INTERNATIONAL JOURNAL OF MANAGEMENT AND ORGANIZATIONAL RESEARCH

Impact of Intellectual Capital on the Sustainable Financial Performance of Private Sector Banks in Pakistan

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Article Info

ISSN (online): 2583-6641
Volume: 04
Issue: 05
September – October 2025
Received: 16-07-2025
Accepted: 18-08-2025
Published: 10-09-2025
Page No: 25-31

Abstract
This study investigates the impact of Intellectual Capital on sustainable financial performance of private sector banks in Pakistan. Panel data from 19 private sector banks covering the period 2012-2021 were obtained from the Financial Statement Analysis (FSA) report publish by the State Bank of Pakistan. Capital employed, human capital, relational capital, and structural capital were used as independent variables, with firm size, financial leverage, and GDP included as control variables. Return on equity (ROE) and return on capital employed (ROCE) served as the dependent variables. Our findings revealed the capital employed efficiency (CEE), relational capital efficiency (RCE) and human capital efficiency (HCE) are positively and significantly related to the return on equity (ROE), whereas these variables also positively influence the return on capital employed (ROCE). The overall intellectual capital, as measured by the MVAIC, there is a positive and significant relationship with the ROCE and is positively associated with the ROE. These findings suggest that managers and policymakers should give greater attention to the components of intellectual capital, as they are key drivers of value creation and can strengthen banks' sustainable financial performance.

DOI: https://doi.org/10.54660/IJMOR.2025.4.5.25-31

Keywords: Intellectual Capital, Private Sector Banks, Sustainable Financial Performance, MVAIC

1. Introduction

In emerging nations, rapid population growth has generated an exceptional demand for community development, energy provision and agricultural infrastructure (Falcone & Sica, 2019) [3]. Consequently, intellectual capital (IC) has become a pivotal issue in the rapidly expanding economies of the developing world. Nonaka and Takeuchi (1995) [4] define intellectual capital as the "capacity of an organization to create new information, disseminate it across the association and embody it in products and services." In simple terms, a firm's IC represents the total value of its intangible resources. It encompasses four dimensions. First, human capital relates to the utilization of employees' skills, capabilities and attributes that contribute to productivity. Second, structural capital refers to the internal systems, processes and databases that support operations. Third, relational capital captures the organization's relationships with customers, suppliers, employees and networks representing its leadership; the success of any organization depends on how effectively it manages these internal and external linkages. Finally, capital employed comprises the financial and physical capital necessary for wealth generation.

A number of studies in emerging economies have investigated the influence of intellectual capital on the financial performance of banks. Pakistan's private banks are under increasing pressure to sustain long-term financial performance in a volatile economic climate and a competitive banking environment. Although profitability, liquidity and asset quality are frequently used to evaluate bank performance, intellectual capital—because of its intangible nature—offers an opportunity to assess the underlying drivers of financial success. Globally, research on the effect of IC on financial performance has attracted significant attention, yet its application to the private banking sector in Pakistan remains comparatively underexplored. In non-industrial countries like Pakistan, little scholarship has been produced on the relationship between corporate performance and intellectual performance. As a developing economy, Pakistan stands to benefit from consolidating and nurturing intellectual capital to

strengthen its economic structure.

Since independence in 1947, Pakistan's economy has passed through several stages. To encourage domestic and foreign investment and promote economic expansion, the government has implemented numerous policy measures at various levels. Acting as a financial intermediary between diverse sectors, the banking industry serves as the backbone of sustainable economic development. At present, there are 22 private banks operating in Pakistan, with combined assets reaching PKR 23 trillion in the fiscal year 2021. By empirically examining the link between intellectual capital and the long-term financial performance of Pakistan's private banks, this study seeks to address the existing void in the literature. Understanding the specific dimensions and components of IC that influence financial performance can provide valuable insights for private banks aiming to optimize their IC management strategies and improve their economic outcomes. The findings of this research have important implications for private banks in Pakistan, as well as for policy makers and regulators, by informing the development of strategies and policies aimed at enhancing intellectual capital management practices within the banking sector.

