IJOESI
International journal of economic sustainability and innovation

Determining the Impact of Intellectual and Human Capital on the Firm's Value: A Case of US Banking Sector

By

Dr. Farzana Shamim

Abstract

Background: The US banking sector's evolution underscores the growing importance of intellectual and human capital in determining firm value. Due to technological advancement and regulatory changes, many banks still undervalue these intangible assets.

Aim of the study: This study aims to quantify the impact of intellectual and human capital on firm value within the US banking sector, highlighting their role in enhancing competitive advantage.

Methodology: A quantitative approach was utilised, analysing panel data from US banks through econometric techniques, including fixed and random effects models, to examine correlations and the Hausman test.

***Results*:** The study found that substantial intellectual and human capital investment positively affects firm value by fostering innovation, operational efficiency, and customer satisfaction.

Keywords: Intellectual Capital, Human Capital, Firm Value, US Banking Sector, Quantitative Analysis, Resourced-Based View (RBV), Knowledge-Based View (KBV), Regression and Correlation Analysis.

Introduction

The US banking sector has experienced significant transformation in recent decades, driven by technological advancement, regulatory changes, and the increasing importance of tangible assets such as intellectual and human capital. Bank's ability to leverage intellectual capital such as proprietary technologies, patents, and data analytics capabilities has become critical for sustaining competitive advantages in this rapidly evolving industry. Moreover, human capital, encompassing employee's skills, expertise, and innovation capacity, plays a crucial role in determining a bank's success and overall firm value. Based on the expanding concept of knowledge management, intellectual capital can be defined as all the knowledge assets of a firm that augment its competitiveness: innovation capital, relationship capital, and knowledge capital. (Ali, and Anwar, 2021) This type of capital is crucial in assisting a firm in providing new solutions, establishing a unique niche market, and sustaining its competitive edge. On the other hand, human capital refers to the human asset that arises in an organisation, which entails

the employees' knowledge, skills, and experience and the intellectual capital through innovation and proper decision-making channels (Tran and Vo, 2020). In the current economic environment, businesses, especially those in the service sector, like the banking sector, people and mind power, or human and intellectual capital, are considered key drivers of corporate performance and value-added more than physical capital (Xu and Li, 2022). The US banking sector exemplifies a Knowledge Intensive Business Services (KBIS), where human capital and expertise are essential for generating and sustaining value. As financial business becomes more automated and increasingly depends on technological skills, the value of these intangible assets significantly increases. That is why learning and innovation in human capital in banks are critical to maintaining their competitiveness, given high dynamism (Soewarno, 2020). This study aims to evaluate the impact of intellectual and human capital on firm value in the US banking sector, identifying how these intangible assets can be leveraged to enhance competitiveness and drive long-term success. It is often apparent that banks that deploy utilisation of their created content through technology and new approaches are higher than average performers. Consequently, there is a requirement to specify a focused examination of the effects. The critical problem this study aims to address is the underperformance of banks in the US due to the inadequate recognition and strategic utilisation of intellectual and human capital. While banks have traditionally focused on tangible assets and technological advancement, they may overlook the significant contributions that intellectual and human capital can make to firm value (Ali and Anwar, 2021). This oversight could lead to missed opportunities for innovation, competitive advantages, and sustained growth. By analysing the impact of these intangible assets on firm value, the study seeks to provide insights that can help banks leverage intellectual and human capital more effectively to enhance their overall performance and long-term success (Salvi et al., 2020). The main aim of this study is to evaluate the separate contributions of intellectual and human capital components to firm value in the US banking sector.

This study contributes to expanding the existing knowledge by presenting a quantitative assessment of the influence of intellectual and human capital on firm value in what can be considered a core segment of the American economy: the banking industry (Xu and Liu, 2020). The study's implications will be most helpful to the banking industry, its leadership, shareholders, and policymakers for highlighting the value proposition of investing in intellectual and human capital. This will allow the advancement of knowledge to help banks

improve their firm value regarding these important assets (Ousama, Hammami, and Abdulkarim, 2020).

