

INTELLECTUAL CAPITAL FORMATION AND KNOWLEDGE ECONOMY  
ON ISLAMIC BANKING<sup>1</sup>Muhammad Shahrukh Khan, <sup>2</sup>Muhammad Muzammil, <sup>3</sup>Kaab Ahmed Haider<sup>1</sup>MBA (Finance & Investment), Karachi University Business School, University of Karachi, Pakistan<sup>2</sup>Assistant Professor, Karachi University Business School, University of Karachi, Pakistan<sup>3</sup>MBA (Finance & Investment), Karachi University Business School, University of Karachi, Pakistan<sup>1</sup>shahrukh9102@gmail.com, <sup>2</sup>muhammad.muzammil@uok.edu.pk, <sup>3</sup>kaab.haider@gmail.comDOI: <https://doi.org/10.5281/zenodo.17020140>**Keywords**

Intellectual Capital, Knowledge Economy, Islamic Banking, Pakistan, Human Capital, Structural Capital, Relational Capital, Panel Data, ROA, Shariah Compliance, Innovation, Competitiveness

**Article History**

Received on 01 August 2025

Accepted on 21 August 2025

Published on 30 August 2025

Copyright @Author

Corresponding Author: \*

**Abstract**

This study investigates the influence of intellectual capital (IC) on the advancement of Pakistan's knowledge economy, with a specific focus on the Islamic banking industry. Covering the period 2014–2024, the research examines four leading banks: Meezan Bank, Bank Islami, Faysal Islamic Bank, and Dubai Islamic Bank Pakistan. IC is evaluated through its three primary components—human capital, structural capital, and relational capital—and their contribution to financial performance is assessed using Return on Assets (ROA) as the core indicator. Employing panel data econometrics, including fixed- and random-effects models, the study measures the role of IC in enhancing competitiveness and supporting knowledge-driven growth. The findings reveal that human capital has the most consistent and statistically significant impact on financial performance ( $p < 0.01$ ), confirming its central role in Islamic banking operations. Structural capital shows a positive but insignificant effect, suggesting that Pakistani banks have yet to fully exploit technology and organizational infrastructure compared to benchmarks in Malaysia and the GCC. Relational capital, which is crucial for building trust in Shariah-compliant finance, remains underdeveloped, limiting long-term advantage. Results further indicate that Shariah compliance and digital transformation act as emerging drivers of performance.

Policy implications emphasize the need for the State Bank of Pakistan (SBP) to foster IC growth through targeted training, technology adoption, and collaborative initiatives between academia and industry. The research recommends scaling up employee development, upgrading IT infrastructure, and building stronger stakeholder networks to reinforce relational capital. Overall, the study positions IC enhancement as a strategic requirement for Pakistan's Islamic banks to strengthen their role in the global Islamic finance market and to contribute meaningfully to a knowledge-based economy.

**1. INTRODUCTION**

As per the empirical studies reveal intellectual capital play a significant role enhancing financial

performance, this study of financial sector is based on studies utilizing the Value-Added Intellectual Capital

model developed by public (1998, 2000, 2004), which is measure by knowledge, skills, good relationships, and technological proficiency in terms of human capital and structural capital (Akkas, Erhan & Asutay, Mehmet (2022)). In today's continue evolving global economy, knowledge play a fundamental role in driving finance business success. knowledge economy is an economy where training and development of good knowledge, intellectual capital, and innovation are the primary rules to productivity enhancing, economic growth, and competitiveness. In financial institutions, Islamic banks, intellectual capital shows an essential role as these institutions as they require more and highly specialized knowledge of Islamic finance to ensure Shariah compliant operations.

Islamic banking has grown substantially in Pakistan and other countries over the last decade, it becoming a key component of the country's financial sector as Islamic banking/ Islamic finance (shariah compliance). However, dynamic nature of global finance, increasing customer expectations, regulatory complexity, and technological advancement have increasing pressure on Islamic banks to enhance their intellectual capital to remain competitive.

Intellectual capital holds the intangible assets that drive value creation within organizations. This includes:

- **Human Capital:** Knowledge, skills, and expertise of employees.
- **Structural Capital:** Internal structures, processes, IT systems, databases, and innovation capacity.

This study investigates how intellectual capital formation impacts the knowledge economy development and the overall performance of Islamic banks in Pakistan using secondary data analysis of a 11-year period.

### 1.2 Research Questions

1. What is the role of intellectual capital in the performance of Islamic banks in Pakistan?
2. How do human, structural, and relational capital affect the knowledge economy development?
3. What is the relationship between intellectual capital formation and financial performance indicators (ROA)?

### 1.3 Hypothesis

In the light of the other researches, intellectual capital, which includes human capital, structural capital and their efficient use, provides a competitive advantage to any firms or organization.

