Intellectual capital performance of Sharia banks: Evidence from Indonesia

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Abstract

Towards a sustainable Islamic banking industry must be attended by the sharia governance of capital allocation. In addition, Islamic banking requires a higher level of intellectual ability, especially intellectual capital in humans to support product innovation. The aims of this paper are to examine the effect of corporate governance, family ownership structure, foreign ownership structure, and digital banking on Intellectual Capital (IC) Performance in Indonesian Islamic banks. Testing and analysis use Least Square Panel data regression with panel data and a total of 93 observations in the period 1999-2016. In this research, IC performance used Islamic Banking Value Added Intellectual Coefficient (IBVAIC). We present empirical evidence that corporate governance had significant implications for improving IC performance. In addition, digital banking negatively influences IC performance. In contrast, family ownership, foreign ownership, liquidity, and age did not affect IC performance. This study contribute literature to the IC performance in sharia banking in the form of a Sharia Business Entity.

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Abstrak

Menuju industri perbankan Islam berkelanjutan harus diikuti oleh tata kelola syariah pada alokasi modal. Selain itu, perbankan syariah membutuhkan tingkat kemampuan intelektual yang lebih tinggi, terutama modal intelektual pada manusia untuk mendukung inovasi produk.Tujuan dari makalah ini adalah untuk menguji pengaruh corporate governance, family ownership, foreign ownership, *dan* digital banking *terhadap* Intellectual Capital (IC) performance *di bank syariah Indonesia. Pengujian dan analisis menggunakan regresi data* Least Square Panel *dengan data panel dan total 93 pengamatan pada periode 1999-2016. Dalam penelitian ini,* IC performance *menggunakan* Islamic Banking Value Added Intellectual Coefficient (IBVAIC). *Kami menyajikan bukti empiris bahwa* corporate governance *memiliki implikasi yang signifikan untuk meningkatkan* IC performance. *Selain itu, perbankan digital memengaruhi* IC performance *secara negatif. Sebaliknya,* family ownership, foreign ownership, *likuiditas dan usia tidak memengaruhi* IC performance. *Penelitian ini memberikan kontribusi literatur untuk kinerja IC dalam perbankan syariah dalam bentuk Badan Usaha Syariah.*

1. Introduction

Intellectual Capital (IC) plays an important role as a production factor of economic wealth than physical assets (Kubo & Saka, 2002). An effective intellectual capital (IC) management has been recognized as the competitive advantage of modern organizations and the most important source of value creation, including the financial services industry to survive and also to compete with powerful new players entering markets such as Islamic financial institution (Nawaz & Haniffa, 2017). This shift is caused by the use of information technology in which businesses place more emphasis on technical skills and capabilities, and less on manual labor and physical capital (Brinker, 2000). Currently, IC becomes a major part of the value of the company and the success of the business entity into a function to utilize IC (Keenan & Aggestam, 2001).

IC represents a key component of corporate wealth and many researchers have attempted to update, improve, and further explain the IC to the company. Management of knowledge and IC are considered among the youngest management disciplines to gain acceptance in the scientific community (Dzenopoljac et al., 2017). IC is a universally recognized, well defined and measured tangible asset in corporate accounts, IC assets are difficult to define, recognized, managed and measured in the traditional sense.

According to Nawaz & Haniffa (2017), the IC phenomenon in Islamic banking is based on the intangible intellectual ideology of Sharia, Islamic law, which guides Islamic Economics. Under the Sharia it is obligatory: not to deal with interest-based *(riba)* activities, not allowed to conduct speculative *(gharar)* activities, and it is prohibited to finance unlawful *(haram)* activities. Furthermore, the principle of risk-sharing and real economic transactions supported by tangible assets shows a clear distinction in funding as well as the structure of the activities of Islamic and conventional financial institutions (Beck, Demirgüç-Kunt, & Merrouche, 2013). Sharia bank-

ing requires a higher level of intellectual ability, especially IC in humans to support product innovation. Therefore, value creation in the Islamic finance industry is a combination of human, structural and financial capital and it is important to examine which of the three components that contribute most to value creation (Nawaz & Haniffa, 2017).

