Pavlović, G. et al. (2024). Human capital dynamics: a catalyst for bank profitability in emerging markets – a case study of Serbia, *SCIENCE International journal, 3*(3), 55-60.
doi: 10.35120/sciencej0303055p UDK: 336.71:658.155]:005.96:303.72(497.11)

HUMAN CAPITAL DYNAMICS: A CATALYST FOR BANK PROFITABILITY IN EMERGING MARKETS – A CASE STUDY OF SERBIA

Goran Pavlović[1], Miloš Stojanović[1], Jasmina Gligorijević[2], Bojan Petrović[3], Miodrag Šmelcerović[2]*

[1] Metropolitan University, Serbia, goran.pavlovic@metropolitan.ac.rs, milos.stojanovic@metropolitan.ac.rs
[2] University Business Academy in Novi Sad, Serbia, jasmina.gligorijevic@fpn.rs, msmelcerovic@yahoo.com
[3] Faculty of Law, Megatrend University, Serbia, bojan.petrovic@megatrend.edu.rs

Abstract: Human capital emerges as a crucial determinant of banks' profitability, particularly in the context of developing economies. Through strategic investments in the specific skills and competencies of employees, banks cultivate a distinct body of tacit knowledge exclusive to their workforce. This tacit knowledge contributes to long-term profitability and establishes a sustainable competitive advantage. This paper aims to investigate the impact of human capital on bank profitability within the dynamics of a developing economy. The research focuses on the banking sector of the Republic of Serbia, covering the time span from 2020 to 2023. The independent variable in this study is human capital, assessed using the VAIC methodology and operationalized through the Human Capital Efficiency (HCE) coefficient. Meanwhile, bank profitability serves as the dependent variable and is operationalized through Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM). The research employs descriptive statistics, normality tests, as well as correlation and regression analyses. The findings demonstrate a statistically significant and positive correlation between human capital and ROA, ROE, and NPM, validating all research hypotheses. This substantiates the assertion that investing in the human capital of bank employees is synonymous with investing in the institution's most crucial asset, ensuring sustained profitability and a competitive advantage. Furthermore, such investments facilitate increased productivity among employees, fostering optimal resource utilization, continuous learning, the development of new knowledge, and effective resolution of complex problems. The significance of this research lies in its comprehensive elucidation of the importance and role of human capital, as a component of intellectual capital, in shaping bank profitability. Future studies could enhance this understanding by incorporating data on human capital and bank profitability from other developed economies, enabling a comparative analysis to glean insights for further improving human capital strategies. Additionally, an extension of the analysis to encompass a more extended time frame and the utilization of advanced statistical techniques like Structural Equation Modeling (SEM) and panel regression would contribute to a more nuanced understanding of the relationship.

Keywords: human capital, bank profitability, bank performance, competitiveness
Field: Business economics

1. INTRODUCTION

Traditional economic paradigms typically revolve around development driven by tangible assets like land, capital, and machinery. However, in the contemporary landscape of a knowledge-based economy, the emphasis shifts towards intangible resources, particularly those of significant value, such as intellectual capital (Tran & Vo, 2020; Onumah & Duho, 2020). Within the realm of intellectual resources, it is unequivocal that human capital stands out as the paramount factor influencing economic development, encapsulating the unique and valuable knowledge acquired by individuals through formal education and their career (Rahman & Akhter, 2021). Human capital emerges as a pivotal determinant contributing to variations in the productivity levels of national economies (Deming, 2022). Recognized as a critical national resource, human capital yields a positive impact on innovation and productivity, solidifying its status as a cornerstone in driving economic progress (Tran & Vo, 2020a). This reservoir of knowledge, experience, and abilities is initially acquired through formal education and further enriched via practical experience and ongoing training throughout an individual's career trajectory (Slavković & Ognjanović, 2018). Embedded within the intellectual capital framework, human capital encompasses elements such as intelligence, tacit knowledge, a predisposition for continuous learning, and adaptability through additional training (Veselinović, Krsić & Veselinović, 2021). Due to its nature as an intrinsic resource tied to individuals, human capital becomes an integral part of intangible assets that are not easily replicable or interchangeable. This uniqueness underscores its positive impact on establishing sustainable competitive advantages (Buallay, Hamdan, Reyad, Badawi & Madbouly, 2019). Given its status as an integral component of a company's intangible and intellectual property, human capital often serves as a decisive factor influencing profitability. This influence is particularly pronounced in its impact on performances

*Corresponding author: goran.pavlovic@metropolitan.ac.rs

like net profit, Return on Assets (ROA), and Return on Equity (ROE) in the context of the banking sector (Soevarno & Tjahjadi, 2020; Peković, Pavlović & Zdravković, 2020; Pavlović, 2023; Githaiga, 2022).