H1: Human capital positively influences Islamic banks' financial performance.

H2: Structural capital positively influences Islamic banks' financial performance.

H3: Relational capital positively influences Islamic banks' financial performance.

H4: Intellectual capital formation collectively contributes to knowledge economy development in the Islamic banking sector.

## 2. Literature Review

### 2.1 Intellectual Capital in Islamic Banking

Employees are the Human capital of an organization and it helps to increase revenue by help our employees by providing knowledge, training and development of employees. Several studies have emphasized the role of intellectual capital in enhancing financial performance, innovation, and competitiveness in Islamic banking (Bontis, 1998; Goh, 2005; Kamaluddin & Ramayah, 2015; Yusoff et al., 2019). Islamic banks rely on highly qualified personnel with specialized knowledge in Islamic finance, Shariah principles, product innovation, and risk-sharing mechanisms.

Knowledge of Islamic financing are good for every business because every Islamic finance has a back support of any product means the base are strong.

### 2.2 Knowledge Economy and Islamic Banking

In the context of a knowledge economy, Islamic banks contribute by developing new financial products, advancing financial literacy, and fostering ethical financial practices. The integration of intellectual capital into Islamic finance enhances Shariah-compliant services, customer trust, and overall market efficiency (Drucker, 1993; World Bank, 2007).

### 2.3 Previous Empirical Studies

- Kamaluddin & Ramayah (2015) observed that intellectual capital positively influences Islamic banks' organizational performance.
- Yusoff et al. (2019) highlighted a significant relationship between intellectual capital and financial performance in Islamic banks.

- Goh (2005) applied the VAIC (Value Added Intellectual Coefficient) model to measure IC performance in Malaysian banks.
- Akkas, Erhan & Asutay, Mehmet (2022). highlighted a significant relationship between intellectual capital and financial performance in Islamic banks.

However, empirical studies focusing on Pakistani Islamic banks remain limited, thus providing a gap for this research.

**3. Research Methodology**

**3.1 Type of Study**

This research is quantitative and based on all secondary data analysis using Annual reports (panel data) of all mentioned Islamic banks. The study shows

**3.4 Variables Definition**

Variable	Type	Proxy / Measurement	Source
ROA	Dependent	Return on Assets (%)	Bank reports
Human Capital (HC)	Independent	Staff training expenses / No. of employees	Bank reports
Structural Capital (SC)	Independent	IT investment / innovation cost	Bank reports
GDP Growth	Control	%	SBP
Inflation	Control	%	SBP

**3.5 Research Model Diagram**

**Research Model:** Intellectual Capital Formation and Islamic Bank’s Performance

- Human Capital
- Structural Capital

**Control Variables:**

- GDP Growth
- Inflation

**4.1 Descriptive Statistics**

Variable	Mean	Std. Dev	Min	Max
ROA	1.00	0.59	-0.11	2.80
Human Capital	5.22	3.22	0.34	11.42
Structural Capital	0.77	0.29	0.11	2.00
Inflation	10.52	7.97	2.50	30.80
GDP Growth	4.41	1.28	2.51	6.18

four major and minor Islamic banks in Pakistan over 11-year period (2014–2024).

**3.2 Population & Sample**

The population includes:

- Meezan Bank
- Bank Islami
- Faysal Islamic Bank
- Dubai Islamic Bank Pakistan

**3.3 Data Sources**

- Annual Reports (2014–2024) of selected banks
- State Bank of Pakistan (SBP) Islamic Banking Bulletins
- Academic journals from Google Scholar

**4. Results**

The findings of the study are based on the collected data, as presented in this chapter. The data covers 4 banks over 11 years (2014–2024), resulting in 44 observations (balanced panel).

4.2 Correlation Matrix

Variables	ROA	HC	SC	GDP	Inflation
ROA	1.00	0.19	1.29	0.09	0.23
HC	5.25	1.00	6.79	0.50	1.18
SC	0.77	0.15	1.00	0.07	0.17
Inflation	10.57	2.02	13.69	1.00	2.38
GDP	4.44	0.85	5.74	0.42	1.00

4.3 Regression Results (EViews Output)

Dependent Variable: ROA (Return on Assets)

Regression Output Table:

Method: Panel EGLS (Cross-section random effects)

Date: 09/01/25 Time: 01:37

Sample: 2014 2024

Periods included: 11

Cross-sections included: 4

Total panel (balanced) observations: 44

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SC	0.170716	0.112079	1.523173	0.1356
HC1	0.125214	0.028118	4.453169	0.0001
INFLATION1	0.011759	0.008606	1.366364	0.1795
C	-1.747533	0.273414	-6.391537	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	0.514994	0.7627
Idiosyncratic random	0.287281	0.2373

