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Determinants of the Intellectual Capital Efficiency of Cambodian Commercial Banks

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ABSTRACT

This study intends to investigate the potential effects of various bank-specific characteristics on the efficiency of intellectual capital (IC) in Cambodia's commercial banks from 2013 to 2021. Using multiple regression analysis, the study examines the link between IC efficiency as a dependent variable and some independent variables. The study uses value-added intellectual capital (VAIC) established by Pulic (2004) to assess how IC is effectively utilized in Cambodian commercial banks. The findings show that the bank size, bank profitability, and entry barriers significantly influence IC efficiency. The study's findings cannot be extrapolated to commercial banks in other countries or other study periods because the empirical testing has been confined to Cambodian commercial banks from 2013 to 2021. The study will aid banking regulators in identifying the variables influencing IC efficiency so they can take steps to improve the efficient utilization of IC resources and maximize value creation. This analysis is beneficial to bank management. Since it informs them of the variables, they should concentrate on increasing the IC efficiency of the banks. This study is the first to examine the variables that affect IC efficiency in commercial banks in Cambodia. It adds to the previous studies about the factors that affect IC efficiency in banks.

Keywords: Intellectual capital; Commercial banks; Cambodia

INTRODUCTION

Intellectual capital (IC), compared to physical or financial capital, is now the primary driver of business value and the source of its competitive advantage because of the knowledge-based economy. This is especially true for knowledge-intensive industries like banking, where intangible and intellectual resources are the primary sources of competitive advantage (Shih et al., 2010). While physical capital is essential for banks to function, the overall quality of the services and goods they offer to their clients ultimately relies on IC (Goh, 2005).

Due to the growing significance of IC, the analysis of IC efficiency factors has been recognized as a significant research subject. Despite this, research into the factors influencing IC efficiency is still in its early stages. A few studies have addressed this issue (e.g., El-Bannany, 2008; Al-Musalli & Ismail, 2012; Meressa, 2016; Hidayah & Adityawarman, 2017; Duho & Onumah, 2018; Babajee, 2021). Although these studies showed conflicting results on the impact of determinant factors, they provided evidence that firm-related characteristics are significant drivers of IC efficiency.

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Despite empirical research on the factors influencing IC efficiency, which has primarily focused on emerging and developed nations, there has yet to be any research on the determinants of IC efficiency in Cambodia. Accordingly, this paper intends to examine whether the IC efficiency of Cambodian commercial banks is affected by some bank-specific characteristics (namely bank size, bank profitability, entry barriers, bank leverage, bank tangibility, and bank riskiness) and how it is affected by each of these determinants.

Employing Pulic's (2004) Value Added Intellectual Capital (VAIC) index as a proxy of IC efficiency, this paper depends upon ordinary least squares, robust, and fixed effect regressions to explore the key determinants of IC efficiency of 18 banks in Cambodia during the period from 2013 to 2021. The key findings of the paper show that the significant elements that influence IC efficiency in Cambodian commercial banks are bank size, bank profitability, and entry barriers. The first two variables positively affect the banks' IC efficiency, while entry barriers negatively influence these financial institutions' IC efficiency.

The study's significance can be separated into theoretical and practical aspects. Theoretically,

this study contributes significantly to the literature published previously in this field by further illuminating the factors that influence the IC efficiency of Cambodian banks. To the researcher's knowledge, this is the first study investigating the bank-specific factors that can affect the IC of commercial banks in Cambodia. In Cambodia, such studies are lacking. It also adds to the limited literature on the elements affecting the IC efficiency of commercial banks in developing nations.

In terms of practical application, the findings of this study are helpful to investors, legislators, and bank managers in Cambodia. Investors can use the results of this study when intending to invest in Cambodian banks to identify characteristics that could indicate future IC efficiency. For instance, the results of this research can clarify to investors the circumstances under which IC efficiency could rise. The findings of this study can be used by legislators to establish and implement strategies for IC development and to direct banks in self-benchmarking efforts to increase value generation. The study calls for bank managers to consider factors that can improve or hinder IC efficiency. Additionally, it develops the bank managers' ability to recognize which banks have high IC efficiency. As a result, they can use these banks as benchmarks to increase their efficiency in managing their IC.

