INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE: CASE OF THE EMERGING MARKET BANKS

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Abstract

Using the value added intellectual capital (VAIC) this study aims to investigate the impact of intellectual capital (IC) on the performance of Jordanian banks listed in the Amman Stock Exchange (ASE) during the years 2005-2018. Two empirical models were designed to test the effect of VAIC, and its three components including capital employed efficiency (CEE), human capital efficiency (HCE) and structural capital efficiency (SCE) on banking performance. The results of the study show that there is a significant and positive relationship between VAIC and banks profitability presented by return on assets (ROA). Meanwhile, when VAIC is split into components, SCE, CEE and HCE have a significant and positive impact on banks performance. Yet, CEE has more influence on performance compared to HCE and SCE. This study contributes to the literature as well as practitioners in financial institutions by providing evidence on the influence of intellectual capital on banks performance in an emerging economy, Jordan, in which its national vision and strategy emphasize the importance of intellectual capital in sustaining its economic growth.

Keywords: Intellectual Capital, Financial Performance, VAIC, ROA, Jordanian Banking Sector

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1. INTRODUCTION

In recent years, the world economy has shifted toward knowledge-based economies (Dženopoljac, Janoševic, & Bontis, 2016). In such economies, intellectual capital (IC) forms the essential part of a firm's market value rather than traditional assets (Proctor, Burton, & Pierce, 2006). Commonly, IC is deemed as a broad model that is divided into three categories that are: capital employed (CE), human capital (HC), and structural capital (SC) (Tseng & James Goo, 2005; Chen, Cheng, & Hwang, 2005). HC is identified as the skills, experiences, and competencies that employees take with them when they leave (Roos & Roos, 1997). In addition, CE is identified as the company's external relationships with stakeholders such as suppliers, investors, creditors, and customers (Riahi-Belkaoui, 2003). Finally, the SC is also identified as the knowledge that remains within the organization (Bontis, 1998).

Investment in IC has become increasingly prevalent among academics and practitioners as effective IC has been proven a key to achieving competitive advantage and efficiency gains. IC

thereby constitutes a crucial constituent of innovation in relation to business processes and products (Tulung, Saerang, & Pandia, 2018) and is deemed crucial to achieve a competitive advantage, which can increase firm's profitability. Yet, while previous studies have comprehensively demonstrated the significance of IC in corporate management in the developed world, a limited number of contributions tackled the significance and impact of IC in emerging economies (Tseng & James Goo, 2005; Tulung et al., 2018; Kamath, 2007). The impact of IC can be more prominent in emerging economies as these economies have abundant human capital at their disposal (Kamath, 2007). Hence, it is important to establish an understanding of IC in a different socio-political and economic setting. In particular, this study will investigate whether IC is efficiently utilized by banks in Jordan. The banking sector is an ideal area for IC research since this sector is "intellectually" intensive and its employees are intellectually more homogeneous than other economic sectors (Kamath, 2007).

There are many reasons that make Jordan an ideal country to conduct this study. First, the financial sector in Jordan plays a pivotal role in promoting and sustaining the kingdom's economic growth and is deemed as one of the largest economic sectors in Jordan, with total assets equaling 170% of GDP in mid-2015 (Al-Amarneh & Yaseen, 2017). Besides, the banking sector in Jordan is sound and resilient, supported by strong financial indicators, including a high capital adequacy ratio, a comfortable level of liquidity and a low ratio of nonperforming loans (Al-Amarneh & Yaseen, 2017). The financial sector is dominated by private banks which are, by and large, well-developed, profitable, and adequately capitalized. There is also a stock exchange market, Amman Stock Exchange (ASE), listing and trading conventional financial instruments. There are also many international banks that are operating and growing in Jordan (Yaseen, Omet, & Kahmash, 2015). As a result of these developments, Jordan's banking sector is required to enhance its competitive capabilities and sustain its position as a leading financial sector through diversifying its products and services and by improving relations with its clients. Thus, the banking sector in Jordan is required to pay more attention to develop its IC performance that is considered as a key aspect of competitive advantage.