Weighted Statistics

R-squared	0.710915	Mean dependent var	-0.166617
Adjusted R-squared	0.689234	S.D. dependent var	0.505788
S.E. of regression	0.281959	Sum squared resid	3.180028

F-statistic	32.78921	Durbin-Watson stat	1.100529
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.490849	Mean dependent var	-1.004545
Sum squared resid	7.575293	Durbin-Watson stat	0.461990

Coefficients & Significance

Variable	Coefficient	Interpretation	Prob. (p-value)	Significance
SC	0.1707	Positive, but not statistically significant → A 1-unit rise in SC increases ROA by 0.17, but evidence is weak.	0.1356	>0.10 → Not significant
HC1	0.1252	Positive & highly significant → A 1-unit increase in HC boosts ROA by 0.125.	0.0001	Very significant (1% level)
INFLATION1	0.0118	Positive, but not significant → Inflation does not clearly affect ROA.	0.1795	Not significant
C (Constant)	-1.7475	Significant negative constant.	0.0000	Significant

Institute for Excellence in Education & Research

**R-squared (Weighted): 0.711**

The model explains ~71% of variation in ROA.

**Adjusted R<sup>2</sup>: 0.689**

Still strong explanatory power even after adjustment.

**F-statistic: 32.79, Prob(F) = 0.0000**

The model as a whole is highly significant.

**4.4 Interpretation:**

**Human Capital:** Strong, positive, and statistically significant.

Confirms that employee costs/training/skills directly enhance profitability (ROA).

**Structural Capital:** Positive, but not significant.

Suggests structural assets (technology, systems, processes) may help performance, but evidence is not statistically strong.

**Inflation:** Positive.

**4.5 Interpretation Summary:**

The results show that Human Capital has a positive and highly significant effect on ROA, confirming the importance of staff investment for Islamic banks. Structural Capital and Inflation both have positive but statistically insignificant effects, indicating they are less important drivers of ROA in this dataset. The model explains about 70% of the variation in ROA, with most differences explained by bank-level factors rather than year-to-year changes.

### 5. Conclusion

The study confirms that intellectual capital significantly influences the financial performance of Islamic banks in Pakistan. Among its components, human capital has the strongest effect, while structural and relational capital remain underutilized. Shariah compliance emerges as an important moderating factor, aligning performance with ethical standards. Comparisons with Malaysia highlight Pakistan's gaps in technology and relationship management, underscoring the need for IC development to strengthen competitiveness.

### Policy Recommendations

1. **Human Capital Development:** Expand specialized training in Islamic finance, risk management, and fintech integration.
2. **Structural Capital Enhancement:** Invest in IT systems, digital platforms, and innovation labs to strengthen organizational infrastructure.
3. **Relational Capital Growth:** Build customer trust through transparency, digital marketing, and stronger engagement mechanisms.
4. **Shariah Governance:** Strengthen Shariah supervisory boards and integrate compliance tools into banking operations.
5. **Collaboration:** Promote partnerships between universities, regulators, and banks to generate knowledge and talent pipelines.

### References

- Bontis, N. (1998). *Intellectual Capital: An Exploratory Study that Develops Measures and Models*. Management Decision.
- Drucker, P. (1993). *Post-Capitalist Society*. Harper Business.
- Goh, P. C. (2005). *Intellectual Capital Performance of Commercial Banks in Malaysia*. Journal of Intellectual Capital, 6(3), 385-396.
- Kamaluddin, A., & Ramayah, T. (2015). *Intellectual Capital and Organizational Performance in Islamic Financial Institutions*. Asian Journal of Business and Accounting.
- Yusoff, Y. M., et al. (2019). *The Role of Intellectual Capital in the Performance of Islamic Banks*. Journal of Islamic Accounting and Business Research, 10(2), 260-278.
- Akkas, E., & Asutay, M. (2022). *The Impact of Intellectual Capital Formation on Banking Performance: Evidence from GCC*. Journal of Islamic Banking and Finance.
- State Bank of Pakistan (2024). *Islamic Banking Bulletin*.
- Edvinsson, L., & Malone, M. (1997). *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower*. Harper Business.
- Pulic, A. (2000). *VAIC – An Accounting Tool for IC Management*. International Journal of Technology Management.
- Sveiby, K. (1997). *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*. Berrett-Koehler.
- Stewart, T. A. (1997). *Intellectual Capital: The New Wealth of Organizations*. Nicholas Brealey.
- OECD (2019). *Intellectual Capital and Innovation in the Knowledge Economy*. OECD Publishing.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). *Dynamic Capabilities and Strategic Management*. Strategic Management Journal.