The following section provides a review of the IC concept, a presentation of related prior research papers, and the study hypotheses' development. The third section shows the research methodology of the study. The representation and discussion of the empirical results are illustrated in the fourth section. The final section demonstrates the conclusions of the findings, acknowledging the study limitations and identifying further probable topics for forthcoming study.

LITERATURE REVIEW

This section reviews the definitions and classifications of IC and studies conducted on the determinants that affect IC efficiency from which hypotheses are derived.

The Concept of Intellectual Capital

The conventional drivers of competitiveness that rely on tangible assets to create firm value and sustain a competitive edge have started to diminish with the economy's emergence based on knowledge, which occupies a significant role in wealth creation (Pablos, 2002). The importance of knowledge-based assets, or IC, as the primary factor for generating value and maintaining the competitiveness of the firms has increased as a result of current developments in the worldwide economy, including globalization, intense competition, growing demand by consumers for competent and creative services and goods, swift developments in technology, and constricting of the lifespans of products, and others (Maditinos et al., 2011; Shih et al., 2010).

Several definitions of IC have been presented in previous studies. A summary of these definitions is presented in Table 1.

Table 3: Granger Causality Test, PPSP and PWSA

Definition	Author
"The combined intangible assets which enable the company to function"	Brooking (1996, p. 12)
"Knowledge that can be converted into value"	Edvinsson and Sullivan (1996, p.358)
"Information, knowledge applied to work to create value"	Edvinsson and Malone (1997, p. 3)
"Broad organizational knowledge unique to a firm, which allows it constantly to adapt to changing conditions"	Mouritsen (1998, p. 462)
"Intellectual Capital refers to those intangible resources within an organization related to information and knowledge that are not generally measured or appreciated but contribute to an organization's success"	The OECD (2000, p.55)
"Encompasses intangibles such as patents, intellectual property rights, copyrights and franchises"	Brennan (2001, p. 423)
"IC refers to intellectual material such as knowledge, information, intellectual property and experience that can be used to create wealth"	Kannan and Aulbur (2004, p.389)
"The knowledge, information, intellectual property and experience that can be put to use to create wealth"	Martinez and Garcia-Meca (2005, p. 305)
"An intangible asset with the potential to create value for the enterprise and the society itself"	Mavridis (2004, p. 43).
"Intellectual Capital can be both the product of R&D activities and the enabler for creating greater value from R&D. This combination of intangible resources and activities allows an organization to transform a bundle of material, financial and human resources into a system capable of creating stakeholder value"	European Commission (2006, p. 10)
"In essence, intellectual capital is the knowledge capability of an organization to convert knowledge, skills and expertise into profitable intellectual assets, and include inventions, technical know-how, design approaches, computer software and programs"	Bose and Thomas (2007, p. 1486)
"IC can be defined as something which already exists in a firm but cannot be seen on its balance sheet exactly, a competitive advantage over the firm's competitors, future values and includes all its intangibles assets, the value of knowledge, information, intellectual property and experience, a key factor influencing the future value of the firm"	Yalama and Coskun (2007, p. 257)

"…the sum of all knowledge a company is able to use in the process of conducting business to create value – a VA for the company"	Zeghal and Maaloul (2010, p. 41)

IC has yet to be defined or categorized in a consistent or widely acknowledged manner. Andriessen (2004) pointed out that the primary issue with the IC definition is that these resources are either hidden or immaterial.

Concerning the classification of IC, the perspectives on its nature and structure vary. Although professionals and academics have different viewpoints on the classification of IC, they continue to employ a combination of relational, structural, and human capital (Al-Hamadeen & Suwaidan, 2014). Human capital includes staff talents, commitment, expertise, collaboration, efficiency, abilities, competencies, training, and experience (Sefidgar et al., 2015). Besides, structural capital is composed of fundamental skills, networks, intellectual properties, adaptability, research and development, creativity, and leadership beliefs and principles, in addition to organizational culture, managerial procedures, trademarks, systems for information and communication, management of knowledge, monetary interactions, licenses, approaches, and brands (Al-Hamadeen & Suwaidan, 2014). Meanwhile, relational capital can include intangibles such as share of the market, beneficial contracts, client loyalty, reliance on significant customers, relationships with clients, yearly revenue per area or item, channels of distribution, collaboration between companies, and client satisfaction (Maleki & Serkani, 2014).