Intellectual capital generates not only intangible goods (such as licenses, trademarks, copyrights and software) but also invisible capabilities and competitive advantages, which in turn contribute to tangible wealth creation. IC thus acts as an invisible driver—sometimes referred to as an "intangible competence." In recent years, scholars have attempted to establish reliable and consistent ways of measuring these elusive resources. Several models linking IC to business performance have been developed, and researchers consistently affirm that knowledge is a resource with essentially limitless potential rather than diminishing returns (Mavridis & Kyrmizoglou, 2003) [5]. The financial sector is a particularly suitable area for IC analysis because published accounts (balance sheets and profit-and-loss statements) provide consistent and accessible data. The banking business is inherently knowledge-intensive and mentally demanding; as Kubo and Saka (2002) [6] observe, bank staff are, as a group, more homogeneous in intellectual attributes than employees in many other economic sectors.

By revealing the linkages between intellectual capital and sustainable financial performance, this study contributes to the existing body of knowledge on IC and provides practical insights for private banks seeking to strengthen their competitive position in Pakistan's dynamic and evolving financial landscape. The remainder of this article is organized as follows: Section 2 presents the literature review, Section 3 explains the methodology, Section 4 reports the empirical findings, and the final section offers conclusions, limitations and directions for future research. Through this comprehensive investigation of the impact of intellectual capital on the sustainable financial performance of private banks in Pakistan, the study aims to enrich both academic discourse and managerial decision-making, paving the way for a more informed and innovative private banking sector in the country.

2. Literature Review

Although intellectual capital (IC) is an intangible resource, it is increasingly recognized as a strategic corporate asset capable of creating sustainable competitive advantage and enhancing financial performance (Barney, 1991) [7]. The purpose of this literature review is to present a comprehensive overview of prior research on IC in the banking sector, focusing on the theoretical frameworks and empirical findings that explain its connection with financial performance.

From a broad perspective, intellectual capital is commonly divided into human capital (HC) and structural capital (SC) (Bontis, 1996). Human capital comprises the intangible attributes of people—such as their skills, knowledge, creativity, health and education—that drive innovation, organizational success and economic growth. Structural capital refers to the organizational infrastructure, processes, databases, intellectual property and systems that support operations and embed knowledge within the firm, thereby contributing to its value and competitive advantage.

Pulic's (2000) [10] Value Added Intellectual Coefficient (VAIC) model operationalized IC by quantifying the efficiency of human capital, structural capital and capital employed (CE) in creating value. Capital employed reflects a company's capacity to generate value from its equity and long-term funds. However, because VAIC overlooks the importance of stakeholder relationships, the Modified Value Added Intellectual Capital (MVAIC) model adds a fourth dimension—relational capital (RC)—to capture a firm's external relationships with customers, suppliers, partners and the broader community. RC embodies the trust, reputation and goodwill developed through these interactions and is regarded as an important intangible asset that can enhance an organization's competitive advantage.

Using VAIC as a measurement tool, many studies have assessed banks' performance by estimating the efficiency of each IC component and comparing results across institutions. Pulic's (2004) research on Australian banks showed that intellectual capital significantly influences organizational success and profitability, with banks investing heavily in IC achieving superior financial performance. Other work applying VAIC in different contexts—such as Turkey, Malaysia, and Thailand—has also reported positive associations between human capital efficiency and financial outcomes (Saengchan, 2007; Yalama & Coskun, 2007; Maheran et al., 2009) [11, 21]. For instance, Australian banks were found to possess higher HC efficiency compared with CE and SC efficiency, whereas Turkish evidence indicates a stronger effect of capital employed on ROA than of human capital, with structural capital exerting little influence. Mixed findings across countries reflect contextual differences and the use of various econometric approaches such as GMM and OLS.

Recent research updates and broadens this evidence base. The Impact of Intellectual Capital on Sustainable Performance: Banking Sector in Saudi Arabia (2024) shows that HCE, SCE and CEE all significantly enhance ROE and net profit margin under sustainability-oriented regulations, illustrating the continuing relevance of IC in a transforming economy. Similarly, Assessing the Intellectual Capital of Value Creation Process of Commercial Banks in the European Union (2025) finds that human and capital-employed efficiencies remain significant predictors of bank performance in a highly regulated market. Evidence from ASEAN banks (2023-2024) likewise highlights that structural capital efficiency plays a crucial role in profitability metrics, though the influence of CEE and HCE varies by national context. In Jordan, a 2024 study of financial institutions confirms strong positive effects of IC

components on ROA and ROE, reinforcing the idea that IC's impact extends across the Middle East and emerging markets. These recent studies provide fresh, geographically diverse confirmation of IC's importance and underscore the need for updated research in Pakistan's private banking sector.

