

IMPACT OF INTELLECTUAL CAPITAL ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN SAUDI ARABIA

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Abstract

This paper seeks to establish the interlinkage, that exists between FP and IC of commercial banks in Saudi Arabia. The study identified ten commercial banks, using the convenience sampling method, covering a six-year span, that included the COVID-19 era. Four regression analyses were conducted, to examine the impact of IC components on the banks' FP. The descriptive analysis revealed that IC, as indicated by VAICTM, and FP, constituted by ROE along with ROA, demonstrated an increasing trend. Regression findings established that

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the overall IC, as indicated by VAICTM, exerted positive and significant influence, by a 1% significance level, on FP. A scrutiny of IC and financial performance indicators revealed that Capital Employed Efficiency correlated positively and significantly with all the FP indicators, at the 1% noteworthy level but both Structural Capital Efficiency and the Human Capital Efficiency did not report any obvious linkage with the FP indicators. Regarding the size of the firm, it reported no significant relationship with ROA while it established pragmatic linkage with ROE. Further, the Covid-19 impact on FP was significant at 1% level of significance.

Keywords: Structural Capital, Human Capital, Capital Employed, ROA, ROE, COVID-19.

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1. Introduction

Knowledge and technology innovation have swept through the planet in the last two decades, and this has sent shockwaves to business models and even more so, to emerging markets. The structure in which the economy is identified, has shifted from one based on manufacturing to one based on knowledge (Canibano, 2018). Chowdhury et al. (2019) and Hermawan et al. (2020) also asserted this fact that Intellectual Capital (IC) is an important, though intangible asset but the measure that it requires, poses some challenges. Inherent complexity certainly renders the concept a somewhat nebulous one for researchers, with many different academic disciplines, providing varied perspectives on IC. Other professionals, such as information technologists, sociologists, psychologists, human resource managers, and accountants, among others, have divergent views on approaches to understanding, measuring, and leveraging IC (Bontis, 2001). Despite its burgeoning growth, the path of IC research remains uncertain. The conventional economic model, based on the scarcity assumption, posits that market prices are determined by supply and demand dynamics. This model, however, does not apply straight away to knowledge as a resource, challenging

traditional economic principles (Bontis, 2000). Hence the need for new frameworks and methodologies to better capture the value and impact of IC. Embracing these changes will be important if businesses and economies are to thrive in the knowledge-based era.

2. Review of Literature

IC consists of such intangible assets of great importance for the overall value of an organization: Human, Relational, and Structural Capital (SC) (Jardon & Martínez-Cobas, 2021). IC in research includes knowledge by scientists themselves (Human Capital (HC)), organizational resources and networks (SC) and the relational connections between those involved in the research (Relational Capital) (Belizón, et al., 2019). According to research, IC is highly bound to organizational success, emphasizing structural, customer, human, and technology capitals (Hesniati & Erlen, 2021). Scanning external and internal capabilities like market knowledge and innovation, helps in improving IC and organizational performance (Huang & Huang, 2020). IC, as an ideal background, is crucial for the survival and growth of the banking industry, helping it to augment operational effectiveness with a competitive advantage (Buallay, 2019; Ermolenko &

Orel, 2019). Buallay et al., (2019) explained that HC and SC greatly contributed to bank profitability and market position, particularly in terms of empirical evidence drawn about banks in India.

IC is critical to the financial soundness of Saudi Arabian commercial banks. The regulatory framework also enables dynamic developments in IC, to provide a very strong context in which to examine the impact of IC on Financial Performance (FP) (**Sulphey & Naushad, 2019; Buallay, 2019**). Literature provides sufficient evidence of the positive relationship between IC efficiency and key financial indicators like Return on Equity (ROE) and Return on Assets (ROA) (**Buallay et al., 2019**). However, gaps remain in the understanding of the development and application of IC in Saudi banks. On the substantive note, strategic investment into IC by the Sharia-compliant banks is likely to make them to report better financial performances (**Naushad, 2019; Ousama et al., 2019**). Used as one of the basic pillars, IC can be a source of competitive differentiation and financial strength and hence it needs further research.