Hence, the aim of this study is to investigate the relationship between IC and the financial performance of banks in Jordan between 2005 and 2018. This study has three main objectives. The first is to measure the IC performance of the listed commercial banks on the ASE during the period 2005-2018. The second is to analyze IC performance within the ASE. The third is to investigate whether IC has an impact on the financial performance of commercial banks in emerging countries, namely Jordan.

The remainder of the study is organized as follows: Section 2 provides theoretical information about IC, Section 3 describes the research methodology and data collection, Section 4 presents the results and discussion, and Section 5 concludes the paper.

2. LITERATURE REVIEW

2.1. Defining intellectual capital

Despite great interests and research in the field of intellectual capital, scholars define the concept of intellectual capital in different ways. Therefore, there is no specific and unified definition for IC. In his efforts to describe the concept and scope of his IC, Nawaz (2019) defined it as a combined intangible asset that allows firms to operate and see the organization or firm as the sum of its tangible and intangible assets. Meanwhile, Marr and Chatzkel (2004) defined IC as a collection of knowledge resources that are the basis for creating competitive advantage. On the other hand, others have described the IC as intangible assets that affecting the financial performance but are not recorded in the firm's balance sheet (Nawaz, 2019; Madyan & Fikir, 2019; Mondal & Ghosh, 2012), e.g., employee relations, personnel management, user/client and stakeholders.

As there is no agreement in the literature on the definition of IC, researchers have not agreed on the various components of IC and their impact on financial performance either (Dženopoljac et al., 2016; Riahi-Belkaoui, 2003; Marr & Chatzkel, 2004). However, it is widely known that IC consists of three main components, namely SC, HC, and CE. Human capital can be defined as know-how that leaves the corporation when employees quit and also it includes the abilities, skills, experience, and knowledge of personnel (Fatihudin, Sembiring, Firmansyah, & Holisin, 2020). At the same time, Varum and Rocha (2012) identified HC as a combination of skills, values, talents, competencies, and attitudes of employees and managers. HC can also be described as innate knowledge that is deeply rooted in workers (Kamukama, 2013; Ahmed & Wang, 2019).

Meanwhile, CE incorporates the interactions with external sources such as customers, suppliers and other stakeholders (Hsu & Wang, 2012). Finally, SC covers the system, structure, and processes of an organization, and it includes non-physical components such as databases, organizational schemes, management processes, and business strategies (Le & Nguyen, 2020). SC is the ability of an organization to meet customer requirements. Recent evidence suggests that a well-organized structure with qualified staff providing efficient and quality service leads to high institutional outcomes (Kurt, 2008; Kamaluddin & Kasim, 2013; Joshi, Cahill, & Sidhu, 2010).

2.2. VAIC and financial performance

In spite of the increasing acknowledgment of IC in achieving financial performance and competitive advantages, there is no single appropriate measure of intellectual capital. In fact, several techniques were developed to measure it. These methods include intellectual capital services, IC-index (Roos & Roos, 1997), market-to-book ratio, Tobin's Q ratio, the technology broker's IC audit (Nawaz, 2019), the intangible asset monitor (Sveiby, 1997), balanced scorecard (Kaplan & Norton, 2007), among others. However, there is extensive research in the international literature that studies the impact of

IC using the value added intellectual capital (VAIC) model, which was first proposed by Pulic and Bornemann (1999).

The VAIC model shows a firm's intellectual ability and whether its resources are used effectively. In other words, VAIC assesses the newly created value per monetary unit invested in each source. The higher the VAIC value, the greater the added value created by the firm's resources (Pulic, 2004). Several studies investigated the relationship between IC influence and financial performance of financial institutions, and VAIC is usually applied as an important indicator to measure IC efficiency, whereas return on assets (ROA) and return on equity (ROE) are commonly used as a financial indicator that measures performance. In this regard, the higher the VAIC value of an organization, the higher the added value created by the overall resources of that organization (Pulic, 2004).

