to remain competitive in the market. Hence, this study tries to address how internal CG mechanisms affect the ICE in IBs of the Organisation of Islamic Cooperation (OIC) countries.

The present research contributes to the literature in several ways. For example, the current study expands the comprehension of the relationship between board structure and IC of IBs in OIC countries, specifically from the Middle East, South Asia and Southeast Asia regions. Second, most prior CG studies empirically tested the influence of CG and IC predominantly by developed countries such as the USA and the United Kingdom. Thus, our finding extended the understanding of IC for value creation in the IB industry. Third, we introduced relational capital (RC) into a research model, aspects that have been neglected by most previous IC studies. Fourth, this study applied the 2SYS-GMM estimation technique to account for the unobserved heteroscedasticity and endogeneity in the panel data. Finally, the analysis undertaken in this study raises the present comprehension on the effect of CG mechanisms to an alternate IC of IBs.

The subsequent section reviews the literature concerning CG with IC and formulates the hypotheses. Section 3 details the research methodology, while Section 4 discusses the reported result and discussion. The final section concludes the findings and recommendation of the study.

2. Literature review and hypothesis development

CG is the way to lead the corporation towards success and resolve the disappointment on the part of the management that originates from the misuse of CG codes (Aslam *et al.*, 2019b). In this way, organisations must need to contribute, collect and set useful governance framework controlled by a knowledge-based system. The knowledge-based framework recommends the

nature of ICE to exist internally and externally, which is controllable by the corporations. Therefore, a sound CG practice and legitimate management can benefit from the skilful preparation, development and preservation of the IC resources (Purnomo, 2018). ICE is an essential part in making and supporting the development of the corporation. According to Faisal *et al.* (2016), ICE alone cannot present a competitive advantage without legitimate management. Thus, the interaction between CG and ICE plays a significant role for corporations to generate good profit and enhance their strength (Chahal and Bakshi, 2015).

Several studies are on the debate regarding the role of CG in effectively deploying, protecting and retaining ICE in an organisation (Al-Musali and Ismail, 2015; Mahmudi and Nurhayati, 2015; Makki and Lodhi, 2014; Nawaz, 2017, 2019). Basyith (2016) found that a combination of CG and ICE affects the performance of Indonesian firms and good CG structure helps firms to generate good profit. Similarly, Arifin (2016) documented the positive relationship between CG and ICE with banking performance. Many studies agree that effective governance structure enhances ICE and disclosure information that helps to improve corporate performance (Aslam *et al.*, 2018; Basyith, 2016; Haris *et al.*, 2019; Jamei, 2017; Saeed *et al.*, 2015). Thus, the management of IC needs a noteworthy advancement, observations and adaptability in the necessary leadership process (Andreeva and Garanina, 2017; Kamath, 2019), which are more likely to exist in a board with greater diversity (Abdullah and Sofian, 2012; Arifin, 2016; Makki and Lodhi, 2014). Therefore, the present study draws that several attributes of CG are preferred in order to enhance ICE in banks.

2.1 Board size (BS)

Board size (BS) is the total number of directors on the board. A number of prior studies were conducted to examine the influence of BS on banking performance (Aslam *et al.*, 2019a), corporate management (Aebi *et al.*, 2012; Lakshan and Wijekoon, 2012) and ICE (Appuhami and Bhuyan, 2015; Faisal *et al.*, 2016). The existing literature is still elusive about the appropriate BS for the organisations. Moreover, directors in small boards are more involved in the operations of an organisation and decision-making process which enhances the efficiency of the organisations. Additionally, some researchers argued that larger board lacks in coordination and non-cohesive decision-making that substantially reduces the management ability to take strategic decisions to enhance their performance (Tanna *et al.*, 2011; Tulung and Ramdani, 2018). On the other side, some studies argued that larger boards have a pool of diversified skills that enhance board monitoring capacity to make appropriate decisions (Abeysekera, 2010). Several studies examined the relationship between BS and ICE (Appuhami and Bhuyan, 2015; Faisal *et al.*, 2016). Some studies documented negative relationship between BS and ICE (Ahmed and Mohd Ghazali, 2013). Nevertheless, some empirical studies found positive relationship between BS and ICE (Appuhami and Bhuyan, 2015; Faisal *et al.*, 2016), but its direction is not clear. Thus, the current study formulates the following hypothesis to determine the relationship in the Islamic banking sector.

