INTELLECTUAL CAPITAL EFFICIENCY AND ITS CONTRIBUTION TO FINANCIAL STABILITY IN ISLAMIC BANKS: A STUDY OF THE GULF COUNTRIES

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Received on: 23-11-24 Accepted on: 28-06-25

https://doi.org/10.57144/hi.v48i2.1221

Abstract

The stability of Islamic banks is critical to the financial systems of the Gulf Cooperation Council (GCC) countries, yet the role of intellectual capital in supporting that stability remains underexplored. This study addresses the research problem of insufficient understanding of how Intellectual Capital Efficiency (ICE) specifically Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Relational Capital Efficiency (RCE)—affects the financial stability of Islamic banks. The primary objective is to empirically investigate the contribution of ICE components to enhancing financial stability, using reliable performance metrics such as the capital-to-asset ratio and net profit margin. To achieve this, the study employs a dynamic panel data approach using the hierarchical Generalised Method of Moments (GMM) estimator. This methodology is justified due to its effectiveness in handling endogeneity issues, unobserved heterogeneity, and autocorrelation in panel data. The dataset

includes 37 Islamic banks operating across six GCC countries including Saudi Arabia, Kuwait, Oman, Qatar, Bahrain and United Arab Emirates from 2010 to 2021. ICE variables are introduced sequentially into the model to measure their individual and combined effects. The results reveal that HCE and SCE have a statistically significant positive impact on financial stability, while the influence of RCE is more context dependent. These findings validate the resource-based theory and provide practical insights for bank managers and policymakers, encouraging strategic investments in intellectual capital to sustain institutional resilience in competitive Islamic financial markets.

Keywords: *Intellectual Capital Efficiency, Human Capital Efficiency, Structural Capital Efficiency, Relational Capital Efficiency, Financial Stability, Generalised Method of Moments (GMM).*

1. Introduction

In 21st Century the dynamic development, *Sharīʿah* based and productivity of Islamic banking has attracted enormous attentions in all Islamic countries especially in the Gulf nations the main reason of this attraction is the *Sharīʿah* based banking and the interest free banking, another reason of attraction when it comes to intellectual capital and how closely it relates to the stability of the financial system, particularly the Islamic banks.[1] The relationship between knowledge-based assets and the stability of financial institutions more especially Islamic banks become a central topic among academicians.[2] The relationship between intellectual capital and Islamic banks' financial stability has been investigated by broadly in an effort to clarify the complex factors that underlie their mutual dependence.[3]

Islamic banking constitutes a distinct financial paradigm rooted in the principles of *Sharīʿah*, which categorically prohibits all forms of transactions and activities considered detrimental to individuals or society. A core objective of the Islamic banking system is the prohibition of interest (*ribā*), which is regarded as unjust and exploitative. In place of conventional interest-based mechanisms, Islamic banks promote financial dealings grounded in ethical values, mutual cooperation, and socio-economic justice, in accordance with *Sharīʿah* tenets. Consequently, the operations of Islamic financial institutions require rigorous and prudent evaluation of the various economic, institutional, and governance-related variables that influence their financial soundness and systemic stability.

Islamic banking is a unique framework based on the principles and ideology of *Sharīʿah* that prohibit all those transaction and activity which are harms for any individual or for society.[4] The

important purpose of Islamic Banking is the prohibition of interest-based transactions, Islamic banks encourage and support all those moral and ethical financial behaviours which are according to *Sharī'ah.*[5] Islamic banking institutions require a cautious and careful analysis of the variables affecting their financial stability and reliability.[6] This study reveals and divulges that intellectual capital, which includes the relational, structural, and human aspects of knowledge inside an organization, is a crucial and vital component.[7] Researcher investigated that there are several factor which affect financial stability of Islamic banks, which is risky to overall economic condition of the Gulf countries.[8] The analysis becomes more complex even though traditional financial metrics that are still relevant because intellectual capital is now recognized as a strategic asset.[9] In 21st century all over the world the organizational procedures contained in human capital and structural capital which have positive impact on different organization especially in Islamic Banking. The implicit expertise ingrained in human capital are all considered forms of intellectual capital.[10] There are several key and important issues regarding the impact of intellectual capital on Islamic banks, which has been investigated in this study. The one important question is that how can the creation of intellectual capital strengthen the ability of Islamic banks in the Gulf nations? The second important question is that which particular elements of intellectual capital have the greatest impact on financial stability? The research is guided by these questions in its attempt and answer to offer complex insights into the dynamics of work.