Several empirical studies have used and adopted the VAIC model in order to determine the correlation between IC and financial performance. A significant relationship has been discovered and reported by Pulic and Bornemann (1999) in studies that examined the relationship between intellectual capital and the firm's performance of Croatian and Austrian banks for the period 1996-2000, where he found that banks financial performance has a significant and positive relationship with intellectual ability. Also, he revealed significant differences in banks ranking based on efficiency and performance.

Similarly, the relationship between IC and financial performance was investigated by Yalama and Coskun (2007) in a study conducted in Turkey between 1995 and 2004. They concluded that IC was more important for banks than traditional capital. These results are also consistent with other studies that have used VAIC to examine the financial performance of banks (Mavridis, 2004).

Although several studies revealed that IC has a significant effect on a firm's financial performance, other studies have failed to give appropriate evidence to support the positive relationship. For instance, Firer and Williams (2003) used VAIC methodology to examine the relationship between IC and financial performance. Their findings did not reveal a positive and strong relationship between the empirical variables. Similarly, Şamiloğlu (2006) noted that there was no relationship between the VAIC and the market-to-book (M/B) ratio of the 12 Turkish banks listed in Borsa Istanbul.

In conclusion, the literature suggests that findings and results that of earlier studies have been varied. Hence there is a need for further studies in order to assess and investigate the relationship between IC and financial performance, particularly in other emerging economies where the concept of IC is still at an infant stage (Firer & Williams, 2003).

3. RESEARCH METHODOLOGY

3.1. Population and sampling

The study population consisted of all commercial banks listed at the Amman Stock Exchange. The main reason behind choosing listed firms is mainly due to the availability and reliability of their financial statements which will be used to collect data needed to measure the dependent variable (ROA). Banks included in the sample should have been active and listed on the market during the period of 2005-2018. All required data will be collected from the annual reports for each bank, besides annual bulletins published by the ASE during the study period. This data could be accessed through the ASE database (http://www.ase.com.jo/).

3.2. Variables definition

Dependent variable

Banks performance can be measured by several indices: ROA, ROE, earnings per share (EPS), market price per share (MP), book value per share (BV). In this paper, ROA will be used as a proxy for bank financial performance and ROA for the bank t in the year i. ROA is calculated by dividing the net profit (the loss) for the current year by total assets (Nirino, Ferraris, Miglietta, & Invernizzi, 2020).

Independent variable

In his study, Pulic and Bornemann (1999) proposed a model for evaluating VAIC and its components to measure its proficiency in value creation. The proposed model used the financial statements of the organization to determine the components of VAIC. In this study, we use the same model proposed by Pulic and Bornemann (1999) to determine the VAIC and its components as independent variables since this technique is convenient and simple and is employed in numerous studies (Nawaz, 2019; Pulic, 2004; Şamiloğlu, 2006). According to Pulic and Bornemann (1999), VAIC can be calculated using the following formula:

$$VA = OP + EC + A \quad (1)$$

where, VA represents the total value created by the bank, OP represents the bank's operating profit, EC represents the employment cost of the bank, while A represents the bank's depreciation and amortization. After calculating the total VA, the components of the VAIC (CEE, HCE, and SCE) are calculated as follows:

$$HCE = \frac{ValueAdded(VA)}{HumanCapital\ (HC)} \quad (2)$$

$$SCE = \frac{StructuralCapital\ (SC)}{ValueAdded\ (VA)} \quad (3)$$

$$CEE = \frac{ValueAdded\ (VA)}{CapitalEmployed\ (CE)} \quad (4)$$

where, *VA* refers to the total value added created by the bank (*Total revenues – (Operating exp. – Employee salaries and wages)*), *HC* represent employee-related expenditures which can be presented by employee salaries and wages, *SC* refers to the difference between *VA* and *HC*, and *CE* refers to the capital employed (*Total assets – Intangible assets – Liabilities*) (Śledzik, 2013).

Control variable

To overcome the bank size bias, we use the natural logarithm of total assets as a control variable (Widyastuti, Komara, & Layyinaturrobaniyah, 2019).

