The association between intellectual capital and financial performance in the Islamic banking industry
An analysis of the GCC banks

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Abstract

Purpose – The purpose of this study is to empirically investigate the impact of intellectual capital (IC) on the financial performance of Islamic banks operating in the Gulf Cooperation Council (GCC) countries.

Design/methodology/approach – The study measures IC by the value added intellectual coefficient model. A regression analysis was used to assess the impact of IC on financial performance. The research sample consisted of Islamic banks operating in the GCC countries during the years 2011, 2012 and 2013. Data originated from the annual reports of Islamic banks.

Findings – The results support the thesis that IC has a positive impact on the financial performance of Islamic banks. Even though the average IC is lower than that reported in other studies, the positive effect on financial performance is obvious. The findings also show that human capital (HC) is higher than capital employed (CE) and structural capital (SC). The study reveals that SC has an insignificant impact on the financial performance of the Islamic banks compared to CE and HC.

Practical implications – The findings provide empirical evidence that IC affects the Islamic banks' financial performance. It helps Islamic banks in the GCC countries to understand how to use their IC efficiently, especially SC as it is yet to be used efficiently. Also, the findings benefit the relevant authorities (e.g. legislators and central banks) who could use them to emphasise strategic policy reforms whenever required.

Originality/value – The current research adds to the empirical studies in the GCC countries as it views the region as a collective as opposed to individual countries. It also extends the IC and performance measurement

literature of Islamic banks in the GCC countries. Moreover, the current study enriches the limited literature on IC in the context of Islamic banking.

1. Introduction

Today's economy is changing with greater emphasis on intangibles such as intellectual capital (IC). However, financial statements have often failed in reporting IC as a significant proportion of the total value of an organisation. Consequently, firms with high IC might look less valuable than their true worth (Petty and Guthrie, 2000) and thereby risk losing valuable competitive advantage (Lev and Zarowin, 1999; Ruta, 2009; Yang and Lin, 2009).

With the rapid shift to a knowledge economy (Organisation for Economic Co-operation and Development – OECD, 2007), the source of economic value is no longer limited to the production of tangible goods but also to the creation of IC. A shift is occurring away from blue collar jobs that once dominated the economy, to more and more people becoming interested in white collar positions because organisations are increasingly dependent on IC to achieve their financial performance and growth objectives (Chen *et al.*, 2005; Guthrie *et al.*, 2006).

IC is an intangible capital and resource (e.g. knowledge, experience, management philosophy, brands, systems and human resources) that supports the creation of firm value (Brooking, 1996; Edvinsson and Malone, 1997; Stewart, 1997). It is valuable leverage for corporate wealth creation and a profit booster when valued properly (Stewart, 1997; Sullivan, 2000). Several international organisations, such as the World Intellectual Capital Initiative, have been founded with the scope to improve the apprehension of IC and related reporting issues (World Intellectual Capital Initiative – WICI, 2011). The Institute of Management Accountants in a 2010 report entitled "*Unrecognised Intangible Assets: Identification, Management and Reporting*" called for renewed attention to the growing unrecognised proportion of these intangible assets for financial reporting purposes (Institute of Management Accountants – IMA, 2010). It emphasised that:

> These items have grown to become a major source of value to public corporations. They contribute to competitive capacity, and they form a critical aspect of an organisation's sustainability in the future. (Institute of Management Accountants – IMA, 2010: p. 1)

Despite the difficulties of making IC part of the mainstream reporting of assets, awareness of its importance is spreading. Several large and small corporations realised the value of IC as an important component of their sustainability (Marshall *et al.*, 2006; Borkowski *et al.*, 2010). Its importance is, therefore, accentuated by the public interest in sustainable business (Institute of Management Accountants – IMA, 2010; Borkowski *et al.*, 2010).