The following are important aspects of this study.

1. It can help Islamic banking institutions to make strategic decisions.
2. It is helpful for policymakers in creation of regulatory frameworks.
3. It supports financial stability which is very significant and important.
4. The results could provide guidance on optimal methods for utilizing intellectual property.
5. This important study is encouraging creativity, resourcefulness and strengthening of general robustness of Islamic banks in the Gulf nations.

2. Literature Review and Hypothesis Development

2.1 Human Capital Efficiency

In any organization there are some important component like skills, knowledge, and expertise possessed by workforce[11], these components play important role in determining different factor like operational effectiveness, risk mitigation, and overall resilience.[12] Some studies indicate that the interest of researchers in the relationship between financial stability and human capital efficiency in the banking sector has grown in past several years.[13] Many Studies

proved and highlight that human capital is very important for any organization[14] especially in financial institutions.[15] Human capital plays a vital role in risk assessment, decision-making procedures, and the general efficacy of financial institutions, because these all are greatly impacted by the expertise and abilities of banking professionals. The research makes it clear that how skilled, professionals and informed workforce are critical for any organization is to preserving financial stability.[16] According to the study learning at work is facilitated by a workforce that is knowledgeable and flexible, which helps financial institutions respond to changing market conditions and it will also improve their financial stability. Keeping in view, the following hypothesis is formulated.[17]

H1: Human capital efficiency has a positive relationship with Islamic bank's financial stability.

2.1 Structural Capital Efficiency

The resilience of an organization is shaped in part by structural capital, which includes institutional knowledge, processes, and systems. This role of structural capital is becoming more widely recognized. It is necessary for financial stability that organization may have an effective structure that is well-structured which improves the capacity to withstand shocks and adjust to changing conditions.[18] Any organization which have an effective organizational framework that is well-structured, will be improved the capacity to withstand shocks and adjust to changing conditions, which in turn leads to financial stability.[19] Researchers indicated that efficient internal structures and streamlined processes lead to cost savings, which in turn to improve earnings and distribution of resources, thereby positively influencing financial stability.[20] Handling of risk or minimize of risk, Financial stability and compliance of regulation is an important challenge for any institutions and for all those organizations which have structural capital that are designed effectively. Those types of organization are better able to handle risks and comply with regulations. Structure organizations are also able to maintain financial stability. As we discussed above the following hypothesis is formulated.

H2: Structural capital efficiency has a positive relationship with Islamic bank's financial stability.[21]

2.3 Relational Capital Efficiency

Driven by the realization that relationships with stakeholders play a critical role in determining the resilience and long-term capability of financial institutions, the association between relational

capital efficiency and financial stability has become a critical area of academic inquiry. Positive stakeholder relationships are facilitated by relational capital, as demonstrated by research conducted.[22] Researchers find out that stakeholders such as suppliers, customers, and the community have been linked to increased financial stability. Organizations possessing that strong relational capital are more adept at overcoming obstacles and fostering resilience. Customer loyalty and brand reputation are strongly associated with relational capital efficiency and these two components are also increase stability.[23] Studies conducted indicate that financial institutions possessing robust relational capital are able to cultivate customer trust, loyalty, and favourable brand perception. In turn, this lowers customer attrition and draws in new clients, which promotes stability.[24] Another study point out that strong management-employee relationships and an effective internal culture are hallmarks of an organizationally stable environment. Crucial markers of relational capital efficiency are commitment and employee satisfaction.

