Indian Journal of Information Sources and Services
ISSN: 2231-6094 (P) Vol.16, No.2, 2026, pp.10-18

DOI: https://doi.org/10.51983/ijiss-2026.16.2.02

The Influence of Human, Structural, and Relational Capital on Financial Performance in Vietnamese Commercial Banks

Tran Thi Lan Anh[1*] and Linh Phan Thi Khanh[2]

[1*]School of Economics, Hanoi University of Industry, Bac Tu Liem, Vietnam
[2]Foreign Trade University (FTU), Dong Da, Hanoi, Vietnam
E-mail: [1]anhttl@haui.edu.vn, [2]linh.phantkhanh@gmail.com
ORCID: [1]https://orcid.org/0000-0001-7000-3504, [2]https://orcid.org/0009-0007-5431-3263
(Received 16 February 2026; Revised 21 March 2026, Accepted 02 April 2026; Available online 05 June 2026)

Abstract - **The proposed research is based on the idea of IC and its influence on the financial performance of Vietnamese commercial banks in 2016-2023. The significance of intangible assets in the process of maximizing profitability and operational efficiency in a bank requires a study in light of the rapid changes occurring in the financial sector, particularly due to the Fourth Industrial Revolution. Using the Modified Value-Added Intellectual Coefficient (MVAIC) model, the Human Capital Efficiency (HCE), the Structural Capital Efficiency (SCE), the Relational Capital Efficiency (RCE), and the Financial Capital Efficiency (FCE) were measured. Return on Assets (ROA) was the key indicator of financial performance. As a secondary source, the research used audited financial reports of 21 commercial banks in Vietnam using a regression analysis based on Pooled Ordinary Least Squares (OLS), Fixed Effects Model (FEM), and Random Effects Model (REM). The Generalized Least Squares (GLS) approach was used to eliminate possible limitations of the model. Findings indicate that there exists a very strong positive correlation between HCE, CEE, and ROA (r=0.6688, r=0.6582, and r=0.6582, respectively). However, SCE and RCE did not have a notable effect on financial results. Based on the findings, financial success in the Vietnamese banking industry is facilitated by structural and relational capital, whereas financial and human capital are much more significant. The research states that a bank can increase its profits and market value through investment in human and financial resources. Further studies could also be used to study the effect of relational capital, regulatory changes, and macroeconomic variables to give a more comprehensive picture of the relationship between IC and financial performance.**

Keywords: **Vietnamese Commercial Banks, IC, Financial Performance, MVAIC (Modified Value-Added Intellectual Coefficient), Efficiency of Human Capital, ROA**

I. INTRODUCTION

Intellectual capital (IC) is an intangible asset of a company that is believed to have a positive influence on the success of the organization, though it is not indicated in the balance sheet. A combination of factors, including knowledge, practical experience, technology resources, customer relationships, and professional expertise, gives the competitive advantage in the market (Edvinsson et al., 2022). Experts have long known that (IC) is a vital ingredient of long-term social and economic development, especially in the information era. The emergence of intangible resources like IC as businesses and nations shift to more traditional, tangible resources has made the role of this resource in encouraging innovation and long-term competitive advantage ever more critical. This change is a turning point, where organizations are now considering using creative and innovative human abilities to be competitive in a fast-changing environment (Herman, 2010; Hashim et al., 2017).

The IC is a critical constituent of organizations that perform well, especially in the information economy (Mondal & Ghosh, 2012). It is a necessity to have an advantage in the modern corporate environment. The world in the past few years has been shifting from an economy based on production to a knowledge-based economy where the highly educated worker and technologically advanced company are in demand. This transition has been enhanced by the industry 4.0 Revolution, which has significantly affected all industries, with the banking industry being the primary beneficiary, as commercial banks are fast adopting the new age technologies, including biometric authentication, artificial intelligence (AI), and mobile payment systems, to enhance services and remain competitive. This change exerts a lot of pressure on banks, especially the ones in the emerging markets such as Vietnam, that tend to have few resources (Azıza & Aslan, 2024).

In Vietnam, the fast progress of Industry 4.0 has made banks use modern technologies and focus on the IC development (Poh et al., 2018). Nonetheless, even in the light of these endeavors, there is still a high number of Vietnamese commercial banks that are small-scale and have not yet been able to capitalize on their IC. Although the study on IC in Vietnam has been on the rise, the results have not been conclusive. To shed light on the correlation between IC and financial performance and give valuable information to improve the competitiveness and sustainability of financial institutions, empirical studies are needed, especially those related to the banking sector (Kannan & Aulbur, 2004; Kweh et al., 2019).

Research Objective

- Analysis of the effects of the four IC components on the bottom lines of commercial banks in Vietnam. These factors are human capital, structural capital, relational capital and financial capital.
- One of them is to determine the impact of HCE to the bottom line of Vietnamese banks.
- To understand the impact of FCE on bottom lines of commercial banks in the banking sector of Vietnam which is undergoing a transition process.

The outline of the paper will be as follows: Section I of the paper will present the study and give an overview of the IC and how it can be applied to the financial performance of commercial banks in Vietnam. By finding substantial results of local and foreign studies, Section II will perform a literary review on the issue of IC and financial performance. Section III can be regarded as the place where we can observe the main ideas and variables of the study and read about the assumptions of the research and the theoretical framework. Section IV explains the method used in the study, such as the means of collecting data, the selection of samples and the analysis of data. Section V comprises the concluding part of the study and the discussion and also entails analysis of how the IC elements influenced bottomline. Section VI wraps up the article by providing a conclusion on the main findings and some recommendations to the commercial banks in Vietnam.