In a knowledge economy, the efficient management of IC creates a long-term competitive advantage. Strategically, this is very crucial for service industries requiring knowledge and skilled human resources such as those required in the banking sector (Shih *et al.*, 2010; Al-Musali and Ku Ismail, 2014). To achieve their strategic objectives and ensure competitive success, both conventional and Islamic banks are expected to provide high-quality services by investing in the training of their human resources, brand building, systems and processes (Goh, 2005; Ahuja and Ahuja, 2012).

However, despite the growing investment in intangibles in the conventional banking system, intangibles in Islamic banks still represent an under-explored area. Several studies

investigated the efficient use of IC in the conventional banking system (Goh, 2005; Shih *et al.*, 2010; Ahuja and Ahuja, 2012; Al-Musali and Ku Ismail, 2014) but few focused on Islamic banking (Khalique *et al.*, 2013; Ousama and Fatima, 2015).

Prior literature has evidenced a positive association between IC efficiency and financial performance (Chen *et al.*, 2005; Tan *et al.*, 2007; Mehralian *et al.*, 2012). This is also true for the banking industry (Goh, 2005; Kamath, 2007; Mondal and Ghosh, 2012; Khalique *et al.*, 2013; Ousama and Fatima, 2015). The goals of banks, including Islamic banks, can only be achieved by using all their resources (tangible and intangible/intellectual). Therefore, it is important to examine whether the banking sector is using its IC and is hence able to contribute to the growth of the new economy.

The current study measures IC efficiency by using the value added intellectual coefficient (VAIC^{TM}) model in the Islamic banking sector in Gulf Cooperation Council (GCC) countries and investigates the relationship between IC efficiency (i.e. VAIC) and financial performance of Islamic banks. The study adds to the existing literature by capturing the uniqueness of Islamic banking activities such as its *Shariah*-styled structure that entails skills, processes and products that differ from conventional banking. This uniqueness is a form of IC. Examining the IC in this industry should add to the existing knowledge on the relationship between IC and banking performance. Secondly, the findings help GCC banks self-assess their level of resource efficiency and improve performance. Further, it constitutes an additional layer of scrutiny of the health of Islamic banks.

The remainder of the paper is organised as follows. Section 2 presents an overview of the GCC Islamic banking industry. Section 3 highlights the prior literature and develops the hypotheses. Section 4 details the research method. Section 5 discusses the results, while Section 6 concludes this research.

2. Islamic banks in the Gulf Cooperation Council countries

Over the past 10 years, the economies of the GCC countries have seen rapid growth ranging from 5 to 6 per cent of GDP (Al-Kuwari, 2013). Despite the efforts of their respective governments to diversify the economy (Hvidt, 2013), the major contributor to the GDP of the GCC countries is oil and gas (Al-Kuwari, 2013). In 2013, oil and gas revenues represented 49 per cent of the total GDP (World Bank, 2013). After the oil and gas sector, services represent the second most important contribution (Al-Ibrahim, 2004), in which the financial services and the banking industry represent a large portion. Recent years have witnessed the growth in both the size and sophistication of the Gulf banking industry (El-Quqa *et al.*, 2005). A few domestic banks dominate the GCC banking sector (Al-Hassan *et al.*, 2010). Several banks in the GCC countries reported interesting yearly growth after the 2007 financial crisis (El Saadani *et al.*, 2011). According to a Standard & Poor's report, the total GCC banking assets – including conventional and Islamic – is expected to rise to $2tn by the end of 2015 from $1.7tn in 2013 (Holmes and Kathpalia, 2014).

Though Islamic financial institutions are spread globally, they are primarily concentrated in the Gulf region. Islamic banks in the GCC countries date back to the 1970s (Wilson, 2009). Today, the GCC countries are set to be one of the two regional heavyweights and pioneers of the industry along with Malaysia (Wilson, 2009; Holmes and Kathpalia, 2014). They have grown to become a prominent player of financial intermediation in the GCC countries and control on average 24 per cent of the region's banking system assets (Al-Hassan *et al.*, 2010).