H3: Relation capital efficiency has a positive relationship with Islamic banks' financial stability.[25]

3. Methodology

3.1 Study Sample

Investigating the relationship between intellectual capital efficiency and financial stability in Islamic banks this study uses two databases. First, Fitch Connect provides an annual dataset comprising bank income statements and balance sheets, and the second one is World Bank's indicator, which provides important information regarding two variables no one GDP per capita and no two inflation rates for every country.[26] This study has an unbalanced panel data set that includes bank selected year observations from six Gulf countries between 2010 and 2021; list is given below in 1st Table.

Countries	Numbers of Islamic Banks
Saudi Arabia	5
Kuwait	6
Oman	4
Qatar	3
United Arab Emirates	7
Bahrain	12
Total	37

Table 1. Sample of banks from each country

3.2 Research Variables

The financial stability of Islamic banks is the variable of interest[27], which is measured with ZCAR and NPM[28]. The three components of intellectual capital efficiency (HCE, SCE, and RCE) [29] are the focus of the independent variables.[30] In contrast, the macroeconomic variables (GDP, INF) and bank-specific variables (bank size, foreign ownership) comprise the set of control variables.[31] The names, definitions, and codes of all the variables that were selected for the current study are compiled in 2nd Table.

Numbers	Variables	Codes	Definition
1	**Financial Stability (Dependent)**		
I.	Financial Stability	ZCAR	Ratio of ROA plus the capital asset ratio which is divided by the standard ROA
II.	Financial Stability	NPM	Ratio of total income over total financing
2	**Intellectual Capital Efficiency (Independent)**		
I.	Human Capital Efficiency	HCE	Value-added/ Gross income-operating expenses
II.	Structural Capital Efficiency	SCE	Value-added/ total expenses for employees
III.	Relational Capital Efficiency	RCE	Value added/ expenditure related to research and development
3	**Bank Characteristics (Controls)**		
I.	Total Debt to Equity	DE	Proportion of total debt over equity
II.	Bank Size	LNTA	Natural log of corporate total assets
III.	Market Share	MKS	It is the share of assets of each bank to total bank assets
IV.	Foreign Ownership	FOWN	Dummy For is a binary variable that takes the value of one if foreign firms have ownership in the firm or zero otherwise
4	**Macro-Economic (Controls)**		
I.	Inflation	CPI	Natural log of consumer price index
II.	Country Growth	GDP	Natural log of total gross domestic product

Table 2. Research Variables and Measurement

3.3 Econometric Model

The model that follows is used to examine how ICE affects the financial stability of IBs.[32] The most popular statistical methods for testing the panel data are the fixed-effects model (FEM) and the random-effects model (REM). The application of REM was recommended by the Hausman test results.[33] The OLS ignores the data's panel structure, this approach is appropriate for ICE studies.[34] The present study uses GMM because it is a more suitable model to account for heteroscedasticity and endogeneity in the model. The econometric model is formulated as follows:

$$ZCAR_{it} = \alpha_o + ZCAR_{it-1} + \sum_k^3 \quad \beta_1 ICE_{it} + \sum_k^6 \quad \beta_2 X_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

$$NPM_{it} = \alpha_o + NPM_{it-1} + \sum_k^3 \quad \beta_1 ICE_{it} + \sum_k^6 \quad \beta_2 X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

In above models 1 & 2, *i represent the Islamic banks*, *t represents the years, ZCAR and NPM represent the proxy of financial stability, ICE represents the intellectual capital efficiency with four proxies (HCE, SCE, RCE)*, *X represent the set of control variables with five proxies (BS, LEV, MKS, FOWN, INF, GDP), and ε represents the error term.*