3.3. Regression model & hypothesis

Two empirical models will be applied to examine the relationship between financial performance and VAIC and its three components (CEE, HCE, and SCE). The models are represented as follows:

Model 1

$$FinancialPerformance(ROA) = \alpha + \beta_1 * VAIC + \beta_2 * ln(TA) + \varepsilon \quad (5)$$

Model 2

$$FinacialPerformance(ROA) = \alpha + \beta_1 * HCE + \beta_2 * SCE + \beta_1 * CEE + \beta_4 * ln(TA) + \varepsilon \quad (6)$$

After reviewing previous studies that adopt the VAIC model as a proxy for IC, this study expects IC to have an important impact on the financial performance of commercial banks in Jordan. Thus, in order to accomplish the objectives of this study, the following hypotheses will be tested using VAIC as a measure of IC:

H_{0a}: There is no significant impact between VAIC and financial performance.

H_{0b}: There is no significant impact between HCE and financial performance.

H_{0c}: There is no significant impact between SCE and financial performance.

H_{0d}: There is no significant impact between CEE and financial performance.

4. RESULTS AND DISCUSSION

Table 1 presents the main characteristics of Jordanian commercial banks. The average bank size (TA) was JD 3,547 million. The average revenues (REVENUES) were JD 145 million. The average operating expenses (OPEXP) were JD 81 million, the human capital (HC) which represent the employee related expenses were JD 32.9 million, which represent about 40% of the average operating expenses. The average book value per share (BV) was JD 2.69 per share with an average market value (MPS) of JD 3.8 per share.

Table 1. Bank characteristics

	TA	*REVENUES*	*OPEXP*	*HC*	*BV*	*MPS*
Mean	3.55E + 09	1.45E + 08	81928368	32935189	2.691565	3.800000
Median	1.72E + 09	74139401	40470406	16523306	1.788973	2.050000
Maximum	2.59E + 10	1.31E + 09	7.59E + 08	2.55E + 08	32.07206	63.30000
Minimum	1.63E + 08	8290026	4571096	2082952	0.348604	0.790000
Std. dev.	5.93E + 09	2.23E + 08	1.31E+ 08	47980620	3.048517	5.806678
Observations	182	182	182	182	182	182

Table 2 presents the descriptive statistics for the main components of VAIC. When classifying the HCE according to bank size, results (results of classification not included here) show that HCE decreased by increasing bank size and banks with total assets less than JD 10,000 million has an average HCE of 3.07 with a maximum value of 15.18 and a minimum value of 0.88. Meanwhile, the standard deviation was 1.356 respectively.

Table 2. Descriptive statistics for independent variables

Intellectual capital components				
	HCE	*SCE*	*CEE*	*VAIC*
Mean	3.073806	0.631665	0.225761	3.931233
Median	2.902406	0.655458	0.214461	3.724502
Maximum	15.17931	0.934121	0.521280	16.63471
Minimum	0.881626	-0.134267	0.067289	0.827466
Std. dev.	1.356135	0.135362	0.080156	1.489437
Observations	182	182	182	182

When classifying SCE according to bank size, results show that SCE decreased by increasing bank size and banks with total assets less than JD 10,000 million have an average SCE of 0.63 with a maximum value of 0.93 and a minimum value of -0.134. There was one observation with negative structural capital, which usually happens when the net income of the bank is negative too, indicating a problem in the procedures and tools used by the bank to produce services for their customers. Meanwhile, when classifying the CEE according to bank size, results show that CEE decreased by increasing bank size and banks with total assets less than JD 10,000 million have an average CEE of 0.225 with a maximum value of 0.521 and a minimum value of 0.067.

As for the VAIC, which represent the sum of HCE, SCE and CEE, the results of classifying VAIC by bank size shows that the average value for VAIC decreased by increasing bank size and banks with total assets less than JD 10,000 million has average VAIC of 3.94 with a maximum value of 16.63 and a minimum value of 0.827.