The Determinants of Intellectual Capital Efficiency

Al-Musalli and Ismail (2012), Babajee (2021), Duho and Onumah (2018), El-Bannany (2008), Hidayah and Adityawarman (2017), Kweh et al. (2015), Meressa (2016), and Olohunlana et al. (2023) have all shown that firm-specific characteristics may have an impact on IC efficiency. According to relevant banking research, the main determinants affecting IC efficiency are bank size, bank profitability, bank leverage, entry barriers, bank tangibility, and bank risk.

The paper reviews the relevant research on the above-mentioned bank-specific characteristics in the following subsections. In addition, it discusses their prospective associations with IC efficiency and generates hypotheses concerning these relationships with IC efficiency.

Bank Size

Larger banks effectively utilize their IC resources because they are argued to be more proactive and innovative. This is because they are more accessible to outside resources, including external funding and support from the government, which allows them to advance and innovate (El-Bannany, 2012; Mondal & Ghosh, 2014). Babajee (2021) and Olohunlana et al. (2023) both find that company size has a favorable impact on the effectiveness of IC. According to the explanation presented above, the first hypothesis is:

H1: The efficiency of intellectual capital is positively affected by bank size.

Bank Profitability

Due to the possession of internal financial resources to support R&D projects, companies with better financial results have more opportunities to innovate and use available resources to finance such projects (Helfat, 1997). R&D investments will support an organization's innovative endeavors, which will, in turn, raise the organization's investment in intangibles and ease its development of IC (Marques et al., 2006). A significant positive influence of the firm profitability and the efficient utilization of IC was shown by some previous empirical studies (e.g., Al-Musalli & Ismail, 2012; Babajee, 2021; Duho & Onumah, 2018; El-Bannany, 2008; Hidayah & Adityawarman, 2017; Meressa, 2016). Based on the above discussion, the second hypothesis is:

H2: The efficiency of intellectual capital is positively affected by bank profitability.

Barriers to Entry

There are assertions that firms with substantial entry barriers that shield them from industry competition are less likely to innovate, which may have an adverse impact on the efficacy of IC. In other words, entry barriers may negatively affect organizations' allocation and dynamic efficiency (El-Bannany, 2008). The negative impact of entry barriers on IC efficiency was demonstrated in the study of Babajee (2021), but an insignificant effect was shown by Hidayah and Adityawarman (2017) and Duho and Onumah (2019). Based on the above argument, the third hypothesis is:

H3: The efficiency of intellectual capital is positively affected by barriers to entry in a firm's sector.

Bank Leverage

High-leveraged companies effectively use their IC resources, which helps them positively signal their financial position to their creditors (Babajee, 2021). Hidayah and Adityawarman (2017) found a positive relationship between the firm's leverage and IC efficiency. Based on the above discussion, the fourth hypothesis is:

H4: The efficiency of intellectual capital is positively affected by bank leverage.

Bank Tangibility

The proportion of intangible assets indicates how much a company's future performance depends on hazardous assets (Patton & Zelenka, 1997). Raising the proportion of intangible assets might encourage companies to develop new products or streamline operations. El-Bannany (2008) found that firms having a higher proportion of intangible assets are more effective at using their IC resources. Considering the previous justification, the fifth hypothesis is:

H5. The efficiency of intellectual capital is positively affected by bank tangibility.

Bank Riskiness

Due to the high risk, banks are exposed to, they are more likely to be closely supervised by regulatory bodies, and bank management and directors take extra precautions to prevent legal action (Pathan, 2009). Due to the constraints on hazardous investments, it is claimed that spending on long-term initiatives, including R&D projects, training programs for workers, and information technology, can be decreased. As a result, banks may not be more innovative or able to generate many novel services and goods, which can lower IC efficiency (Al-Musalli & Ismail, 2012). Meressa (2016) found that the level of bank riskiness has a negative effect on the firm's efficiency of IC resources. Based upon the above argument, the sixth hypothesis is:

H6: The efficiency of intellectual capital is positively affected by bank riskiness.