3. Statement of the Problem

While various studies have explored the impact of IC on FP, its specific effects on commercial banks in Saudi Arabia have not been adequately analyzed. This study aims to enhance the knowledge base about how IC may influence Saudi Arabian commercial banks' FP. Given that IC plays a crucial role in improving organizational performance, it is essential to examine its impact on Saudi Arabian banking institutions to fill the existing gap in the literature.

4. Need of the Study

IC plays a critical role in driving organizational success and competitiveness (**Jordan and Jones, 1997; Noruzi and**

Vargas Hernandez, 2010). However, there is little research on its impact on the FP of commercial banks in Saudi Arabia. Previous studies show that IC has minimal effects on FP, which indicates a gap in the literature. The purpose of this study is to address this gap by examining the fundamental impact of IC on the FP of commercial banks in Saudi Arabia, thus contributing to a better understanding of the relationship between IC and FP in the Saudi context.

5. Objectives of the Study

The key objective of this study is to find out the level of FP, with reference to IC of the privately listed Saudi Arabian commercial banks. The specific objectives include:

1. Investigating the status of IC among Saudi Arabian commercial banks.
2. Examining the FP level of these banks.
3. Exploring the impact of IC attributes on the Saudi Arabian commercial banks' performance.

6. Hypotheses of the Study

Structural capital is a key component of intellectual capital. According to **Moon and Kym (2006)**, structural capital is less visible compared to other elements of IC because it is more specialized. Structural capital refers to regular knowledge, made up of knowledge stored in databases, procedures, publications, and organizational culture, which provide value to an organization (**Kong, 2008**). Structural capital refers to an organization's non-human knowledge storehouses that underpin its human capital (**Watson and Stanworth, 2006**). Previous studies showed that structural capital efficiency and financial success were positively related (**Bharadwaj et al. 1999; Garicano and Wu, 2012**). Therefore, it has been hypothesized that:

H₁: Structural Capital Efficiency (SCE) and FP are positively associated with each other.

HC is a very critical portion of IC, including collective knowledge, skills, experience, and competence (Sarwenda, 2020). It cannot be managed externally or separated from the owner (Wang, 2011). Studies indicate a positive relationship between HC and organizational performance (Youndt et al., 1996; Sardo et al., 2018; Smriti and Das, 2018). Studies in the Indian engineering and steel sectors, under the Value-Added Intellectual Coefficient (VAIC™) model, HC exerts positive impact on FP (Maji and Goswami, 2016). Based on this insight, the study proposes the following hypothesis:

H₂: Human Capital Efficiency (HCE) positively correlates with FP.

Capital Employed Efficiency (CEE) is about efficiently managing physical assets, customer relationships, and financial resources, thereby creating value-added efficiency. According to Soewarno and Tjahjadi, 2020, this would mean that the budgeting process is an important tool for the estimation and determination of the financial capital for IC. Studies show CEE to exert positive impact on knowledge-based as well as traditional industries (Maji and Goswami, 2016). IC requires physical infrastructure and can generate bank value, especially in the case of BRICS nations (Kamal et al., 2012; Nadeem et al., 2019). Hence the hypothesis:

H₃: CEE and FP are strongly correlated to each other.

7. Research Methodology

7.1 Sample Selection

The study considered ten local Saudi Stock Exchange-listed commercial banks, approved by

the Saudi Central Bank (SAMA) for operation. This selection included 11 local banks and 20 foreign banks, with the focus solely on local banks, based on their annual reports for the period 2017-2022.

7.2 Period of Study

This study was conducted during the period from Jan 2023 to Jan 2024. The data collection took about two months, from Feb 2023 to Mar 2023.