The banking sector plays a pivotal role in fostering economic development by facilitating a robust financial system, fostering the growth of the capital market, and serving as an efficient channel for credit activities (Dogan & Yildiz, 2023). Given its status as a knowledge-based industry, it is indisputable that human capital stands out as a key determinant influencing the profitability and competitive advantage achieved by banks (Mirza, Hasnaoui, Naqvi & Rizvi, 2020). The financial system of Serbia has a bank-centric character (Pavlović, 2023). Significant economic changes occurred precisely with the parallel growth and development of the banking sector (Paunović, Dimić & Arsenijević, 2019). As highlighted by Đuričin & Lončar (2020), various macroeconomic variables indicate that the Republic of Serbia's economy currently holds a favorable position compared to earlier periods. Simply put, the Republic of Serbia has evolved into one of the developing economies, as evidenced by the average GDP growth rate reaching 3.6% by the end of 2023 (Statistical office of the Republic of Serbia, 2024).

Banks' human capital is developed through the synergistic effect of formal education, professional development and accumulated years of hands-on experience within the banking sector (Liu, Liu & Zhang, 2021). The competencies of bank employees tend to exhibit a higher degree of homogeneity compared to other sectors, fostering a notable level of expertise that significantly shapes the outcomes of the banks' operations (Tran & Vo, 2020). Key profitability indicators such as ROA, ROE, and net profit emerge as the most prevalent metrics for assessing banks' achievements, providing a direct reflection of their earning capacity (Dogan & Yildiz, 2023). Examining intellectual capital and its impact on banks in Vietnam, Tran & Vo (2020) underscore the pivotal role of intellectual capital as a determining factor of the profitability of financial institutions in developing economies, with human capital standing out as the most influential contributor. Similarly, in a study conducted in the banking sector of Bangladesh, Rahman & Akhter (2021) identified a positive correlation between human capital and bank performance. Further, a study in Vietnam spanning the years 2007 to 2019, conducted by Le & Nguyen (2020), highlighted the positive influence of intellectual capital (measured through the VAIC methodology) and human capital on the returns realized by banks. On the African continent, Onumah & Duho (2020) conducted an analysis of intellectual capital's impact on bank returns in Ghana, covering a timeframe from 2000 to 2015. The study, encompassing 32 banks, established a positive correlation between intellectual capital and profitability. Notably, the study underscored the paramount importance of human capital in contributing to these positive outcomes.

Duho (2020) points out that banks in developing economies should focus on investing in human capital, as these economies eventually become knowledge-based economies, where human capital represents central factor of competitive advantage. In a similar vein, Li et al. (2020) assert that in these evolving landscapes, all facets of intellectual capital exert a decisive influence on business success and development. However, human capital stands out as the most critical element, primarily due to its profound impact on employee productivity. While research on the influence of intellectual capital on banks' profitability exists in the Republic of Serbia (Bontis, Janošević & Dženopoljac, 2013; Peković, Pavlović & Zdravković, 2020), studies exclusively focused on the impact of human capital on profitability are scarce. Pavlović (2023) delved into the relationship between human capital and achieved performance, albeit within the specific context of the COVID-19 pandemic's effects on the fluctuation of human capital value and its subsequent repercussions on the financial results of banks. Recognizing the dearth of research specifically addressing the influence of human capital on profitability within the banking sector, and drawing insights from studies highlighting such influence in developing economies, the following hypotheses can be formulated.:

H1: Human capital has a statistically significant and positive impact on banks' ROA.
H2: Human capital has a statistically significant and positive impact on banks' ROE.
H3: Human capital achieves a statistically significant and positive impact on NPM of banks.