Several Pakistani sectoral studies also point to the relevance of IC. Using VAIC, research on Pakistan's financial industries (2008–2013) shows that IC is a major driver of firms' financial efficiency, with human capital playing the most prominent role. Other work on the oil and gas sector (2007–2011) finds positive and significant relationships between human and structural capital efficiency and financial performance. Pharmaceutical industry evidence similarly reports a significant effect of IC on profitability. Together, these findings imply that while Pakistani organizations recognize the importance of IC, empirical research in the private banking sector remains limited and dated.

Beyond measurement, the disclosure of IC has attracted scholarly attention because intellectual capital is one of the most representative yet elusive resources a company owns (Dumay, 2012). Dumay (2016) defines disclosure as "the revelation of information that was previously secret or unknown." Prior studies emphasize the role of annual reports (Abeysekera & Guthrie, 2005) and intellectual capital reports (Mouritsen et al., 2001; 2003) as key tools for disseminating IC information, even when companies manage these resources under other labels (Ordóñez de Pablos, 2003). The main purpose of developing IC remains value creation within the company rather than external reporting (Tee Jeok Inn et al., 2015), and directors may choose not to disclose IC details to avoid informing competitors (Healy & Palepu, 2001). This discretion, coupled with weak regulatory enforcement (Bloom, 2015), explains the variability in IC reporting across firms.

Pulic's pioneering work in Croatia (2001; 2002) demonstrated the potential of VAIC rankings to capture banks' value creation efficiency but also noted that IC is still not treated as an asset equivalent to physical and financial capital in many service firms. Scholars have therefore called for new measurement models and accounting systems that better integrate IC. Despite extensive international research, mixed evidence on the IC–financial performance relationship persists, motivating further empirical studies tailored to specific contexts such as Pakistan's private banking sector.

Taken together, the literature shows that intellectual capital—through its human, structural, relational and capital employed components—has a demonstrable impact on financial performance across a range of banking systems. Yet updated empirical studies using comprehensive models and recent data remain scarce for Pakistan's private banks. Addressing this gap, the present study empirically investigates the connection between IC and the long-term financial performance of Pakistani private banks, providing insights to guide managers and policymakers in optimizing IC management strategies.

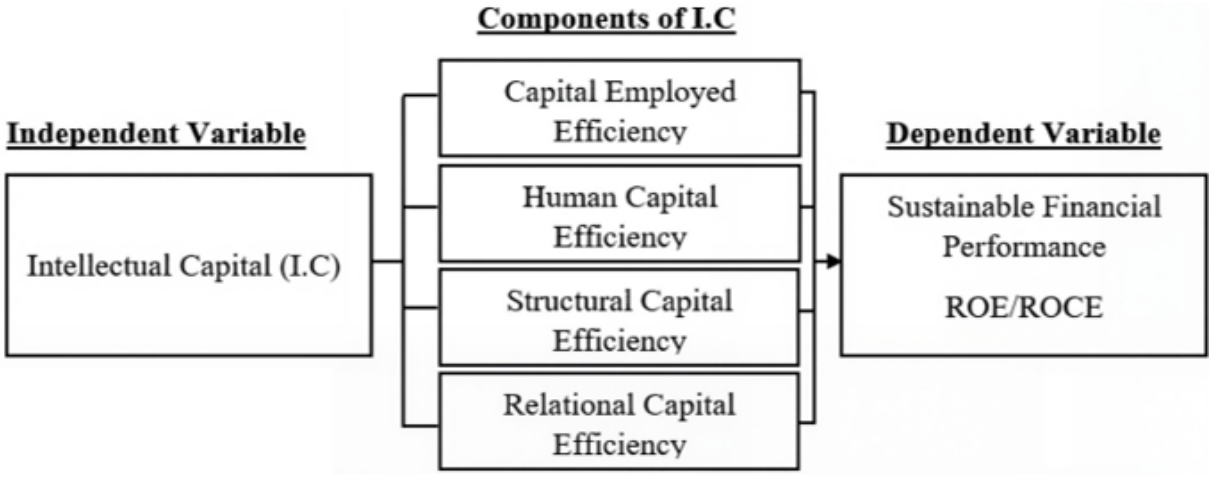
3. Research Design and Methodology

The data of private sector banks is collected from "financial statement analysis" which was issued by State bank of Pakistan. We have collected this data from 19 private sector banks. The data for these 19 PSB were collected from the year 2012 to 2021.