7.3 Sources of Data

Secondary data were used for this study. The data were collected from the Saudi Exchange website (Tadawul) and banks' websites.

7.4 Tools used in the Study

The study employed the method of Pulic (1998), which is called the VAIC method, to measure IC performance, aligning with previous research of Abdulsalam et al. (2011) and Al-Musali & Ismail (2014), which also concurred with Mohammad, et al., 2018 and Sulphey & Naushad (2019). The VAIC method is computed as follows:

$$\text{VAIC} = \text{Physical and Organizational Assets (SCE)} + \text{its Employees' skills (HCE)} + \text{its overall resource utilization (CEE)...}, \quad (1)$$

To understand how well banks manage their intellectual resources (SC, HC, and utilized capital), researchers examined the relationship between these resources and the banks' FP (measured by ROA together with ROE). The study preferred four Ordinary Least Square (OLS) regression models, to examine the effect of IC (measured by VAIC™, with its components) on FP (proxied by ROA, with ROE). Table-1 presents the equations of the four regression models.

8. Data Analysis and Interpretation Regarding the impact of intellectual capital

on financial performance of commercial banks in Saudi Arabia

Table-2 shows the results of descriptive statistics of the collected data, based on selected variables of the study. The mean or average value of SCE was 0.6688, with a standard deviation of 0.22349 and total values ranged between 0.19 to 1.69. Similarly, the mean values of HCE, CEE and VIACTM were 3.0365, 0.0224 and 3.7277, with their standard deviations at 1.50918, 0.00638 and 1.53368 respectively. The average values of ROA and ROE were 0.0171% and 0.1160%, with standard deviations at 0.00714% of 0.05202%. Average values of firm size, proxied by total assets and firm age, were 5906.7167 and 46.300. The skewness values ranged between -1.985 and 1.444, indicating that the variables of the study were within the valid ranges (-2 to +2) (Byrne, 2010; Hair et al, 2006). On the other hand, the kurtosis values of the variables varied between -1.526 to 7.713, which demonstrated the normality of the data (-7 to + 7) (Hair et al, 2006).

Table-3 presents the values of IC and FP of Saudi Arabia banking companies. SCE, values over the study period, ranged between 0.604 to 0.754. From 2017 to 2019, the SCE was slightly increasing. In 2020, the SCE had increased to 0.754 from 0.64 but dropped to 0.655 in 2021. HCE value was evidently lightly increasing. Regarding HCE values in 2017, 2018 & 2019 were reported as 2.917, 2.994 & 3.198 respectively. In 2020, the HCE value dropped to 2.738 and in 2021, it again increased to 3.29. Regarding the CEE, its value was 0.23 in 2017. It remained constant until reaching the peak of 0.024 in 2019. From them on, it decreased steadily to a level of 0.021 in 2022. Regarding the VAIC status, its value was recorded as 3.544 in 2017. This percentage increased to reach the

peak of 3.86 in 2019 and later, it declined rapidly to 3.51 in 2020. Again, it increased to 3.965 in 2021. **Table-4** presents the variance inflation factor of all the variables of the study, under four regression models. It is seen that the Variance Inflation Factor (VIF) values ranged between 1.001 to 2.297, indicating that it was free of multicollinearity problem of the independent variables of the models, as the maximum valid limit was 5 (James et al, 2013).

Table-5 and **Table-6** summarise the regression results of model 1, 2, 3 and 4, and hypotheses tests. The regression analyses reveal that VAICTM was strongly associated with ROA and ROE, at 1% level of significance, under model 1 and 2, indicating a positive effect of IC on the profitability of Saudi Arabian banks. While examining the IC's components separately, under model 3 and 4, only CEE revealed positive connection to FP, and ROA and ROE were not significantly impacted by SCE and HCE.

