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The Influence of Intellectual Capital on Earnings Quality: Evidence from Firms Listed on the Cambodia Securities Exchange

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ABSTRACT

This study aims to determine whether the efficiency of intellectual capital (IC) and each of its three constituents—human capital efficiency (HCE), capital employed efficiency (CEE), and structural capital efficiency (SCE)—can generate better earnings quality (EQ) in an emerging market. Drawing on the Pulic (2004) model for measuring the efficiency of IC and the absolute value of discretionary accruals as a proxy for EQ, the study analyzes the data of a sample of Cambodian nonfinancial firms listed on the Cambodian Securities Exchange (CSX) during the period from 2013 to 2021. The empirical results indicated that Cambodian firms active in utilizing IC has more tendency to provide reports of high quality. Besides, it is shown that each of the three elements of IC significantly and positively influences EQ. Meanwhile, SCE has the most significant impact among the three components. Those results offer an enhanced understanding of IC-utilizing and EQ practices that might be in favor of investors, regulatory bodies, and scholars. This study is among the first studies investigating Cambodian firms for IC and EQ topics.

Keywords: : Earnings quality; Value-added intellectual coefficient; Human capital efficiency; Employed capital efficiency; Structural capital efficiency

INTRODUCTION

Globally, the enhancement of information technology and telecommunication has improved the employment of intelligence and data. In this composite and amending work environment, the existence of firms relies upon initiating inventive products, innovation, and following procedures focused on advanced knowledge, which is known as intellectual capital (IC); thus, the efficiency of such resources can be represented as effective employment of organization resources (Chen et al., 2005).

One of the most important fields in which firms ought to efficiently utilize their IC is enhancing the quality of financial reporting. Earnings can also be considered an indicator of the efficient utilization of firms' resources; therefore, different users need accurate and valid data about earnings to make decisions. This indicates that firms' efficiency in utilizing IC and providing high-quality earnings are related.

Regarding the association between these two variables, two opposing perspectives are suggested. The optimistic viewpoint based on the resource-based view argues that earnings quality (EQ) is higher in firms that effectively employ their IC since they are under less financial pressure and are in a better position to detect and prevent fraud since the effective employment of IC can improve firms' financial performance and increase the effectiveness of their internal control system. Depending on the agency theory, the opposing viewpoint states that controlling effective IC enables managers to prepare their reports in a way that assists them in achieving their objectives.

The impact of IC efficiency on the EQ has been studied by Darabi et al. (2012a; 2012b), Hatane et al. (2019), and Rachmawati (2020), but they generated different results. The review of the preceding investigations that examine the relationship between IC efficiency and EQ emphasizes a significant relationship between those two variables. However, there is a need for more Cambodian investigations into this issue. Therefore, the research examines the role and importance of IC and its components in determining EQ among firms listed on CSX.

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Financial statements provide data for measuring IC efficiency and EQ. Pulic's (2004) value-added intellectual coefficient (VAIC) model is employed as a proxy for IC efficiency. EQ is measured by the absolute value of discretionary accruals calculated through a modified Jones model.

Based upon a sample of 38 firm-year observations from 2013 to 2021 and the governing firms' characteristics, practical findings advocate a positive link between IC efficiency and EQ. This indicates that the efficient use of IC positively impacts enhancing the quality of earnings. In addition, IC components have a significant and positive influence on EQ. However, structural capital (SC) has a more substantial impact on EQ than human capital (HC) and capital employed (CE), indicating that firms that efficiently use SC provide high-quality reports.

Understanding the influence of IC efficiency on earnings quality in different sectors could be very important for policymakers, regulatory bodies, and standard setters. The advanced literature on explaining the relationship between a firm's IC and its EQ sparked extensive debate among scholars globally and nationally. This study could also be considered one of Cambodia's first investigations clarifying the link between IC and EQ.

This paper has four sections. After the introduction, the second portion reviews prior studies on this issue. The third part presents the research methodology, and the findings and conclusion are shown in the last two sections.

LITERATURE REVIEW

The IC literature reveals the significance and intangible character of such resources. The IC's principal efforts are indebted to Machlup's studies in 1962, but Galbraith invented the IC concept in 1969. He considered that IC is beyond rational action and involves an intellectual accomplishment. In the evolution of the IC concept, theorists have offered diverse definitions for IC from numerous perspectives and by empirical and experimental models (Abeysekera, 2008).

Barney (1991) asserts that IC has a concealed character and has been identified as a firm strategic resource. Brooking (1996) also recognizes IC as a mixture of four key elements: market properties, human-based possessions, intellectual resources, and infrastructure assets.

Edvinsson and Sullivan (1996) define IC as knowledge that can be transformed into value. As indicated by Ross et al. (1997), IC comprises an intellectual portion (such as HC) and a non-intellectual portion (such as SC). According to Stewart (1997), the broadest definition of IC is the collection of intelligence, information, intellectual property, and expertise of every person in a firm used to build wealth and competitive advantage.

Sveiby (1997) argues that IC comprises three intangible asset categories: inner structure, exterior structure, and worker capability. Furthermore, Klein (1998) defines IC as knowledge, skills, proficiency, and linked soft resources more readily available than tangible and monetary capital. In operationalizing the concept of IC, Nahapiet and Ghoshal (1998) have emphasized that HC and SC (through knowledge, skills, and capabilities) can enhance organizational development.