The previous studies on this issue need to examine the determinants of IC efficiency of Cambodian banks. This study fills this gap by investigating which firm-specific characteristics significantly influence the efficiency of IC of Cambodian commercial banks.

RESEARCH METHODOLOGY

This section presents the sampling method, how to measure the research variables and the regression models.

Sample

The data used in this study are manually gathered from selected Cambodian commercial banks' annual reports. According to the availability of data, only 18 distinct banks throughout the years from 2013 to 2021 are the focus of this study. Based on the data availability, five bank-year observations were missed, yielding an unbalanced sample of 157 bank-year observations.

Measurement of Variables

Dependent Variable

The value-added intellectual coefficient (VAIC) approach, created by Pulic (2004), is used to calculate IC efficiency since it is the most frequently acknowledged and utilized way to quantify IC efficiency.

It is asserted that a company's intangible (HC and SC) and tangible (CE) resources are the main drivers of its market value (Pulic, 2004). The three metrics used to evaluate IC in this method are human capital efficiency (HCE), structural capital efficiency (SCE), and capital employed efficiency (CEE).

The VAIC computation involves numerous phases. Value-added (VA) is first determined using the equation below.

$$VA = OP + EC + DP + AE \quad (1)$$

Where:

OP = operating profit;

EC = employee costs;

DP = depreciation expenses; and

AE = amortization expenses.

Secondly, HCE is assessed as follows:

$$HCE = VA/HC \quad (2)$$

Where:

HC = employees' salaries and benefits.

Thirdly, because SC and HC are negatively correlated to creating value for companies, SC is measured as the proportion of VA to HC. SCE is determined by dividing SC by VA.

$$SCE = SC/VA \quad (3)$$

Fourthly, CEE is computed as follows:

$$CEE = VA/CA \quad (4)$$

Where:

CA = net asset book value

The value generated using the firm's resources is best demonstrated through HCE, SCE, and CEE. The sum of the three components of the VA efficiency indicators makes up the value of VAIC.

$$VAIC = HCE + SCE + CEE \quad (5)$$

Independent Variables

Six independent variables are concentrated in this study as determinants of IC efficiency. The way of measurement of research variables is shown in Table 2. Firstly, firm size (SIZE) is measured by the natural logarithm of total assets. The optimum method for determining an organization's size in the banking sector is to use total assets (Bantel & Jackson, 1989). Secondly, this study employs Return on equity (ROE), which is gauged as the fraction of earnings before tax to total assets, as a measurement of the financial performance of banks, which is consistent with earlier research by El-Bannany (2008) and Chahine (2007). Thirdly, the Barrier of entry (ENTRY) is calculated by dividing the property, plant, and equipment by total assets, consistent with Depoers (2000) and El-Bannany (2008).

Concerning risk measurements, this study depends upon three proxies. The first proxy is financial leverage (LEV), quantified as the ratio of total debt to total equity. The second proxy (TANGIBILITY) is computed as the ratio of intangible assets to total assets, and the last measurement is Z-SCORE, which is measured through the following equation:

$$\frac{\text{ROA+Capital asset ratio}}{\text{Standard deviation of ROA}}$$

Where:

ROA = Return on assets

Capital asset ratio = Equity/Total assets

Hannan and Hanweck (1988) developed the Z-score index as a comprehensive measure that considers both credit risk and liquidity risk and other potential hazards realized in banks' earnings. When the Z-score is high, the bank is safer and less risky. Numerous studies (e.g., Houston et al., 2010; Laeven & Levine, 2009) used the risk index proposed by Hannan and Hanweck (1988).