H1. A higher (lower) number of board of directors will have a greater (lesser) influence on ICE of IBs.

2.2 Non-executive directors

Boards of directors are the spokesperson of the shareholders in an organisation, and their primary duty is to develop the organisational performance and protect the interest of owners (Mulyadi, 2018). The top management of an organisation relates the competence and efficiency of the board with the number of non-executive directors (NEXDs) on board (Aslam *et al.*, 2020). Thus, the existence of NEXDs improves the quality of decision-making of board

due to their professional knowledge and aptitude. Similarly, [Farag et al. \(2018\)](#) stated that NEXDs review the performance of management and ensure that management action must comply with the interest of stakeholders. Hence, they also play significant role to mitigate the conflict between management and shareholders ([Haris et al., 2019](#)). There are studies which found negative influence of NEXDs on organisational performance ([Bukair and Abdul Rahman, 2015](#); [Mollah et al., 2017](#)), while others found positive and significant relationship in an organisation ([Almutairi and Quttainah, 2017](#); [Farag et al., 2018](#)). Furthermore, there are several studies which found positive association of board governance and ICE ([Ahmed and Mohd Ghazali, 2012](#); [Appuhami and Bhuyan, 2015](#)). Nevertheless, in some cases researchers found an insignificant relationship between board governance and IC performance ([Alizadeh et al., 2014](#); [Faisal et al., 2016](#)). Thus, the current study tries to establish whether these findings match with the results in the Islamic banking sector. So for this purpose, the present study draws the following hypothesis:

H2. A higher (lower) number of NEXDs will have a greater (lesser) influence on ICE of IBs.

2.3 CEO duality (CD)

Historically CEO duality (CD) is universal in many countries, but after the subprime crisis, the OECD calls for a separation of CEOs and chairman duties ([Appuhami and Bhuyan, 2015](#)). While in some countries, the duality still exists. Thus, [Vo and Nguyen \(2014\)](#) applied the tournament theory and stated that duality is in favour of an organisation to enhance its performance. In contrast, the stakeholder theory proposes that non-duality can assume a superior role in affecting and underwriting revelation choices in satisfying their autonomous monitoring role ([Ahmed and Mohd Ghazali, 2013](#)). Some studies found positive and significant relationship of CD with performance and ICE ([Almutairi and Quttainah, 2017](#); [Grassa and Matoussi, 2014](#); [Hajer and Anis, 2018](#); [Nawaz, 2017](#); [Vo and Nguyen, 2014](#)), and some studies found negative relationship ([Bukair and Abdul Rahman, 2015](#); [Farag et al., 2018](#); [Mollah et al., 2017](#)). The prior studies give blended results; therefore, the present study is in favour of duality and develops the following hypothesis:

H3. CD has a greater (lesser) impact on ICE of IBs.

2.4 Shariah board (SB)

As a feature of the CG framework in IBs, Shariah board (SB) is a fundamental bit of Islamic account in building and keeping up the certainty of the investors with a confirmation that all the exchanges, practices and exercises agree to the Shariah standards ([Nomran et al., 2018](#)). SB responsibilities are currently getting increasingly different and advance in corresponding with the improvement of the Islamic finance industry around the world ([Aslam and Haron, 2020](#)). In light of the noteworthy development and expanding modernity of the Islamic account segment, the SB is quickly advancing in the difficulties of the Islamic finance-related industry. Prior literature found positive and significant relationship of SB with the performance ([Hassan et al., 2017](#)) in Pakistan, ([Nomran et al., 2018](#)) in Malaysia, ([Khan et al., 2017](#)) in IBs from South Asia, ([Farag et al., 2018](#)) in 90 IBs from different countries. Hence, the relationship of SB with IC is not yet researched in IBs. So, for this purpose, the present study develops the following hypothesis:

H4. A higher (lower) number of SB members will have a greater (lesser) influence on ICE of IBs.