According to Bontis et al. (2000), IC includes knowledge, information, intellectual assets, and experience to create wealth. "Intellectual asset" refers to total intellectual capacity or primary knowledge. Marr (2005) identifies IC as an assemblage of knowledge resources that are regarded as the firm's characteristics, and importantly, raising the level of value-added for the main interested parties of the firm results in enhanced effectiveness. Furthermore, Ghosh and Wu (2007) further described IC as the specified and valued knowledge belonging to the firm, for example, know-how, patents, and skilled personnel.

Moreover, IC can be described as a pool of a firm's intangible assets, which allows it to perform numerous functions. It can be employed as a strategic resource for the firm's specific and valued knowledge. More recently, IC is illustrated by organizational assets, such as skilled employees, knowledge, and management's philosophy (Anuonye, 2016).

Although no globally recognized and standard definition of IC is presented, there is relative agreement on its components (Tan et al., 2007). From an accounting perspective, Pulic (2004) divided IC into three components: HC, SC, and CE. This paper applies this accounting viewpoint to IC.

The first and most crucial component of IC is HC, which is regarded as a primary driver in generating value for a firm and realizing effectiveness and competitiveness (Chen et al., 2009; Dokko & Rosenkopf, 2010; Nordenflycht, 2011). According to Mayo (2001), HC

components include the employees' capabilities, growth potential, motivation, commitment, and innovativeness. Secondly, SC comprises organizational capital (all the assets strengthening the firm's processes) and relational capital (associations with stakeholders). Such capital is part of the culture, system of knowledge management, effective procedures, and support of the top management of the organization (Yang & Lin, 2009). Finally, CE refers to the entire capital harnessed in a firm's physical and financial assets. From the financing side, it equals total assets less than intangible ones (Bozbura, 2004).

Due to the effect of the financial statements on the decisions of stakeholders, one of the most important fields in which IC can be efficiently utilized is providing reports of high quality. Accounting earnings are regarded as one of the most important financial statement elements that are valuable for shareholders (Hessayri & Saihi, 2015). Since accounting numbers are subject to different accounting policies and estimates, the practice of earnings management (EM) can result in a false presentation of a firm's financial condition, thus lowering the quality of earnings (Peni & Vähämaa, 2010).

There are two opposing views in studying the relationship between IC and EQ. The optimistic perspective based on resource-based theory argues that firms that efficiently utilize their IC are less prone to engage in EM practices. This theory evaluated a firm's competitive advantage, particularly for businesses built on the knowledge-based economy. The theory focuses on the efficient use of strategic assets as a prerequisite for achieving competitive advantage (Zéghal & Maaloul, 2010). According to this argument, firms can efficiently utilize their IC resources to enhance the quality of their financial reports.

The pressure generated by growing financial or nonfinancial difficulties and significant flaws in control systems or the low likelihood of detecting fraud are two key factors driving corporations to commit fraud (Rodgers et al., 2015). As a result, it is presumed that IC helps eliminate firms' opportunistic behavior. Firstly, the financial performance argument asserts that IC boosts firms' profitability. Many studies demonstrate that IC boosts financial performance (e.g., Nadeem et al., 2018; Nawaz, 2017).

The role of HC and CE in this aspect can be observed since managing physical and financial capital aids in achieving the firm's financial performance goal, particularly related to accounting profit. Besides, managers with a background in managing assets and capital can be more alert to the detrimental influence of EM practices on firms' financial performance, and this competence will constrain engaging in EM practices (Nuryaman et al., 2019). Hence, IC can relieve firms' financial pressure and lower misleading financial reporting.

Secondly, from the perspective of corporate governance, the presence of significant internal controls eliminates fraudulent activity. According to Cressey (1953), IC components like SC may encourage and enhance the effectiveness of corporate governance and internal controls, which may be considered distinct elements for preventing and detecting fraud. SC will aid the firm in generating cautious planning and an active management control system, which can monitor the management to perform proficiently and inhibit management activities that will hurt the firm's value in the long run. Therefore, SC is expected to restrict EM (Nuryaman et al., 2019).

On the other hand, according to agency theory, the pessimistic view states that controlling intellectual resources might assist managers in preparing their reports to achieve their opportunistic objectives. The principal-agent connection is embraced by agency theory (Fama, 1980; Jensen & Meckling, 1976). This theory emphasizes that every person has the freedom to act in his or her own best interests. The party directing the agent to act on their behalf and manage the firm is known as the principal. Managers who work for the principal may be more adaptable and knowledgeable about the firm than the principal. In actuality, the manager will retain the accounting data for his personal advantage. The business owners became suspicious of this, which prompted a conflict. Moreover, this conflict prompts management to use EM and deceives stakeholders about the firm's actual performance. Since the financial statements submitted by the agent to the principal serve as the basis for determining the agent's compensation as well as the assessment of the agent's success in attempting to enhance the principal's welfare (Jensen & Meckling, 1976; Watts & Zimmerman, 1986), the principal's and stakeholders' confidence in these statements is unquestionably put at risk if a manager has a high level of intellectual resources when regulating firm information.

Numerous previous studies have investigated the relationship between IC efficiency and EQ, and all of those investigations depend on the VAIC model

developed by Pulic (2004) to measure IC efficiency. However, they differ in the method of measuring EQ. For example, Darabi et al. (2012a) examined the relationship between firms' IC and EQ across a sample of firms listed in the Iran stock market from 2005 to 2010. The empirical analysis was done depending on the absolute value of discretionary accruals as a measure of EM. The statistical test results showed that the IC and HC components significantly impact EQ. In contrast, SC and CE have no direct influence on EQ.