2. MATERIALS AND METHODS

To test the formulated hypotheses, a comprehensive study was conducted to examine the impact of human capital on the profitability of banks in the Republic of Serbia. The research encompassed all banks operating within the country, with the analysis period spanning from 2020 to 2023. It is noteworthy that the data utilized for the year 2023 extends to the third quarter, given the absence of officially published financial reports on the achieved results for the entire year. During the initial phase of the study (2020-2022), the research population consisted of 22 banks. However, changes in the banking landscape during 2023 led to the integration of certain banks, resulting in a refined research population of 20 banks operating in the Republic of Serbia for this period. The independent variable in this study is human capital, while bank

profitability serves as the dependent variable, gauged through metrics such as ROA, ROE, and NPM. Human capital was quantified using the VAIC methodology (Value Added Intellectual Capital Coefficient). In this approach, the first step involves determining the value added, computed as the difference between income and realized investments. Notably, investments in employees are treated as a distinct category, necessitating the deduction of employee wages from total costs. Once the value added is calculated, it is then placed against the investments made in employees, typically observed through wages, resulting in the derivation of the Human Capital Coefficient (HCE) (Pulić, 2000). The research operationalizes ROA as the ratio of net profit after tax to total assets, while ROE is calculated as the ratio of net profit to invested capital. NPM, on the other hand, is defined as the ratio of net profit to realized revenues. This approach ensures a comprehensive evaluation of the intricate interplay between human capital and the profitability metrics of the banks in the Republic of Serbia..

3. RESULTS

At the beginning of the statistical analysis, descriptive statistics were applied, the results of which are presented in Table 1.

Table 1. Descriptive statistics

Variables	Min	Max	Mean	Standard deviation
HCE	-1.72	6.91	1.3494	1.82605
ROA	-3.99	6.34	0.6870	1.58116
ROE	-9.46	69.09	13,1125	16.48392
NPM	-171.51	253.27	14.8431	49.75591

Source: Authors

By observing the results of descriptive statistics, it is evident that all variables exhibit a positive average value. Specifically, the HCE attains an average value of 1.3494, accompanied by a relatively low standard deviation of 1.82605. The analyzed banks demonstrate a ROA of 0.6870, coupled with a ROE of 13.1125. Notably, the NPM is 14.8431, featuring a relatively high standard deviation. It becomes apparent that within the population, certain banks have experienced both notably low and exceptionally high levels of net profit over time, contributing to the observed high standard deviation. Prior to delving into the correlation analysis, it is imperative to assess the distribution of the data. This involves conducting the Kolmogorov-Smirnov and Shapiro-Wilk tests, with the detailed data presented in Table 2.

Table 2. Normality tests

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
HCE	0.140	106	0.000	0.929	106	0.000
ROA	0.197	106	0.000	0.911	106	0.000
ROE	0.115	106	0.001	0.867	106	0.000
NPM	0.253	106	0.000	0.776	106	0.000

Source: Authors

Since the Kolmogovor-Smirnov and Shapiro-Wilk tests for all variables achieve a statistically significant result ($p<0.05$), it can be argued that the data do not follow a normal distribution, which implies non-parametric tests. The results of Spearman's correlation are presented in Table 3.

Table 3. Correlation analysis

Variables	HCE	ROA	ROE	NPM
HCE	1	0.729**	0.702**	0.763**
ROA	0.729**	1	0.905**	0.917
ROE	0.702**	0.905**	1	0.907**
NPM	0.763**	0.917**	0.907**	1

Note: Correlation is significant at the 0.01 level (2-tailed).
Source: Authors

Analyzing exclusively the relationship between the independent variable and the dependent variables, it is observed that the correlation is the highest between HCE and NPM (0.763). As a correlation

greater than +/-0.5 can be considered high (Cohen, 1988), it can be concluded that there is a high direct correlation between HCE and NPM, but also HCE on the one hand, and ROA and ROE on the other. Table 4 shows the results of the regression analysis.

Table 4. Regression analysis

Model	R2 –	β	t	Sig.	Durbin Watson	VIF
HCE→ROA	0.434	0.659	8,935	0.000	2,026	1,000
HCE→ROE	0.551	0.742	11,292	0.000	2,041	1,000
HCE→NPM	0.347	0.589	7,439	0.000	2,199	1,000

Source: Authors

The results of the regression analysis show a statistically significant and positive impact of HCE on ROA, ROE and NPM. Human capital explains 43.4% of ROA variability, 55.1% of ROE variability and 34.7% of NPM variability. The results of the Durbin Watson test in the case of the impact of HCE on ROA and HCE on ROE are slightly above 2, which indicates the absence of autocorrelation (Bontis et al, 2013). However, it is noticeable that the result of the Durbin Watson test in the case of the impact of HCE on NPM is 2.199, which is slightly more than 2, and which shows the relative presence of autorelation, so this result of the regression analysis has a lower degree of reliability than others. In all regression models, the VIF factor is less than 5, which shows that there is no presence of multicollinearity (Field, 2000).