To check the effect of intellectual capital this study utilizes the modified value-added coefficient methodology.

3.1. Private Sector Banks

Sr.no	Names	Abbreviation	Commence. Year
1	Allied Bank Ltd	ABL	1974
2	Askari Bank Ltd	ASB	1992
3	Bank al Habib Ltd	BAH	1991
4	Bank Al Falah Ltd	BAF	1992
5	Bank Islami Pakistan Ltd	BIPL	2006
6	Dubai Islamic Bank Ltd	DIBP	2006
7	Faysal Bank Ltd	FBL	1994
8	Habib Bank Ltd	HBL	1941
9	Habib Metropolitan Bank Ltd	HMB	2006
10	JS Bank Ltd	JSBL	2006
11	MCB Bank Ltd	MCBL	1948
12	Meezan Bank Ltd	MBL	2002
13	Samba Bank Ltd	SBL	2008
14	Silk Bank Ltd	SILK	1995
15	Soneri Bank Ltd	SNBL	1992
16	Standard Chartered Bank Ltd (Pak)	SCBPL	2006
17	Summit Bank Ltd	SMBL	2007
18	United Bank Ltd	UBL	1959
19	Al Baraka Bank (Pak) Ltd	ABPL	2006



Note: Firm size, leverage and GDP are included as control variables in the regression analysis but are not shown in the figure for simplicity.

Fig 1: Conceptual Framework

4. Methodology

Panel data are used in this study to investigate the effect of intellectual capital on sustainable finance. This study examines the MVAIC to check the effect of intellectual capital on sustainable finance. Many researchers such as (Weqar, F.; Khan, 2020), (Tran, D.B 2018) have used the MVAIC method. In order to accurately represent the CE, HC, SC and RC. Descriptive statistics and correlation matrix variables are used in the first stage to comprehend the nature and relationship of variables. (Daniel, H 2007). In second stage the stationarity of the variables is checked. Various unit root tests were used the stationarity of the data. We observed that different variables were not stationary. The study uses two dependent variables for checking firm's performance the first is (ROE) and the second is (ROCE) (Soetanto, T; Liem, 2019) [12]. At first stage the impact of each dependent variable on the independent factors of intellectual capital (HC, CE, RC, and SC) was evaluated. Also consolidated effects are examined using the variables described above (measured by MVAIC). This research uses three control variables, including firm size, debt and GDP, which are used to minimize external effects (Xu, J.; Wang, B. 2019) [15].

Table 1: Variables

S. No.	Variable Name	Abbr.	Measurement / Formula	Source
Independent Variables – Intellectual Capital Components				
1	Capital Employed Efficiency	CEE	CEE = VA / CE	CE = Equity + Long-term Loans. VA = EBIT + Employee Cost + Depreciation. Pulic (2000) [10].
2	Human Capital Efficiency	HCE	HCE = VA / HC	HC = Total Employee Expenditure. Pulic (2000).
3	Structural Capital Efficiency	SCE	SCE = (VA – HC) / VA	SC = Value Added – Human Capital. Pulic (2000) [10].
4	Relational Capital Efficiency	RCE	RCE = VA / RC	RC = Amount invested in marketing, selling, and advertising. Barak & Sharma (2023) [8].
5	Modified Value-Added Intellectual Coefficient	MVAIC	MVAIC = CEE + HCE + SCE + RCE	Composite measure of IC efficiency. Pulic (2000) [10].
Dependent Variables – Financial Performance				
6	Return on Equity	ROE	Net Income / Shareholders' Equity	Annual Reports
7	Return on Capital Employed	ROCE	EBIT / Capital Employed	Annual Reports
Control Variables				
8	Financial Leverage	LEV	Total Debt / Total Equity	Annual Reports
9	Firm Size	SIZE	ln (Total Assets)	Annual Reports
10	Gross Domestic Product	GDP	GDP = C + I + G + (X − M)	World Bank

5. Models

We have developed four regression model to examine the effect of Intellectual Capital on financial performance of banks. The relationships between the components of Intellectual Capital (HC, CE, SC, and RC) and return on equity (ROE), and return on capital employed (ROCE) are depicted in Equations 1 and 2. Equation 3 and 4 examine how combined Intellectual Capital and (MVAIC) relate to return on capital employed (ROCE) and return on equity (ROE).