Additionally, Darabi et al. (2012b) investigated the effect of different IC components on the quality of financial reporting among a sample of firms from different industries listed on the Tehran Stock Exchange between 2004 and 2009. Models developed by Dechow and Dichev (2002) and Francis et al. (2005) were employed to compute the quality index of financial statements. The results demonstrated that human capital efficiency (HCE) and capital employed efficiency (CEE) positively influence the quality of financial reporting. In contrast, SCE has a meaningfully negative influence on the quality of financial reports. Among these three IC ingredients, HCE's impact on the quality of financial reporting was more effective than the other two components.

Depending upon earning stability and earning predictability as indexes of EQ, Zanjirdar and Chogha (2012) found a positive and significant association between the IC efficiency and EQ indexes across a sample of firms listed in the Tehran Exchange Market through five years from 2004 to 2009. Similarly, Asadollahi et al. (2013) tested the correlation between IC and the earnings predictability of firms listed on the Tehran Stock Exchange between 2007 and 2011. They depended on the Francis et al. (2005) model to assess earnings predictability. The findings from testing the study hypotheses illustrated a meaningful positive connection between IC efficiency and earnings predictability. They also realized a positive and meaningful connection between HCE and SCE and earnings predictability, while CEE has no significant relationship with earnings predictability.

Azizi et al. (2013) investigated the association between IC efficiency and EQ through a sample of firms listed on the Tehran stock exchange in 10 years between 2002 and 2011. Eight financial performance indicators in five sets, including receivable accounts, gross profit, cost of sales management, applied capital rate, liquidity realization, operational liquidity, inventory, and profitable reinvested assets ratio, were employed to measure EQ. The results demonstrated a significant and positive relationship between IC efficiency and EQ. Employing the modified Jones model as an index of EQ, Mojtahedi (2013) demonstrated that IC had a positive and meaningful influence on EQ across a sample of Malaysian firms between 2000 and 2011. Conversely, Galdipour et al. (2014) indicated a significant reverse relationship between IC efficiency and EM through a sample of firms listed on the Tehran stock exchange from 2006 to 2012.

Marzban et al. (2014) examined the association between IC and indicators of earnings quality in evolving firms listed on the Tehran Stock Exchange from 2007 to 2012. Earnings stability, predictability, the profit-to-equity ratio, and changes in operating cash flow with profit were used as indicators of earnings quality (EQ). They showed a meaningful positive correlation between IC and income sustainability and predictability. They also discovered no meaningful relationship between IC and the profit-to-equity ratio or operating cash flow with profit.

Parast et al. (2014) investigated the relationship between IC efficiency and earnings stability in the petrochemical and pharmaceutical firms listed on the Tehran Stock Exchange between 2002 and 2008. They showed a significant positive connection between IC and the stability of earnings. They also showed a significant and positive link between HCE and earnings stability. However, there is no significant relationship between SCE and CEE and earnings stability. Furthermore, Sarea and Alansari (2016) investigated the correlation between IC efficiency and EQ for the firms listed in the Bahrain Bourse. They applied the modified Jones model to measure EQ. The findings showed a positive association between the IC and its three elements with EQ. In comparing firms in the consumer goods sector listed on Indonesia's and Malaysia's stock exchanges for six years from 2011 to 2015, Hatane et al. (2019) concluded that IC positively impacts EQ in Indonesia. However, the influence is shown to be negative in Malaysian firms.

By employing the Roychowdhury (2006) model to measure real earnings management (REM), Nuryaman et al. (2019) examined the effect of IC on REM in Indonesian manufacturing firms listed on the Indonesia Stock Exchange in 2016. They showed that the combination of IC elements can decrease EM behavior through the manipulation of sales operations. Additionally, Rachmawati (2020) examined the effect of IC and its ingredients on REM

among a sample of 80 firms listed on the Indonesia Stock Exchange from 2015 to 2017. The research findings showed that neither IC nor its components affect REM.

Arnas et al. (2021) sought to identify the factors influencing EM across 14 Indonesian transportation-listed firms, such as IC, institutional and managerial ownership, and audit quality. They depended on the modified Jones model to determine EM. Only IC among the studied variables was found to influence EM positively. Throughout the eleven years from 2008 to 2018, Jaya et al. (2021) investigated whether the management of a sample of 70 Indonesian listed firms used their IC to commit fraud by misrepresenting earnings in financial statements. They depended on the absolute value of discretionary accruals calculated using the modified Jones model as a measurement of EM, and they showed that HC had a negative impact on EM behaviors in contrast to SC and CE, which positively affect such fraudulent activity.

To explain how IC affects EQ, Mutuc (2021) combined the moderating impact of industry competitiveness with the mediating influence of financial performance. This study's sample consisted of 259 nonfinancial listed firms from seven countries—China, India, Malaysia, South Korea, the Philippines, Taiwan, and Thailand—from 2011 to 2017. The modified cross-sectional Jones model served as a proxy for EQ. The significant conclusions showed that IC investments are crucial for improving EQ and adding value to the organization. IC causes better EQ, although the effect is somewhat mediated by financial performance across firms in China, the Philippines, Taiwan, and Thailand. Moreover, industry competition supports a change in how IC affects EQ. It is demonstrated that industry competitiveness moderates the IC-EQ association positively in firms with higher industry competition while negatively moderating this relationship in Thailand and the Philippines' enterprises.

