

Intellectual Capital and the Financial Performance of Banks in Bahrain

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Abstract

This study examines whether intellectual capital influenced the financial performance of banks in Bahrain during the period 2005 to 2007. Pulin's Value Added Intellectual Coefficient (VAIC) was used as the efficiency measure of intellectual capital. Two regression models were constructed to test if the overall VAIC, and each of its three components (capital employed efficiency, human capital efficiency and structural capital efficiency) affect banks' performance. The results support the hypothesis that intellectual capital has a positive impact on the financial performance of banks in Bahrain. In addition, when VAIC is classified into its three major components, we find that financial performance is positively associated with capital employed efficiency (CEE) and human capital efficiency (HCE). However, our findings fail to find any significant association between structural capital efficiency (SCE) and financial performance of the banks. This study provides an understanding of the influence of intellectual capital on banks' performance in an emerging economy, Bahrain, in which its economic vision 2030 emphasises the importance of human capital, knowledge, innovations and other elements of intellectual capital in sustaining its economic growth.

Keywords: Intellectual capital, financial performance, VAIC, Bahrain.

1. Introduction

In most companies today, intellectual capital (IC), rather than the traditional assets, forms the greater part of firms' market value (Proctor, 2006). It is argued that the inability of financial statements in explaining firm value is due to the fact that the source of economic value is no longer the production of material goods, but the creation of intellectual capital. Intellectual capital is the possession of knowledge, experience, skills, good relationships, and technological capacities, which give organizations competitive

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advantage. Intellectual capital includes human capital and structural capital comprising of customers, processes, databases, brands, and systems (Edvinsson & Malone, 1997).

Intellectual capital has been a subject of intense research in recent years by the research community in the developed world, the focus of which is on specific industries. However, only a handful number of studies have focussed on emerging economies in evaluating the implications of intellectual capital in specific industries (Kamath, 2007). The implications of intellectual capital can be more prominent in the emerging economies as they have abundant human capital at their disposal (Kamath, 2007). With that in mind and considering the significance of emerging economies to the overall wellbeing and balance of the global economy, it is important to establish an understanding of intellectual capital in a different socio-political and economic setting. In particular, this study will observe if intellectual capital is efficiently utilized by banks in Bahrain to their advantage in enhancing their profitability.

The banking sector, in any country plays a pivotal role in setting the economy in motion and in its development process. Banks promote growth and success of businesses in both developed and developing countries. According to Kamath (2007), the banking sector is an ideal area for IC research because the banking sector is "intellectually" intensive and its employees are (intellectually) more homogeneous than those in other economic sectors.

There are two reasons that make Bahrain an ideal jurisdiction to conduct this study. First, Bahrain's financial sector is well-developed and diversified, consisting of a wide range of conventional and Islamic financial institutions and markets. There is also a stock exchange, listing and trading both conventional and Islamic financial instruments. The sector is therefore well-positioned to offer a wide range of financial products and services, making it the leading financial centre in the Gulf region (www.cbb.gov). The financial sector is the largest single employer in Bahrain, with Bahrainis representing over 80% of the work-force in the sector. Overall, in 2006, the banking sector contributed to 27% of Bahrain's Gross Domestic Product (GDP), making it one of the key drivers of growth in the country (www.cbb.gov). As at December 2006, the banking sector's assets stood at over US\$180 billion, more than twelve times the country's annual Gross Domestic Product.

Second, despite these successes, the Bahraini banking industry faces a strong threat from its regional rivals. For example Dubai is aggressively marketing the Dubai International Financial Centre (DFIC), an initiative which has the potential to undermine Bahrain's role as the regional financial hub. Qatar and Saudi Arabia are also striving to become leading financial centres in the region. In addition, there is an increasing number of foreign banks establishing themselves in Bahrain as it has to comply to open its financial market under the General Agreement on Trade and Services (GATS). As a result of these developments, it is anticipated that the competition among banks in Bahrain would become fierce.