Equation

$$ROE = a + \beta_1 HC + \beta_2 CE + \beta_3 SC + \beta_4 RC + \beta_5 SIZE + \beta_6 LEV + \beta_7 GDP + \mu$$

Equation

$$ROCE = a + \beta_1 HC + \beta_2 CE + \beta_3 SC + \beta_4 RC + \beta_5 SIZE + \beta_6 LEV + \beta_7 GDP + \mu$$

Equation

$$ROE = a + \beta_1 MVAIC + \beta_2 SIZE + \beta_3 LEV + \beta_4 GDP + \mu$$

Equation

$$ROCE = a + \beta_1 MVAIC + \beta_2 SIZE + \beta_3 LEV + \beta_4 GDP + \mu$$

6. Results and Discussion

6.1. Univariate Analysis

Table 2: Summary Statistics

	CE	HC	SC	RC	MVAIC	LEV	SIZE	GDP	ROE	ROCE
Mean	0.240903	1.667624	0.379331	1.628322	3.916177	19.63368	7.12E+08	2.95E+11	0.115263	0.069368
Median	0.2359	1.65545	0.40945	1.6322	3.93775	14.125	4.72E+08	3.07E+11	0.16	0.075
Maximum	0.6224	8.6264	5.5055	4.7127	10.4846	636.45	4.07E+09	3.56E+11	1.04	1.21
Minimum	-1.9172	-1.5428	-4.3414	-1.5217	-4.0535	-12.21	63509562	2.24E+11	-3.18	-3.26
Std. Dev.	0.206421	0.841221	0.775969	0.691989	1.705198	47.28859	6.91E+08	4.68E+10	0.339978	0.27352
Skewness	-5.98758	2.403718	0.812306	-0.526366	-1.102948	11.88426	1.943228	-0.255719	-6.444948	-9.223236
Kurtosis	64.15885	27.81695	31.11871	7.845819	8.783507	154.1911	7.553876	1.57201	55.65983	118.5591
Jarque-Bera	30746.83	5058.689	6280.299	194.6724	303.3266	185437.6	283.7517	18.21406	23268.72	108412.3
Proba.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000111	0.000	0.000
Sum	45.7715	316.8486	72.0728	309.3812	744.0736	3730.4	1.35E+11	5.60E+13	21.9	13.18
Sum Sq. Dev.	8.053238	133.7464	113.802	90.50253	549.5554	422643.7	9.03E+19	4.14E+23	21.84554	14.13972

Table 2 displays the summary statistics of the variables. Among the four independent components of intellectual capital, the mean value of human capital is the highest. Conforming to Pulic, A. 2000 [10], 25-40% of the total value added comes from HC., that is why in contrast with HC other components of intellectual capital have relatively low mean values. The mean (median) values of CE, HC, SC and RC as 0.240 (0.2359), 1.667 (1.655), 0.379 (0.4094) and 1.6283 (1.6322). For control variables LEV, SIZE and GDP their mean (median) values are 19.63 (14.12), 7.12 (4.72) and 2.95 (3.07).

6.2 Correlation

Table 3: Correlation

	CE	HC	SC	RC	MVAIC	LEV	SIZE	GDP	ROE	ROCE
CE	1									
HC	0.3390	1								
SC	-0.0657	0.0539	1							
RC	0.4320	0.6724	0.0027	1						
MVAIC	0.4337	0.8318	0.4748	0.7911	1					
LEV	-0.1561	-0.2475	0.2093	-0.2699	-0.1553	1				
SIZE	-0.0164	0.3161	0.0990	0.3587	0.3446	-0.0839	1			
GDP	-0.2113	-0.0300	0.1013	-0.0571	-0.0174	0.0912	0.2724	1		
ROE	0.1598	0.3516	-0.3144	0.3771	0.2027	-0.7777	0.1199	-0.1005	1	
ROCE	0.8375	0.3767	-0.0645	0.4226	0.4293	-0.1609	0.1147	-0.0553	0.0682	1