In a sample of 187 listed firms on the Tehran Stock Exchange between 2011 and 2018, Lotfi et al. (2022) evaluated the effect of IC and its components, namely the effectiveness of human capital, structural capital, relational capital, and customer capital, on fraud in financial statements. The adjusted Beneish (1999) model was employed in this study to detect fraud in the sample firms' financial statements. The results demonstrated a negative and significant correlation between IC and its elements and financial statement fraud, meaning that by investing in IC and its elements, the amount of fraud in the financial statements of commercial firms is reduced. Furthermore, Sowaity (2022) examined the impact of IC on EM across a sample of Jordanian-listed firms and found a significant negative relationship between these two variables. Regarding the IC component, they realized that EM is negatively and significantly related to SCE but not significantly associated with HCE.

More recently, Romadhoni and Achyani (2023) investigated the impact of IC on the quality of earnings across a sample of Indonesian manufacturing listed firms during two years from 2019 to 2020. They found that the quality of earnings is positively affected by CEE, but HCE or SCE does not influence it. Across a sample of firms listed on the Iraqi Stock Exchange between 2012 and 2018, Salehi et al. (2023) examined the influence of IC on financial statement fraud. They found that IC negatively affects such a practice.

The review revealed that none of these studies focused on investigating this issue among Cambodian firms. There is a research gap in investigating the impact of IC efficiency on EQ in such a country, and this research tries to fill this gap by examining whether Cambodian-listed firms that efficiently utilize their IC engage in EM practices, especially with the mixed results of previous research.

Cambodian firms pay great attention to IC resources. Cambodia's Human Development Index, a composite measure published by the United Nations that includes life expectancy, educational attainment, and income level, increased from a 0.44 score in 2001 to a 0.6 score in 2020, growing at an average annual rate of 1.64%. Since 1989, when it returned to a market-oriented economy, Cambodia has introduced policies and reforms to develop its private sector and business environment and boost economic growth through investment and trade. According to the World Bank's Doing Business 2018 report, Cambodia ranks 131 out of 189 economies on the Protecting Minority Investors Index.

Regarding CE in Cambodia, the country's environment provides natural resources, such as forests, waterways, plants, and wildlife. Natural resources also include minerals, energy, and extractives. The environment is also varied, covering at least seven distinct landscapes nationwide. Depending upon the explanation above, the following hypothesis is formulated:

H_1: IC efficiency affects the level of engagement in accrual-based earnings management (AEM) of Cambodian listed firms.

Since HC, CE, and SC are the three components that constitute IC, separate hypotheses are established for each of these components:

H_2: HCE affects the level of engagement in AEM of Cambodian listed firms.

H_3: SCE affects the level of engagement in AEM of Cambodian listed firms.

H_4: CEE affects the level of engagement in AEM of Cambodian listed firms.

METHODOLOGY

Data and Sample

Accounting data for study variables are retrieved from firms' financial reports. The study's sample involves the nonfinancial Cambodian firms listed on CSX from 2013 to 2021. In line with preceding research, financial firms are omitted due to their exceptional disclosure practices since they are subjected to diverse reporting requirements that make evaluating discretionary accruals problematic (Hong & Anderson, 2011; Kim et al., 2012). There are seven nonfinancial firms listed on CSX during the study period. Table 1 illustrates the name of these firms, the year of listing on CSX, and the number of available reports for each firm since the year of the listing.

Table 1: Details of Firms Listed on the Cambodia Securities Exchange

Firm name	Year of listing	Number of available reports
DBD Engineering Plc.	2021	1
Pestech (Cambodia) Plc.	2020	2
Sihanoukville Autonomous Port	2017	5
Phnom Penh SEZ Plc.	2016	6
Phnom Penh Autonomous Port	2015	7
Grand Twins International (Cambodia) Plc.	2014	8
Phnom Penh Water Supply Authority	2012	9
Total		38

This table illustrates that the final sample of the seven Cambodian nonfinancial listed firms encompasses 38 firm-year observations. Table 2 shows all observations allocated by industry and year.

Table 2: Sample Distribution by Industry and Year

Industry	Complete sample	
	N	%
Apparel Clothing	8	21.05
Construction and Engineering	1	2.63
Port Services	12	31.58
Power	2	5.26
SEZ Developer	6	15.79
Water Utility	9	23.68
Total	**38**	**100**

Year	Complete sample	
	N	%
2013	1	2.63
2014	2	5.26
2015	3	7.89
2016	4	10.53
2017	5	13.16
2018	5	13.16
2019	5	13.16
2020	6	15.79
2021	7	18.42
Total	**38**	**100**

Variables Measurement

The research model consists of three variables, and here is how to measure each.

Independent Variables

Intellectual Capital (IC) Efficiency

IC efficiency is measured using the VAIC method developed by Pulic (2004). Despite different methods of measuring IC, the VAIC model developed by Pulic (2004) is the most widely accepted and widely used means to measure IC efficiency. Pulic (2004) claimed that the firms' market value is generated by CE and IC comprising SC and HC. In this approach, information about the efficiency of value generation is computed using a firm's intangible (HC and SC) and tangible resources (CE). This approach ultimately evaluates IC through HCE, SCE, and CEE.

This approach's main advantage is its simplicity. The numerals are relatively easy to acquire from firms' annual reports and can be utilized for comparisons between or within firms once calculated for a year. Conversely, this straightforwardness has various shortcomings. Comparing a firm's labor expenditures to its IC might underestimate IC compared to other market-based methodologies. Furthermore, a firm might utilize its workforce resources ineffectively (Starovic & Marr, 2003).

The computation of VAIC takes many steps. First, value added (VA) is calculated as the sum of operating profit (OP), employee costs (EC), depreciation expenses (DP), and amortization expenses (AE).