Literature Review

Intellectual Capital and Firm Value

Intellectual capital is a vital asset containing information, expertise, and contacts that help shape a firm's competitive advantage and value. This can be described as the accumulated learning, abilities, expertise, and innovation embraced by a firm's workforce. Human assets that refer to attributes and characteristics of the people in an organisation act as prime determinants of innovation, productivity, high-quality services and excellent operations (Wang et al., 2021). Knowledge workers create new work products, enhance organisational work, and enhance firm-specific sources of competitive advantage. Organisational capital, including the firm's systems, processes and technology, provides a backbone for the company to run smoothly by having well-coordinated standard operating procedures. This infrastructure enhances human capital's effective functioning while coordinating the relational capital, which deals with external stakeholders. Relational capital is the relationship between the firm and its customers, suppliers, and regulatory authorities (Alvino et al., 2021). There is always a solid positive linkage between strong external relations and customer loyalty, compliance with the regulatory frameworks, and developing more markets. These components are interrelated: human capital aligns the use of an organisation's resources to create and sustain beneficial external relationships, and the efficient system and process sustains these relationships. It is crucial that such synergy guarantees that while enhancing the circulation of intellectual capital internally, the firm's market position is also bolstered (Salvi et al., 2020). It follows that by deploying human, organisational, and relational capital, firms can generate superior, sustained competitive advantage and total value.

Hypothesis (H1): Intellectual capital significantly enhances firm value in the banking industry by driving innovation, improving operational efficiency, and increasing customer satisfaction.

Human Capital and Firm Value

Human capital is crucial in determining a firm's value, particularly in learning-intensive industries like banking. It encompasses the technical competencies of the workforce, including their knowledge, skill, experience, creative abilities, and other measures of workforce capability that go into the core of organisations' operations, innovation, and customer

satisfaction. First, employees' level of knowledge and ability to make decisions affects the quality of the financial products and services produced by the banks (Kadim, Sunardi, and Husain, 2020). Staff who have been well-trained and have lots of experience are well equipped with risk assessment abilities, creativity in their approaches to delivering financial solutions, as well as the ability to deal with the ever-changing regulations; all of these are factors that help the bank to be more competitive and to deliver more value. Therefore, interpersonal work relations assist in developing effective interpersonal bridges and long-term interpersonal relations, which are essential for business profitability and customer relations. Furthermore, human capital is among the key determinants of organisational culture since it defines organisational culture, which in turn determines organisation productivity, employee job satisfaction and overall organisational performance (Wang et al., 2021). A positive culture that encourages a training and development atmosphere affects employee retention, turnover cost, overall organisational financial performance and firm market capitalisation. In conclusion, human capital plays an excellent role in building value within the firms within the banking industry, directly affecting innovation, customer and organisational value propositions (Tran, 2020).

Hypothesis (H2): In the banking sector, effective human capital management positively influences organisational culture, employee job satisfaction, and overall financial performance, enhancing market capitalisation.

Theoretical Foundation of Intellectual Capital and Human Capital

The Resource-Based View (RBV) is one of the most acknowledged theoretical perspectives that explain how intellectual capital affects the firm value. RBV argues that it is a firm’s resources, especially its intellectual capital, which can indirectly determine competitive advantage (Rehman, Aslam, and Iqbal, 2022). This theory theorises that resources must meet four criteria to be considered genuine sources of competitive advantage to a firm: Valuable, Rarity, Inimitability and Non-substitutability (VRIN). Consider that in the banking sector context, the intellectual capital aspect is of specific relevance. In this case, the industry is considerately competitive and knowledge-oriented; thus, product innovation and enhancement of the provided services are the primary concerns for banks (Gerhart and Feng, 2021).

Human capital, part of intellectual capital management, is significant in encouraging and supporting innovations and strategic plan implementation. Through proper processes and technologies of structural capital, future services from the banks can be quality services at even

lower costs. Relational capital wants to ensure that the banks have good relations with their clients, the regulatory commissions and other vital players in the field, thus being critical for sustainable development (Jiang et al., 2020). According to the RBV, firms with superior possession of IC can generate premium customer value propositions (Mhadhbi et al., 2020), altering market environments and earning higher profitability and firm market value. In the US banking industry, where difference and value creation are based primarily on services and customer relationships, intellectual capital becomes a significant asset for sustaining competitive advantage and firm value.