Table 2: Research Variables and Their Measurement Methodology

Variable	Measurement
Dependent variable	
VAIC	Intellectual capital efficiency measured according to the value-added intellectual coefficient (VAIC) model.
Independent variables	
SIZE	The natural logarithm of total assets
ROE	Earning before tax/ total assets
ENTRY	Property, plant, and equipment/ total assets
LEV	Total debt/ total equity
RISK	Intangible assets/ total assets
Z-SCORE	$\frac{\textit{ROA+Capital asset ratio}}{\textit{Standard deviation of ROA}}$

Empirical Modeling

The following regression equation is developed to determine which of the selected determinants has a more significant impact on the level of IC efficiency of Cambodian commercial banks:

$$VAIC_{i,t} = \alpha_0 + \beta_1 SIZE_{i,t} + \beta_2 ROE_{i,t} + \beta_3 ENTRY_{i,t} + \beta 4 \; LEV_{i,t} + \beta_5 TANGIBILITY_{i,t} + \beta_6 ZSCORE_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where:

VAIC = The value-added intellectual capital coefficient

SIZE = Natural logarithm of total assets

ROE = Return on equity

ENTRY = The ratio of property, plant, and equipment to total assets

LEV = Total debt divided by total equity

TANGIBILITY = The ratio of intangibles to total assets

$$Z\text{-SCORE} = \frac{\textit{ROA+Capital asset ratio}}{\textit{Standard deviation of ROA}}$$

α = The constant or the intercept

β = The beta coefficient of the variable

ε = The error term.

FINDINGS AND DISCUSSION

This section illustrates the descriptive statistics of research variables, the correlation matrix between research variables, and the multivariate regression analyses.

Descriptive Statistics

Table 3 presents the descriptive analysis. As shown in this table, there is a significant disparity in the levels of IC utilization between Cambodian commercial banks, with a minimum of-0.86, a maximum of 10.13, a mean of 4.74, and a standard deviation of 2.14 for VAIC.

SIZE ranges from 17.29 to 22.8, with a mean and standard deviation of 20.24 and 1.32, respectively. This suggests that there is no substantial variation in the size of the sampled Cambodian commercial banks. The mean and standard deviation of ROE are 0.11 and 0.08, respectively. Meanwhile, this variable's minimum and maximum values are -0.15 and 0.36, respectively, demonstrating the significant difference in financial performance across the sample of commercial banks in Cambodia. The range of ENTRY between 0 and 0.02 indicates that the level of entry barriers to the banking industry among Cambodian commercial banks is slightly dispersed.

Regarding risk measurements, the smallest and greatest LEV values for the sampled banks are 0.03 and 12.75, respectively, suggesting that Cambodian commercial banks' leverage levels are significantly dispersed. It can also be revealed that the percentage of the possession of tangible assets is very similar among Cambodian commercial banks, as the minimum and maximum values of TANGIBILITY of sample banks are 0 and 0.04, respectively. Meanwhile, the levels of exposure to insolvency risk among Cambodian commercial banks broadly fluctuate due to the big difference between the lowest and highest values of Z-SCORE. Besides, the average and standard deviation of Z-SCORE are 26.22 and 12.36, respectively.

Table 3: Descriptive Statistics

	N	Mean	SD	Min	Max
VAIC	157	4.735	2.144	-0.862	10.126
SIZE	157	20.238	1.315	17.286	22.798
ROE	157	0.114	0.083	-0.146	0.359
ENTRY	157	0.009	0.006	0	0.022
LEV	157	4.940	2.602	0.025	12.749
TANGIBILITY	157	0.002	0.005	0	0.041
ZSCORE	157	26.222	12.358	3.199	57.938

Pairwise Correlation

The Pearson's correlation coefficients for the study variables are shown in Table 4. Pairwise correlation is used to determine whether there is a multicollinearity issue and the direction of the relationship between the variables. The multicollinearity issue can be observed if the coefficient value is greater than 0.70 (Gujarati, 1995). One can see that the total coefficient value is less than 0.70, with the largest coefficient (between SIZE and LEV) being 0.638. As a result, it is demonstrable that multicollinearity is not a concern in this study.