Comparing the mean and standard deviation values for the three components of VAIC, HCE (3.073, 1.356), SCE (0.632, 0.135) and CEE (0.225, 0.0672) reveals that during the study period 2005-2018, the Jordanian commercial banks were more effective in generating value from its human capital rather than earnings generated from physical and structural assets.

Table 3. Descriptive statistics for independent variables

	ROA
Mean	1.397481
Median	1.391007
Maximum	4.965169
Minimum	-0.165919
Std. dev.	0.646835
Observations	182

The figures indicate that the average ROA for our sample banks was 1.397, with a maximum value of 4.96 and a minimum value of -0.165 indicating a negative net income for this observation. The standard deviation was 0.6468 indicating that commercial banks have law variation or dispersion in their ROA.

4.1. Diagnostic checks

This study uses multicollinearity, heteroscedasticity, and serial correlation tests as the diagnostic checks. Pearson correlation coefficients (correlation matrix) is used as an indicator to check the multicollinearity problem.

Table 4. Correlation matrix between the independent variables as in Model 1

	LNTA	*VAIC*
LNTA	1.000000	

VAIC	**-0.085286**	1.000000
	(0.2523)	-----

Table 4 presents the result of the Pearson correlation between the independent variables in the study as in regression Model 1. It is clear that the correlation relationship between the independent variables (ln(total assets), VAIC) are not significantly strong and high, we noticed that the correlation coefficient was -0.085286 and insignificant, this means that multicollinearity is not the main concern between the independent variables in the regression Model 1.

Table 5. Correlation matrix between the independent variables as in Model 2

	LNTA	*HCE*	*SCE*	*CEE*
LNTA	1.000000			

HCE	**-0.087937**	1.000000		
	(0.2378)	-----		
SCE	**0.010356**	**0.724086**	1.000000	
	(0.8896)	0.0000	-----	
CEE	**-0.114466**	**0.374807**	**0.333969**	1.000000
	(0.1239)	0.0000	0.0000	-----

Table 5 presents the result of the Pearson correlation between the independent variables in the study as in regression Model 2. It is clear that the correlation relationship between the independent variables (ln(total assets), HCE, SCE and CEE) are not significantly strong and high, we noticed that all correlation coefficients are less than 0.8 (Gujarati, 2004) this means that multicollinearity is not the main concern between the independent variables in the regression Model 2.

Table 6. Correlation matrix between the dependent variable (ROA) and all independent variables

	ROA
ROA	1.000000

	(0.0000)
LNTA	**-0.161561**
	(0.0293)
HCE	**0.764705**
	(0.0000)
SCE	**0.716560**
	(0.0000)
CEE	**0.672188**
	(0.0000)
VAIC	**0.797562**
	(0.0000)

Results in Table 6 show a highly significant positive correlation between ROA and HCE, SCE, CEE and VAIC ($r >= 0.5$).

To determine the optimal lag selection, we run the unrestricted VAR estimate, the result of the vector auto-regression estimate indicates that the Akaike information estimate is the best technique to determine this lag period. Lag structure and lag length criteria were studied depending on Akaika information criterion (AIC) and Table 7 presents the lag order selected by the AIC:

Table 7. Optimal lag selection

Variables	*Lag order*
ROA	1
VAIC	1
CEE	1
HCE	2
SCE	1
LNTA	1

4.2. Hypothesis testing

We use the panel least square regression method to test the first hypothesis, we solve for heteroscedasticity problem and results presented in Table 8. Panel data regression will be applied under the fixed effect since the Hausman test reveals that Chi-Sq statistic of 23.122246 with prob. = 0.0001.