The question now is what Bahraini banks can do to fight back. Bahrain's banking sector is required to enhance its competitive capabilities and sustain its position as a leading financial sector in the region through diversifying its products and services and by improving relations with its customers. Thus, the financial sector in Bahrain is required to pay more attention to develop its intellectual capital performance which is widely considered to be a major source of corporate competitive advantage. The emphasis given to IC is consistent with Bahrain's vision 2030 which forecasts Bahrain's future growth with the expansion of knowledge-based sectors. In particular, the banking industry is an important knowledge-based sector, perceived as the economic engine of Bahrain.

The objective of this study is to examine the influence of intellectual capital on financial performance of banks in Bahrain. In particular, this study aims to examine empirically the association between a measure of intellectual capital, that is the Value Added Intellectual Coefficient (VAIC) developed by Ante Pulic, and banks' financial performance. The study contributes to the literature by focusing on Bahrain rather than a developed Western economy, unlike most research already available in the field of IC. Empirical evidence of the understanding and development of intellectual capital (IC) concepts in emerging economies is still in its infant stage (Firer and Williams, 2003). Because emerging economies contribute significantly to the prosperity and stability of the world economy, there is a need to establish evidence of the development of intellectual capital in these economies.

The remaining of this paper is organised as follows. First, a review of literature is presented. The section discusses the definition of intellectual capital, reviews previous studies and presents the hypotheses. Next, there is a section discussing the research methods adopted in this study. It is followed by a presentation and discussion of the findings. Finally, the paper ends with a conclusion.

2. Literature review

2.1 Defining intellectual capital

According to Engstrom et al. (2003), there is no uniform definition of intellectual capital. However, the definitions are not significantly different among the researchers. Basically, most of the definitions contain the same key words: knowledge, skills, know-how, experiences, intangible assets, information, processes, and value creation. For example, Edvinsson and Sullivan (1996) define intellectual capital as knowledge that can be converted into value. According to them, this definition is very broad, encompassing inventions, ideas, general knowledge, designs, computer programs, data processes, and publications. Edvinsson and Malone (1997) define intellectual capital as "the possession of the knowledge, applied experience, organizational technology, customer

relationships and professional skills that provide a company with a competitive edge in the market". Andriessen (2004) argues that the problem with intangible resources is that they are hidden, and thus difficult to identify.

Brooking (1996) defines intellectual capital as the combined intangible assets which enable the company to function and see an enterprise as the sum of its tangible assets and intangible assets as expressed in the following formula:

$$\text{Enterprise} = \text{Tangible Assets} + \text{Intellectual Capital}$$

Moving a step further, Edvinsson (1997) equates intellectual capital with the sum of human capital, structural capital and customer capital, i.e.

$$\text{Intellectual Capital} = \text{Human Capital} + \text{Structural Capital} + \text{Customer Capital}$$

Based on the definition given by the Institute of Certified Management Accountants (ICMA, 2001), human intellectual capital (HIC) captures the knowledge, professional skill and experience, and creativity of employees. Structural intellectual capital (SIC) consists of innovation capital (intellectual assets such as patents) and process capital (organizational procedures and processes). Relational intellectual capital (RIC) captures the knowledge of market channels, customer and supplier relationships, and governmental or industry networks. Thus, intellectual capital is the possession of knowledge and experience, professional knowledge and skill, good relationships, and technological capacities, which when applied will give organizations competitive advantage.

Despite the increasing recognition of intellectual capital in driving firm value and competitive advantages, there is no one acceptable measure of IC. According to Goh (2005), there are more than 20 methods of measuring intellectual capital. To name a few, they are market-to-book value, Tobin's 'q', Calculated Intangible Value (CIV), Balanced Scorecard (BSC), Economic Value Added (EVA), and Value Added Intellectual Coefficient (VAIC) proposed by Pulic.