Figure 1 is the IC score trend during the observation period. Based on the financial statement data, Islamic banking IC performance, in general, did not increase significantly. This can be seen from Figure 1 the IC Performance of Islamic Bank which is measured based on the Value Added Intellectual Capital every year. The data shows that only Bank Syariah Mandiri (BSM), which since 1999 has tried to reform their banking system and chose to be concerned about the issue of IC, while in other banks only concerned with the issue of IC in 2008. BSM managed to achieve a very significant increase in 2000, but no significant improvement was seen in the year after that. On the other hand, Bank Panin Syariah actually experienced a significant decline in 2009. Based on data obtained from financial statements, it can be concluded that IC performance in Islamic banks still cannot be said to be good because it is still lagging behind conventional banks. IC performance values from 1999-2016 were recorded at 0.913 below conventional banks valued at 3.112 (Tjendani, Widagdo, & Muthmainah 2018).
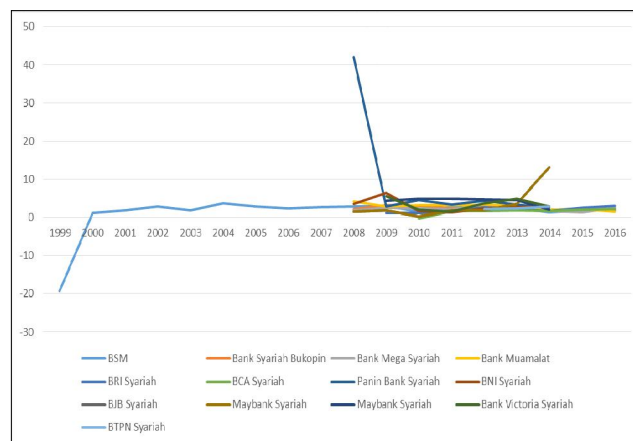

Figure 1. IC performance of Islamic banks

In various literatures, there have been many researchers who have conducted research on the factors that influence IC performance (Saleh, Rahman, & Hassan, 2009; Al-Musali & Ismail, 2012; Anthony & Widagdo, 2013; Wahid et al., 2013; Makki & Loddhi, 2014; Greco, Ferramosca & Allegrini, 2014; Shahveisi, Khairollahi & Alipour, 2017; Forte et al., 2017, Tjendani, Widagdo, & Muthmainah, 2018). The factors that influence IC performance are grouped into company characteristics, ownership structure, and corporate governance.

Research examining the characteristics of companies represented using leverage on IC performance was conducted by Anthony & Widagdo (2013); and Forte et al. (2017). Anthony & Widagdo (2013) prove that leverage has no effect on IC performance. However, Forte et al. (2017) prove that leverage has a positive effect on IC performance.

Good corporate governance and ownership structure should improve IC performance, this can be seen from many kinds of research related to corporate governance and ownership structure that affect IC performance include Saleh, Rahman, & Hassan, 2009; Al-Musali & Ismail, 2012; Anthony & Widagdo, 2013; Wahid et al., 2013; Makki & Loddhi, 2014; Greco, Ferramosca, & Allegrini, 2014; Shahveisi, Khairollahi, & Alipour, 2017; Forte et al., 2017. The results of various studies still show inconsistencies.

Al-Musali & Ismail (2012), Wahid et al. (2013), Makki & Loddhi (2014), and Appuhami & Bhuyan (2015) conducted research related to the effect of corporate governance on IC performance. The positive effect on corporate governance on IC performance can be proven in the research of Wahid et al. (2013), Makki & Loddhi (2014). However, this is inversely proportional to Al-Musali & Ismail (2012) which prove that corporate governance has a negative effect on IC performance. Inconsistencies in results are due to different measurement tools.

Saleh, Rahman, & Hassan (2009), Al-Musali & Ismail (2012), Anthony & Widagdo (2013), Greco,

Ferramosca, & Allegrini (2014), Forte et al. (2017) conducted research related to the effect of family ownership on IC performance. The positive effect on family ownership on IC performance can be proven in the research of Greco et al. (2014) and Forte et al. (2017). However, this is inversely proportional to Saleh, Rahman, & Hassan (2009), Al-Musali & Ismail (2012), and Anthony & Widagdo (2013) which prove that family ownership has a negative effect on IC performance.

Saleh, Rahman, & Hassan (2009), Al-Musali & Ismail (2012), Anthony & Widagdo (2013) conducted research related foreign ownership on IC performance. The positive influence on foreign ownership of IC performance can be proven in the research of Azzama, Fouad, & Ghosch (2013); Ting, et al. (2016). This is inversely proportional to Anthony & Widagdo (2013) which proves that foreign ownership has a negative effect on IC performance. However, foreign ownership has no influence on IC performance can be proven in the research Saleh, Rahman, & Hassan (2009), Al-Musali & Ismail (2012).