According to the table 3 correlation analysis, most components of intellectual capital show positive association with ROE and these variables are also positively correlated with ROCE. Unlike other components, structural capital exhibits a negative relationship with financial performance. This may indicate that investments in systems and processes are not currently translating into profitability for Pakistani private banks, possibly due to inefficiencies, regulatory constraints, or underdeveloped organizational infrastructure. For checking multicollinearity, the correlation analysis has been done among the variables. All coefficients are low to moderate, indicating that multicollinearity is unlikely to significantly affect the regression results. Hence, further work can be done by applying multivariate regression models to test the hypotheses.

6.3. Panel Unit Root Test

Table 4: Stationary Test

	Level	1st diff	2nd diff
CE	0.0154	-	-
HC	0.2699	0.0004	-
SC	0.0055	-	-
RC	0.1639	0.0001	-
MVAIC	0.0196	-	-
LEV	0.9964	0.0001	-
SIZE	1.0000	0.9163	0.0005
GDP	0.9636	0.0000	-
ROE	0.0006	-	-
ROCE	0.0094	-	-

In table 4 ADF unit root test has taken of all variables, the ROE, CE, ROCE, SC, MVAIC are stationary in level their p-value is < 0.05. The p-value of HC, RC, LEV and GDP are stationary at 1st difference. SIZE variable is stationary at 2nd

difference where p-value is < 0.05.

6.4 Regression Test

Model 1				
DV: ROE				
Variable Names	**Coeff**	**Std. Errors**	**t-Stat**	**Probab**
C	0.119816	0.106053	1.129768	0.260
CE	-0.106216	0.080495	-1.319544	0.188
HC	0.048687	0.023583	2.06454	0.040
SC	-0.079146	0.019254	-4.110596	0.000
RC	0.069148	0.030797	2.245331	0.026
LEV	-0.004893	0.000327	-14.96347	0.000
SIZE	-1.55E-12	2.40E-11	-0.064446	0.948
GDP	-1.55E-13	3.30E-13	-0.468072	0.640
R^2	0.672			
Adjusted R^2	0.660			
(F-statistic)	0.000			

Model 2				
DV: ROCE				
Variable Names	**Coeff**	**Std. Errors**	**t-Stat**	**Probab**
C	-0.426938	0.077248	-5.526861	0.000
CE	1.111684	0.058631	18.96057	0.000
HC	0.027012	0.017177	1.572528	0.117
SC	-0.010676	0.014025	-0.76127	0.447
RC	-0.0091	0.022432	-0.405687	0.685
LEV	-6.77E-05	0.000238	-0.284427	0.776
SIZE	3.33E-11	1.75E-11	1.899856	0.059
GDP	6.10E-13	2.40E-13	2.53808	0.012
R^2	0.731			
Adjusted R^2	0.721			
(F-statistic)	0.00			

Model 3				
D.V: ROE				
Variable Names	**Coeff**	**Std. Errors**	**t-Stat**	**Probab**
C	0.243242	0.109122	2.229077	0.027
MVAIC	0.013752	0.009847	1.396564	0.164
LEV	-0.005461	0.000334	-16.33277	0.000
SIZE	2.16E-11	2.51E-11	0.858772	0.391
GDP	-3.05E-13	3.49E-13	-0.87348	0.383
R^2	0.614			
Adjusted R^2	0.605			
(F-statistic)	0.000			

Model 4				
D.V: ROCE				
Variable Names	**Coeff**	**Std. Errors**	**t-Stat**	**Probab**
C	-0.125007	0.126756	-0.986202	0.325
MVAIC	0.068151	0.011438	5.958078	0.000
LEV	-0.000548	0.000388	-1.411471	0.159
SIZE	-1.24E-11	2.92E-11	-0.424838	0.671
GDP	-1.79E-13	4.06E-13	-0.442377	0.658
R^2	0.195			
Adjusted R^2	0.178			
(F-statistic)	0.000			

Result for this study is taken by using panel least square model for regression analysis. In Equation 1 we have taken ROE as dependent variable in which HC, SC, and RC these independent variables are significant and have affected the dependent variable (ROE) while structural capital (SC) is negative and significant. In Equation 2 we have taken ROCE as dependent variable in which CE is significant and all other independent variables are weakly significant. Equations 3 and 4 introduce the aggregated intellectual capital efficiency (MVAIC); it is insignificant for ROE (Equation 3) but positively and significantly affects ROCE (Equation 4). All models are statistically significant, as indicated by F-statistics with p-values below 0.05.