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

Secondly, HCE is computed as the computed VA coefficient over HC, where HC is computed by drawing from employees' salaries and benefits. HCE is measured as follows:

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

Thirdly, structural capital (SC) is calculated as the ratio of VA to HC because SC and HC are negatively associated with generating value for businesses (Lin et al., 2015). Structural capital efficiency (SCE) is calculated as the fraction of SC to VA.

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

Fourthly, the influence of CE utilized in generating value for firms is measured by net asset book value. CEE offers information concerning the proportion of VA over the CE. CEE is calculated as follows:

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

HCE, SCE, and CEE exemplify the value generated from the firm's whole resources. The value of VAIC equals the aggregate amount of the three elements of VA efficiency indicators.

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

Dependent Variable

Earnings Quality (EQ)

The absolute value of discretionary accruals (ABDA), calculated through the modified Jones model (1995), was used as a proxy for EQ. Although numerous methods of measuring EQ exist, the modified John model is considered the most effective. It has also been mentioned as a powerful model that can detect EM by measuring unexpected accruals better than other models. A higher value of absolute discretionary indicates a higher EM effort, implying a lower EQ (Mojtahedi, 2013). Although the sample is small, this study depends on this model for measuring the extent of EQ, as it has been widely employed in previous research with small samples (e.g., Romadhoni & Achyani, 2023; Sowaity, 2022).

When assessing the current discretionary accruals, the total current accrual for a firm *i* in year *t* ($TCA_{i,t}$) is initially computed as follows:

$$TCA_{it} = \Delta CA_{it} - \Delta cash_{it} - \Delta CL_{it} + \Delta STDebt_{it} - DEP_{it} \quad (1)$$

Where:

ΔCA_{it} = change in current assets

$\Delta Cash_{it}$ = change in cash and cash equivalent

ΔCL_{it} = change in current liabilities

$\Delta STDebt_{it}$ = change in short-term debt

DEP_{it} = Depreciation and amortization expense for firm *i* in year *t*.

Secondly, an ordinary least squares method was employed for running the following regression for all firms in the sample:

$$\frac{TCA_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{TA_{it-1}}\right) + \beta_1 \left(\frac{\Delta REV_{it}}{TA_{it-1}}\right) + \beta_2 \left(\frac{PPE_{it}}{TA_{it-1}}\right) + \varepsilon_{it} \quad (2)$$

Where:

TA_{it-1} = Lagged value of total assets for firm *i*.

ΔREV_{it} = change in net revenues

ΔREC_{it} = change in net receivables

PPE_{it} = Property, plant, and equipment for firm *i* in year *t*.

Thirdly, the non-discretionary accruals ($NDAC_{i,t}$) value for each firm was computed through valuations of α_0, α_1, β_1, and β_2 as follows:

$$NDAC_{it} = \hat{\alpha}_0 + \hat{\alpha}_1 \left(\frac{1}{TA_{it-1}}\right) + \hat{\beta}_1 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{TA_{it-1}}\right) + \hat{\beta}_2 \left(\frac{PPE_{it}}{TA_{it-1}}\right) \quad (3)$$

Fourthly, the discretionary accruals (DACi,t) value was estimated as the residuals of the previous regression as follows:

$$DAC_{it} = \frac{TCA_{it}}{TA_{it-1}} - NDAC_{it} \quad (4)$$

Finally, ABDA was evaluated by the absolute value of DAC_{it}.

Control Variables

According to the prior literature (Dechow et al., 1995; Klein, 2002; Pincus & Rajgopal, 2002; Roychowdhury, 2006; Skinner & Sloan, 2002), four control variables, which have been realized to affect EQ, have been included in research regression. Mainly, the chosen control variables are firm size (SIZE), return on equity (ROE), firm leverage (LEV), and firm growth (GROWTH). Table 3 shows the measurement of the research's independent, dependent, and control variables.

Table 3: Measurement of the Study Variables

Variable	Measurement
Independent variables	
VAIC	IC efficiency is measured according to the VAIC model.
HCE	HCE coefficient.
SCE	SCE coefficient.
CEE	CEE coefficient.
Dependent variable	
ABDA	The absolute value of discretionary accruals (calculated through the modified Jones model).
Control variables	
SIZE	Natural log of total assets.
ROE	Net income / total equity.
LEV	Total debt / total equity.
GROWTH	The asset growth rate is calculated through the following equation: $\frac{\text{Assets}_{i,t} - \text{Assets}_{i,t-1}}{\text{Assets}_{i,t-1}}$

Empirical Model

After gathering data, a regression equation is assessed to examine the first hypothesis of the research as follows:

$$ABDA_{it} = \alpha_0 + \alpha_1 VAIC_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROE_{it} + \alpha_4 LEV_{it} + \alpha_5 GROWTH_{it} + \varepsilon_{it} \quad (1)$$

Where:

$ABDA_{it}$ = The absolute value of discretionary accruals (calculated through the modified Jones model)

$VAIC_{it}$ = The efficiency of IC

$SIZE_{it}$ = The natural logarithm of total assets

ROE_{it} = The ratio of net income to total equity

LEV_{it} = The ratio of total debt to total assets

$GROWTH_{it}$ = Assets growth rate

To avoid the problem of multicollinearity, a separate regression equation is addressed for each VAIC component as follows:

$$ABDA_{it} = \alpha_0 + \alpha_1 HCE_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROE_{it} + \alpha_4 LEV_{it} + \alpha_5 GROWTH_{it} + \varepsilon_{it} \quad (2)$$

$$ABDA_{it} = \alpha_0 + \alpha_1 SCE_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROE_{it} + \alpha_4 LEV_{it} + \alpha_5 GROWTH_{it} + \varepsilon_{it} \quad (3)$$

$$ABDA_{it} = \alpha_0 + \alpha_1 CEE_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROE_{it} + \alpha_4 LEV_{it} + \alpha_5 GROWTH_{it} + \varepsilon_{it} \quad (4)$$

Where:

HCE_{it} = The coefficient of HCE

SCE_{it} = The coefficient of SCE

CEE_{it} = The coefficient of CEE

RESULTS

This section is divided into three parts. The first part presents the descriptive statistics of the study variables, while the second section shows the correlation matrix among research variables. The final part discusses the implications of the relationship between EQ and VAIC and its components regarding the clarified projected hypotheses.