II. Research Overview

The Fourth Industrial Revolution has brought about rapid changes in the management, operation, and development of businesses. This directly impacts the development trends in human resource management in each enterprise, requiring each business to invest in IC. Specifically, investing in IC means investing in increasing the organization's ownership of knowledge, applied experience, technological assets, customer relationships, and professional skills, which give the business a competitive advantage in the market.

Hitherto, many scholars have developed approaches and measures to quantify IC. Numerous studies have provided empirical evidence showing a relationship between IC and the financial performance of businesses, including commercial banks (Maditinos et al., 2011).

International Studies

In order to empirically research the connection between IC and its constituents (SCE, HCE, and Capital Employed Efficiency) and the financial performance of enterprises, the Value-Added Intellectual Coefficient (VAIC) model was employed (Firer & Mitchell Williams, 2003). The conventional financial performance ratios that were utilized in this study included ROA, Asset Turnover (Asset Ratio), and Market Value (calculated as the ratio of market value to book value) (Vishnu & Kumar Gupta, 2014). Profitability and SCE were positively correlated, and asset utilization and HCE were negatively correlated. Put the VAIC model to use with data collected from 65 Indian banks between 1999 and 2008. Results showed that HCE and SCE, IC, had a good effect on financial performance, as shown in ROTA and ROE, and this has a direct bearing on a bank's bottom line. Most of the regression results reached a level of significance that was 1% (Chen et al., 2005).

The VAIC model suggested that IC, especially HCE, was among the factors that made 44 Turkiyean institutions financially successful between 2005 and 2014 (Ozkan et al., 2017). The value production of banks was inefficient compared to the efficiency of both used and structural capital (Singhal et al., 2019). In recent times, the MVAIC has been utilized by a number of writers who have been investigating the effects of IC (Mouritsen, 2003). The MVAIC has a wider measure of IC, which compared to the older Value-Added Intellectual Coefficient (VAIC) makes it stand out. MVAIC considers other factors to enhance predictability of its financial performance unlike VAIC that is more interested with efficiency of physical and intellectual resources (Śledzik, 2013).

To determine how IC affects the bottom lines of the Indonesian banks, MVAIC will rely on the data gathered between 2009 and 2012 (Nimtrakoon, 2015). State-owned banks were the most successful among the domestic banks of Indonesia owned by individuals because they were more efficient and used their resources better in comparison with lower-rated banks. Also, the researchers in India examined the impact of IC on the bottom lines of both the public and the private banks (Barak & Sharma, 2024). The researcher used the MVAIC to measure IC and its components. The performance of the public sector banks indicates a positive relationship between the HCE and most of the financial performance measures except Return on Equity (ROE). These measures are Return on Assets (ROA), Return on Capital Employed (ROCE) and Return on Sales (ROS). Efficiency of deployed and structured capital positively influences all measures of financial performance by the public sector banks. IC and its components have a positive influence on financial results of banks in the private sector. Precisely, IC leads to improved monetary results.

Domestic Studies

The VAIC model showed that IC positively influences the financial performance of 30 banks between 2011 and 2019. The increase in commercial banks in Vietnam has been in the interest and profit income due to the increased efficient use of human and structural capital in the country (Velnampy & Nimalathasan, 2010).

To date, despite numerous studies inside and outside the country on the subject, the results regarding the influence of innovation capability (IC) on the financial performance of firms and commercial banks have not been homogeneous (Soewarno & Tjahjadi, 2020). Most of these studies show that there is a positive connection between IC and the financial success of commercial banks, but some studies have not found any link. A study conducted established that IC had no

effect on financial performance of banks, in terms of ROA and ROE, in most South African countries (Firer & Mitchell Williams, 2003). Moreover, other studies have indicated that some elements of IC are even detrimental to the financial performance of commercial banks (Mavridis, 2004). The paper will fill these gaps by looking at the impacts of IC and its various aspects on the profitability of commercial banks in Vietnam.

III. Research Hypotheses and Theoretical Framework

3.1 Perspectives on IC

All the knowledge, information, intellectual property, and experience are included in the IC of an organization that add value. An example of an intangible asset that assists a firm to create value and prosperity is ICS, which is information that can be converted into profit. IC represents a non-physical asset, which could bring future advantages to the business, e.g. competitive advantage, however, is not yet present in any tangible form.

According to most experts, human capital, structural capital and relational capital are obviously the three most significant types of IC. The human capital (HC) in a company is the information of employees, skills and experiences that the employees have including the degree of competence, motivation to work at the company and ability to be innovative. The various competencies of the personnel, recruitment, and training cannot be considered any less important as far as developing the resources of an organization and having a competitive advantage is concerned.

Structural Capital (SC) includes all intangible resources other than human resources. Structural capital is the organizational mechanism and structure that helps employees achieve optimal intellectual performance. Structural capital results from systems and programs, information technology, corporate culture, innovation, and development. SC is a condition for an organization to function and also supports employee activities such as corporate culture, work processes, and intellectual property.