7. Limitations and Recommendation for Future:

Even though this study made every effort to conduct a thorough investigation, it is impossible to account for all of the factors that contributed. Recognizing the shortcomings of the current research paper is necessary in order to make recommendations for subsequent studies. The primary objective of this study was to ascertain how private sector banks' sustainable financial performance is affected by intellectual capital. A study on the public sector, the foreign sector, regional rural banks, small finance banks, and payments banks could be carried out to better understand how intellectual capital influences the other pillars of the banks. The future examination should thoroughly investigate the effect of different qualities of intellectual capital and their relationship with execution and market conduct to assemble a total image of the impact of this dimension. For a comprehensive analysis over a longer period, dividing it into phases, and also examining trends across industries, future research might want to concentrate on examining the association between the independent variables covered in this study and performance. Finally, the methods and data's validity and dependability limit the findings. The instrument should be retested in different sociopolitical and economic contexts in future studies to verify its validity and/or improve it. In addition, future research may also refine this study's methodology to provide additional insights. The main limitations are the reliance on the MVAIC model and the use of private bank data only. A different intellectual measurement model and a wide range of bank data can be used in subsequent research. However, the present study's findings demonstrate the significance of intellectual in boosting banks' profitability and productivity. It could be argued that investing in banks' intellectual capital is just as important as investing in their monetary capital. Along with the other factors, it should be recognized as one of the important and promising investments that banks can make to drive sustainable growth. One more ramification of this study is that it helps the financial business and the controllers likewise in tending to the variables influencing the banks' monetary execution and making moves to boost their worth creation.

8. Conclusions and Implications:

Numerous studies have evaluated intellectual capital connection with banks' financial performance. A review of the literature reveals that intellectual capital has a positive effect on the financial performance of banks. All private banks' intellectual capital efficiency is measured in this study. The value was determined by employing the modified value-added coefficient (MVAIC) method. This demonstrates how intellectual capital influences the financial performance of Pakistani banks. As dependent variables, the two financial ratios of return on equity (ROE) and return on capital employed (ROCE) were used. As independent variables, dimensions of human capital (HC), employed capital (CE), structural capital (SC), and relational capital (RC) were used. Additionally, the size, financial leverage, and GDP served as

control variables. Using the unit root method, in the second stage, the stationarity of the dataset for the various variables was examined. Unit root tests were carried out for the first and second differences at a particular level. At the first difference, it was discovered that all of the variable data series were stationary except size it is become stationary at level in second difference. Accordingly, the entire dependent and independent variable data transformed into first difference and size in second difference. The four models were created to investigate how each dependent variable is affected by the independent components of intellectual capital (HC, CE, SC, and RC). Additionally, the MVAIC-measured variables were used in the study of the combined effect. The size, GDP, and leverage were also used as control variables in the study. Our empirical results revealed that the return on equity is positively and significantly correlated with the elements of IC, including capital employed, relational capital, and human capital (Smriti, N 2018) [19]. Whereas these variables also have a positive impact on the return on capital employed (ROCE) (Le, T.D 2018) [20], (Ozkan, N 2018) [22]. The MVAIC's overall intellectual capital has a positive and significant relationship with the ROCE as well as a positive relationship with the ROE. The discoveries from the current review have suggestions for various gatherings like strategy decision maker, controllers, investors, and the board of management. As a result, those organizations might be able to better allocate their resources. These factors should be considered when forming policies and making decisions at national and international levels. Even though this study's empirical findings indicate a positive correlation between private sector banks' sustainable financial performance and their intellectual capital, banks have so far invested little in the development of their I.C. in comparison to other developing nations. As a result, it is essential that private sector banks strengthen their investments to improve their investments in intellectual capital. Instances of this include investments in innovation, worker preparation, and improvement meetings and the improvement of client connections by offering better service. As a result, executives and regulators may be able to use this study as a reference to determine the importance of investing in the banks' intellectual capital and its effectiveness.

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