Descriptive Statistics

Table 4 shows the descriptive statistics of the complete sample. The table shows that ABDA ranges between 0.00001 and 0.018, with a mean of 0.008 and a standard deviation of 0.005, indicating that the difference between EM engagement levels is high between firms listed on CSX. Meanwhile, the minimum value of 1.384, the maximum value of 8.109, the mean value of 3.517, and the standard deviation of 1.817 of VAIC illustrate that the difference between the levels of utilizing IC between Cambodian listed firms is slightly dispersed.

A comparison of the means and standard deviations of HCE (2.7, 1.55), SCE (0.519, 0.274), and CEE (0.112, 0.056) suggests that the sample firms were commonly more active in creating value from their HC rather than from their CE and SC since the significant share of the VAIC consists of the HCE. This indicates that most of the generated value results from how the firms employ their HC.

Firm size (SIZE) has an average value of 18.793. This variable ranges between 16.247 and 20.346; its standard deviation was 0.948. This demonstrates that there is no significant difference in the size of the sampled firms. Financial performance measured by the return on equity (ROE) has an average value of 0.068 and a standard deviation of 0.041. While the maximum value of ROE amounted to 0.155, the minimum value amounted to -0.02. This illustrates that the ROE figures of Cambodian firms listed on CSX differ somewhat.

The range of leverage (LEV) is between 0.114 and 1.549. The mean value of LEV is 0.603, and the standard deviation is 0.348, which shows that the difference between the leverage levels of the sampled firms is not large. Finally, firm growth represented by asset growth (GROWTH) has an average value of 0.084 and a standard deviation of 0.073. This variable's lowest and highest values are -0.07 and 0.225, respectively, which indicates a slight difference in the growth of Cambodian-listed firms.

Table 4: Descriptive Statistics

	N	MEAN	SD	MIN	MAX
ABDA	38	0.0083	0.0049	0.00001	0.0175
VAIC	38	3.5174	1.8173	1.3842	8.1091
HCE	38	2.6984	1.554	1.1296	7.016
SCE	38	0.5192	0.274	0.1147	0.877
CEE	38	0.1117	0.0562	0.0348	0.2238
SIZE	38	18.7932	0.9484	16.2465	20.3461
ROE	38	0.0683	0.0408	-0.0197	0.1552
LEV	38	0.6033	0.3477	0.1139	1.5491
GROWTH	38	0.0841	0.0733	-0.0695	0.2246

The Correlation Matrix

Table 5 exhibits Pearson's correlation coefficients for the study variables. Pairwise correlation is performed to check whether there is a multicollinearity problem and to observe the direction of the relationship between variables. The multicollinearity problem can be observed if the coefficient value exceeds 0.70 (Gujarati, 1995). It can be noticed that the whole coefficient value is less than 0.70, where the maximum coefficient is 0.585, which is between the LEV and ROE. Accordingly, there is no problem of multicollinearity in this research. Because all variables are reflected in separate regression analyses, the coefficients between VAIC and all of its components and the coefficients between VAIC components are not considered in detecting multicollinearity.

VAIC is significantly and negatively correlated with ABDA, suggesting that sample firms' value-generating undertakings positively influence earnings quality. The analysis also illustrates that both HCE and SCE have a negative and significant correlation with ABDA, while CEE is not significantly correlated with ABDA. This suggests that firms with better utilization of HC and SC engage less in EM practices. Meanwhile, LEV is positively and significantly correlated with ABDA. This indicates that firms with higher leverage levels engage more in EM activities.

Besides, SIZE has a positive and significant association with VAIC. This illustrates that the bigger the firm size, the more efficient the utilization of IC. Regarding IC components, SIZE has a positive and significant relationship with HCE and SCE. This shows that Cambodian firms with bigger sizes pay more attention to HC and SC utilization. Additionally, ROE and LEV are negatively correlated with CEE, illustrating that highly leveraged or profitable firms make less effective use of tangible capital.

Table 5: Correlation Matrix

	ABDA	VAIC	HCE	SCE	CEE	SIZE	ROE	LEV	GROWTH
ABDA	1								
VAIC	-0.3821**	1							
	0.0179								
HCE	-0.3651**	0.9982***	1						
	0.0242	0.0000							
SCE	-0.4479***	0.9457***	0.9259***	1					
	0.0048	0.0000	0.0000						
CEE	-0.0969	-0.2923*	-0.3144*	-0.2628	1				
	0.5627	0.0749	0.0546	0.1109					
SIZE	-0.1257	0.458***	0.4437***	0.4857***	0.0473	1			
	0.4519	0.0038	0.0053	0.002	0.7778				
ROE	0.2578	0.1645	0.1719	0.1027	-0.3913**	0.1341	1		
	0.1181	0.3236	0.302	0.5396	0.0151	0.4222			
LEV	0.386**	-0.1261	-0.1301	-0.0651	-0.4328***	-0.1184	0.5853***	1	
	0.0167	0.4506	0.4364	0.6978	0.0066	0.4788	0.0001		
GROWTH	0.024	0.0398	0.0406	0.0195	-0.1625	-0.2638	0.4568***	0.4022**	1
	0.8863	0.8126	0.8089	0.9074	0.3296	0.1095	0.0039	0.0123	

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

Multivariate Results

The Effect of VAIC on the Quality of Earnings

Table 6 demonstrates the regression outcomes of VAIC on both ABDA and EA. Three regression models are developed to support the regression findings further. Model 1 presents the OLS regression between the VAIC and ABDA, along with the control variables. Model 2 runs a robust regression estimation of Model 1. Further tests are conducted using the random effect regression model shown in Model 3.