3.4 Descriptive Statistics

Descriptive statistics of the study has been showed in 3rd Table, where the financial stability mean is 10.91 percent and the net profit margin mean value is 13 percent (in terms of ZCAR). Additionally, the descriptive findings of the intellectual capital indicators—HCE, SCE, and RCE—show that, with a mean score of 33, 68, and 17 percent respectively. SCE may be the most important factor in wealth accumulation when it compared with HCE and RCE. The mean of BS (2.23), mean of LEV (2.29), mean of MKS (0.019), mean of FOWN (0.06), Inflation (1.54), and GDP (19.07) are the control variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
ZCAR	407	0.1091	0.0421	0.1495	0.8170
Net Profit Margin	407	0.1306	0.1255	0.0726	1.0726
Human capital efficiency	407	0.3357	0.8693	-0.622	7.6303
Structural capital efficiency	407	0.6812	1.6943	-1.134	18.907

Relational capital efficiency	407	0.1765	0.5029	-0.3808	4.7991
Bank size	407	2.2392	0.6552	1.1514	3.7128
Leverage	407	2.2948	1.7890	0.9317	8.0298
Market share	407	0.0193	0.0298	0.00247	0.2022
Foreign ownership	407	0.0680	0.1322	0.00123	0.3252
Inflation	407	1.54154	0.0851	1.41287	1.9432
Gross domestic product	407	19.0712	1.23987	7.43275	11.9706

Table 3. Descriptive Statistics

3.5 Correlation and Multicollinearity

The correlation between the variables used in the study is shown in 4th Table, which shows that there is no multicollinearity issue because the correlation values are lower than 0.8. Additionally, we use the Variance Inflation Factor (VIF) test to examine multi-collinearity. All VIF values reported in Table are unable to detect any multi-collinearity among the independent variables that we have chosen.[35]

Variables	HCE	SCE	RCE	BS	LEV	MKS	FOWN	INF	GDP
Human capital efficiency	1								
Structural capital efficiency	0.336722	1							
Relational capital efficiency	0.477333	0.4650041	1						
Bank size	0.109416	-0.000047	0.0460094	1					
leverage	0.096	0.083	0.061	0.142	1				

	659	063	087	008					
Market share	0.066	0.038	0.045	0.025	0.110	1			
	63	37	72	89	72				
Foreign ownership	-0.066	-0.038	-0.045	-0.025	0.110	0.016	1		
	63	37	72	89	72	575			
inflation	0.159	-0.057	0.022	0.124	-0.015	-0.118	0.115	1	
	142	64	721	967	74	91	748		
Gross domestic product	0.203	0.013	-0.008	0.126	0.140	-0.130	0.017	0.234	1
	281	223	1	923	425	93	507		
Variance Inflation factor	1.452	1.527	1.294	0.996	1.015	1.145	0.996	1.23	1.354
	672	168	368	384	008	376	384		

Table 4. Correlation and Multicollinearity Analysis

4. Results and Discussion

The effect of intellectual capital efficiency on bank financial stability is shown in 5th Table. The GMM model was estimated using a hierarchical method in which the ICE components were added to the model one after the other. The first column displays the results using one ICE measure, and the last column display the results using all ICE measures. The empirical findings show that the lag-dependent variable L1 in the form of ZCAR and NPM has a positively significant relationship with the current value of financial stability in all columns. This suggests that the models are dynamic and free of simultaneity, endogeneity, and reverse causality issues. The present results of this study is closed related with the findings of past study[36], The findings of past studies suggest that past financial stability indicators support the current year's financial stability of banks. Besides this, all models pass the Hansen test, rejecting the null hypothesis and proving the validity of the model's instruments. Moreover, AR (2) shows that none of the models have autocorrelation problems.

The results of this study regarding intellectual capital efficiency showed that HCE significantly and favourably affects financial stability in terms of ZCAR and NPM. This validates our first hypothesis, according to which IB financial stability is driven by HCE. The outcomes corroborate[37] who stated that HCE initiates

financial stability. This demonstrates how important IC is to boosting banks' capacity for innovation in order to enhance their financial stability. Correspondingly, SCE in both models shows a statistically significant and favourable effect on the FS of Islamic banks. This validates our second hypothesis, according to which HCE promotes IBs' financial stability. These results contradict the study by[38], which claimed that SCE drives bank financial stability, and is consistent with the findings of [39] . These results suggest that IBs can be very important if they allocate more funds within their framework and hierarchical order in ways that encourage innovation and development, which will support IBs' financial stability.