Islamic finance seems to be an attractive opportunity for investors (Pastré and Gecheva, 2008) and has shown a better positioning than conventional banks to absorb external shocks (Hassan and Zaher, 2001) and to generate financial stability (Cihak and Hesse, 2008). From

2008 to 2009, the *Shariah*-compliant assets grew by 29 per cent to reach $822bn (The Economist Group, 2009) with an estimated growth rate of 7 per cent per year through to 2020 (Bain and Company, 2013). With this growth trajectory, the Islamic finance assets are set to reach $3.4tn by the eve of 2020 (Ho and Liau, 2014).

GCC countries' Islamic financial institutions learned a lot from their counterparts in the conventional system and saw their systems and services improve throughout the years. These institutions are getting larger and more global, with more sophisticated techniques and skills in the way they do business (Wilson, 2009). For its future outlook, the Islamic banking industry is set to continue its growth because of the strong economic prospects and governments mega infrastructure projects (Holmes and Kathpalia, 2014).

3. Literature review and hypotheses
3.1 Literature review
IC literature has increased significantly in the past two decades (Ousama *et al.*, 2011a). Researchers studied several topics covering the definition of IC, its measurement and its reporting, among others (Brooking, 1996; Stewart, 1997; Guthrie *et al.*, 2006; Kamath, 2008; Striukova *et al.*, 2008). Other issues such as determinants of IC disclosure (White *et al.*, 2007; Whiting and Woodcock, 2011), effect of IC on performance (Bontis *et al.*, 2000), effect of IC information on market value (Ousama *et al.*, 2011b) and usefulness of IC information (Ousama *et al.*, 2011a) have also been examined.

Different accounting models and frameworks for IC measurement have been developed (Guthrie *et al.*, 2007). These frameworks include direct IC methods, market capitalisation methods, firm performance methods and scorecard methods (Sveiby, 2007). The growing number of frameworks stems from the need to reflect the market value of companies in their financial reports (Guthrie *et al.*, 2007). This supports the increasing importance of IC (Marr *et al.*, 2003). IC is a measurement metric in evaluating firm performance using traditional balance sheets and income statements to compare the return of assets between different firms (Guthrie *et al.*, 2007; Bhartesh and Bandyopadhyay, 2005). This approach relies on historical data to compute IC. Iazzolino and Laise (2013) highlighted that over the last three decades, there was more innovated methods to measure IC such as VAIC, economic value added (EVA), human resource accounting, and value chain scoreboard.

Few studies examined IC issues other than the impact of IC efficiency on performance in the GCC countries such as IC disclosure (Abdull Razak *et al.*, 2016), determinants of IC performance (El-bannany, 2012) and IC performance efficiency and corporate governance (Al-Musali and Ku Ismail, 2012a, 2012b). Abdull Razak *et al.* (2016) examined the IC disclosure in the annual reports of the Saudi banking sector and their IC performance using VAIC. They found that the banks disclosed IC information discursively and human capital (HC) was the highest category. Also, human capital efficiency (HCE) was higher than structural capital efficiency (SCE).

El-bannany (2012) examined the determinants of IC performance of banks in the United Arab Emirates (UAE). He found that investment in information technology systems, barriers to entry, bank risk, bank size, bank age and bank listing age were statistically significant of IC performance. Al-Musali and Ku Ismail (2012a, 2012b) found that corporate governance variables in GCC banks (i.e. board size, number of independent directors, family ownership and domestic strategic institutional ownership), bank-specific characteristics (i.e. bank adherence to Islamic Shariah principles and bank riskiness) and bank industry characteristics (i.e. banking industry concentration and presence of foreign banks) had a significant relationship with IC performance.