Multicollinearity is again assessed by the variance inflation factor (VIF). Collinearity is only concerning when VIF is higher than 10 (Netter et al., 1983). Table 6 demonstrates that all independent variables' VIFs are lower than 2. These results provide additional evidence that the regression model does not exhibit multicollinearity.

The heteroscedasticity test is also assessed to indicate whether the variance of the regression errors is dependent on the values of the independent variables. Table 6 shows no heteroscedasticity problem since the p-value of this test is insignificant (P > 0.1).

It is shown that the assessed VAIC coefficients are negative and significant across the three models, demonstrating that H1 is verified. This means that firms with efficient IC management provide high-quality reports. This finding is consistent with previous practical results recognized by Darabi et al. (2012a; 2012b), Zanjirdar and Chogha (2012), Asadollahi et al. (2013), Azizi et al. (2013), Mojtahedi (2013), Marzban et al. (2014), Parast et al. (2014), Sarea and Alansari (2016), Nuryaman et al. (2019), and Mutuc (2021).

Concerning control variables, the results show that none of these variables is significantly associated with ABDA.

Table 6: The Relationship between VAIC and EQ

	Absolute value of discretionary accruals (ABDA)		
	Model 1	**Model 2**	**Model 3**
	Pooled OLS	**Robust**	**Random Effect**
	Coeff.	**Coeff.**	**Coeff.**
	(t-stat)	**(t-stat)**	**(z-stat)**
VAIC	-0.0012554**	-0.0012554**	-0.001297*
P-value	0.034	0.038	0.071
VIF	1.38	1.38	
SIZE	-0.00000147	-0.00000147	0.0003475
P-value	0.999	0.998	0.788
VIF	1.51	1.51	
ROE	0.0299658	0.0299658	0.0293186
P-value	0.234	0.125	0.208
VIF	1.94	1.94	
LEV	0.0037553	0.0037553	0.007134*
P-value	0.178	0.153	0.052
VIF	1.72	1.72	
GROWTH	-0.0121394	-0.0121394	-0.0151327
P-value	0.327	0.153	0.191
VIF	1.53	1.53	
Cons	0.0092395	0.0092395	0.0003718
	0.615	0.529	0.989
N	38	38	38
F/Wald Chi2	2.85	6.93	14.22
Prob > F	0.0308	0.0002	0.0143
R	0.3081	0.3081	0.2921
Heterosceda-sticity test (chi2, p-value)	(0.35, 0.5525)		

Note: *, **, and *** indicate significance levels at 0.1, 0.05, and 0.01, respectively.

The Effect of VAIC Components on the Quality of Earnings

Table 7 presents multivariate regression results of each VAIC component on ABDA. Like previous regression analysis, three regression models are run to show the effect of each VAIC component on ABDA. The first three models are related to HCE, the following three models are associated with SCE, and the last final models are connected to CEE. Multicollinearity assessment by VIF is also conducted in this regression analysis. It is concluded that this problem is not evident in this regression analysis since the VIFs of all regression variables are lower than 2, as shown in Table 7.

The heteroscedasticity test, as shown in Table 7, demonstrates no heteroscedasticity problem in all regression analyses since the p-value of this test in each regression analysis is insignificant (P > 0.1).

Concerning the influence of HCE on ABDA, the coefficients of HCE are negative and significant across the three models, indicating the significant effect of the efficient utilization of HC in eliminating Cambodian firms' tendency to engage in EM behavior. This finding supports H2, which states that HCE has a negative relationship with EM. This implies that employees' knowledge, abilities, and competency have a positive impact on constraining the firm's engagement in AEM practices. This result is consistent with Darabi et al. (2012 a, b), Asadollahi et al. (2013), Parast et al.

(2014), Jaya et al. (2021), and Mutuc (2021).

In support of H3, the coefficients of SCE across all related models are negative and significant, illustrating that SCE positively influences enhancing the quality of earnings of Cambodian listed firms. In other words, Cambodian firms that efficiently utilize their systems, processes, and culture provide higher-quality earnings. This finding is consistent with Asadollahi et al. (2013) and Mutuc (2021). On the contrary, the coefficients of CEE are insignificant across the three models, demonstrating that firms' tangible capital has no significant effect on limiting their engagement in AEM practices. Therefore, the study rejects H4.

Regarding the control variables, only LEV has a significant and positive relationship with ABDA across the nine models except the first two, indicating that firms with higher leverage levels have a higher tendency to engage in EM practices.