2.5 Audit committee (AUDC)

An audit committee (AUDC) is one of the central committees of the board. It plays a significant role in the structure of CG, specifically in the enhancement of the financial reporting process (Pathan and Paff, 2013) as well board effectiveness (Chou and Buchdadi, 2017). The function of the AUDC in monitoring the reporting process has been widely discussed in the literature (Chou and Buchdadi, 2017; Mahmudi and Nurhayati, 2015). While some studies found positive and significant relationship (Li *et al.*, 2012; Mahmudi and Nurhayati, 2015), some studies found negative (Alizadeh *et al.*, 2014) and few studies found insignificant relationship (Appuhami and Bhuyan, 2015) of AUDC with ICE. Thus, the current study proposes the following hypothesis to explore this complicated relationship in IBs.

H5. A higher (lower) number of AUDC members will have a greater (lesser) influence on ICE of IBs.

3. Methodology

3.1 Study sample and data collection

The present study focusses specifically on IBs from OIC countries. Therefore, initially, we extracted all 163 IBs data from the Bankscope database across the 36 countries. The data of the study were collected for ten years spanning from the period of 2008–2017. These years were selected because most of the countries started the practices of CG in their countries, and IBs started their operations in several countries. For a fair comparison, the present study included only full-fledged IBs and Islamic windows that were provided with complete information about their IC, financial output and are still in operation during the sample period. Thus, the final sample consists of a panel of 129 IBs involving 29 Islamic countries, mainly from the Middle East, South Asia and Southeast Asia regions. The financial data related to ICE and CG are obtained from the Bankscope, and any missing data were collected from the annual reports – balance sheet, income statement and cash flow statement of the IBs. All the yearly statements were available on the bank's official websites, and selected data were collected in US\$ millions. Several prior studies have used this type of data for this type of research (Safieddine *et al.*, 2009; Sharabati *et al.*, 2013; Taliyang and Jusop, 2011; Wasuuzzaman and Nair Gunasegavan, 2013).

3.2 Variables descriptions

The current study investigates the link between CG and ICE in IBs. CG is measured through BS, NEXDs, CD, SB and AUDC. ICE is based on human capital efficiency (HCE), structural capital efficiency (SCE) and relational capital efficiency (RCE) besides the set of bank-specific and macro-economic control variables. The detailed explanation of all variables is given in Table 1.

3.3 Model specification and econometric tool

We use 2SYS-GMM estimator constructed to measure the sensitivity of ICE. We apply this technique, developed by (Blundell and Bond, 1998) for numerous reasons. First, an OLS ignores the panel structure of the data (Aslam *et al.*, 2019a, b). Second, a time-invariant parameter cannot be estimated with fixed-effect methods. Third, this method is suitable because it lessens the effect of high persistence of CG attributes and controls the endogeneity bias by including the lagged value of regressors and accounting the heteroscedasticity problem (Aslam and Haron, 2020; Mollah *et al.*, 2017; Nomran *et al.*, 2018). Besides, for each projected coefficient, the Hansen test for the instrument's validity and first- and second-order serial correlation tests are conducted. The null hypothesis is