9. Findings of the Study

The components of intellectual capital, measured by VAICTM and financial performance measures, were positively related, indicating that commercial banks economic gain can be achieved through the employment of increased intellectual capital. The findings of the study demonstrated that control variables demonstrated negative consequences of COVID-19 on the FP of Saudi Arabian commercial banks. Additionally, firm size, represented by total assets, positively affected ROE, at 1% significance level, under both model 2 and 4, suggesting that larger banks reported better earnings potential. Firm age, however, did not significantly influence profitability. The regression models, indicated by Durbin-Watson values, revealed no autocorrelation issues, and the corrected values of R-square, indicated that at least 50% of the variance in the dependent variables can be explained by the model.

10. Suggestions

The FP of Saudi commercial banks can be improved by banks' growth strategies and enhanced asset base, through creative financial products and merger issues. It is also suggested to develop robust risk management frameworks, to mitigate the impact of external shocks like COVID-19. Investment in digital banking and diversification of revenue streams could be one of the key measures to help in this matter. Although the age of the company was not a major factor, good governance and operational practices should be improved by new banks. Secondly, investment in HC, through training and development for business re-engineering, would help innovation and effective decision-making.

11. Conclusion

The VAICTM method, as a tool for measuring IC, has been identified as a user-friendly technique (Mohammad et al., 2018). Utilizing this method, the study employed multiple regression models, to assess the influence of IC on the profitability of Saudi Arabian commercial banks, as proxied by ROE as well as ROA. Descriptive statistics indicated normality in the data set and the results of the study can be summarized as follows: Firstly, VAICTM was strongly linked to ROE as well as ROA, suggesting that an increase in total IC would enhance. Secondly, among the IC's elements, only CEE strongly influenced profitability. The statistically adverse impact of COVID-19 on the financial health of the sampled banks, was notable. The study's focus on commercial banks in Saudi Arabia, particularly during a six-year period that covered the global COVID-19 pandemic, highlights the need for future research over a more extended period and potentially employing other methodologies for measuring the IC. The findings offer new insights for policymakers of commercial banks in Saudi

Arabia, to devise appropriate strategies and contribute to the existing literature by providing fresh perspectives for academics and researchers.

12. Limitations of the Study

This study was limited by its focus on privately listed commercial banks in Saudi Arabia and therefore, may not be representative of the entire banking industry. Availability and accuracy of financial data would very much affect any meaningful analysis of the same. The COVID-19 pandemic may have had an impact on the findings that is still not fully understood.

13. Scope for Further Study

In the future, studies can be extended to include various types of banks and other financial institutions in Saudi Arabia. Longitudinal studies will be able to provide more dimensions on the long-term effects of IC on FP. Another area where further research could be particularly useful, is on how the IC-FP relationship is influenced by different technologies and changing market conditions.

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Table-1: Regression Models Equations Regarding the Impact of Intellectual Capital on Financial Performance of Commercial Banks in Saudi Arabia

Model 1	$Y(\text{ROA}) = \alpha + b1\text{VAICTM} + b2\text{F_Size} + b3\text{F_AGE} + b4\text{Covid-19} + \varepsilon \dots (1)$
Model 2	$Y(\text{ROE}) = \alpha + b1\text{VAICTM} + b2\text{F_Size} + b3\text{F_AGE} + b4\text{Covid-19} + \varepsilon \dots (2)$
Model 3	$Y(\text{ROA}) = \alpha + b1\text{SCE} + b2\text{HCE} + b3\text{CEE} + b4\text{F_Size} + b5\text{F_AGE} + b6\text{Covid-19} + \varepsilon \dots (3)$
Model 4	$Y(\text{ROE}) = \alpha + b1\text{SCE} + b2\text{HCE} + b3\text{CEE} + b4\text{F_Size} + b5\text{F_AGE} + b6\text{Covid-19} + \varepsilon \dots (4)$