Table 8. Regression results for Model 1

Variable	*Coefficient*	*Std. error*	*t-statistic*	*Prob.*
VAIC	0.388120	0.021420	18.11955	0.0000
VAIC(1)	-0.277328	0.051681	-5.366163	0.0000
ROA(1)	0.696078	0.085669	8.125188	0.0000
LNTA	-0.215806	0.062826	-3.434951	0.0008
C	4.594464	1.369975	3.353685	0.0010
Effects specification				
Cross-section fixed (dummy variables)				
Adjusted R-squared		0.852236		
f-statistic		61.55933		
Durbin-Watson stat.		1.864025		
Prob. (f-statistic)		0.000000		

Our findings reveal that VAIC has a positive and significant impact on ROA. Moreover, the model is highly significant since f-statistic = 61.55933 with prob. = 0.0000. The Durbin-Watson statistics is near 2 (1.864), so there is no serial correlation in our model. The results indicate that Jordanian

commercial banks with greater value added will have a higher ROA.

Again, we use the panel least square regression method to test the second hypothesis, we solve for heteroscedasticity problem and results presented in Table 9. Panel data regression will be applied under the fixed effect since the Hausman test reveals that Chi-Sq. statistic of 34.258060 with prob. = 0.000.

Table 9. Regression results for Model 2

Variable	*Coefficient*	*Std. error*	*t-statistic*	*Prob.*
HCE	0.244847	0.030516	8.023494	0.0000
HCE(1)	-0.216825	0.063263	-3.427339	0.0008
SCE	1.226890	0.245680	4.993851	0.0000
SCE(1)	0.058422	0.388782	0.150270	0.8808
CEE	2.855960	0.615677	4.638732	0.0000
CEE(1)	-2.093376	0.751696	-2.784870	0.0061
ROA(1)	0.576951	0.091433	6.310062	0.0000
LNTA	-0.173786	0.061407	-2.830059	0.0053
C	3.215789	1.311659	2.451696	0.0154
Effects specification				
Cross-section fixed (dummy variables)				
Adjusted R-squared		0.880690		
f-statistic		63.00492		
Durbin-Watson stat.		1.884088		
Prob. (f-statistic)		0.000000		

Results show that HCE, SCE and CEE have a positive and significant impact on ROA for our sample. Moreover, the model is highly significant since f-statistic = 63.00492 with prob. = 0.0000. The Durbin-Watson statistics is near 2 (1.864), so there is no serial correlation in our model.

The Model 1 which investigates the impact of the VAIC, can explain 85.2% of unpredictability of banks profitability that is presented by ROA, whereas the Model 2 suggested that the components of VAIC (HCE, SCE and CEE) can explain about 88.0% of variability of ROA. Suggesting that, the component of VAIC can explain more variability on ROA for Jordanian commercial banks.

5. CONCLUSION

This study aims to test the influence of IC on the financial performance of Jordanian Banks listed in the Amman Stock Exchange during the years from 2005-2018. First, the VAIC is used as a whole to test for association, and then the main components of the VAIC (HCE, SCE, and CEE) were used to test for the association. The results reveal that there is a positive and significant impact of VAIC and its three main components (HCE, SCE, and CEE) on banks profitability presented by ROA. Our findings are valuable to banks management, shareholders, policymaker and regulators in Jordan. Since the efficient utilization of human capital, structural capital and tangible capital will lead to better profitability. Banks investments in all intellectual capital components should be considered and properly allocated by managers to generate higher earnings.

The results reveal that the VAIC and its main components can efficiently explain banks profitability measured by ROA, so banks should demonstrate a high interest in the components of intellectual capital and work to manage and evaluate the performance of their business accordingly. The link between intellectual capital and the financial performance of banks came from the concept of performance, which is the key to achieving the goals of banks and increasing their ability to survive, grow and continue in light of the internal and external conditions that surround them. Consequently, the banks administration should attract distinguished human resources with efficiency, experience and knowledge, and allocating funds for that.

This study limits the sample as it focuses on a small emerging market namely, the ASE market, where there are a relatively small number of banks available for the data collection. In addition, this study missed communication and interaction with banks management to better understand intellectual capital drivers.

Our main recommendation is to encourage further study in the area of intellectual capital in developing countries since studies in this field of research are very limited compared with those in developed countries. Furthermore, research with additional methodologies, such as adjusted value added intellectual coefficient (A-VAIC) could provide results that are more consistent than those of the VAIC model.

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