Of special interest is the VAIC, proposed by Pulic, which is a new management and control tool designed to enable an organization monitor and measure the intellectual capital performance and potential of a firm (Kamath, 2007). Instead of directly measuring firms' intellectual capital, VAIC measures the efficiency of value added (VA) by corporate intellectual ability. The major components of VAIC can be viewed from a firm's resource base – employed capital, human capital, and structural capital (Pulic, 2000). While employed capital is tangible in nature, human capital and structural capital are intangibles. Essentially, VAIC indicates the total efficiency of value creation from both tangible and intangible resources employed. Intellectual capital efficiency (ICE), which is part of VAIC, reflects the efficiency of value created by the human

capital and structural capital employed. VAIC is based on the belief that the better a company's resources are utilized, the higher the company's value creation efficiency will be (Kujansivu and Lonnqvist, 2007).

Nazari and Herremans (2007) came up with an extended model of Pulic's VAIC. Because it is still at its infant stage and not widely applied, it is not the intension of this paper to discuss and adopt the model.

2.2 *Previous studies*

Several studies have adopted the VAIC model as the primary measurement of IC (Nazari and Herremans, 2007). For instance, Chen et al. (2005) used VAIC to investigate the relationship between firms' intellectual capital and market-to-book value ratios. They analyze whether intellectual capital contributes to firms' financial performance and whether intellectual capital can be used as a leading indicator for future financial performance. Using all firms listed on the Taiwan stock exchange (TSE) during 1992-2002, they found that firms' market value and financial performance is positively associated with corporate intellectual ability. They also conclude that intellectual capital may be an indicator for future financial performance.

With regard to bank performance and intellectual capital, there have been a number of research that adopted VAIC to examine the influence of intellectual capital on banks' performance. Among other studies, Pulic (1997 and 2002) measured intellectual capital performance of Austrian banks for the period 1993-1995 and Croatian banks for the period 1996-2000. He revealed significant differences in bank ranking based on efficiency and performance. Goh (2005) conducted a study to measure the intellectual capital performance of commercial banks in Malaysia for the period 2001 to 2003. He found that value creation capability of both domestic and foreign banks in Malaysia is largely attributed to human capital efficiency. The study concluded that the investment in human capital yields a relatively higher return than investment in the two other components of VAIC - physical and structural capital.

Yalama and Coskun (2007) tested the effect of intellectual capital performance on profitability of banks in Turkey for the period 1995 to 2004. They concluded that IC is more important than physical capital for banks. Other studies that adopted VAIC in examining bank performance include the works of Mavridis (2004), and Mavridis and Kyrmizoglou (2005). Their findings are consistent with those found by Yalama and Coskun (2007).

In India, Kamath, (2007) estimated VAIC in measuring the value-based performance of the Indian banking sector for a period of five years, from 2000 to 2004. The study confirms the existence of vast differences in the performance of Indian banks in different segments. There is also an improvement in the overall performance over the study period. However, Firer and Williams (2003) adopted the VAIC method to examine

the relationship between intellectual capital and traditional measures of corporate performance, including profitability (returns on assets), productivity (turnover of total assets) and market value (market-to-book value ratio of net assets) in South Africa. Except that the capital employed efficiency has a significantly positive effect on market value of firms, their empirical results failed to find any strong association among the three value-added efficiency components and the three dependent variables.

To sum up, the findings of previous studies are mixed. Most of these studies present evidence that there is a relationship between intellectual capital and firms' financial performance. However, some studies such as that of Firer and Williams (2003) failed to find any strong association between intellectual capital and profitability. Therefore, there is a need to study further the relationship between intellectual capital and financial performance of banks in other countries since empirical evidence of the understanding and development of intellectual capital (IC) concepts in emerging economies is still in its infant stage (Firer and Williams, 2003). In addition, the banking industry in any economy is underpinned by cultural concerns, the legal system and its practices. Therefore, the findings of other studies may not be generalized to banks in Bahrain because they have been conducted in environments different from Bahrain.