Several studies focused on the relationship between IC efficiency and corporate performance of companies and found that IC efficiency is positively related to companies'

performance (for example Chen *et al.*, 2005 and Wang, 2011 in Taiwan; Cohen and Kaimenakis, 2007 and Maditinos *et al.*, 2011 in Greece; Gan and Saleh, 2008 in Malaysia; Makki and Lodhi, 2008 and Ahmad and Ahmed, 2016 in Pakistan; Clarke *et al.*, 2011 in Australia; Zanjirdar and Kabiribalajadeh, 2011 in Iran; Pal and Soriya, 2012 in India; and Guerrini *et al.*, 2014 in Italy).

With regard to financial institutions, there is a positive relationship between IC efficiency and corporate performance such as Goh (2005) in Malaysia, Yalama and Coskun (2007) in Istanbul, Turkey, Kamath (2007) in India, El-Bannany (2008) in the UK, Joshi *et al.* (2010) in Australia, Zou and Huan (2011) in China, Abdulsalam *et al.* (2011) in Kuwait, Al-Musali and Ku Ismail (2014) in Saudi Arabia and Al-Musali and Ku Ismail (2016) in the GCC. Despite the scarcity of studies targeting Islamic financial institutions, i.e. Islamic banks, the existing studies have found similar outputs to conventional banks (Latif *et al.*, 2012 for Pakistan; Ousama and Fatima, 2015 for Malaysia; Setianto and Sukmana, 2016 for Indonesia and Malaysia; and Nawaz and Haniffa, 2017 for Asia, Europe and the Middle East.

Studies that focused on Islamic financial institutions (i.e. banks) mentioned above have found that the banks were able to use their IC resources efficiently with a higher-HCE compared to structural capital (SC) and employed capital efficiencies. These studies confirmed that there is a positive relationship between IC and financial performance (which is similar to the findings of IC and performance of companies). More specifically, Latif *et al.* (2012) found that HC had a significant effect on IC and performance. Ousama and Fatima (2015) support the significant impact of IC and its component, i.e. capital employed (CE), SC and HC on the Islamic banks' performance in Malaysia. Setianto and Sukmana (2016) found that IC had a significant impact on banks' performance in Indonesia, but not in Malaysia. This finding is not consistent with the findings of Ousama and Fatima (2015). However, it did support that HC and CE influenced banks' performance in both Malaysia and Indonesia. Furthermore, the findings of Ousama and Fatima (2015) and Setianto and Sukmana (2016) were supported by the findings of Nawaz and Haniffa (2017).

The review shows that IC affects the financial performance of banks (both conventional and Islamic). However, this topic of research has not been applied to the GCC countries despite its concentration of Islamic banks. This study addresses this lacuna in the literature.

3.2 Conceptual framework and development of hypotheses

According to the resource-based theory, a company is perceived to achieve a comparable sustainable advantage optimising its tangible and intangible assets (Riahi-Belkaoui, 2003). These assets should be valuable, rare, inimitable and non-substitutable (Barney, 1991). The theory views IC as a strategic resource because firms achieve competitive advantage through its efficient use (Zeghal and Maaloul, 2010). While some studies look at IC as a complete set (Youndt *et al.*, 2004), others such as Nawaz (2017) consider IC's components. In this view, Youndt *et al.* (2004) argue that it might be useful to look at IC as a whole rather than independently focusing on its components. However, the current study agrees with Nawaz (2017) who argues that IC is losing sight of the whole meaning that the literature can treat its components, i.e. CE , SC and HC as a completely independent construct.

The framework for this study as depicted in Figure 1 shows that IC influences corporate performance. The solid line represents the relationship between the IC (i.e. VAIC) and financial performance. The dotted lines represent the relationships between IC components, i.e. capital employed efficiency (CEE), HCE, SCE and financial performance.