Variables	Codes	Definition
<i>Intellectual capital (dependent)</i>		
Human capital efficiency	HCE	Ratio of value added divided by human capital. Where: the value added = gross income – operating expenses. Where the human capital = total expenses related to employees
Structural capital efficiency	SCE	Ratio of value added divided by structural capital. Where: the value added = gross income – operating expenses. Where the structural capital = total expenses related to research and development
Relational capital efficiency	RCE	Ratio of value added divided by relational capital. Where: the value added = gross income – operating expenses. Where the relational capital = total expenses related to marketing
<i>Corporate governance mechanisms (independent)</i>		
Board size	BS	Total number of members on the board
Non-executive directors	NEXD	Total number of members of non-executive directors
CEO duality	CD	If CEO also holds chairman position, then the value is 1 and if it is separate, then the value is 0
Shariah supervisory board	SB	Log of total number of members of Shariah board
Audit committee	AUDC	Total number of members in audit committee
<i>Bank characteristics (controls)</i>		
Bank size	TA	Natural log of corporate total assets
Leverage	LEV	Proportion of total debt over equity
Foreign ownership	FOWN	Dummy is a binary variable that takes the value of 1 if foreign firms have an ownership in the firm or 0 otherwise
<i>Board features (controls)</i>		
Gender	GEND	If CEO is male, the value is 1 and if CEO is female, then the value is 0
Board meetings	BM	Total number of board meetings
<i>Macro-economic (controls)</i>		
Country growth	GDP	Natural log of total gross domestic product

Table 1.
Description of the variables

accepted for Hansen test that connotes instruments are valid, and instruments do not have a correlation between them, and the error term is also different for all models. Additionally, a high *p*-value of AR (1) and AR (2) presents that the disturbances are not serially correlated in all models. To examine the influence of CG on ICE of IBs, the following regression models are developed.

$$HCE_{it} = \alpha_0 + HCE_{it-1} + \sum_K^5 B_1 CG_{it} + \sum_L^7 B_2 X_{it} + \varepsilon_{it}, \quad (1)$$

$$SCE_{it} = \alpha_0 + HCE_{it-1} + \sum_K^5 B_1 CG_{it} + \sum_L^7 B_2 X_{it} + \varepsilon_{it} \quad (2)$$

$$RCE_{it} = \alpha_0 + HCE_{it-1} + \sum_K^5 B_1 CG_{it} + \sum_L^7 B_2 X_{it} + \varepsilon_{it} \quad (3)$$

In Eqns (1–3), α is the intercept, *i* and *t* correspond to IBs and years. HCE refers to human capital efficiency, SCE refers to structural capital efficiency, RCE refers to relational capital efficiency, CG refers to corporate governance with five proxies (BS, NEXD, CD, SB, AUDC),

X refers to a set of control variables with six proxies (TA, DE, INF, GDP and Dummy) and e refers to the error term.

3.4 Description of the data

Table S2 in supplemental file describes the descriptive statistics of the whole sample that consists of 129 observations yearly and 1,290 observations for the pooled sample. The result shows that the mean value of HCE of the pooled sample is 1.03, the SD value is 2.67 and the median value is 0.17. The average amount of HCE steadily increased throughout the study sample. The continuous increase in HCE is due to Islamic banking expansion, so that is the reason the board of directors invests more in their HCE (Nawaz, 2017). The average value of SCE is 2.09 of the pooled sample, the SD value is 5.21 and the median value is 0.45. These results indicate that IBs invested more in structural capital as compared to human capital. Overall the mean value of SCE also varies throughout the sample period. Furthermore, the mean value of RCE of the pooled sample is 0.543, the SD value is 1.547 and the median value is 0.080. The lowest mean value was noticed in 2009, and the highest mean value was seen in 2017. Overall the mean value continued to increase throughout the sample period except for 2014. These results indicate that IBs were investing more money on their structure rather than the HCE and RCE; this could be due to IBs' priority change in expansion of their infrastructure.

Regarding the CG variables, the mean of the BS of the pooled sample is 8.5, with SD value of 2.8, and the median value is 8. We find that this is the ideal BS for the banking sector, similar to other studies (Al-Sartawi and Abdalmuttaleb, 2018; Bukair and Rahman, 2015; Mollah *et al.*, 2017). The average BS remains between 8.03 and 8.8 throughout the sample period, similar to the other studies (Hassan *et al.*, 2017). Moreover, the NEXD is 58% of the total BS of the pooled sample. This size is more significant than the mean size of NEXD in the study of Almutairi and Quttainah (2017). The maximum number of NEXD is found in 2016, and the overall size of NEXD fluctuates during the sample period.