Relational Capital (RC): This refers to the connections and collaborations with external entities such as customers, suppliers, or creditors. Relational capital reflects the company's reputation and public trust in it.

Thus, IC can be understood in many different aspects, but in general, IC is an intangible asset that helps create value and competitive advantage for an organization, such as professional skills, work experience, information technology, and relationships.

3.2 Measuring IC

Value Added Intellectual Coefficient Method (VAIC)

Pulic (1998) is credited with developing this approach. It is superior to other methodologies that examine only one form of capital since it takes into account the financial and human capital and structural and total assets.

In this model, the contribution of an IC to the company is utilized to measure its performance. Human capital, structural capital and relational capital are all important contributors to IC and the extent to which a company utilizes them is determined by the magnitude of the contribution of each. The higher the efficiency with which resources are used, the more value is added.

The VAIC index is calculated from three components:

HCE , SCE , and CEE - capital employed efficiency (Equation 1).

$$\boldsymbol{VAIC = HCE + SCE + CEE} \qquad (\mathbf{1})$$

HCE

This metric can be used to measure the ability of a company to create value out of its human resource. HCE measures labor productivity and the efficiency of the workforce by comparing the value added to the activities of a company to the pay that the employees are receiving. This index, therefore, represents the payback (ROI) of a business per unit of pay. As such, wages are regarded as an investment on human capital and not an expense. This is to say that the higher the wage that workers are paid, the more they are motivated to make greater contributions to the business in terms of finance (De Silva et al., 2019).

SCE

This index measures the effectiveness of the utilization of the structured capital of a company. In order to locate structural capital, subtract human capital from the total added value. This is because there is a belief that investments in human and structured capital generate added value among the people.

Commenting on the VAIC index, stated that: VAIC has certain advantages over other measures of IC, as it is based on audited financial data, is verifiable and objective, and can be used for cross-comparison between companies (Firer & Mitchell Williams, 2003). However, the VAIC model does not mention relational capital, nor does it consider relational capital as part of IC (Mention, 2012). .

Critics of the VAIC model have cited one of the issues with the model as not counting all types of financial and human capital in its calculation of an organization capacity to create value; another issue is that the model is easy to understand and apply and has been widely used across the globe. One can say that VAIC does not attack other methods directly, but it

omits some significant information about IC. Certain researchers have enhanced and made VAIC more sophisticated owing to its inefficiencies which have led to a revised model of VAIC.

Modified Value Added Intellectual Coefficient Method (MVAIC)

To overcome the weaknesses of the VAIC model, many scholars have expanded and extended the traditional model, thereby developing the MVAIC model. Accordingly, VAIC is supplemented with a relational capital component measured through the human capital utilization efficiency coefficient (RCE). The fact that we were able to add relational capital to the VAIC model allowed us to build upon the work of Pulic (2000) and obtain a more comprehensive estimate of IC (Ulum et al., 2014).

Accordingly, the value added coefficient will be estimated through the components of IC, including: *HCE, SCE, RCE, and FCE (Equation 2)*.

$$\boldsymbol{MVAIC = HCE + SCE + RCE + CEE} \quad (\mathbf{2})$$

In order to establish the influence of IC on the bottom lines of commercial banks, the adjusted IC value-added coefficient was used in this study.

3.3. Relevant Theories and Research Hypotheses

Resource-Based Theory

Companies get a competitive edge by making use of their resources. Not all the resources of a firm, however, lead to its competitive advantage. To ensure that the resources can give an advantage over the competition, ensure that they are valuable, rare, difficult to copy, and also non-renewable.

Human capital and structural capital are also regarded as enterprise internal resources, as they help in bringing efficiency as a result of the collective use of resources in a company. These resources are unique to each employee and the peculiarities of each business. This and other intangibles make human and structural capital components difficult to steal. Human resources constitute a strategic asset of a company, whereas its structural capital does as well.

In addition, companies are seen as a compilation of both physical and immaterial resources and competencies. Having rare, unique, inimitable, and irreplaceable resources enables a company to acquire a competitive advantage over its competitors by differentiating itself by creating new value.

Dynamic Capabilities Theory

This theory is based on resource theory. The resources of a company assist to develop competitive advantage through developing and enhancing the essential skills that enable the company to adapt to the external changes that are not part of the business and lead to the enhancement of the efficiency of the functioning of the company. Relational capital refers to the relationship that an organization has with its customers, partners and stockholders.

It is concerning the way the business deals with customers, suppliers, teachers and other related partners. Having good connections with customers and suppliers may also enable the business to make more money and generate more value. The theory of dynamic capability can be used to explain the impact of relational capital on the financial performance of a business.

Knowledge-Based Theory

One of the resources, which offer a competitive advantage and organizational success, is knowledge. The knowledge-based theory builds on the resource-based theory in the sense that it takes into consideration both internal and external forces on the organization. It highlights the fact that knowledge among employees is very crucial in the establishment of competitive advantage. This is information that eventually affects the financial performance of the business.

Agency Theory

Business managers possess more information about a company's operations than its owners. Managers tend to make decisions aimed at maximizing their own benefits rather than maximizing the company's value. Therefore, managers may act and make decisions to achieve the best financial results.

Hypothesis H1: IC positively impacts the financial performance of commercial banks.