3.2.1 Intellectual capital efficiency and performance. The importance of IC has increased and is reflected in creating the value of companies (Holland, 2003). In this regard, value creation in the knowledge-intensive sectors such as the banking industry requires both IC

and physical capital (Holland, 2010; Chen *et al.*, 2014). Garcia-Meca (2005), Beattie and Thomson (2007), Holland (2010) and Chen *et al.* (2014) link IC with competitive advantage and a primary source of sustainable competitive advantage in banking (Chen *et al.*, 2014). It is likely that IC relates a firm's competitiveness to firm value. Thus, it is expected that successful companies have a high competitive advantage and higher IC. In other words, the more value IC (VAIC) adds to the Islamic banks in GCC, the higher is its economic performance. Accordingly, the following hypothesis is developed to test the relationship between IC and financial performance:

H1. Islamic banks with greater IC (VAIC) tend to have better financial performance.

3.2.2 Capital employed efficiency and performance. IC should be combined with financial and non-financial assets to create value for firms (Pulic, 1998; De Castro and Sáez, 2008; Murthy and Mouritsen, 2011; Chen *et al.*, 2014). Beltratti and Stulz (2012), Berger and Bouwman (2013) and Chen *et al.* (2014) suggest that a strong capital base helps banks to enhance the survival likelihood and market share at all times. Some empirical studies found that CEE has a significant positive impact on organisational financial performance (Chen *et al.*, 2005; Chan, 2009a, 2009b). Although, other prior studies in Turkey, Malaysia and Australia found that the CEE was less effective in creating value in the banking sector (Goh, 2005; Joshi *et al.*, 2010; Ozkan *et al.*, 2016). Based on this discussion, the following hypothesis is developed to test the relationship between CE and financial performance:

H2. Islamic banks with greater CEE tend to have better financial performance.

3.2.3 Human capital efficiency and performance. HC plays a great role in a firm's value creation (Holland, 2003) and investors incorporate the HC information into their firm valuation processes. MERITUM (2002: p. 11) defines HC as:

> [...] the knowledge that the employees take with them when they leave the firm. It includes the knowledge, skills, experiences, and ability of people. Some of this knowledge is unique to the individual; some may be generic. Examples are innovation capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, stratification, learning capacity, loyalty, formal training and education.

Lajili and Z´eghal (2005) found a positive and significant association between firm equity market values and HC-related information. The findings of Ozkan *et al.* (2016) suggest that the IC of the Turkish banking sector is mainly affected by HC. Mondal and Ghosh (2012) reached a similar result in India. Gan and Saleh (2008) and Chu *et al.* (2011) found that HC plays a major role in enhancing the returns of banks. Al-Musali and Ku Ismail (2014) found that HC was more efficient in generating value for Islamic banks compared to other IC components. Nawaz (2017) argued that in the case of Islamic banks, HC is important as an
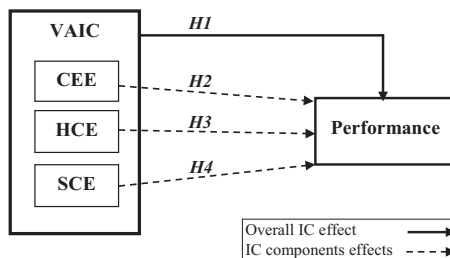

Figure 1.
Theoretical framework

employee having good knowledge of the *Shari'ah* (i.e. Islamic laws) will enhance their credibility and reputation in the capital market. Thus, the knowledge embedded in the human CE by the Islamic banks is valuable. Based on this discussion, the following hypothesis is developed to test the relationship between HC and financial performance:

H3. Islamic banks with greater HCE tend to have better financial performance.

3.2.4 Structural capital efficiency and performance. SC provides an environment which enables an organisation to create and influence knowledge (Nawaz, 2017). An organisation with strong SC encourages an innovative environment (Florin *et al.*, 2003). It is argued that SC has a significant impact on performance (De Brentani and Kleinschmidt, 2004). MERITUM (2002: p. 11) defines SC as:

[. . .] the knowledge that stays within the firm at the end of the working day. It comprises the organisational routines, producers, systems, culture databases, etc.; examples are organisational flexibility, a documentation service, the existence of a knowledge centre, the general use of information technologies, organisational learning capacity, etc. Some of them may be legally protected and become Intellectual Property Rights, legally owned by the firm under a separate title.