In addition, the mean value of SB is 3.71 of the pooled sample, the SD value is 1.46 and the median value is 3. The largest average SB size was found in 2008, and then later it remains constant averaging from 3.69 to 3.76 throughout the sample period. The average mean of AUDC is 3.46 of the pooled sample, and the median value is 3; a similar AUDC size is found by Khan *et al.* (2017) in Pakistan. The average size of AUDC ranges between 3.35 and 3.53 throughout the sample period. According to the OECD, this size of AUDC is right for the organisations (Kallamu and Saat, 2015). Besides, the average mean of CD of the pooled sample is 7%, SD value is 2.6% and the median value is 0 representing that majority of the banks do not have CD (Bukair and Abdul Rahman, 2015).

As per control variables, the mean value of bank size is US\$ 5,020m for the pooled sample, with the SD value of US\$ 11,004m, and the median value is US\$ 1,040m. Hence, the mean value of the total asset value of IBs consistently increased throughout the sample period. The average value of leverage (LEV) of the pooled sample is 7.35, SD value is 7.41 and the median value is 6.47. These results show that IBs have more ratio of debt as compared to equity. With respect to the macro-economic variables, the average mean of the inflation is 120 of the pooled sample, the SD value is 47 and the median value is 108. The average value of GDP is 27.91 of the pooled sample, the SD value is 3.81 and the median value is 27.66. The mean value of GDP slightly increased throughout the sample period.

3.5 Correlation matrix and multicollinearity

The correlation matrix determines the trend of association between the variables. Table S3 in the Supplemental file demonstrates that ICE measures (HCE, SCE, RCE) have a positive and weak relationship with BS, NEXD, SB and AUDC, but have a negative association with CD.

Moreover, HCE, SCE and RCE have a negative association with a board meeting, but have a positive association with gender. Similarly, ICE measures have a positive and weak relationship with TA, LEV and GDP, but have a negative association with foreign ownership (FOWN). In addition, the variance inflation factor (VIF) is also computed to detect the presence of multicollinearity. If an independent variable in a model has a VIF value of more than or equal to 10, it indicates the presence of multicollinearity in the model (Wooldridge, 2005). As shown in Table S3, the VIF value of all variables is less than 10, so there is no multicollinearity problem in this study.

4. Results and discussion

The 2SYS-GMM estimator is constructed to measure the sensitivity of ICE on CG. This method is robust because it lessens the effect of high persistence of CG measures and controls the bias of endogeneity by including the lagged value of regressors (Nguyen *et al.*, 2015). Furthermore, for each regression, the current study projected the coefficients, Hansen test for the instrument's validity as well the first- and second-order tests for serial correlation. The null hypothesis is accepted for the Hansen test connoting that instruments are valid, and they do not correlate, and the error term is also different for all models. Additionally, a high *p*-value of AR (2) presents that the disturbances are not serially correlated in all models. Table 2 and models 1, 2 and 3 present that the signs of lagged values of HCE, SCE and RCE have positive and statistically significant relationship (at 1% level) with current year HCE, SCE and RCE value of the IBs. These results indicate that for the current year, the level of ICE in terms of HCE, SCE and RCE is significantly affected by the past year of HCE, SCE and RCE value of the Islamic banks.

BS has a positive and significant relationship with HCE and SCE, but it has an insignificant relationship with RCE, consistent with the findings of Appuhami and Bhuyan (2015) and Mahmudi and Nurhayati (2015). The outcome is consistent with the stakeholder theory, where a larger board holding reflects varied experience and expertise.