Hypothesis H2: The efficiency of human capital utilization positively impacts the financial performance of commercial banks.

Hypothesis H3: he bottom line of commercial banks gains through effective strategies of using structural capital.

Hypothesis H4: There is no effect on the bottom lines of commercial banks due to inefficient utilization of financial capital.

Hypothesis H5: The bottom line of commercial banks is positive due to the use of efficient relational capital.

IV. Research Methodology

The article will look at how IC affects the financial performance of Vietnamese commercial banks from 2016 to 2023 through the analysis of panel data. The research model applied in the study is shown in fig 1. IC is measured with the help of the MVAIC score, the elements of which include HCE, SCE, RCE, and FCE. Financial performance indicators are the dependent variables, which are ROA, ROE, and Q of Tobin.

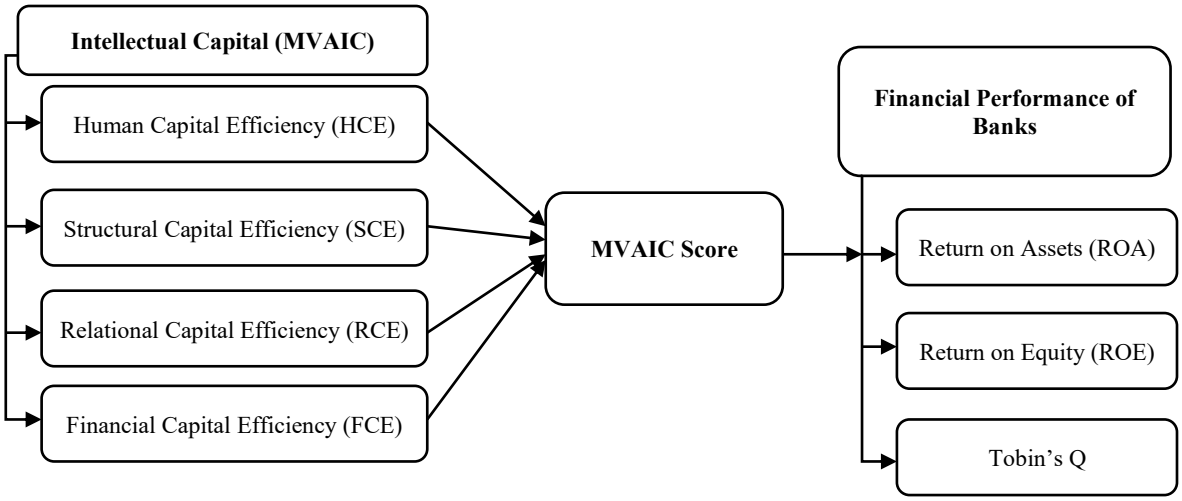

Fig. 1. Conceptual Framework of the Relationship Between IC, MVAIC, and Financial Performance of Banks

4.1 Research Design

The study is a quantitative study that aims at examining the impact of intellectual capital (IC) on the financial performance of Vietnamese commercial banks. It is based on secondary data, comprising of audited financial reports of 21 commercial banks in Vietnam, 2016-2023. The regression analysis is employed in the study to analyze the data, and the models employed in examining the relationship between the elements of IC and financial performance indicators such as ROA are Pooled, FEM, REM, and GLS. The paper takes into consideration four dimensions of IC, namely, HCE, SCE, RCE and FCE. The effectiveness of these elements is determined by the MVAIC tool. ROA is the main financial performance indicator used in this stud.

4.2. Research Sample

(i) The research sample consists of 2016, 2023, and 21 commercial banks. Of the eighteen types of banks, four will be wholly or partially owned by the state, four will be controlled by the state, and seventeen will be domestic joint-stock commercial banks. The sample did not have enough information to cover joint-venture banks and branches of foreign commercial banks in Vietnam. The sample of 21 commercial banks that constituted it ensures that it is representative since they hold over 70% of the total assets of the banking system.

(ii) Data Collected: Audit financial reports were published on the websites of commercial banks.

4.3. Research Model

$$ROA_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 RCE_{i,t} + \beta_4 CEE_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 OWN_{i,t} + \beta_7 LEV_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$ROA_{i,t} = \beta_0 + \beta_1 MVAIC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 OWN_{i,t} + \beta_4 LEV_{i,t} + \varepsilon_{i,t} \quad (4)$$

In which (Equations 3 & 4): β_0 is a constant; β_j are the regression coefficients corresponding to the independent variables; $\varepsilon_{i,t}$ is the random error.

Dependent Variable

ROA: Return on total assets. These are aggregate indicators reflecting the profitability and efficiency of a company's financial resource utilization.

The dependent variables are calculated based on financial data from the company's financial statements.

Independent Variable

HCE, SCE, RCE, and FCE are the independent variables of this study, and they gauge the effectiveness of human, structural, relational, and financial resources, respectively. Also, there are Bank Size (SIZE), Leverage (LEV), and Ownership (OWNER), SIZE being the total assets of the bank, LEV being the proportion of debt to equity, and OWNER being the government ownership. These are variables that are utilized to determine their effects on the financial performance of Vietnamese commercial banks.

4.4. Data Analysis Methods

To determine the relationship between the variables, the study employed regression analysis to estimate the relationship between the variables using the Pooled OLS, FEM, and the REM models in STATA17. To select the most appropriate model and guarantee the reliability of the results, the researchers addressed the multicollinearity, heteroskedasticity, and autocorrelation. The GLS method was used to address any issues.