Empirically, Hsu and Wang (2012) found that the SC had a positive effect on the financial performance. On the other hand, Mondal and Ghosh (2012) found that Indian banks' SC was not as important to their profitability. Islamic banks' SC is important as it can provide a good environment for innovation such as new Islamic products, which is expected to enhance the firm's value. Thus, knowledge and management processes along with the philosophy embedded in the structural CE by the Islamic banks are valuable. Based on this discussion, the following hypothesis is developed to test the relationship between SC and financial performance:

H4. Islamic banks with greater SCE tend to have better financial performance.

4. Research method
4.1 Sample and data collection
The research sample consisted of Islamic banks operating in Bahrain, Qatar, Saudi Arabia and the UAE. Omani full-fledged Islamic banks were excluded from the analysis because of the shortage of data at the time the study was conducted as they started operations in December 2012. A total of 37 Islamic banks were identified, and after excluding banks with missing required data, the study sample comprised 31 Islamic banks as reported in Table I. The research period covered three years from 2011 to 2013. Because of the small number of Islamic banks, the study covered these three years to increase the sample size. This period was selected as it included the most recent data at the time of data collection. In addition, this period was after the global financial crisis to avoid its effects and examine the impact of IC efficiency on financial performance.

4.2 Variables definition
4.2.1 Dependent variables. This research uses profitability as a proxy for performance. It represents the dependent variable in the models. It is measured by two financial performance proxies: return on assets (ROA) = operating income/total assets and return on equity (ROE) = net income/shareholders' equity.

4.2.2 Independent variables. IC approached by the VAIC model[1] (Pulic, 1998, 2000) is the independent variable in this research. The model considers the value of a company to

No.	Name of bank
1	ABC Islamic Bank
2	Al Baraka Bank
3	Al Salam Bank
4	Bahrain Islamic Bank
5	Bank Al Khair
6	Capinnova Investment Bank
7	City Islamic Investment Bank
8	Elaf Bank
9	Global Banking Corporation
10	International Investment Bank
11	Ithmaar Bank
12	liquidity Management Centre
13	Seera Investment Bank
14	Khaleeji Commercial Bank
15	Venture Capital Bank
16	Bank Aljazira
17	The Islamic Corporation
18	Islamic Development Bank
19	National commercial Bank
20	Ahli United Bank
21	Boubyan Bank
22	Kuwait International Bank
23	Qatar International Islamic Bank
24	Qatar Islamic Bank
25	Masraf Al Rayan
26	Abu Dhabi Islamic Bank
27	Ajman Bank
28	Al Hilal Bank
29	Dubai Islamic Bank
30	Emirates Islamic Bank
31	Sharjah Islamic Bank

Table I.
Sample of the study

consist of CE (i.e. financial and physical capital) and IC (Pike and Roos, 2004). The latter consists of capital and SC. The VAIC provides information on the value creation efficiency of the physical and IC recourses of a company (Tan *et al.*, 2007). The VAIC model is an analytical process developed to enable stakeholders (e.g. management and shareholders) to effectively control and evaluate the efficiency of the VA by a company's total capital and resources and by each major component of the capital and resources (Firer and Williams, 2003).