Based on the description above, previous studies prove inconsistent results and many are also done on conventional banks. The inconsistencies of the results of previous studies suggest that CG effects IC performance, so a good CG will improve the company's IC performance. However, when viewed from existing data even though Islamic banking is referred to as an institution that has good CG, however, the performance of Islamic banking ICs still lags behind the performance of conventional IC banks. Therefore, research related to the influence of corporate governance and ownership structure on IC performance is still very interesting to be used as a research object. This study will examine the effect of corporate governance adjusted to the characteristics of Islamic banking and ownership structure on IC performance in an Islamic banking company environment in Indonesia. This study also examined the effect of the application of digital banking on IC performance. Digital banking is considered important not only in conventional banks

but also in Islamic banks, the Islamic banking industry also needs to favor digital banking in the development of information technology, behavior changes, and lifestyles of customers in using banking services. This condition certainly makes Islamic banking to always be able to innovate in higher quality services in order to attract customers so that this can be the key to achieving competitive advantage.

Research on IC has been one of the research domains quite productive in the management literature in the last two decades. Studies focusing on high-tech industries such as information technology (Hsu & Wang, 2012), biotechnology (Hermans & Kauranen, 2005) and manufacturing (Tseng & Goo, 2005) have shown significant influence between IC and firm performance. Recently, research has shown a sustained interest in the service sector especially for financial institutions (Kubo & Saka, 2002; El-Bannany, 2008; Murthy & Mouritsen, 2011; Mention & Bontis, 2013; Al-Musali & Ismail, 2014; Curado, Guedes, & Bontis, 2014; Nimtrakoon, 2015) in understanding how the IC's influence on performance. In contrast, studies conducted in the financial sector have shown mixed evidence of the influence of corporate governance and ownership structure on IC performance. Some considerations that motivate and distinguish from previous research are as follows: (1) the need to develop research on IC performance in more depth, especially on the method developed by Ulum (2013) using IBVAIC. (2) The index used in measuring corporate governance adopts an index of Hermawan & Dina (2012) that has been adapted to the situation of the Sharia Business Entity in Indonesia. (3) Presenting additional variables associated with digital banking as measured using indexes, it is expected to provide a repertoire for sharia banking in Indonesia, and research on this subject is still very limited because it is something new.

Based on the phenomenon of practice and literature review of previous research it is known that IC is a very important resource for value creation and competitive advantage for the company in mod-ern business especially in the era of digital banking as it is today. Nevertheless, accounting standards (both in Indonesia and internationally) have not been able to provide guidelines for accurately recognizing and measuring IC, resulting in IC not being included in financial statements (Rashid et al., 2012; Widarjo & Bandi, 2018).

Furthermore, there is rarely research on the effects of digital banking on IC performance, especially in Islamic banks. This study aims to contribute literature to the area, by empirically testing its effect on IC performance in sharia banking in the form of a Sharia Business Entity. Acharya, Kagan, & Lingam (2008) revealed the application of the internet gives a positive influence on financial performance in the banking industry. In contrast to Al-Smadi & Al-Wabel (2011) who stated that e-banking has a negative effect on performance in the banking industry.

The objective of this research is to find empirical evidence about how corporate governance, family ownership structure, foreign ownership structure, and digital banking influence intellectual capital performance in Indonesian sharia banks. This research contributes to the existing literature by filling the research gap from previous research using better measurement variables of corporate governance and highlighting something new, especially in the area of digital banking in Indonesian sharia banking. In this research, we analyze the annual and financial reports of selected Indonesian sharia banks for a period around 1999-2016 with a total of 93 research samples. The periods are chosen because of the issuance of the first annual and financial report in 1999. The remainder of this paper is organized as follows: hypotheses development, analysis method, result and discussion, and conclusion.

2. Hypotheses Development

Corporate governance on IC performance

For investors, various disclosures by companies are one way of protecting investors other than

by applying corporate governance from inefficient markets (Cerbioni & Parbonetti, 2007). Agency theory suggests that firms with high agency costs (bonuses to management) will reduce them by increasing oversight activity through corporate governance (through its mechanism) as well as a number of disclosures. Previous studies have provided insights into the corporate governance's impact on various aspects of organizations such as performance, culture, accountability and disclosure of intangible goods (Haniffa & Cooke, 2002; Brennan & Solomon, 2008). This study focuses more on the study of corporate governance, IC theory, and agency.

Several studies highlight the importance of IC management by minimizing agency problems within the organization (Cerbioni & Parbonetti, 2007). The corporate governance system of an organization is expected to function as a control mechanism to protect investors by minimizing agency problems. Corporate governance works as an "intensive monitoring package for reducing opportunistic behavior" of managers and minimizes negative impact on ICs. It also ensures that managerial decision making is focused on developing, retaining and utilizing IC (Safieddine, 2009). While in other studies mentioned, "corporate governance is responsible for creating, developing, and utilizing ICs that are in society, structure, and company processes'" (Keenan & Aggestam, 2001). Other studies mention that good corporate governance is a secondary factor affecting the attractiveness and retention of intellectual capital (Wahid et al., 2013). The results of other studies conducted at a university show that CG and IC are related and see CG as a major factor for the attractiveness of IC (Saûeddine, 2009).