The Knowledge-Based view extends the RBV by giving particular importance to knowledge as a resource. KBV opines that knowledge, an element of the second type of intellectual capital, is a crucial activator of competition. (Cooper et al., 2023). This theory stresses the flow of knowledge in a firm and the creation and implementation of knowledge. That is where using and navigating knowledge becomes critical competence in industries such as banking, whereby it is apparent that possessing specialised knowledge makes a difference (Kianto et al., 2020). All these theories, in aggregate, show that intellectual capital, with particular emphasis on human capital, is the engine that drives the creation of overvalued innovations and competitive advantage within a firm.

Empirical Evidence from the US Banking Sector

The importance of the firm's intellectual and especially human capital has been acknowledged and investigated in the US banking sector. Studies suggest that knowledge assets affirmable by patents, technology, and other organisational assets can significantly contribute to a bank's competitive advantage and value addition. For example, when investing in sophisticated technological systems or new and exotic financial instruments, the banking industry tends to record improved financial returns and market capitalisation (Jiang et al., 2020). Other components also affect a firm and its value, such as human capital, which comprises employee skill, knowledge, and management. There is overwhelming evidence that the ratio of skilled and well-trained workforce has a positive relationship with the overall profitability and the banks' risk level. Amid extensive surveys on the impact of knowledge management on banks, it has been found that the banks which invest significantly in training their human capital, have enhanced knowledge management framework, and nurture a culture of innovation are likely to achieve higher profitability and market capitalisation (Mhadhbi et al., 2020). For instance, those banking organisations that can employ their intellectual capital

to create new value in their offerings, such as offering a new line of financial services or improving organisational functions, may gain a competitive edge and increase the shareholders' value. Moreover, leadership quality and employee engagement have a positive relationship with the operations' performance as well as customers' satisfaction, all of which enhance the firm value (Wang et al., 2021).

Hypothesis (H3): In the US banking sector, higher investments in intellectual capital, including advanced technology and employee training, are positively associated with improved financial returns and increased market strategies.

Challenges and Criticisms

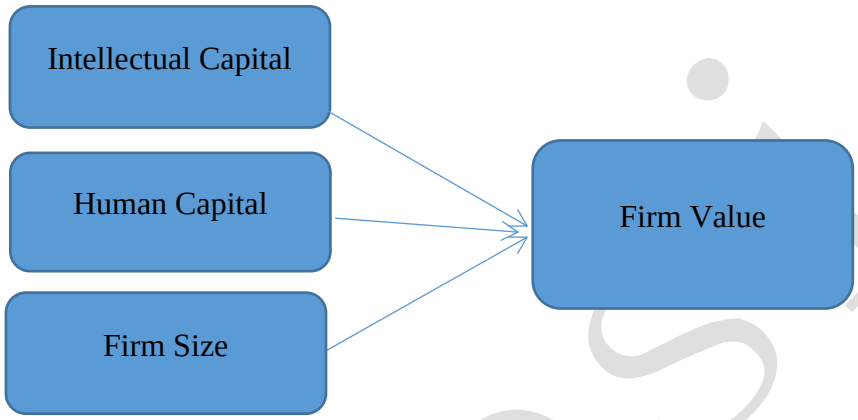
There are several issues and critiques associated with the above-laid reviews and suggestions. The computation of intellectual and human capital is always likely to be imprecise due to its subjective nature, thus under or overstating the effect on the firm's value. This high reliance of organisations on intangible assets has made it challenging to ascertain direct and tangible cause-effect relationships between the kinds of capital and financial performance (Merson et al., 2018). Furthermore, complexity and fluctuations in the mechanism of the banking sector and growth in the high pace of the different technologies can create a problem in generalising the findings in different periods or under various economic conditions. Others say that while intellectual and human capital roles are relevant, their impact on firm value is inflated. In contrast, several other factors include regulatory changes as well as macro meteor factors (Kuzmin et al., 2020).