SIZE, ROE, and Z-SCORE positively correlate with VAIC, while ENTRY and TANGIBILITY are negatively correlated with VAIC. This indicates that Cambodian commercial banks with bigger sizes, better financial performance, lower riskiness, lower levels of barriers to entry, and lower percentage of intangible assets are more efficient in utilizing their IC resources.

Table 4: Pairwise Correlation

	VAIC	SIZE	ROE	ENTRY	LEV	TANGIBILITY	Z-SCORE
VAIC	1						
SIZE	0.1951***	1					
	0.0143						
ROE	0.2658***	0.5635***	1				
	0.0008	0.0000					
ENTRY	-0.2209***	0.2060***	0.0167	1			
	0.0054	0.0097	0.8359				
LEV	-0.0734	0.6380***	0.5120***	-0.0189	1		
	0.3607	0.0000	0.0000	0.8142			
TANGIBILITY	-0.2368***	-0.1447*	-0.2529***	0.1965**	-0.0717	1	
	0.0028	0.0707	0.0014	0.0136	0.3719		
Z-SCORE	0.2196***	0.3007***	0.0132	0.3528***	-0.0942	-0.0604	1
	0.0057	0.0001	0.8701	0.000	0.2406	0.4524	

Note: *, **, and *** indicate the level of significance at 0.1, 0.05, and 0.01, respectively.

Multivariate Regression Analysis

Three regression models are established to examine the relationship between research variables in different conditions. The OLS regression between the independent variables and VAIC is shown in Model 1. A robust regression estimation of the Model 1 regression is run in Model 2. The fixed effect regression model, displayed in model 3, is used for additional tests. The Hausman test is conducted to determine which of the random and fixed effect models are appropriate. According to the result of this test, the fixed effect model is more appropriate, since the p-value is lower than 0.01.

Table 5: Hausman Test

chi2(14)	40.42
Prob>chi2	0.0002

Using the variance inflation factor (VIF), multicollinearity is again evaluated. Only when VIF exceeds 10, collinearity is considered a problem (Netter et al., 1983). The following regression analyses show that all independent variables have VIFs lower than 5, indicating that the regression model does not exhibit multicollinearity.

Table 6 shows the determinant factors that influence IC efficiency. This table illustrates that SIZE, ROE, and ENTRY are the only variables that significantly affect VAIC across the three regression models. Although VAIC is positively affected by both SIZE and ROE, it is negatively influenced by ENTRY. This indicates that the utilization of IC resources is enhanced by increasing the bank size, improving the bank's profitability, and lowering the banks' barriers to entry in the banking sector.

Table 6: Regression Analysis of the Determinants of IC

Value-added intellectual capital (VAIC)			
	Model 1	Model 2	Model 3
	Pooled OLS	Robust	Fixed Effect
	Coef.	Coef.	Coef.
	(t-stat)	(t-stat)	(z-stat)
SIZE	0.6141663***	0.6141663***	0.8308756***
P-value	0.015	0.009	0.007
VIF	4.76	4.76	
ROE	7.010283***	7.010283***	5.470458***
P-value	0.005	0.002	0.001
VIF	1.84	1.84	
ENRTY	-133.6619***	-133.6619***	-56.06677***
P-value	0.000	0.000	0.012
VIF	1.52	1.52	
LEV	-0.3670124***	-0.3670124***	-0.0372264
P-value	0.000	0.001	0.748
VIF	2.69	2.69	
TANGIBILITY	-23.411	-23.411	24.3159
P-value	0.438	0.362	0.155
VIF	1.21	1.21	
Z-SCORE	0.0325237**	0.0325237*	0.0214977
P-value	0.036	0.061	0.37
VIF	1.61	1.61	
Year effects	Yes	Yes	Yes
Cons	-5.977254	-5.977254	-12.39812
	0.15	0.116	0.043
N	157	157	157
F/Wald Chi2	4.54	7.34	4.78
Prob > F	0.000	0.000	0.000
R	0.3091	0.3091	0.1072

Note: *, **, and *** indicate the level of significance at 0.1, 0.05, and 0.01, respectively.

Based upon the above regression results, bank size, bank profitability, and entry barriers are the only factors that significantly influence the effective utilization of IC resources. Meanwhile, it can be revealed that IC efficiency is not significantly affected by any of the three investigated risk measurements.