Thus, the authors hypothesize that corporate governance has a significant influence in attracting, maintaining, and exploiting intellectual capital effectively. If financial and physical assets can be lost due to mismanagement, the same can happen to IC Performance. Therefore, the first hypothesis in this study is formulated as follows:

H_1: there is a positive association between corporate governance and IC performance

Family ownership on IC performance

The literature collection shows that the influence of family ownership can extract wealth for personal gain (Claessens et al., 2002; Villalonga & Amit, 2006). For example, Cohen & Lauterbach (2008) find that CEOs are more highly compensated in companies where CEOs are owned by families with most of the stock. This evidence is consistent with the hypothesis (Morck, Shleifer & Vishny, 1988), which predicts that the performance of the firm increases as ownership that will reduce agency costs (such as management or family) increases. In contrast, if such ownership is large enough (so the owner can control the company entirely), there is a tendency for corporate owners to use private profits at the expense of minority shareholders. The family's negative influence on performance is exacerbated when company control is passed on to the next generation of generations (Cucculelli & Micucci, 2008). In addition, managers in family firms tend to face cognitive conflicts in maintaining professional influence versus family influences. This can impede effective co-operation and decision making (Kellermanns & Eddleston, 2007).

Since the ownership structure in Indonesia is more concentrated than the ownership structure in Western countries (Claessens et al., 2002), the existence of family ownership is always combined with the controlling power of the company. Since the tendency and focus of the controlling family is to extract wealth for personal gain, it is estimated that this activity will reduce the company's long-term investment in IC, reducing their focus on creating value for the company and then having a negative influence on IC performance is the result of studies undertaken by Cheung, Rau, & Stouraitis (2006) suggest that related parties (including families) can extract wealth by using transactions with parties with special effects. Therefore, the second hypothesis in this study is formulated as follows:

H_2:   there is a negative association between family ownership and IC performance

Foreign ownership on IC performance

Foreign ownership is predicted to have a positive effect on performance. Bonin, Hasan, & Wachtel (2005) found a positive influence in the banking industry. In contrast, Lensink & Naaborg (2007) find domestic banks more profitable than foreign banks because of the costs associated with the distance between the principal and the agent.

Foreign ownership can be seen as a mechanism that can complement the current corporate governance structure to monitor the management of value-maximizing activities. This is because their role resembles institutional investors (Dahlquist & Robertsson, 2001). In accordance with this argument, Lindemanis, Loze, & Pajuste (2019) found a positive influence between foreign ownership and corporate profitability in India when there was clear control over the firm. In order for foreign investors to achieve positive results (in holding foreign equity entities), investors can influence domestic firms to invest in activities that create more value that will contribute to better company performance over the long term. Then this will cause the IC performance to be better. Therefore, the third hypothesis in this study is formulated as follows:

H_3**:**   there is a positive association between foreign ownership and IC performance

Digital banking on IC performance

Digital banking is about how customers gain consistent experience in all channels and all their interactions when accessing Financial Industry data which focuses on Analytic and Automation processes and requires changes in products and services, information technology and human resources in order to achieve optimal economic value (Cisco, 2014).

In Indonesia, digital banking, also referred to as Digital Banking Services, is defined as banking services/activities through bank offices using electronic/digital facilities owned by banks and/or through digital media conducted independently by customers that enable prospective customers and/or customers The bank obtains information, communicates, registers, opens accounts, banking transactions and closes accounts, including obtaining other information and transactions outside of banking products, including financial advisory (financial advice and opinions), investments, e-commerce transactions and other needs (Financial Services Authority). Simple payments with mobile phones are transformed into services that help customers receive, organize and redeem offers. Visits to "regular branches" or online banking sites are converted into meetings with highly qualified financial planners regarding customer retirement strategies. Online and mobile services can provide customized advice, even without advisers, through analysis. In short, IoE (Internet of Everything) can help financial services firms deliver the kind of personal interactions that the most innovative customers demand in the world, including emerging competitors who are starting to offer (Cisco, 2014). Then this will also cause the IC performance to be better. Therefore, the fourth hypothesis in this study is formulated as follows:

H_4:   there is a positive association between digital banking and IC performance.