Notably, RCE has a significant relationship in column 4 but an insignificant effect in column 3 on the financial stability of IBs. This is consistent with the findings of [40] and supports our third hypothesis.[41] These results indicate that relationships without efficient human capital and good infrastructure perform poorly. Moreover, banks are still in their infancy and need to invest more in relational capital to build strong relationships in the economy and society, our findings imply that RCE enhances IB financial stability. People may be more inclined to use IBs as a direct result of their increased awareness of them and their *Sharīʿah* compliance business. RCE thus plays a major role in maintaining the financial stability of IBs.

	Model ZCAR				Model NPM			
Variable	1	2	3	4	1	2	3	4
L1. ZCAR	0.1210***	0.1421***	0.0213***	0.2125***				
L1. NPM					0.1231***	0.2139***	0.4325***	1.5435***
Human capital efficiency	0.0237**			0.02345***	0.0472***			-0.0868***
Structural capital efficiency		0.0437**		0.0736**		0.0849*		0.0518*
Relational capital efficiency			0.0234	0.0745**			0.0256	0.0376**
log of total assets	0.0271***	0.0593***	0.0648***	0.00036**	0.0351***	0.0324***	0.0493***	0.0416***

Leverage	-0.0233***	-0.0347***	-0.0231***	-0.0423***	0	-0.0367	-0.0451	-0.00018
Market share	0.0174***	0.0435***	0.0621***	0.0834***	0.0391***	0.0299	0.0834	0.0368
Foreign ownership	0.0264**	0.0457**	0.0573**	0.0204**	0.0326**	-0.0123	-0.0326	-0.0236
Inflation	-0.0235***	0.0321***	-0.0222***	-0.0234***	-0.0017***	-0.0234***	-0.0236***	-0.0289***
Gross domestic product	0.0015*	0.0014*	0.0012	0.0017*	0.0163*	0.0023***	0.0045***	0.0128***
Year dummy	-0.001***	-0.0001***	-0.0013***	-0.0004***	-0.0230**	0	0	0.0000
Constant	0.0001	0.0025	0.0047	0.0183	-0.0067	-0.0345**	-0.1034**	-0.235**
N. of observations	407	407	407	407	407	407	407	407
AR(1) test statistics (p-value)	0.2268	0.2304	0.4234	0.22234	0.0234	0.00223	0.00785	0.003456
AR(2) test statistics (p-value)	0.20923	0.27445	0.26023	0.22476	0.38277	0.41555	0.2734	0.27722
Hansen test (p-value)	0.1923	0.1923	0.2134	0.2987	0.3245	0.4123	0.2378	0.3489

Table 5. GMM Regression Analysis

According to the control variables, bank size has a positive and significant impact on the financial stability of all models in the study[42], supporting the findings of other studies.[43] This finding suggests that stability is significantly influenced by the size of banks.[44] Bank leverage affects FS negatively and not very much. Market share and all financial stability variables are positively and significantly correlated. These results support those of [45] in Asian nations, suggesting that increased bank market share contributes to enhanced bank stability. In all models, foreign ownership has a

positive and significant impact on IBs' financial stability. These findings run counter to those of [46], who claimed that a sizable foreign ownership stake had a negative impact on financial performance. In addition, we discover that GDP positively and significantly correlates with the financial stability of Islamic banks, while inflation negatively and significantly correlates with the FS of Islamic banks, these results corroborate the hypothesis.[47] According to this research, higher GDPs are associated with faster national growth, which strengthens Islamic banks' financial stability.