The VAIC is measured by the VA efficiency of the IC coefficient for a company. The VA efficiency consists of three efficiency coefficients that include the CEE, the HCE and the structure capital efficiency (SCE). The VAIC is measured by the following formula (Pulic, 1998, 2000; Firer and Williams, 2003): VAIC = CEE + HCE + SCE. The CEE is an indicator of the VA efficiency of CE, which measures as a ratio of the VA of the company and CE. The CE is the book value of the net assets of the company. CEE is measured by the following formula: CEE = VA/CE. The VA is calculated by deducting inputs (i.e. all expenses except personal costs) from outputs (i.e. all income). The following formula is used to measure the VA (Pulic, 1998, 2000; Firer and Williams, 2003): VA = output − input. The HCE is an indicator of the VA efficiency of HC that measures as a ratio of the VA and total salary and wage of HC (i.e. personnel cost which is considered an investment). The HCE is measured by the following formula: HCE = VA/HC. The SCE is an indicator of VA efficiency of SC, which

measures the amount needed to invest in SC to generate VA (Pulic, 1998, 2000; Firer and Williams, 2003). The SC is calculated as the difference between VA and HC (i.e. SC = VA − HC). The SCE is measured by the following formula: SCE = SC/VA.

The control variables include the leverage (i.e. LEVERAGE) which is a ratio of equity and debt used to finance the assets. Leverage is measured based on dividing the total liabilities by total shareholders' equity. Another control variable is the firm size (i.e. SIZE) which is measured by total revenue.

4.3 Regression models
Ordinary least squares regression model is used to study the impact of IC (VAIC and its components) on the financial performance. Models A and B refer to the financial performance (i.e. ROA and ROE, respectively). Models 1 to 4 test the impact of the VAIC and its three components (i.e. CEE, HCE and SCE) on financial performance. The models are written as follows:

$$\text{Model 1A}: \text{ROA}_{jt} = \propto_{jt} + \beta_1 \ \text{VAIC}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

$$\text{Model 1B}: \text{ROE}_{jt} = \propto_{jt} + \beta_1 \ \text{VAIC}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

$$\text{Model 2A}: \text{ROA}_{jt} = \propto_{jt} + \beta_1 \ \text{CEE}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

$$\text{Model 2B}: \text{ROE}_{jt} = \propto_{jt} + \beta_1 \ \text{CEE}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

$$\text{Model 3A}: \text{ROA}_{jt} = \propto_{jt} + \beta_1 \ \text{HCE}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

$$\text{Model 3B}: \text{ROE}_{jt} = \propto_{jt} + \beta_1 \ \text{HCE}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

$$\text{Model 4A}: \text{ROA}_{jt} = \propto_{jt} + \beta_1 \ \text{SCE}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

$$\text{Model 4B}: \text{ROE}_{jt} = \propto_{jt} + \beta_1 \ \text{SCE}_{jt} + \beta_2 \text{LEVERAGE}_{jt} + \beta_3 \text{SIZE}_{jt} + \varepsilon_{jt}$$

where:
ROA_{jt} or ROE_{jt} = Profitability (i.e. the measure of performance) of Islamic bank j in year t;
VAIC_{jt} = Value-added intellectual coefficient of Islamic bank j in year t; and
LEVERAGE_{jt} = Leverage of Islamic bank j in year t; and SIZE_{jt} is the size of Islamic bank j in year t.

5. Results and discussion
5.1 Descriptive statistics and correlation analysis
Tables II and III report the descriptive statistics and the correlation matrix, respectively. The VAIC mean for Islamic banks operating in the GCC countries is 4.398

	CEE	HCE	SCE	VAIC	SIZE	LEVERAGE	ROA	ROE
Mean	0.017	3.562	0.852	4.398	172050.820	3.651	0.028	0.002
Median	0.040	2.979	0.875	3.697	59121.000	3.441	0.007	0.020
Std deviation	0.285	11.152	0.527	11.332	253663.842	3.316	0.138	0.218
Skewness	−2.387	0.837	0.185	0.793	1.943	0.601	−2.878	−2.302
Std error of skewness	0.250	0.250	0.250	0.250	0.251	0.250	0.250	0.250
Kurtosis	10.006	6.337	9.337	6.301	2.874	−0.480	12.112	8.023
Std error of kurtosis	0.495	0.495	0.495	0.495	0.498	0.495	0.495	0.495