3.   Method, Data, and Analysis

The population of this research is all Islamic banking companies in Indonesia. While the sample is a sharia banking company in Indonesia and sharia Business Entity from 1999 to 2016. Financial and annual reports are used as the object of this research. For the sampling method, this research uses purposive sampling. The selected sample should meet the following criteria: (1) selected sample must be a sharia banking company in Indonesia and in the form of a Sharia Business Entity during 1999-2016; (2) selected sample must have total equity with a

positive nominal value; (3) Selected sample must be with a positive value of IC efficiency.

The total sharia banking companies are 12 companies. The total observations used in this research were 93 cases. The summary of research samples based on sampling criteria are presented in Table 1.

This research uses panel data from Indonesian sharia banks for the 1999-2016 year. There are 93 observations from 12 banks for 18 years period. The summary of research samples based on sampling criteria are presented in Table 1. The usage of panel data has some benefits (Gujarati, 2012), namely: a) Controlling for individual heterogeneity; b) More information data sets; c) Better to study the dynamics of adjustment; d) Identification of parameters that would not be identified with pure cross-sections or pure time-series. This research uses Microsoft Excel and E-views 9 software in data processing. The reason for choosing E-views software is because E-views can choose the best testing method between Pool Least Square (Common Effect), Fixed Effect and Random Effect.

This research uses IC performance as the dependent variable (Y). As for the independent variables, there is corporate governance (X_1), family ownership (X_2), foreign ownership (X_3), and digital banking (X_4). In addition, this research is equipped with some control variables, namely liquidity (financial to debt ratio), age, and size. The operationalization of the variables is presented in Table 2.

Table 1. The summary of research samples based on sampling criteria

Description	Total				
	1999-2012	2013	2014	2015	2016
Population (Islamic banking company)	49	11	12	12	12
Banking companies that have a negative equity (not sampling criteria)	-	-	-	-	-
Banking companies that have a negative VA (not sampling criteria)	(2)	-	(1)	-	-
Total Research Samples	47	11	11	12	12
The company used as the research sample					93

Table 2. The operationalization of variables

Variable	Operationalization
Dependent Variable	
IC Performance	Islamic Banking Value Added Intellectual Capital
Independent Variables	
Corporate Governance	Corporate governance scoring adapted from Hermawan & Dina (2012)
Family Ownership	Percentage of family-controlling shareholder representative on board to total board members
Foreign Ownership	Percentage of foreign-controlling shareholder representative on board to total board members
Digital Banking	Dummy variables (1 if one of the consideration was fulfilled, conversely)
Control Variables	
Liquidity Risk	Financing to deposit ratio
Bank Age	Established year

This research uses panel data regression analysis to test hypotheses. The regression model is stated as follows:

$$IBVAIC = \alpha + \beta CG + \beta + \beta FAM + \beta FOR + \beta DB + \\ \beta FDR + \beta AGE + e \qquad (1)$$

Where: IBVAIC: Islamic Banking Value Added Intellectual Capital; CG: Corporate Governance; FAM: Family Ownership; FOR: Foreign Ownership; DB: Digital Banking; FDR: Financing to Deposit Ratio/ Liquidity Risk; AGE: established year

In this study IC performance was measured by VAIC. VAIC shows the level of efficiency of value creation from tangible assets and intangible assets owned by the company. Research shows that the main formula for measuring the performance of Islamic banking IC is not much different from the Pulic model:

$$IBVAIC = IBVACA + IBVAHU + IBSTVA \qquad (2)$$

This model is the result of a modification of the Pulic model conducted by Ulum (2013). The difference lies in the accounts used to develop the VA formula. VA in the Pulic model is constructed from total income, while in iB-VAIC, VA is constructed from sharia activities.

Each value added coefficient in the modified formula Ulum (2013) is obtained from:

$$IB\ VACA = \frac{VA}{CE} \qquad (3)$$

Where: Value Added Capital Employed (VACA) is every value added generated by every capital rupiah used (capital employed / CE).

$$IB\ VAHU = \frac{VA}{HC} \qquad (4)$$

Where: Value Added Human Capital (VAHU) is every value added (value added) generated by every employee expense (human capital / HC).

$$IB\ STVA = \frac{SC}{VA} \qquad (5)$$

Where: Structural Capital Value Added (STVA) is any value added generated by each structural capital rupiah obtained from the IB VA and human capital (HC) difference.

To get the VA the formula used is:

$$IB\ VA = OUT - IN \qquad (6)$$

The output value is derived from the main operating income of sharia activities plus other income less profit sharing for third parties and temporary *syirka*h and non-operational income. Input values come from the sum of operational and non-operational expenses but do not include employee expenses.