V. Research Results and Discussion

This study findings imply that Vietnamese commercial banks ought to focus on investment in human capital and financial capital to increase the return on assets. The HCE and FCE are very influential on profitability and, therefore, banks must put their efforts on enhancing the skills of their employees and

financial management practices. They are also significant in SCE and RCE that do not have a direct impact on the financial performance as strongly as expected. However, these types of capital contribute to the long-term perspective, and it is important that the banks should pay a significant attention to the investments in such structural aspects as technology and organizational systems and customer relationships. In general, a holistic approach to work with the intangible capital and place human and financial capital in the center and structural and relational capital are streamlined along with them may contribute to the banks gaining a sustained competitive advantage and enhancing their financial performance in an increasingly dynamic and digital banking environment.

TABLE I DESCRIPTIVE STATISTICS OF RESEARCH VARIABLES

Variable	Number of Observations	Median	Standard Deviation	Minimum Value	Maximum Value
ROA	210	0.1257	0.0786	-0.1233	0.3033
MVAIC	210	4.2535	1.1230	1.4239	7.5436
HEC	210	3.2981	1.0999	0.2507	6.5618
SCE	210	0.6450	0.2793	-2.9886	0.8476
RCE	210	0.2805	0.3046	0.0759	4.1602
CEE	210	0.0299	0.0139	0.0016	0.0841
OWNER	210	0.8095	0.3936	0	1
SIZE	210	5.3656	0.5110	4.1993	6.3619
LEV	210	0.9155	0.0331	0.7797	0.9594
ROE	210	0.1123	0.0875	-0.1452	0.3521
Tobin's Q	210	1.4520	0.3210	0.7325	3.6254

(Source: Compiled by the Author from Research Results*)*

Table I presents the MVAIC of Vietnamese commercial banks between 2016 and 2023. The average is 4.2535, with a SD of 1.1229, and the values range from 1.4239 to 7.5436. This implies that these banks are utilizing their intellectual capital in generating value. The average of the HCE component makes 3.2981 and has a range of 0.2507 to 6.5618 indicating the significance of human capital in value addition. The range of values of the SCE and RCE components are much broader, however, which implies that there are significant disparities in the way these banks utilize such resources.

The FCE (CEE) mean is 0.0299, and the variation is 0.0016 to 0.0841, indicating different rates of efficiency in the use of financial resources. The (ROE), with a mean of 11.23% and a range between -14.52% and 35.21) show variations in the profitability of the banks on their equity. The Tobin Q ratio, which measures the value of assets relative to the cost of replacement, has a mean of 1.452 and a range between 0.7325 and 3.6254, indicating moderate market value in relation to the cost of replacement. The results indicate the difference in IC as well as the financial performance of the Vietnamese commercial banking industry.

Fig 2 illustrates the two-way relationship between the variables, including the strength and direction of the relationship between two variables. When the coefficient is positive, then the variables will move in the same direction and when negative, they move in the opposite direction. Some of the variables such as the MVAIC, HCE, SCE and CEE are positively correlated with ROA. HCE showed the greatest correlation with ROA (0.6688), and next with CEE (0.6582). Nonetheless, there was negative correlation between RCE and ROA, which means that they have an inverse relationship. Correlation matrix also revealed that there was multicollinearity between certain independent variables but the coefficient of variance inflation factor (VIF) was less than 10 implying that the multicollinearity did not have significant effects on the regression outcomes.

All the three regression models were suitable, and the FEM model was the best based on the F-test (Prob > F = 0.0000), and the Hausman test (Prob > chi2 = 0.0046). The Breusch-Pagan test also indicated that the REM was more appropriate than OLS. These findings validate the use of the FEM model as the most suitable in this study. The regression shows that ROE is positively correlated with ROA (0.8561), MVAIC (0.7024), and HCE (0.7621), which means that the higher the ROE is, the higher the financial performance and the more effective use of intangible capital. Tobin Q also presented a positive correlation with ROA (0.4873) and MVAIC (0.6021), which implies that banks that are valued more in the market than their asset replacement costs have better financial results.