Variables	Labels	Model 1 HCE	Model 2 SCE	Model 3 RCE
Lag of human capital	L1.HCE	0.8361***		
Lag of structural capital	L1.SCE		0.7789***	
Lag of relational capital	L1.RCE			0.7377***
Board size	BS	0.2380**	0.3296**	0.1675
Non-executive directors	NEXD	0.2865***	0.8888***	0.5395***
CEO duality	CD	-0.1716*	-0.4992**	0.9357***
Shariah board	SB	-0.1253***	0.0286	-0.0231
Audit committee	AUDC	0.0996**	-0.1648***	-0.1140**
Gender of CEO	GEND	-0.3256***	-0.4644***	-0.4689***
Board meetings	BM	0.0765**	0.0223	0.0421
Bank size	TA	0.0116	0.0204	0.0043
Leverage	LEV	0.0324***	0.0326***	0.0344***
Gross domestic product	GDP	-0.0240**	-0.0097	-0.0602***
Foreign ownership	FOWN	0.4485***	0.5454**	-0.1666
Constant	Cons	0.3132	0.1533	2.1786***
N. of observations	<i>N</i>	1061	1058	1061
AR (1) test statistics (<i>p</i> -value)	ar1p	0.0001	0.0012	0.000
AR (2) test statistics (<i>p</i> -value)	ar2p	0.5879	0.9584	0.1744
Hansen test (<i>p</i> -value)	Hansen-p	0.268	0.6117	0.3213

Table 2.
2SYS-GMM corporate
governance as a
function of intellectual
capital

Note(s). ***, ** and * denote significance at 1, 5 and 10% significance levels, respectively

However, the results indicate that larger board is aware of the importance of IC as they believe that well-trained human and structural capital plays a significant role to enhance the value of the IBs. Similarly, NEXD has a positive and significant relationship with HCE, SCE and RCE value of the IBs. These results are consistent with (Alizadeh *et al.*, 2014; Kamath, 2019), where they found that NEXD prefers to enhance the value of ICE. Thus, the results are consistent with the stakeholder theory, which explains that board with the majority of NEXDs is in favour to lessen the top management exploitation of shareholders' wealth, and efficient use of IC added the value for the IBs. Hence, NEXDs have a positive and significant relationship with all measures of ICE, but they are more interested in improving the SCE because they believe that massive structure is essential for creating better performance in IBs.

CD has a negative and significant relationship with HCE and SCE, consistent with the finding of Faisal *et al.* (2016), but it has a positive and significant relationship with RCE, in line with the findings of Appuhami and Bhuyan (2015). These results imply that duality in CEO intensifies the value of RCE and discourages the investment in HCE and SCE of IBs. This may be because of the lack of awareness on CEO/Chairman regarding the significance of HCE and SCE. Similarly, SB has a negative and significant relationship with HCE, but it has an insignificant relationship with SCE and RCE. This negative relationship indicates that an increase in the size of SB decreases the value of ICE in terms of HCE. Moreover, AUDC has a positive and significant relationship with HCE. The results are in line with Mahmudi and Nurhayati (2015), but AUDC has a negative and significant relationship with SCE and RCE, parallel with the result of (Appuhami and Bhuyan, 2015). This negative relationship indicates that as the size of AUDC increases the value of SCE and RCE reduces. The possible reason of this inverse relationship is because AUDC is responsible for bringing the transparency in accounts, and perhaps SCE and RCE are not considered as a valuable driver than the HCE for generating the revenue in the Islamic banking industry. Thus, the overall results indicate that CG measures have significant relationship with ICE, supporting the finding of prior studies (Appuhami and Bhuyan, 2015; Faisal *et al.*, 2016; Jamei, 2017; Mahmudi and Nurhayati, 2015).

As for the control variables, GEND has a negative and significant relationship with HCE, SCE and RCE value of the IBs. These results show that more men as CEO will decrease the value of ICE because they will prefer to invest in value-generating projects to show their performance. In contrast, board meetings have a positive and significant relationship with HCE, consistent with the finding of (Ahmed and Ghazali, 2012). This result presents that more board meetings are in favour to invest in HCE because the highly trained staff can improve the quality of IBs. Islamic banking is still at its initial stage, so it needs well-trained staff that can provide the best services and significantly contribute to the performance of IBs.