4. Results

Descriptive statistics

We analyze descriptive statistics to generate summary and description of the data from the research objects.

Based on Table 3, it can be seen that the total sample of this study is 93 banks for the period of 1999-2016. From the above observations, the dependent variable Islamic Bank Value Added Intellectual Capital (IBVAIC) has an average score of 0.91. This shows that the quality of IC performance in sharia banking is quite good. The minimum score is -1.05. Meanwhile, the maximum score is 3.74 indicating that there are some banks with good performance of ICs.

The observation of the corporate governance variable (CG) shows that its minimum score is 53 while its maximum score is 114 and the average score is 99.46. These indicate that corporate governance

implementation by research objects is good in average. The family ownership variable as represented by affiliated board members shows an average score of 0.95. The minimum score is 0 while the maximum score is 12.20. Meanwhile, foreign ownership variable as represented by affiliated board members shows an average score of 9.05. The minimum score is 0 while the maximum score is 87.42.

The digital banking shows a mean value of 0.58, with a maximum value of 1.00 and a minimum value of 0.14 that indicates the application of digital banking in sharia banking is still relatively low. The financing debt ratio has a 95.67 mean value. The minimum value is 46.08 and the maximum value is 289.20. The age variable's mean is 6.65 while its minimum is 0.00 and its maximum 25.00.
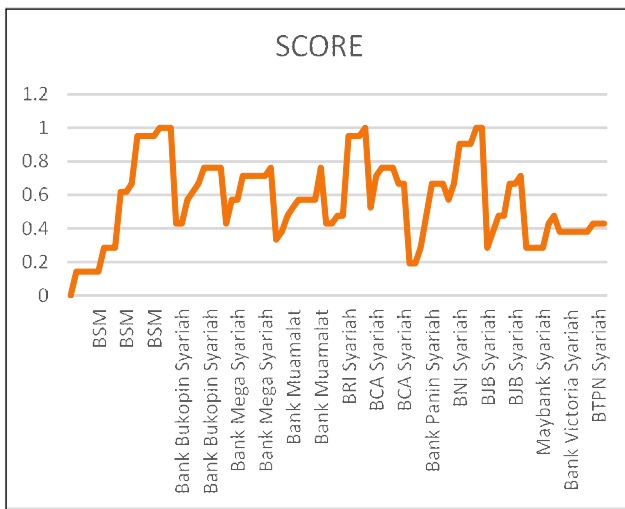

Figure 2. Trend of digital banking

Chow Test

The Chow test is performed to select the panel data model that is best used between the Pooled Least Square (PLS) and the Fixed Effect Model (FEM). The Fixed Effect model is used if the probability value is less than 0.05 (5%). If the probability value is greater than 0.05 (5%), the better model to use is the Common Effect (Gujarati & Porter, 2009). This study has a probability of 0.0586, greater than 0.05 (5%) or significant. The cross-section F-probability value of 0.0586, which is greater than the significance of 5%, means that the better model to use is the Common Effect model.

Lagrange Multiplier Test

The Lagrange Multiplier test is performed to select the panel data model that is best used between the Common Effect Model (CEM) and the Random Effect Model (REM). The Random Effect Model is used if the probability value is less than 0.05 (5%). If the probability value is greater than 0.05 (5%), the better model to use is the Common Effect. The probability value of 0.7044 which is greater than the significance of 5% means that the better model to use is the Common Effect model.

Endogeneity Test

Endogeneity testing broadly refers to situations where explanatory variables are correlated

Table 3. Descriptive statistics

Variable	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
IBVAIC	93	0.913	0.904	3.740	-1.049	0.548
CG	93	99.462	105.000	114.000	53.000	14.849
FAM	93	0.946	0.000	12.200	0.000	2.376
FOR	93	9.057	0.000	87.420	0.000	24.916
DB	93	0.586	0.570	1.000	0.140	0.239
FDR	93	95.677	91.400	289.200	46.080	28.542
AGE	93	6.645	5.000	25.000	0.000	6.021

Note: IBVAIC: Islamic Banking Value Added Intellectual Capital; CG: Corporate Governance; FAM: Family Ownership; FOR: Foreign Ownership; DB: Digital Banking; FDR: Financing to Deposit Ratio/Liquidity Risk; AGE: Established Year

with error terms. The difference between endogenous and exogenous variables comes from the simultaneous equation model, where a separate variable whose value is determined by the model of the predetermined variable. According to Soetanto & Liem (2019) to capture the dynamic relationship between independent and dependent variables, dynamic panel data regression uses lag dependent variables as regressors and uses them as instruments to control endogeneity. Several studies such as Soetanto and Liem (2019) have shown how IC has a significant and positive influence on company performance by implementing a Generalized Method of Moments (GMM) estimator system to obtain consistent results. By using a dynamic estimator of the GMM system, they have revealed that IC is an important resource for achieving company goals. Other studies Nadeem et al., (2017) also use GMM methods that are applied to account for endogeneity, mainly because of the unobserved simultaneity and heterogeneity. In addition, this study uses an added value intellectual coefficient (VAIC) model that is adjusted to measure IC efficiency.