Literature Gap

Although prior studies emphasise the importance of intellectual and human capital in improving firm value, especially in the US banking industries, there are still some gaps to fill. First, it is essential to mention that most of the theoretical and empirical work has been conducted about large, universal banks, thus providing weak insights into how these types of capital impact small or midsize ones (Jiang et al., 2020). The interactions between intellectual and human capital and another class of firm resources are unacknowledged, hindering an insightful analysis of the combined effects of the two capitals and other intangible resources like social capital or organisational culture on firm value (Akomea-Frimpong et al., 2022). The first significant gap that can be identified is cross-sectional; many investigations present a clear picture of the current state of affairs rather than showing how relations between intellectual and human capital accumulation change over the years. In addition, the impact of external

antecedents, including regulatory environment, business cycle, and technology shocks, on the intellectual and human capital-firm value nexus is investigated only to a limited extent (Ali, Ally, and Dwivedi, 2020). Filling these gaps may yield a better appreciation of how intangible assets such as intellectual and human capital can propel the value-creation process in the banking industry.

Conceptual Framework



Here in this conceptual framework, Human Capital, Intellectual Capital, and Firm Size have been used as independent variables affecting the Firm Value. Organisational capital (e.g., employee training and turnover) and intellectual assets (e.g., R&D and patents) positively impact firm value through an improvement in competitive advantage. Human capital and firm size have a positive relationship and, thus, still work as a control variable that influences intellectual capital. Information presented in this framework shows how these capitals and firm sizes assist towards firm value, offering insights on their contribution to performance.

Methodology

This research adopts a quantitative research method to analyse the effects of both intellectual and human capital on the value of firms in the banking industry of the United States of America. The study uses a research design that compares the correlations between intellectual capital, human capital, and firm value, which is the dependent variable. The preceding relationships will be tested using a panel data approach to compare the effects of intangible assets on firm performance among several banks. Also, this design is appropriate for finding trends, patterns, and cause-and-effect relations at the level of the banking sector (Kadim, Sunardi, and Husain, 2020). This research data will be sourced from secondary sources such as financial statements, annual reports, World Bank, and Bloomberg databases. The software for this analysis is

STATA. The measures will be obtained from a few more micro variables, including the employee cost, Research and technology or development expense, and customer interaction statistics. Non-financial performance will be assessed through an evaluation of firm value employing measures. The sample data will include a cross-section of US banks during the year to reduce the risk of generalisation for greater accuracy. The data will then be analysed using econometric techniques applicable to panel data, fixed effects, or random effects (Ousama, Hammami, and Abdulkarim, 2020). These models are selected to avoid the problem of endogeneity and heteroscedasticity across the banks and to absorb time. The first analysis to be conducted will involve descriptive statistics to summarise the observed data and determine whether there are any outliers. After that, correlation analysis will be used to test the effect of the independent variables (Intellectual and human capital) on the dependent variable (firm value). The study will analyse a sample of 60 listed banks in the US over a year (2018-2023). This sample size is chosen to ensure sufficient data points for statistical analysis. The primary analysis will, therefore, include regression models through which the hypotheses will be tested, and the main variables of intellectual and human capital will be run against firm value (Susanti et al., 2020). Relationship terms may be added to establish the moderating of the human and intellectual capital. Some of the tests to be conducted include the graphic diagnosis of multicollinearity, heteroscedasticity, and autocorrelation tests, enabling the researcher to test the validity and reliability of the regression model.