Table 7: The Relationship between VAIC Components and ABDA

	ABDA			ABDA			ABDA		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	Pooled OLS	Robust	Random Effect	Pooled OLS	Robust	Random Effect	Pooled OLS	Robust	Random Effect
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
	(t-stat)	(t-stat)	(z-stat)	(t-stat)	(t-stat)	(z-stat)	(t-stat)	(t-stat)	(z-stat)
HCE	-0.0013644**	-0.0013644**	-0.0014415*						
P-value	0.047	0.049	0.088						
VIF	1.36	1.36							
SCE				-0.0093628***	-0.0093628**	-0.0093179***			
P-value				0.006	0.013	0.009			
VIF				1.36	1.36				
CEE							0.0121136	0.0121136	0.0121136
P-value							0.482	0.545	0.477
VIF							1.29	1.29	
SIZE	-0.0000992	-0.0000992	0.0003553	0.0004168	0.0004168	0.0003633	-0.0009493	-0.0009493	-0.0009493
P-value	0.916	0.895	0.789	0.652	0.518	0.721	0.297	0.249	0.289
VIF	1.48	1.48		1.61	1.61		1.23	1.23	
ROE	0.0305714	0.0305714	0.0304905	0.0216747	0.0216747	0.0199736	0.026701	0.026701	0.026701
P-value	0.23	0.116	0.191	0.36	0.275	0.391	0.325	0.131	0.318
VIF	1.95	1.95		1.9	1.9		1.99	1.99	
LEV	0.0037495	0.0037495	0.0074958**	0.0045618*	0.0045618*	0.0054317*	0.0056036*	0.0056036**	0.0056036*
P-value	0.184	0.157	0.047	0.082	0.058	0.053	0.066	0.02	0.057
VIF	1.73	1.73		1.64	1.64		1.76	1.76	
GROWTH	-0.0126628	-0.0126628	-0.015808	-0.0105251	-0.0105251	-0.0116738	-0.0177295	-0.0177295	-0.0177295
P-value	0.31	0.325	0.171	0.372	0.354	0.311	0.177	0.192	0.168
VIF	1.52	1.52		1.53	1.53		1.49	1.49	
Cons	0.0106993	0.0106993	-0.0004967	0.0014325	0.0014325	0.0021037	0.0223356	0.0223356	0.0223356
	0.561	0.479	0.985	0.937	0.909	0.916	0.229	0.185	0.22
N	38	38	38	38	38	38	38	38	38
F/Wald Chi2	2.69	6.35	13.8	3.8	12.41	18.11	1.75	4.13	8.73
Prob > F	0.0386	0.0003	0.0169	0.0082	0.0000	0.0028	0.1526	0.0052	0.1204
R	0.2961	0.2961	0.2776	0.3724	0.3724	0.3708	0.2143	0.2143	0.2143
Heterosceda sticity test (chi2, p-value)	(0.31, 0.5768)			(0.91, 0.3405)			(0.14, 0.7063)		

Note: *, **, and *** indicate significance levels at 0.1, 0.05, and 0.01, respectively.

The research illustrates that a firm has to integrate all IC components as an efficient instrument to minimize the practice of EM. Consistent with a resource-based view, firms in Cambodia are aware that hiring skilled staff, developing an effective internal control system, and enhancing physical capital may all help curb managers' opportunism.

Among the three components of IC, the SC of Cambodian-listed firms has a greater effect on enhancing their EQ. This suggests that Cambodian-listed firms' systems, processes, and culture must effectively function to restrain EM practice. It further suggests that employees in Cambodian-listed firms possess relevant expertise, knowledge, and capability to enhance their background about IC's significance in enhancing the quality of financial reports. Finally, it is suggested that Cambodian-listed firms need to deploy their financial and physical capital more efficiently to add firm value.

CONCLUSION

In today's competitive environment, Cambodian firms must produce high-quality reports. On the other hand, since the significance and recognition of IC in firms are increasingly growing, we attempt to investigate the impact of IC and its three components, HCE, SCE, and CEE, on the quality of earnings for nonfinancial Cambodian firms listed on CSX for a 9-year-period between 2013 and 2021. While the VAIC method developed by Pulic (2004) is used as a proxy of IC efficiency, the quality of earnings is represented by the absolute value of discretionary accruals computed through the modified Jones model.

It is found that earnings are high-quality in firms with efficient IC employment. The impact of each of HCE and SCE is positive and significant on the quality of earnings. However, CEE has no significant effect on mitigating firms from engaging in earnings management practices. Therefore, efficient employment of human resources, systems, processes, and culture can prevent management from conducting unhealthy business practices, including earnings management.

This study has various theoretical and practical implications. It provides the foundation for a theoretic comprehension of the significant association between IC and the quality of earnings in the Cambodian environment. It also opens novel doors for organizations and scholars who intend to reinforce this relationship in countries with different conditions. Based on the consequences of the recent study and the significant effect of IC as an intangible asset on the financial reporting quality among Cambodian listed firms, this investigation would be helpful for users of financial reports in making their decisions. Efficient employment of IC resources might play an important role in gasping international investors' attention to the national markets, particularly in an emerging nation like Cambodia. This study also recommends that Cambodian firms consider both HC and SC since they are vital in enhancing their business value and increasing the quality of their financial reports. It also urges policymakers to encourage Cambodian firms to efficiently utilize their intellectual resources to generate high-quality financial reports, which can enhance capital markets' efficiency.

Regarding the study's limitations, this investigation only analyses nonfinancial Cambodian firms that are publicly traded. Researchers would be encouraged to undertake further studies regarding the relationship between IC and EQ of listed firms in other Asian countries. This study also focuses only on the absolute value of discretionary accruals in measuring the quality of earnings. It is proposed that researchers investigate the association between IC and other indicators of the quality of earnings. Besides, the current research depends upon Pulic's (2004) model in measuring the efficiency of IC and its three components, and future research can consider other models having different elements of IC.

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