Table 4. Best estimation: Common effect

Endogeneity Test			
Null hypothesis: CG are exogenous			
Specification: IBVAIC C CG FAM FOR DB FDR AGE			
Instrument specification: C SIZE FAM FOR DB FDR AGE			
Endogenous variables to treat as exogenous: CG			
	Value	**d.f.**	**Probability**
Difference in J-stats	0.004318	1	0.9476
J-statistic summary:			
	Value		
Restricted J-statistic	0.004318		
Unrestricted J-statistic	0.000000		

Based on the Table 4, it can be seen that the model in this study has a probability of 0.9476, greater than 0.05 (5 percent) or significant. The cross section F-probability value of 0.9476, which is greater than the significance of 5 percent, means that this model states that there is no endogeneity.

Panel regression results

This research uses panel regression analysis to test the hypotheses. The result is presented on Table 5.

Table 5. Best estimation: Common effect

Variable	Coefficient	Prob.
C	0.0249	0.9545
CG	0.0129	0.0118
FAM	0.0072	0.8423
FOR	-0.0019	0.6844
DB	-0.9706	0.0095
FDR	0.0016	0.4278
AGE	0.0033	0.8486
R-squared		0.1341
Adjusted R-squared		0.0737
F-statistic		2.2202
Prob. (F-stat)		0.0486

Note: CG: Corporate Governance; FAM: Family Ownership; FOR: Foreign Ownership; DB: Digital Banking; FDR: Financing to Deposit Ratio / Liquidity Risk; AGE: Established Year

The regression results provide evidence that corporate governance positively influences IC performance and thus implies that the stronger the corporate governance, the better the IC performance generated by the bank. Family ownership and for-

Table 6. Hypotheses summary

Hypotheses	Finding	Status
H_1. Corporate governance on IC Performance	Positive influence	H_1 Accepted
H_2. Family ownership on IC Performance	No influence	H_2 Rejected
H_3. Foreign ownership on IC Performance	No influence	H_3 Rejected
H_4. Digital banking on IC Performance	Negative influence	H_4 Rejected

eign ownership do not affect IC performance. Surprisingly, digital banking is found to have a negative effect on IC performance. Two control variables FDR and age also have no effect on IC performance. Hypotheses are summarized as Table 6.

5. Discussion

Corporate governance on IC performance

The above findings prove that the application of several theories in practice gets support and rejection. Hypothesis 1 accepted as corporate governance was found to be positively related to IC Performance. The implementation of good corporate governance as a whole enhances IC performance, which in this study uses the object of Islamic banking in Indonesia. This finding supports previous research from Cerbioni & Parbonetti (2007), Safieddine (2009), Wahid et al. (2013) who found a positive influence of several mechanisms and components of corporate governance.

Family ownership on IC performance

Family ownership is not affected by IC performance, so hypothesis 2 is rejected. This result means that the presence of controlling family shareholders or their representatives on the board of commissioners does not bring the effect of IC performance in Indonesian sharia banking. The results of this test are different from previous studies conducted by Anthony & Widagdo (2013), this is quite interesting because the structure of family ownership should have a negative effect on IC performance. Family ownership can lead to reduced long-term investment that will reduce IC performance. This is because family shareholders in Indonesia place more independent parties and do not place many representatives in the company, so they are not involved in making decisions related to the company's strategy. Therefore, the existence of family ownership has no effect on IC performance. The authors suspect this is due to the rules of fit and

proper tests for board members so that only competent people can be placed in that position. This regulation is stated in the Financial Services Authority Regulation Number 55/POJK.03/2016 concerning the determination of bank governance. Therefore, ownership that is related to the family does not place their representation on the board members.

Foreign ownership on IC performance

Foreign ownership, which was previously strongly predicted and positively influenced IC performance, was not proven and hypothesis 3 was rejected. This finding also implies that the presence of foreign investors tends not to have any effect related to IC performance, especially in Indonesian Islamic banking. Although the initial hypothesis states that the presence of foreign investors will help Indonesian Islamic banks to improve their IC performance through increased knowledge or increased competition, these results indicate that there is no influence between the two. The author suspects that the interaction between corporate governance and foreign ownership does not have the same reason as the interaction between corporate governance and family ownership has no effect. Fit and proper test rules for board members so that only those who are competent can be placed in that position. This regulation is contained in the Financial Services Authority Regulation Number 55/POJK.03/2016 concerning the determination of governance of commercial banks. Therefore, foreign owners do not place their representatives on board members.