Regression Model Equation

The basic regression model for the study can be represented as follows:

$$\text{Firm Value}_{it} = \alpha + \beta_1 (\text{Intellectual Capital}_{it}) + \beta_2 (\text{Human Capital}_{it}) + \beta_3 (\text{Firm Size}_t) + \varepsilon_{it}$$

Ethical Considerations and Limitations

The following ethical questions arise while researching the link between knowledge and human capital on a firm's value in the USA banking industry (Raimo et al., 2020). However, the study has the following limitations that are worth noting. Generalizability could be limited because achieving a high level of accuracy in determining strengths and weaknesses of the intellectual and human capital in the banking sector could be hampered by the limited availability of data and information (Ali and Anwar, 2021). However, it can be noted that conclusions derived from this particular industry cannot be taken as a benchmark for any other sector, area or country because the practices and the patterns of economic conditions may vary. Finally, the causality of the first two components, namely, the intellectual and human capital on the firm

value, cannot be stated outright because more than one determinant contributes to firm performance.

Result And Discussion

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
human capital	60	5.949289	1.33885	3.638925	8.58654
Intellectual capital	60	5.752876	1.548162	2.836097	9.102367
firm value	60	0.223325	0.038834	0.159111	0.320849
firm size	60	10.6578	0.007472	10.64209	10.67067

The dataset includes 60 observations with the following variables: Human capital, intellectual capital, firm value, and size of the firm are some of the variables that are being used. The mean, 5.95, of variable Human capital is Std. Dev. is 1.338, ranging from 3.64 to 8.59. The mean of the measure of Intellectual capital is 5.7,5 while the standard deviation is 1.55. The variability in Human and intellectual capital suggests diverse levels of asset management among firms. The low variability in firm size 0.0074 indicates that thefirm's size ande significance differences in Human and intellectual capital may impact firm value, with high investments in these areas could achiemore excellentter value.

Correlation Analysis

	Human Capital	Intellectual Capital	Firm value	Firm size
Human capital	1			
Intellectual capital	0.0571*	1		
Firm value	-0.08*	0.0608*	1	
Firm size	-0.0859*	-0.1157*	-0.1794*	1

The correlation analysis shows the relationship between human capital, intellectual capital, firm value, and firm size. A significant positive correlation exists between intellectual capital

and human capital (0.0571) and firm value (0.0608), indicating that firms with higher intellectual capital tend to have stronger human resources and higher value. The negative correlations between human capital and firm value indicate weak inverse relationships.

Diagnostic Analysis

Random-Effects Model

firm value	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
Human capital	-0.0028492	0.00381	-0.75	0.454	-.0103156 .0046172
Intellectual capital	0.0011352	0.003304	0.34	0.731	-.0053414 .0076118
firm size	-0.9491159	0.68613	-1.38	0.167	-2.293905 .3956735
_cons	10.34923	7.316618	1.41	0.157	-3.991077 24.68954

The Human capital is -0.0028, which showed an expected value of 0.0028 with a p-value of 0.454. This point indicates that differences in human assets cannot account for differences in firm value in this mode. The intellectual capital is 0.0033, which is also positively statistically significant with a coefficient estimate of 0.0011 with a p-value of 0.731, and it also indicates that this has no impact on the firm value of the organisations and companies. It implies that differences in human capital slightly affect firm value. Likewise, intellectual capital, it has a coefficient of 0.0011 with a p-value of 0.731, thus indicating that there is no effect on the value of the firm's size.

Fixed-Effects Model

firm value	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
Human capital	-0.003885	0.00439	-0.89	0.381	-.0127156 .0049455

					-.0067262
Intellectual capital	0.0006067	0.003645	0.17	0.869	.0079396
firm size	-1.292996	0.756809	-1.71	0.094	-2.8155 .2295074
					-2.212431
_cons	14.02344	8.070559	1.74	0.089	30.25931

The coefficient of human capital is -0.00038 with a p-value of 0.381, which implies that human capital has no impact on firm value. The obtained value of the Intellectual Capital coefficient is 0.00060. The human capital, intellectual capital and firm size do not affect firm value since the p-values of 0.381, 0.869 and 0.094 are more significant than the chosen significance levels of 95%. These results indicate that the fixed-effects model is just slightly better than the random-effects model, which still provides only a moderate explanation for the variations in these variables.