4. DISCUSSIONS

Based on the findings of the research, human capital emerges as a pivotal determinant influencing the profitability of banks. The study reveals a statistically significant and positive impact of human capital on ROA, ROE, and NPM, thereby confirming the hypotheses H1, H2, and H3, respectively. These results align with analogous studies conducted in developing economies, reinforcing the consensus that human capital exerts a positive effect on bank profitability (Le & Nguyen, 2020; Duho, 2020; Tran & Vo, 2020; Rahman & Akhter, 2021). The potential transformation of developing economies into knowledge-based economies hinges on sustained investments in human capital. Knowledge, acquired through education and continuous learning initiatives, stands out as a decisive factor shaping the success and competitive advantage of national economies. In this transformative process, banks play a pivotal role by fostering an efficient healthcare system. Consequently, bank managers bear a crucial responsibility in facilitating the acquisition of essential knowledge by employees, thereby unlocking the potential for long-term success and sustainable competitive advantage. Given the inherent homogeneity of human capital within the banking sector compared to other industries, employees develop specialized skills and expertise tailored to address specific challenges, resulting in a positive impact on productivity. The collaborative learning environment, knowledge sharing, and the cultivation of tacit knowledge contribute to the formation of human capital unique to each bank's workforce. The research demonstrates an initial positive impact on ROA, followed by ROE, underscoring the justifiable consideration of human capital as the most crucial form of assets and capital at a bank's disposal. Unlike other tangible forms of capital, human capital is intangible, valuable, and rare, making it resistant to easy appropriation by competitors. Investments in such intangible assets and forms of capital translate into high rates of return, positively influencing profitability. Examining the relationship between human capital and the mentioned variables, a significant influence on the variability of profitability indicators is evident, particularly in the case of ROE. This reinforces the notion that human capital stands as a distinctive and special form of capital accessible to banks. Decisions by bank management to invest in employees' competencies and knowledge result in heightened productivity, creativity, and problem-solving skills. Consequently, employees are adept at optimizing resources, tackling intricate problem situations, driving sales of banking products, and thereby contributing to the realized profit.

5. CONCLUSIONS

Aligned with the primary objective of this study, it has been established that human capital exerts a statistically significant and positive influence on the profitability of banks. Over the past few years, the Republic of Serbia has demonstrated commendable growth rates in GDP and employment. Key contributors to this economic advancement are undoubtedly human capital, embodied through knowledge and competencies, and the banking sector, which plays a vital role in maintaining a stable financial

system. Through strategic investments in the education, skills, and capabilities of their workforce, banks concurrently bolster essential segments of assets and capital, culminating in heightened productivity and robust profitability. This research's significance lies in its contribution to an area where analyses focusing on the impact of human capital on bank profitability in a developing economy, such as the Republic of Serbia, remain relatively scarce—distinct from the ample literature exploring the influence of intellectual capital. Consequently, the study offers a comprehensive understanding of the potency of human capital as a determinant of achieved profitability, carrying both theoretical and practical implications.

Theoretical advancements emerge as the research expands the existing literature concerning the intricate relationship between human capital and bank profitability, particularly within banks operating in developing economies globally. Given the scarcity of such research within the Republic of Serbia, this study concurrently lays a foundation for subsequent scientific analyses. From a practical standpoint, the research outcomes furnish valuable insights that can be effectively communicated to bank managers and HR professionals. Recognizing the predictive power of human capital in actual performance, decision-makers are encouraged to invest in employees, facilitating the acquisition of knowledge and skills conducive to heightened productivity and specialized problem-solving expertise. However, the research is not without limitations, which concurrently serve as guidelines for future investigations. While the Republic of Serbia's economy is in development, broader insights could be gained by expanding the analysis to encompass additional developing economies. To ensure a valid and objective scientific understanding, it is advisable to focus on economies similar to that of the Republic of Serbia. The study is further limited by the relatively narrow scope of bank profitability indicators, necessitating the inclusion of a more extensive array of profitability parameters in subsequent research. Objectivity in scientific results can be enhanced by incorporating additional statistical techniques, such as SEM analysis or panel regression. Furthermore, the relatively short time frame of the research suggests the need for future studies to encompass a more extended period, incorporating data from several years to provide a comprehensive analysis of banks' operations.