Source: Authors's own creation based on hypotheses

Table-2: Results of Descriptive Statistics of the Variables of the Study

	SCE	HCE	CEE	VAIC TM	ROA	ROE	F_SIZE	Covid19	F_AGE
Valid	60	60	60	60	60	60	60	60	60
Missing	0	0	0	0	0	0	0	0	0
Mean	0.6688	3.0365	0.0224	3.7277	0.0171	0.1160	5906.7167	0.3333	46.3000
Std. Deviation	0.22349	1.50918	0.00638	1.53368	0.00714	0.05202	4628.32791	0.47538	19.18889
Skewness	1.396	-1.418	-1.985	-0.846	-1.713	-0.614	1.445	0.725	-0.503
Std. Error of Skewness	0.309	0.309	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis	6.713	5.162	6.732	2.417	6.656	3.329	0.924	-1.526	-0.860
Std. Error of Kurtosis	0.608	0.608	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Minimum	0.19	-3.27	-0.01	-1.94	-0.02	-.08	1481.00	0.00	11.00
Maximum	1.69	6.22	0.03	7.09	0.03	0.24	19964.00	1.00	73.00

Source: Authors calculation from annual reports of sample banks using SPSS 20.00

Table-3: Results Showing the Values of IC and FP Indicators

	IC				FP	
Year	SCE	HCE	CEE	VAICTM	ROA	ROE
2017	0.604	2.917	0.023	3.544	0.018	0.118
2018	0.612	2.994	0.023	3.63	0.02	0.129
2019	0.64	3.198	0.024	3.86	0.018	0.126
2020	0.754	2.738	0.018	3.51	0.011	0.085
2021	0.655	3.29	0.021	3.965	0.017	0.113
2022	0.748	3.085	0.021	3.856	0.02	0.126

Source: Authors calculation from annual reports of sample banks using Excel Software

Table-4: Results Showing the VIF Values for the Impact of Intellectual Capital on Financial Performance of Commercial Banks in Saudi Arabia

Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept				
VAICTM	1.470	1.470		
SCE			1.200	1.200
HCE			2.297	2.297
CEE			2.204	2.204
F_SIZE	1.909	1.909	1.987	1.987
F_AGE	1.409	1.409	1.484	1.484
COVID_19	1.001	1.001	1.120	1.120
Dependent Variable	ROA	ROE	ROA	ROE

Source: Authors calculation from annual reports of sample banks using SPSS 20.00

Table-5: Results of Regression Regarding the Impact of Intellectual Capital on Financial Performance of Commercial Banks in Saudi Arabia

Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	0.002*** (3.238)	0.000*** (3.768)	0.071 * (1.841)	0.805 (-0.005)
VAIC TM	0.000*** (4.870)	0.009*** (2.705)		
SCE			0.727 (-0.371)	0.104 (-1.656)
HCE			0.561 (0.581)	0.190 (-1.329)
CEE			0.000*** (8.935)	0.000*** (7.104)
F_SIZE	0.128 (1.547)	0.001*** (3.375)	0.201 (1.294)	0.000*** (3.957)
F_AGE	0.843 (0.200)	0.382 (-0.882)	0.160 (1.423)	0.907 (-0.118)
COVID_19	0.001*** (-3.427)	0.023 (-2.333)	0.037** (-2.134)	0.519 (-0.649)
Adjusted R -Sqaure	0.514	0.471	0.806	0.720
F	16.581	12.345	41.855	26.331
Sig	0.000	0.000	0.000	0.000
Durbin-Watson	1.811	1.524	2.043	1.640

Source: Authors calculation from annual reports of sample banks using SPSS 20.00

Table-6: Summary of Hypotheses Tests Regarding the Impact of Intellectual Capital on Financial Performance of Commercial Banks in Saudi Arabia

Hypotheses No.	Relation	Results
H1	SCE on Financial Performance	Rejected
H2	HCE on Financial Performance	Rejected
H3	CEE on Financial Performance	Accepted

Source: Authors calculation from annual reports of sample banks using SPSS 20.00