Hausman Test

chi2(3)	(b-B)'[(V_b-V_B)^(-1)](b-B)
	1.56
Prob>chi2	0.6675

The Hausman test with the chi2 value of 1.56 and p-value of 0.6675 supports the null hypothesis. It means that there is no difference between fixed and random effects estimators, therefore making the random-effect model suitable in this case.

Modified Wald Test

chi2 (10)	72.87
Prob>chi2	0.0001

The Modified Wald test shows an issue with heteroscedasticity (chi2 = 72.87, p <0.0001), which means that the variances within panels are not constant. As a result, Generalization Least Squares (GLS) regression is suitable for handling heteroscedasticity.

Wooldridge Test

F(1, 9)	6.661
Prob > F	0.0297

The Wooldridge test that gives the first-order autocorrelation result (F = 6.661, p = 0.0297) shows that the errors in the panels are also correlated through time.

GLS Regression

Firm value	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Human capital	0.00046	0.002518	0.18	0.855	-.0044746 .0053942	
Intellectual capital	0.001448	0.00274	0.53	0.597	-.003 9214 .006818	
Firm size	-0.27144	0.522091	-0.52	0.603	-1.294719 .7518399	
_cons	3.099201	5.563603	0.56	0.577	-7.80526	14.00366

The coefficient of human capital is 0.0005 with the probability value or p-value of the test being evaluated equal to 0.855, which means that there is no impact on the firm's value. Closely connected with the coefficient of intellectual capital, which is equal to 0.0014 with a p-value of 0.597, the results are also insignificant in terms of extent and consequence. The coefficient for a firm's size is -0.2714 with a p-value of 0.60, indicating that firm size has no significant impact on firm value. These results suggest that human capital, intellectual capital, and firm size do not have a significant impact on the firm's value.

Conclusion

In conclusion, the analysis reveals that human and intellectual capital does not significantly impact firm value in the US banking sector. Several reasons can explain the findings of this study, which focused on the relationship between human and intellectual capital and firm value concerning the US banking sector. This might be due to the lapse in the range of the variables used in the study and the small sample size used in the research. Also, firm value is a multi-faceted and multi-dimensional construct that depends on all kinds of factors that are not limited

to human and intellectual capital but also encompass market forces, competition, and regulatory frameworks. Recommendations include expanding research and extending the sample of variables that define the behavior of the firms' value to include other financial variables, market share, and strategic actions. Policy implications indicate that, for instance, human and intellectual capital investment issues may not be enough to enhance the firm value in highly regulated sectors, such as the banking sector. It should thus be noted that there are other factors that policymakers should consider to optimise the general economy concerning the formulation of policies to improve firm performance. Although practitioners should also commit adequate resources to human and intellectual components, other strategic considerations, including regulatory aspects and market conditions, should also be considered when enhancing firm performance. It is possible that future research can overcome these limitations to offer a better understanding of how these capitals affect firm value with distinct intensity in diverse segments and under different circumstances.

Reference

Akomea-Frimpong, I., Adeabah, D., Ofosu, D. and Tenakwah, E.J., 2022. A review of studies on green finance of banks, research gaps and future directions. *Journal of Sustainable Finance & Investment*, *12*(4), pp.1241-1264.

Ali, B.J. and Anwar, G., 2021. Intellectual capital: A modern model to measure the value creation in a business. *Ali, BJ, & Anwar, G.(2021). Intellectual capital: A modern model to measure the value creation in a business. International Journal of Engineering, Business, and Management*, *5*(2), pp.31-43.

Ali, O., Ally, M. and Dwivedi, Y., 2020. The state of play of blockchain technology in the financial services: A systematic literature review. *International Journal of Information Management*, *54*, p.102199.

Alvino, F., Di Vaio, A., Hassan, R. and Palladino, R., 2021. Intellectual capital and sustainable development: A systematic literature review. Journal of intellectual capital, 22(1), pp.76-94.

Basu, M.S.S., Boz, M.E., Gopinath, M.G., Roch, M.F. and Unsal, M.F.D., 2020. *A conceptual model for the integrated policy framework*. International Monetary Fund.