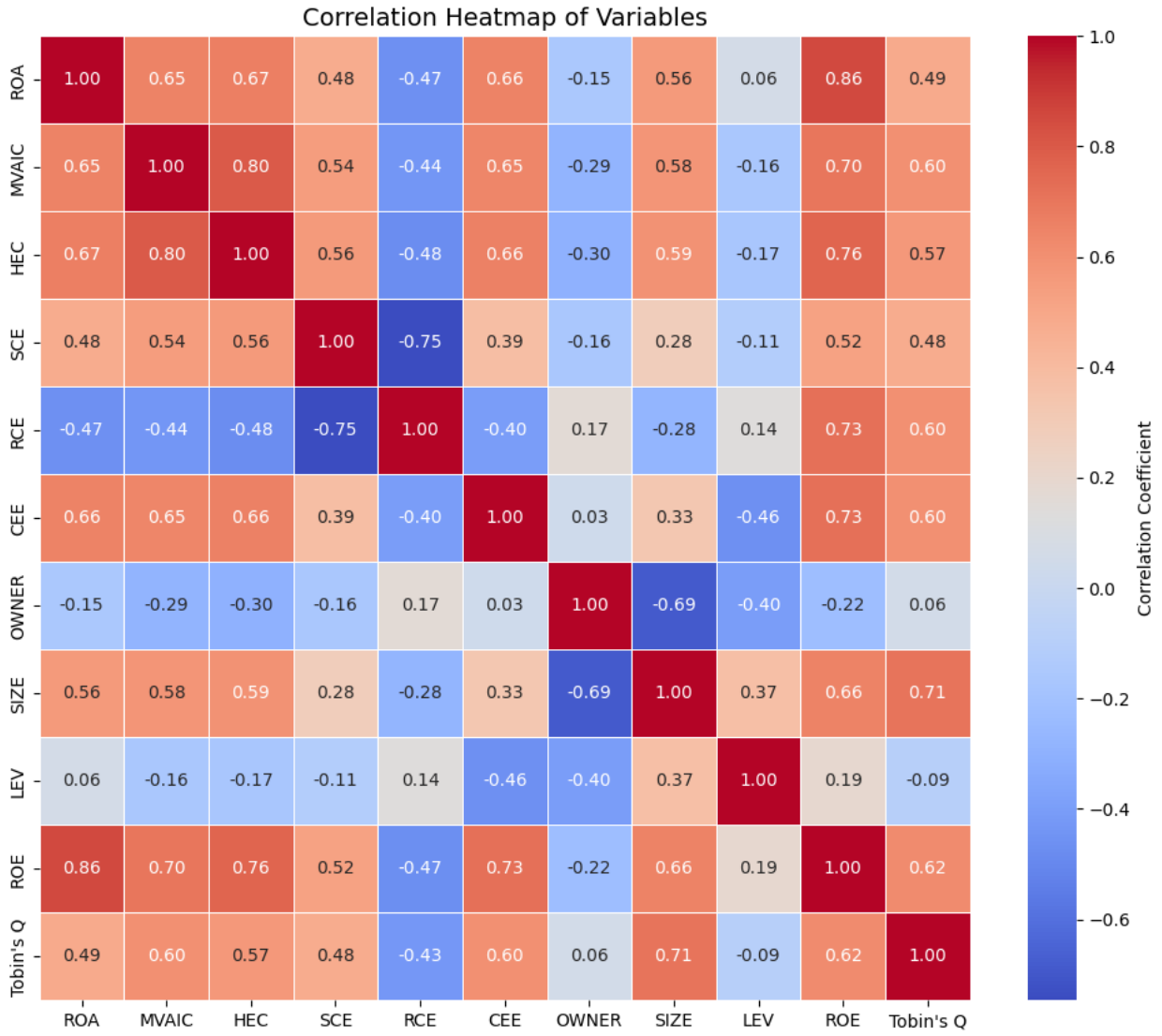

Fig. 2 Correlation Coefficient Matrix Between Research Variables

(Source: Compiled by the Author from Research Results)

TABLE II SUMMARY OF REGRESSION RESULTS OF THE RESEARCH MODEL

Variable	Correlation coefficient (Coef.)	Standard deviation (Std.Err.)	P-value	Research hypothesis
MVAIC	0,024768	0,003997	0,032	Chấp nhận giả thuyết
HEC	0,008310	0,003874	0,464	Chấp nhận giả thuyết
SCE	0,022626	0,030913	0,683	Bác bỏ giả thuyết
RCE	-0,011059	0,027070	0,000	Bác bỏ giả thuyết
CEE	3,510439	0,377489	0,000	Chấp nhận giả thuyết
LEV	0,668181	0,135357	0,001	Chấp nhận giả thuyết
OWNER	0,038202	0,011721	0,000	Chấp nhận giả thuyết
SIZE	0,042861	0,011563	0,000	Chấp nhận giả thuyết

(Source: Compiled by the Author from Research Results)

In table II, IC is measured by the MVAIC, which has four measures: HCE, SCE, RCE, and FCE. Among them, the MVAIC itself, as well as two of its components, HCE and FCE, have a positive influence on the financial performance of Vietnamese commercial banks. SCE and RCE are the other two elements, and they are not positively impacting. This observation is consistent with the past studies, which suggest that when banks invest heavily in intellectual capital, their financial results tend to improve. The investment in intellectual resources, including people, processes, and technology, will enable the banks to analyze and evaluate risks and opportunities associated with such activities as

investment, operations, and lending more accurately and comprehensively, which will enable them to make more accurate and comprehensive decisions.

This helps the banks to make good financial decisions, reduce bad debts, and minimize losses in their operations. Moreover, banks with a high IC can comprehend the market requirements in a better way and thus come up with appropriate products and services to satisfy different customers in the market. This increases customer satisfaction with products and services offered by the bank, which increases customer usage and finally, bank profits.

The hypothesis testing results have shown that Hypothesis H1, which states that IC has a positive impact on the financial performance of commercial banks, is accepted. IC, as measured by MVAIC has a very high positive correlation with financial performance ($p = 0.032$). But not supported is Hypothesis H2, that deals with the efficiency of utilization of the human capital, because the correlation was not significant ($p = 0.464$). On the same note, Hypothesis H3 about the use of structural capital and Hypothesis H4 about the use of relational capital were also rejected (they did not demonstrate a significant effect, $p = 0.683$ and $p = 0.000$, respectively). Conversely, the Hypothesis H5 that financial capital utilization positively affects the financial performance is supported and a positive impact is found to be strong on FCE ($p = 0.000$).