3. Research hypotheses

The traditional view of the firm states that a firm obtains its resources from investors, employees, and suppliers to produce goods and services for its customers. In particular, this traditional notion views corporate performance to be the financial returns to a firm's owners from the consumption of tangible resources (Firer and Williams, 2003). Alternatively, the more recent theoretical views suggest investors, employees, suppliers, customers and other relevant stakeholders together contribute and receive benefits from a firm. For example, under the stakeholder theory, "the firm is a system of stakeholders operating within the larger system of the host society that provides the necessary legal and market infrastructure for the firm's activities. The purpose of the firm is to create wealth or value for its stakeholders by converting their stakes into goods and services" (Clarkson, 1994). In resource-based theory, firms are viewed as collections of physical and intangible assets and capabilities. The theory suggests that corporate performance is a function of the effective and efficient use of not only the tangible resources, but also the intangible assets of a firm.

Therefore, this study expects intellectual capital to play an important role in enhancing firms' financial performance. Using VAIC as a measure of corporate intellectual ability, this study proposes the following hypothesis:

H_1 : There is a positive relationship between value added intellectual coefficient (VAIC) and financial performance of banks in Bahrain.

The theoretical positive relationship between VAIC and financial performance of banks is supported by several studies such as Pulic (1997), in Austria, Pulic (2002), in Croatia, Goh, (2005) in Malaysia, Mavridis (2004) in Japan, Mavridis and Kyrmizoglou, (2005) in Greece, and Kamath (2007) in India. As VAIC is composed of both the tangible resources efficiency (capital employed efficiency) and IC efficiency (human capital efficiency and structural capital efficiency), we subsequently test the following hypotheses:

- H_2 : There is a positive relationship between human capital efficiency and financial performance of banks in Bahrain.
- H_3 : There is a positive relationship between structural capital efficiency and financial performance of banks in Bahrain.
- H_4 : There is a positive relationship between capital employed efficiency and financial performance of banks in Bahrain.

4. Research methods

4.1 Data

There are 21 banks listed on the Bahrain Stock Exchange. However, due to the unavailability of the annual reports of three banks, only 18 banks become the subjects of investigation. This study covers a three-year period, from 2005 to 2007; thus there are a total of 54 observations. The necessary data are obtained from the banks' annual reports. Since the data are audited, the measurement is objective and verifiable.

4.2 Analysis

Financial performance is the dependent variable in this study. Although there are several ways of measuring financial performance such as return on equity (ROE), those of market-based and economic value added, we measure performance by return on assets (ROA). According to Haniffa and Hudai (2006), a higher ROA indicates effective use of companies' assets in serving shareholders' economic interests. The ROA is used in this study because it provides a measure for assessing the overall efficiency with which firm assets are used to produce net income from operations (Miller et al., 2001). Moreover, Miller et al. (2001) argue that ROA reflects management's effectiveness in deploying capital, because it is certainly possible to be efficient and yet poorly positioned in terms of how capital is being utilized. The ROA, compared to other measures such as ROE, is appropriate for the banking industry because the latter does not take into consideration the financial risks of banks' activities whereas the former does. Despite the argument

that ROA is calculated based on profit figures that can be manipulated through earnings management (see for example, Dechow, 1994; DeFond and Park, 1997; and Dechow and Skinner, 2000), we believe that ROA is a reasonable measure of profitability.

The VAIC (Pulic, 1998) forms the underlying measurement basis for the independent variables. Formally, VAIC is a composite sum of three separate indicators. The following equation formalizes the relationship algebraically:

$$\text{VAIC} = \text{Capital employed efficiency (CEE)} + \text{Human Capital Efficiency (HCE)} + \text{Structural Capital Efficiency (SCE)}$$

The three components of VAIC are calculated as follows:

$$\text{CEE} = \text{Value Added (VA)} / \text{Capital Employed (CE)},$$

$$\text{HCE} = \text{Value Added (VA)} / \text{Human Capital (HC)}, \text{ and}$$

$$\text{SCE} = \text{Structural capital (SC)} / \text{Value added (VA)}$$

Value added (VA) is calculated as follows:

$$\text{VA} = \text{OUTPUT} - \text{INPUT}$$

OUTPUT refers to total revenue generated during the fiscal year by an organization, and INPUT includes operating expenses excluding those of employees. This concept of Value Added does not treat employee-related expenditures as part of the expenses anymore. Rather, employee-related expenditures are treated as investments. Capital employed refers to the tangible assets of a company, or total assets minus intangible assets. Human capital (HC) refers to employee expenses and structural capital (SC) is VA minus HC.