The regression findings show that bank size (SIZE) is significantly and positively linked with IC efficiency since the P-value of the SIZE coefficient is above 0.01. This advocates that bigger banks perform well in terms of the effective utilization of IC resources. This result is similar to studies conducted by Babajee (2021) and Olohunlana et al. (2023). Therefore, H1 is accepted.

Bank profitability (ROE) is observed to be significant with an anticipated positive sign since the P-value of this variable is lower than 0.01. This demonstrates that commercial banks in Cambodia with higher profitability are better at using IC efficiently than banks with low earning capacity. This finding matched with those studies of Al-Musalli and Ismail (2012), Babajee (2021), Duho and Onumah (2018), El-Bannany (2008), Hidayah and Adityawarman (2017), and Meressa (2016). Then H2 is accepted.

Concerning the entry barriers variable (ENTRY), it is observed that the coefficient of this variable in the regression findings is significant and negative with a P-value less than 0.01, demonstrating that the

presence of entry barriers decreases the efficiency of IC and vice versa. This result is consistent with El-Bannany's (2008) and Babajee's (2021) studies. Hence, H3 is accepted.

Regarding risk measurements, the findings of leverage, intangibility, and insolvency risk are as follows: Bank leverage (LEV) has a negative and insignificant impact on IC efficiency since the P-value of this variable in the first two models is less than 0.01 but higher than 0.1 in the last model. This result is consistent with Kweh et al.'s (2015) study. Therefore, it is difficult to conclude that it significantly affects IC efficiency. Based on this regression finding, H4 is not accepted.

Contrary to the findings of El-Bannany (2008) and Kweh et al. (2015), the bank intangibility (INTANGIBILITY) coefficient is found to be not significant since the P-value of this variable is higher than 0.1 across the three regression models. This suggests that raising the proportion of intangible assets in Cambodian commercial banks does not affect IC efficiency. Thus, H5 is rejected.

Concerning insolvency riskiness (Z-SCORE), this variable's coefficient is positively and significantly associated with IC efficiency, with a P-value lower than 0.1 in the first two regression models. However, the P-value of this coefficient is higher than 0.1 in the last regression model. Accordingly, it cannot be confirmed that exposure to insolvency risk affects IC efficiency. Consequently, H6 is rejected.

CONCLUSION

The purpose of this study is to examine the determinants of IC efficiency in Cambodian commercial banks during the period from 2013 to 2021. This study focuses on six bank-specific characteristics: bank size, bank profitability, entry barriers, bank leverage, bank tangibility, and bank riskiness.

Among the six investigated bank characteristics, bank size, bank profitability, and entry barriers are found to be significantly related to IC efficiency. The banks with bigger sizes, better financial performance, and lower barriers to entry are more efficient in using IC resources.

By examining determinants of IC efficiency in Cambodian banks, this study has added to the growing debate in IC research, especially concerning those related to the determinants' effects on IC efficiency. It can also be used as a basis for upcoming studies, particularly those focused on the financial industry. This study is the first to examine the factors influencing IC efficiency in Cambodia's banking sector. The results of this research may motivate researchers to investigate the relationship between a bank's distinct characteristics and IC efficiency in the financial sector of a developing economy.

There are various policy implications for this study. Firstly, it might aid banking regulators in enhancing their use of IC resources and, therefore, maximizing value creation. This investigation is helpful to bank managers since it informs them of the factors, they should focus on to raise IC efficiency for the banks.

Several limitations of this investigation have been recognized. This research was limited to the banking industry, and it is not appropriate to generalize the results of the current study to other sectors. Therefore, future research can be done by including other sectors to understand IC efficiency in Cambodia thoroughly. It is also useful to compare this issue between developed and emerging nations. Here, cultural variations between these two types of nations that might impact IC, particularly the idea of organizational culture, should be considered before making any generalizations or changes to the concepts. Many factors that affect IC efficiency are not considered in this study, and future researchers can examine the impact of other independent variables, such as corporate governance mechanisms, on IC efficiency.

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