SCE is used to gauge the efficiency of the structural resource of a bank, i.e., organizational systems, corporate culture, and technological infrastructure. Although these resources are important to day-to-day operations, they might not have as significant an immediate effect on ROA as human capital or financial capital which are more directly correlated with generation of profits. The absence of significance of SCE in the study can be explained by the fact that the study period (2016-2023) was short-term in nature since the long-term payoffs of enhanced structural capital may not be immediately indicated in financial outcomes. Also, in relation to the Vietnamese commercial banks, structural capital might not be as important as human capital and financial capital, and this is in a period of fast digitalization and technological modernization. Equally, RCE, which is a measure of the effectiveness of the bank in relation to its external stakeholders such as customers and suppliers, exhibited negative relationship with ROA. This implies that there is a possibility that the relational capital may not be harnessed masterfully to enhance finance performance. This may be due to the market factors where high dependence on external relations may raise operating costs without direct financial gain benefits and because relational capital may require more time to be converted into profits especially in the Vietnamese banking market, where customer relations may not be optimized to make financial gains.

Furthermore, research results show that economies of scale help commercial banks improve their financial efficiency. Some banks are more efficient than others due to their flexibility of raising capital to expand and also because of their high leverage ratio. The efficiency of state-owned banks is far higher than that of commercial banks.

TABLE III COMPARISON OF VARIABLE VALUES IN THE PROPOSED MODEL (MVAIC) VS. EXISTING MODELS

Variable	Proposed Model (MVAIC)	Existing Model (VAIC)
HCE	Mean = 3.298, SD = 1.099	Mean = 2.58, SD = 1.08
SCE	Mean = 0.645, SD= 0.279	Mean = 0.62, SD = 0.25
RCE (RCE)	Mean = 0.280, SD= 0.305	-
FCE	Mean = 0.0299, SD= 0.0139	Mean = 0.025, SD = 0.012
MVAIC	Mean = 4.2535, SD= 1.1230	-
Market Value vs. Book Value	Tobin's Q: Mean = 1.452, SD= 0.321	-

The following table III presents the comparison of the values of the variables used in the Proposed Model (MVAIC) and the Existing Model (VAIC). It brings out the disparity in the measurement and aggregation of IC elements like HCE, SCE, RCE, and FCE. The Proposed Model (MVAIC) proposes RCE and puts the components together into a single efficiency score, whereas the Existing Model (VAIC) does not propose RCE and does not put the components together. Moreover, the Proposed Model also has a market value indicator that is known as Tobin Q, which is not in the VAIC model. This addition renders the proposed model more holistic in evaluating the impact of the internal capital on the financial performance.

Limitations

The research has certain limitations since it uses a small sample of 21 Vietnamese commercial banks which do not necessarily represent the entire banking sector in the world or even in various regions within Vietnam. Also, the data utilized in this paper is secondary and relates to audited financial reports made publicly, which could also be biased or contain omissions. The time frame (2016-2023) used in the study is relatively short, which is not always able to reflect long-term trends or the consequences of instant economic changes. The fact that only foreign commercial banks and joint-venture banks were left out begs the question of whether the findings can be generalized to all Vietnamese financial institutions. Moreover, the research fails to consider any other external variables that may affect financial performance, including macroeconomic, regulatory, or any other.

VI. Conclusion

The paper examines the impact of information cost on the financial performance of Vietnamese commercial banks in the period between 2016 and 2023. The study finds that FCE

and HCE have a major effect on financial performance. The correlation coefficients between HCE and CEE and ROA are 0.6688 and 0.6582 respectively. These conclusions highlight the nature of the optimal utilization of human and financial resources to spearhead profitability and operational efficiency. SCE and RCE, on the contrary, do not statistically significantly affect the financial performance. This suggests that human and financial capital have a larger role in financial performance in the case of the Vietnamese commercial banks as compared to structural and relational capital. The association between IC and monetary achievement is calculated in totality through the MVAIC model that aggregates the factors of IC. MVAIC, ROE, and the Q of the Tobin are also correlated in a positive manner to highlight the value of the IC in enhancing the profitability and market value. Specifically, the Q of Tobin had a moderate and positive correlation with ROA (0.4873), i.e., when banks are overvalued in the market relative to the cost of replacing their assets, then they are likely to perform better in financing.

Future research could explore how macroeconomic factors and changes in regulations affect the link between internal control and financial performance. The study would also be helpful in expanding the research to encompass more banks across countries or regions, which would give a more accurate picture of the applicability of these findings on a global scale. To make better future models to assess the overall effects of internal control on the performance of banks, more effective methods of measuring relational capital are preferable.