Digital banking on IC performance

One of the most surprising results in this study is that digital banking is negatively related to IC performance and thus hypothesis 4 is rejected. This means that electronic banking has not been able to improve IC performance in Indonesian Islamic banking. Indonesian Islamic banking still relies on tradi-

tional channels to carry out their banking operations. This finding supports previous research from Al-Smadi & Al-Wabel (2011) which found a negative effect on some banking performance. This is because the application of digital banking in Indonesia is not optimal (the average implementation of digital banking in Indonesia during 2012-2016 is 0.492 or equivalent to digital banking 2.0) and is still in the process of development.

FDR on IC performance

The results of the analysis of the control variables show that Financing Debt Ratio is not related to IC performance. Liquidity risk represented by FDR does not affect IC performance. This is possible because most of the samples have a good loan to deposit ratio.

Company age on IC performance

The company age test results of Indonesian Islamic banking prove that age has no effect on IC performance. Although the company age shows the experience the company has, the longer a company is established, Indonesian Islamic banking does not pay much attention to improving IC performance as a potential way to achieve the company's competitive advantage.

Robustness Test

The Robustness test is used to ensure the strength of the findings in the main model. This study conducts additional tests to broaden the results in reaching research conclusions. Additional tests conducted in this study were to use sample grouping for each family ownership structure. The purpose of this additional test is to validate the family ownership structure regression process by grouping samples based on percentages of more than 10 percent and more than 25 percent. This additional test is done by panel data regression. The data processing program used is E-views.

The Chow Test and the Lagrange Multiplier test prove that the common effect model is the best model that can be used in this research. Because the significance level is more than 0.05 (5 percent), then all models can be used to predict the dependent variable, IC performance.

Based on Table 7, regression test results by grouping the structure of family ownership of more than 10 percent proves that the structure of family ownership has no effect on IC performance. This indicates that the results of the regression test with grouping and without grouping prove consistent results that the structure of family ownership does not affect IC performance.

Table 7. Best estimation: Common effect

Variable	Family ownership (more than 10%)		Family ownership (more than 25%)	
	Coefficient	Prob.	Coefficient	Prob.
C	0.2128	0.7135	0.0122	0.9776
CG	0.0131	0.0107	0.0131	0.0107
FAM	**-0.2005**	**0.6256**	**0.2005**	**0.6256**
FOR	-0.0018	0.6687	-0.0018	0.6687
DB	-0.9616	0.0098	-0.9616	0.0098
FDR	0.0016	0.4279	0.0016	0.4279
AGE	0.0029	0.8692	0.0029	0.8692
R-squared		0.1361		0.1361
Adjusted R-squared		0.0759		0.0759
F-statistic		2.2587		2.2587
Prob. (F-stat)		0.0451		0.0451

Note: CG: Corporate Governance; FAM10: Family Ownership more than 10%; FOR: Foreign Ownership; DB: Digital Banking; FDR: Financing to Deposit Ratio / Liquidity Risk; AGE: Established Year

Regression test results by grouping the structure of family ownership of more than 25% prove that the structure of family ownership has no effect on IC performance. This indicates that the results of the regression test with grouping and without grouping prove consistent results that the structure of family ownership does not affect IC performance.

6.   Conclusion, Limitations, and Suggestions

Conclusion

This research was conducted to answer certain questions about the determinant of IC performance in corporate governance, dimensions of ownership, and also digital banking. The results show that the implementation of corporate governance is positively related to IC performance. Meanwhile, the ownership dimension consisting of family ownership and foreign ownership has no relation with IC performance. In contrast, surprisingly digital banking showed a negative associated with IC performance. In addition, liquidity risk represented by FDR and age was also found to have not associated with IC performance.

Limitations and suggestions

There are some limitations of this study that need to consider in interpreting the results. First, this research uses the IBVAIC method for IC Performance variable measurement. Further study might use methods other than the Pulic model, such as adding R & D as a proxy of the relational capital and innovative capital components adopted from Chen et al. (2005). Another well-known method that can be used to measure ICs is the intangible asset monitor (Ghosh & Mondal, 2009). Second, this study is a single country study using a sample of sharia banks in Indonesia. Further study, therefore, might employ cross country study covering sharia banks in some regions, such as East Asia and the Middle East.

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