Cooper, C., Pereira, V., Vrontis, D. and Liu, Y., 2023. Extending the resource and knowledge based view: Insights from new contexts of analysis. *Journal of Business Research*, *156*, p.113523.

Gerhart, B. and Feng, J., 2021. The resource-based view of the firm, human resources, and human capital: Progress and prospects. *Journal of management*, *47*(7), pp.1796-1819.

Jiang, E.X., Matvos, G., Piskorski, T. and Seru, A., 2020. Banking without deposits: Evidence from shadow bank call reports. *NBER working paper*, (w26903).

Kadim, A., Sunardi, N. and Husain, T., 2020. The modeling firm's value based on financial ratios, intellectual capital and dividend policy. *Accounting*, *6*(5), pp.859-870.

Kuzmin, O., Bublyk, M., Shakhno, A., Korolenko, O. and Lashkun, H., 2020. Innovative development of human capital in the conditions of globalization. In *E3S Web of Conferences* (Vol. 166, p. 13011). EDP Sciences.

Kianto, A., Ritala, P., Vanhala, M. and Hussinki, H., 2020. Reflections on the criteria for the sound measurement of intellectual capital: A knowledge-based perspective. *Critical Perspectives on Accounting*, *70*, p.102046.

Maditinos, D., Chatzoudes, D., Tsairidis, C. and Theriou, G., 2011. The impact of intellectual capital on firms' market value and financial performance. *Journal of intellectual capital*, *12*(1), pp.132-151.

Maditinos, D., Chatzoudes, D., Tsairidis, C. and Theriou, G., 2011. The impact of intellectual capital on firms' market value and financial performance. Journal of intellectual capital, 12(1), pp.132-151.

Merson, M., Inrig, S., Merson, M. and Inrig, S., 2018. Challenges and Criticisms. *The AIDS Pandemic: Searching for a Global Response*, pp.239-257.

Mhadhbi, K., Terzi, C. and Bouchrika, A., 2020. Banking sector development and economic growth in developing countries: a bootstrap panel Granger causality analysis. *Empirical Economics*, *58*, pp.2817-2836.

Ousama, A.A., Hammami, H. and Abdulkarim, M., 2020. The association between intellectual capital and financial performance in the Islamic banking industry: An analysis of the GCC banks. *International Journal of Islamic and Middle Eastern Finance and Management*, *13*(1), pp.75-93.

Raimo, N., Ricciardelli, A., Rubino, M. and Vitolla, F., 2020. Factors affecting human capital disclosure in an integrated reporting perspective. *Measuring Business Excellence*, *24*(4), pp.575-592.

Rehman, A.U., Aslam, E. and Iqbal, A., 2022. Intellectual capital efficiency and bank performance: Evidence from islamic banks. *Borsa Istanbul Review*, *22*(1), pp.113-121.

Salvi, A., Vitolla, F., Giakoumelou, A., Raimo, N. and Rubino, M., 2020. Intellectual capital disclosure in integrated reports: The effect on firm value. *Technological forecasting and social change*, *160*, p.120228.

Soewarno, N. and 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), pp.1085-1106.

Susanti, N., Widajatun, V.W., Aji, M.B. and Nugraha, N.M., 2020. Implications of intellectual capital financial performance and corporate values. *International Journal of Psychosocial Rehabilitation*, *24*(07), pp.6588-6599.

Tran, N.P. and Vo, D.H., 2020. Human capital efficiency and firm performance across sectors in an emerging market. *Cogent Business & Management*, *7*(1), p.1738832.

Wang, Z., Cai, S., Liang, H., Wang, N. and Xiang, E., 2021. Intellectual capital and firm performance: the mediating role of innovation speed and quality. *The International Journal of Human Resource Management*, *32*(6), pp.1222-1250.

Xu, J. and Li, J., 2022. The interrelationship between intellectual capital and firm performance: evidence from China's manufacturing sector. *Journal of Intellectual Capital*, *23*(2), pp.313-341.

Xu, J. and Liu, F., 2020. The impact of intellectual capital on firm performance: A modified and extended VAIC model. *Journal of Competitiveness*, (1).