This study applies two regression models. Model 1 examines the relationship between financial performance and the aggregate measure of value added, VAIC. Model 2 examines the association between financial performance and the three major components of VAIC (CEE, HCE, and SCE). The models are represented as follows:

$$\text{Financial performance (ROA)} = \alpha + \beta_1 \text{VAIC} + \varepsilon \quad (1)$$

$$\text{Financial performance (ROA)} = \alpha + \beta_1 \text{CEE} + \beta_2 \text{HCE} + \beta_3 \text{SCE} + \varepsilon \quad (2)$$

We acknowledge that financial performance is a function of various factors, such as corporate governance mechanism, ownership structure and other company characteristics such as size and leverage. Nevertheless, it is not our intention to test the influence of these factors on profitability.

5. Results

Table 1 presents the descriptive statistics of the variables. The ROA ranges from 0.00 to 0.51, with a mean of 0.072 and a standard deviation of 0.087. The mean value of VAIC is 7.000 which indicates that VAIC is not high because the minimum value is 2.33 and the maximum is 20.57. The small standard deviation of 3.312 shows that the values are not widely dispersed.

Table 1

Descriptive Statistics

	Mean	Std. Deviation	Minimum	Maximum
ROA	0.072	0.087	0.00	0.51
VAIC	7.000	3.312	2.33	20.57
CEE	0.099	0.065	0.03	0.39
HCE	6.106	3.201	1.80	19.24
SCE	0.795	0.100	0.44	0.95

The mean value of capital employed efficiency (CEE) is 0.099 which means that the CEE is low because the minimum value is 0.03 and the maximum is 0.39. Besides, there are small differences between values of CEE because the standard deviation is low (0.065). The mean value of human capital efficiency (HCE) is 6.106. The mean score is low as the minimum and maximum values are 1.80 and 19.24, respectively. The standard deviation is 3.201. The structural capital efficiency (SCE) ranges from 0.44 to 0.95, with a mean score of 0.795, and a standard deviation of 0.100.

A comparison of CEE (mean = 0.099; sd = 0.065), HCE (mean = 5.483; sd = 2.593), and SCE (mean = 0.795; sd = 0.100), suggests that during 2005-2007, the sample banks were generally more effective in generating value from its human capital rather than from its physical and structural assets. The standard deviation of all the variables is small. Since the number of observations is small, we performed tests of normality assumptions. Results indicate that the normality assumptions are satisfied.

Table 2 shows the results of univariate analysis using Pearson correlation. It is shown that VAIC is significantly and positively related to ROA, suggesting that banks' financial performance is positively and significantly associated with their value creation. The higher the value of VAIC, the better the ROA banks can obtain. The analysis also suggests that HCE and CEE are significantly and positively correlated with ROA. This finding is consistent with prior studies such as Chen et al. (2005), Kamath (2007), Mavridis and Kyrmizoglou (2005), and Yalama and Coskun (2007). On the other

hand, the analysis revealed that SCE is not significantly correlated with ROA. This is consistent with prior studies such as Chen et al. (2005), Firer and Williams (2003), and Goh (2005).

Table 2

Correlation Matrix for all dependent and independent variables (n=54)

	VAIC	CEE	HCE	SCE
ROA	.541 (.000)***	.883 (.000) ***	.719 (.000) ***	.230 (.094)
VAIC		0.488 (.000) ***	0.406 (.002) **	0.800 (.000) ***
CEE			0.622 (.000) ***	0.274 (.045) **
HCE				0.210 (.128)

*** Significant at the 0.01 level (2-tailed)

** Significant at the 0.05 level (2-tailed)

It is observed from Table 2 that the correlations among the three variables (CEE, HCE and SCE) are not high, the highest being 0.622, that is between CEE and HCE. Thus, multicollinearity is not a major concern. Results of the Variance Inflation Factors (VIF) tests also show that there is no multicollinearity problem because the VIF for each independent variable is less than 10 (see Hair et al.,1998)