REFERENCES

Bontis, N., Janošević, S., & Dženopoljac, V. (2013). Intellectual capital and corporate performance of Serbian banks. Актуальні проблеми економіки, 4, 287-299.
Buallay, A., Hamdan, A.M., Reyad, S., Badawi, S., & Madbouly, A. (2019). The efficiency of GCC banks: the role of intellectual capital. European Business Review, 32(3), 383-404.
Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Routledge.
Deming, D.J. (2020). Four facts about human capital. Journal of Economic Perspectives, 36(3), 75-102.
Dogan, M., & Yildiz, F. (2023). Testing the factors that determine the profitability of banks with a dynamic approach: evidence from Turkey. Journal of Central Banking Theory and Practice, 1, 225-248.
Duho, K.C.T. (2020). Intellectual capital and technical efficiency of banks in an emerging market: a slack-based measure. Journal of Economic Studies, 1-23.
Đuričin, D., & Lončar, D. (2020). Oblikovanje buduće privrede Srbije – novi model rasta i povezana platforma za vođenje ekonomskih politika. Ekonomika preduzeća, 68(1-2), 1-21.
Field, A. (2000). Discovering statistics using SPSS for Windows. Sage Publications.
Githaiga, P.N. (2022). Intellectual capital and bank performance: the moderating role of income diversification. Asia-Pacific Journal of Business Administration, 1-19.
Le, T.D.Q., & Nguyen, D.T. (2020). Intellectual capital and bank profitability: New evidence from Vietnam. Cogent Business & Management, 7(1), 1-19.
Li, G., Luo, Z., Anwar, M., Lu, Y., Wang, X., & Liu, X. (2020). Intellectual capital and the efficiency of SMEs in the transition economy China; Do financial resources strengthen the routes? Plos One, 15(7), 1-25.
Liu, G., Liu, Y., & Zhang, C. (2021). Human capital in the financial sector and corporate debt maturity. China Economic Review, 69, 1-21.
Mirza, N., Hasnaoui, J.A., Naqvi, B., & Rizvi, S.K.A. (2020). The impact of human capital efficiency on Latin American mutual funds during Covid-19 outbreak. Swiss Journal of Economics and Statistics,156(16), 1-7.
Onumah, J.M., & Duho, K.C.T. (2020). Impact of intellectual capital on bank efficiency in emerging markets: evidence from Ghana. International Journal of Banking, Accounting and Finance, 11(4), 435-460.
Paunović, S.S., Dimić, M.S., & Arsenijević, O.M. (2019). Analiza društveno-ekonomskih kretanja u Srbiji u uslovima krize. Baština, 48, 153-170.
Pavlović, G. (2023). The COVID-19 pandemic and its effect on human capital and financial performance: evidence from Serbian banks. The Annals of the Faculty of Economics in Subotica, 1-13.
Peković, J., Pavlović, G., & Zdravković, S. (2020). The influence of intellectual capital on financial performance of commercial banks in the Republic of Serbia. Ekonomika, 66(2), 103-111.
Pulić, A. (2000). VAIC - an accounting tool for IC management. International Journal of Technology Management, 20(5), 702-714.
Rahman, M., & Akhter, B. (2021). The impact of investment in human capital on bank performance: evidence from Bangladesh. Future Business Journal, 7(61), 1-13.
Slavković, M., & Ognjanović, J. (2018). Impact of human capital on business performance of hotel enterprises in Serbia. Teme,

42(4), 1339-1355.
Statistical office of the Republic of Serbia. (2024). Retrieved https://www.stat.gov.rs/.
Soeawarno, 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.
Tran, N.P., & Vo, D.H. (2020). Do banks accumulate a higher level of intellectual capital? Evidence from an emerging market. Journal of Intellectual Capital, 1-19.
Tran, N.P., & Vo, D.H. (2020a). Human capital efficiency and firm performance across sectors in an emerging market. Cogent Business & Management, 7(1), 1-15.
Veselinović, N., Krstić, B., & Veselinović, M. (2021). Measuring the efficiency of human capital. Ekonomika, 5(2), 1-17.