As per bank-specific, bank size has a positive but insignificant relationship with all ICE variables. This result does not support the argument that large-size banks prefer to invest more to improve the ICE of IBs. Furthermore, leverage has a positive and significant relationship with HCE, SCE and RCE, similar to the finding of (Ahmed and Mohd Ghazali, 2012). These results present that as a ratio of debt increases, IBs start investing in their staff and infrastructure to deploy their debt properly as to improve the quality of IBs. Against our assumption, GDP has a negative and significant relationship with HCE and RCE, but it has a negative and insignificant relationship with SCE. This result shows that an increase in GDP reduces the value of ICE. One of the possible reasons for this negative relationship is that banks are already enjoying the high growth, so they do not prefer to invest more on ICE and may save their money for distress time. FOWN has a positive and significant relationship with HCE and SCE, but it has a positive and insignificant relationship with RCE. This result presents that banks with FOWN prefer to invest more in HCE and SCE

because they believe that highly trained employees and good infrastructure are essential for the growth of IBs.

5. Conclusion

The objective of this study is to investigate the influence of internal CG structure on ICE in IBs of OIC countries. Drawing based on the stakeholder theory, the study hypothesises the internal CG relationship such as BS, NEXDs, CD, SB, AUDC with ICE such as HCE, SCE and ECE. The study utilised data for ten years during the period of 2008–2017 from 29 OIC Islamic countries. By using the 2SYS-GMM, the study finds that BS and NEXDs significantly influence the ICE in the Islamic banking sector. The results are in line with [Ahmed and Mohd Ghazali \(2013\)](#); [Appuhami and Bhuyan \(2015\)](#) in which they stated that the responsibility for prudent development and the efficient use of ICE resides with the CG structure. In contrast, CD has a negative and significant influence on ICE, parallel with the findings of [Faisal *et al.* \(2016\)](#). Moreover, the SB and AUDC have a mixed relationship with ICE. Overall these findings are in line with [\(Ahmed and Mohd Ghazali, 2013; Appuhami and Bhuyan, 2015; Faisal *et al.*, 2016; Taliyang and Jusop, 2011\)](#) as they argued that larger and diversified board develops and efficiently uses the ICE resources for organisational growth.

The finding of this study will benefit various stakeholders (bank managers, regulators, policymakers and researchers) not only in IBs but also to the other financial sectors in several ways. First, the finding of this study will help the standard setters and regulatory bodies in OIC countries to modify the existing code of CG in order to enhance the ICE in IBs. Second, this research will encourage the policymakers to devise the policies expertly because IBs relied on well-trained employees and technology to produce complicated products in the competitive environment. Third, it will change the manager's behaviour in realising the importance of ICE and making an effective strategy to manage both financial and intangible assets to improve their performance. Lastly, it will enhance the confidence among the stakeholders as well as the employees towards the quality of CG that is applied in IBs of OIC countries.

This study has some limitations that demand further research. First, the study was explicitly done in IBs in OIC countries. However, IBs are also influenced by Shariah law; hence, the ICE of IBs can be different. It would be interesting in future research to examine the relationship between CG and ICE in various financial sectors. Second, this study used secondary data collected from the Bankscope and the annual reports of IBs. Future studies can use other methods of data collection to analyse the relationship between CG and ICE (survey and interviews, etc.). Third, this study used multiple regressions to examine the influence of CG on ICE. Futuremore, studies can use other ways of estimation (e.g. content analysis). Finally, this study used value-added intellectual coefficient (VAIC) method to measure the ICE. Measurement of the accurate ICE is still complicated. Thus, future studies can use an alternative way to correctly measure the ICE in banks.

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Appendix
Supplementary data

Supplementary data to this article can be found online at: <https://drive.google.com/file/d/1C9n1hXeVmz5QsC8uX53aRO03SCo7fQpz/view?usp=sharing>

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