Table 3

Regression results of Model I (ROA and VAIC)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.027	.024		-1.140	.260
VAIC	.014	.003	.541	4.644	.000***
Adjusted R ² = 0.280					
Sig. F change = 0.000					

*** Significant at the 0.01 level

Tables 3 and 4 present the results of the two regression models. The results in Table 3 reveal that VAIC is significantly and positively associated with financial performance. This result suggests that banks with greater value added perform better in terms of return on assets.

Table 4 shows that ROA is positively correlated with CEE and HCE, suggesting that the banks' financial performance is positively associated with capital employed as well as one of the intellectual capital components, that is human capital efficiency (HCE). However, SCE has no significant association with financial performance. The major contribution on ROA is from capital employed efficiency (CEE). Except for H_3 , all the other three hypotheses are supported.

Table 4

Regression results of financial performance and components of VAIC

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.057	.041		-1.367	.178
CEE	.956	.102	.717	9.362	.000***
HCE	.009	.003	.278	3.687	.001***
SCE	-.021	.053	-.024	-.392	.697

Adjusted R² = 0.816
Sig. F change = 0.000

*** Significant at the 0.01 level

Table 3 shows that the value added intellectual capital coefficient (VAIC) can only explain 28 percent of the variability in banks' financial performance whereas in Table 4, it is found that the value of the adjusted R² remarkably increases to 81.6 percent. This suggests that the three components of VAIC are better in explaining the financial performance of banks compared to the aggregate measure of VAIC. This is consistent with some of the previous studies that found R² in Model 2 is greater than R² in Model 1. For example, Chen et al. (2005) shows that the adjusted R² increased from 0.4684 to 0.8423. Results of the regression analysis imply that banks that are more efficient in utilizing its tangible assets and human capital appear to have better financial returns. However, the efficiency of structural capital is not associated with banks' financial performance. The fact that banks (as compared to other industries) do not often involve innovation capital (for example research and development, and patent) and process

capital (for example organizational procedures and processes) may explain why structural capital is not associated with bank performance.

This study supports previous findings by Chen et al. (2005), Kamath (2007), Mavridis and Kyrizoglou (2005), and Yalama and Coskun (2007) which found that there is a positive relationship between VAIC, HCE, and CEE and financial performance. Where structural capital is concerned, the finding is consistent with those of Chen et al. (2005), Firer and Williams (2003), and Goh (2005) in which it was found that structural capital efficiency does not have any significant influence on firms' financial performance.

6. Discussion and conclusion

This study examines the influence of intellectual capital on financial performance of banks in Bahrain. First, the overall measure of intellectual capital, VAIC, is used to test for the association. Then, we break the VAIC into its three components and find if each of the components is also associated with the banks' financial performance. This study provides evidence that intellectual capital has a positive association with financial performance of banks in Bahrain. Subsequently, when the VAIC is segregated into its three major components, we found that financial performance is positively associated with capital employed efficiency and human capital efficiency, but not with structural capital efficiency. The findings from this study have implications for numerous parties such as policy makers, regulators, shareholders and managers of banks in Bahrain. Shareholders may use the findings to attach different values to the three components of VAIC. Since efficient utilization of tangible capital and human capital lead to better performance, proper allocation of banks' investments in these two resources is an important consideration to the managers. As far as intellectual capital is concerned, this study supports the initiatives taken by the authorities in Bahrain to capitalize not only on tangible resources but also on human resources in enhancing firm performance and in realising its economic vision 2030.

Although structural capital does not appear significant in enhancing the profitability of banks in Bahrain, this study does not suggest that structural capital is to be ignored. This is because this study only uses one measure of profitability, that is the ROA. This study also does not classify structural capital into further components such as research and development. The importance of structural capital in enhancing firm performance could perhaps be observed in other industries. Future studies may deal with these limitations.

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