5. Conclusion

This study explored the relationship between intellectual capital efficiency (ICE) comprising Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Relational Capital Efficiency (RCE) and the financial stability of Islamic banks in the Gulf Cooperation Council (GCC) region. Using panel data from 37 Islamic banks operating across six Gulf countries from 2010 to 2021 and employing the Generalized Method of Moments (GMM) dynamic panel estimator, the research aimed to address endogeneity, reverse causality, and simultaneity issues inherent in such longitudinal datasets.

The findings demonstrate that ICE particularly HCE and SCE plays a statistically significant and positive role in enhancing financial stability, measured through ZCAR and Net Profit Margin (NPM). These results align with the Resource-Based Theory (RBT), affirming that the strategic deployment of intangible, VRIN-based resources (such as intellectual capital) can confer sustainable competitive advantages and promote institutional resilience. Although RCE exhibited weaker or less consistent effects compared to HCE and SCE, it still holds strategic value, especially in customer loyalty and stakeholder relations.

This study contributes to the existing body of knowledge by empirically validating the theoretical propositions of RBT in the context of Islamic banking—a sector that uniquely combines ethical finance with risk-sharing mechanisms. It underscores that investments in intellectual capital are not merely internal operational decisions but strategic imperatives for financial soundness in a rapidly evolving economic environment.

Additionally, the results present practical implications for regulators, policymakers, and bank managers, highlighting the need for integrated frameworks that promote human resource development, technological innovation, and ethical governance in Islamic banking systems.

However, this study is not without limitations. It is geographically limited to Islamic banks within the Gulf region, which may affect the generalizability of the findings to other regions or conventional banking systems. Future research could expand the scope to include comparative analyses across different banking models, economic contexts, or emerging financial technologies. Further studies may also consider alternative proxies for financial stability—such as return volatility, capital adequacy ratios, or market value metrics—to validate and extend these findings.

6. Practical and Policy Implications

This research provides several actionable insights for banking practitioners, policymakers, and regulatory bodies operating in the Islamic financial ecosystem:

1. **Human Capital Development:** The strong association between HCE and financial stability emphasizes the need for continuous investment in workforce development. Bank management should prioritize professional training programs in *Sharīʿah*-compliant finance, risk analytics, digital banking tools, and ethical governance. Governments and regulators can support this through certification frameworks, educational partnerships, and skill-development subsidies.
2. **Structural Capital Enhancement:** SCE was found to be a critical determinant of financial resilience. Banks should focus on strengthening internal systems, digital infrastructure, and compliance mechanisms. Regulatory agencies may encourage banks to disclose intellectual capital investments and governance systems in their annual reports, thereby improving transparency and accountability.
3. **Relational Capital Utilization:** While RCE showed a relatively weaker impact, it remains essential for reputation management and stakeholder trust. Managers should foster deeper client relationships, improve service responsiveness, and engage with local communities to enhance loyalty and resilience in times of crisis. Regulatory frameworks can support this by incentivizing customer-centric practices and stakeholder engagement.
4. **Tailored Regulatory Policies:** Policymakers across GCC nations should consider integrating intellectual capital indicators into risk assessment models and supervisory frameworks. Developing policy guidelines that link ICE to performance benchmarks will help standardize practices and reduce information asymmetries in the banking sector.
5. **Sector-Wide Collaboration and Benchmarking:** Islamic banks can benefit from industry-wide benchmarking initiatives to assess and compare intellectual capital efficiency across institutions. This would facilitate knowledge-sharing and innovation

diffusion, contributing to the overall robustness of the Islamic banking ecosystem.

6. **Contextual Sensitivity in Application:** Given the region-specific findings, policymakers must tailor these recommendations to local institutional, legal, and economic contexts. The Gulf's unique financial and cultural landscape requires adaptable but grounded regulatory strategies that respect *Sharīʿah* principles while enhancing operational efficiency.

In sum, the study highlights that intellectual capital—when strategically cultivated—can significantly enhance financial stability, thereby enabling Islamic banks in the Gulf region to thrive in a competitive and increasingly knowledge-based global economy.

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