REFERENCES

[1] Azıza, N. A., & Aslan, H. (2024). The Effect of Intellectual Capital on the Financial Performance of Islamic and Conventional Life Insurance Companies in GCC and ASEAN. *İktisadi İdari ve Siyasal Araştırmalar Dergisi*, *9*(24), 466-485. https://doi.org/10.25204/iktisad.1347656

[2] Mondal, A., & Ghosh, S. K. (2012). Intellectual capital and financial performance of Indian banks. *Journal of intellectual capital*, *13*(4), 515-530. https://doi.org/10.1108/14691931211276115

[3] Barak, M., & Sharma, R. K. (2024). Analyzing the impact of intellectual capital on the financial performance: A comparative study of Indian public and private sector banks. *Journal of the Knowledge Economy*, *15*(4), 20320-20348. https://doi.org/10.1007/s13132-024-01901-4

[4] Chen, M. C., Cheng, S. J., & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of intellectual capital*, *6*(2), 159-176. https://doi.org/10.1108/14691930510592771

[5] Edvinsson, L., Mas, F. D., Pablos, P. O. D., Massaro, M., & Dumay, J. (2022). From a value-based knowledge economy to a worth economy. New reflections and perspectives on intellectual capital research. *International Journal of Learning and Intellectual Capital*, *19*(1), 83-101. https://doi.org/10.1504/IJLIC.2022.119282

[6] Firer, S., & Mitchell Williams, S. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of intellectual capital*, *4*(3), 348-360. https://doi.org/10.1108/14691930310487806

[7] Ulum, I., Ghozali, I., & Purwanto, A. (2014). Intellectual capital performance of Indonesian banking sector: a modified VAIC (M-VAIC) perspective. *Asian Journal of Finance & Accounting*, *6*(2), 103-123. https://doi.org/10.5296/ajfa.v6i2.5246

[8] Kannan, G., & Aulbur, W. G. (2004). Intellectual capital: measurement effectiveness. *Journal of intellectual capital*, *5*(3), 389-413. https://doi.org/10.1108/14691930410550363

[9] Kweh, Q. L., Ting, I. W. K., Hanh, L. T. M., & Zhang, C. (2019). Intellectual capital, governmental presence, and firm performance of publicly listed companies in Malaysia. *International Journal of Learning and Intellectual Capital*, *16*(2), 193-211. https://doi.org/10.1504/IJLIC.2019.098932

[10] Mention, A. L. (2012). Intellectual capital, innovation and performance: A systematic review of the literature. *Business and Economic Research*, *2*(1), 1-37. http://dx.doi.org/10.5296/ber.v2i1.1937

[11] Maditinos, D., Chatzoudes, D., Tsairidis, C., & Theriou, G. (2011). The impact of intellectual capital on firms' market value and financial performance. *Journal of intellectual capital*, *12*(1), 132-151. https://doi.org/10.1108/14691931111097944

[12] Mavridis, D. G. (2004). The intellectual capital performance of the Japanese banking sector. *Journal of Intellectual capital*, *5*(1), 92-115. https://doi.org/10.1108/14691930410512941

[13] Mouritsen, J. (2003). Intellectual capital and the capital market: the circulability of intellectual capital. *Accounting, Auditing & Accountability Journal*, *16*(1), 18-30. https://doi.org/10.1108/09513570310464246

[14] Nimtrakoon, S. (2015). The relationship between intellectual capital, firms' market value and financial performance: Empirical evidence from the ASEAN. *Journal of intellectual capital*, *16*(3), 587-618. https://doi.org/10.1108/JIC-09-2014-0104

[15] Ozkan, N., Cakan, S., & Kayacan, M. (2017). Intellectual capital and financial performance: A study of the Turkish Banking Sector. *Borsa Istanbul Review*, *17*(3), 190-198. https://doi.org/10.1016/j.bir.2016.03.001

[16] Poh, L. T., Kilicman, A., & Ibrahim, S. N. I. (2018). On intellectual capital and financial performances of banks in Malaysia. *Cogent Economics & Finance*, *6*(1), 1453574. https://doi.org/10.1080/23322039.2018.1453574

[17] Singhal, S., Choudhary, S., & Biswal, P. C. (2019). Return and volatility linkages among International crude oil price, gold price, exchange rate and stock markets: Evidence from Mexico. *Resources policy*, *60*, 255-261. https://doi.org/10.1016/j.resourpol.2019.01.004

[18] Śledzik, K. (2013). The intellectual capital performance of polish banks: an application of VAIC™ model. *Finansowy Kwartalnik Internetowy e-Finanse*, *9*(2), 92-100. https://doi.org/10.65748/fiqf-2013-0019

[19] Soewarno, N., & Tjahjadi, B. (2020). Measures that matter: an empirical investigation of intellectual capital and financial performance of banking firms in Indonesia. *Journal of intellectual capital*, *21*(6), 1085-1106. https://doi.org/10.1108/JIC-09-2019-0225

[20] De Silva, D. N., Chinna, K., & Azam, S. F. (2019). Major determinants on the profitability of Sri Lankan local commercial banks. *European Journal of Economic and Financial Research*. https://doi.org/10.5281/zenodo.3533416

[21] Vishnu, S., & Kumar Gupta, V. (2014). Intellectual capital and performance of pharmaceutical firms in India. *Journal of intellectual capital*, *15*(1), 83-99. https://doi.org/10.1108/JIC-04-2013-0049

[22] Hashim, M. J., Adeyemi, A. A., & Alhabshi, S. M. (2017, October). Effects of intellectual capital on microfinance institutions' performance. In *Proceedings of the 2nd advances in business research international conference: ABRIC2016* (pp. 187-196). Singapore: Springer Singapore. https://doi.org/10.1007/978-981-10-6053-3_18