Table II.
Descriptive statistics of the variables

Variables	VAC Sig.	SIZE Sig.	LEVERAGE Sig.	ROA Sig.	ROE Sig.	CEE Sig.	HCE Sig.	SCE Sig.
VAIC	1.000	0.268***	0.258**	0.607***	0.533***			
Sig.		0.010	0.012	0.000	0.000			
SIZE		1.000	0.279***	0.179	0.231**	0.204	0.274***	−0.128
Sig.			0.007	0.088	0.027	0.051	0.008	0.223
LEVERAGE			1.000	0.283***	0.354***	0.224**	0.265***	−0.178
Sig.				0.006	0.001	0.031	0.010	0.088
ROA				1.000	0.779***	0.774***	0.605***	−0.172
Sig.					0.000	0.000	0.000	0.099
ROE					1.000	0.691***	0.532***	−0.181
Sig.						0.000	0.000	0.082
CEE						1.000	0.736***	−0.169
Sig.							0.000	0.104
HCE							1.000	−0.082
Sig.								0.437
SCE								1.000
Sig.								

Notes: *** significant at 0.01 level; ** significant at 0.05 level

Table III.
Correlations analysis
of the variables

(Table II). This is lower than the means reported in prior studies in Islamic banks operating in other countries such as Pakistan and Malaysia (Latif *et al.*, 2012; Ousama and Fatima, 2015). The components of the VAIC also show means lower than what has been reported in previous research (Ousama and Fatima, 2015) with 0.017, 3.562 and 0.852, respectively, for CEE, HCE and SCE. This may suggest that the Islamic banks in the GCC countries are not using their IC to its full potential. This could be because of the fact that IC is still in the expansion phase in most developing countries including the GCC countries.

On the other hand, the HCE has the highest mean among the three components of the VAIC (3.562). This could be a preliminary indication of the importance given by Islamic banks on the efficient use of their HC compared to CE and SC. This finding is consistent with Ousama and Fatima (2015) who reached a similar preliminary conclusion for Islamic banks in Malaysia as did Al-Musali and Ismail (2014) for Saudi Arabia and Goh (2005) for conventional banks in Malaysia.

Table III shows the results of the correlation analysis. Under the univariate correlation, financial performance measures are related positively (statistically significant correlation) to the VAIC construct and its components with the exception of SCE (negative non-statistically significant relation for both ROA and ROE). The positive relationship between ROA, ROE, VAIC, CEE and HCE suggests that the Islamic bank's financial performance is positively associated with the organisation's IC and its CE and HC, but not the SC. Furthermore, with regard to the control variables, the leverage has a significant positive relationship with the CEE and the HCE, whereas size only shows a significant relationship with the HCE.

5.2 Regression analysis
Tables IV-VII report the results of the regression analysis of the six models. The financial performance is expected to be influenced by the IC (i.e. VAIC) and its components (i.e. CEE, HCE and SCE). The models are a good fit (F significant).

5.2.1 Value added intellectual coefficient analysis. Table IV presents the results of the regression analysis of the VAIC with ROA and ROE[2]. The explanatory power of Models 1A and 1B are relatively important. The adjusted R^2 are 36.5 and 31.2 per cent for Models 1A and 1B, respectively. The coefficient on VAIC is significantly positive for both regressions (ROA and ROE). These findings corroborate the initial findings of the correlation analysis. It aligns with literature supporting the idea that IC positively impacts financial performance (Goh, 2005; Kamath, 2007; Rehman *et al.*, 2012; Al-Musali and Ku Ismail, 2014; Ousama and Fatima, 2015; Ahmad and Ahmed, 2016; Nawaz and Haniffa, 2017). The empirical findings favour *H1*. Hence, *H1* is supported. None of the control variables are statistically significant in Model 1A, while only leverage is significant in Model 1B.

5.2.2 Capital employed efficiency, human capital efficiency and structural capital efficiency analysis. Tables V and VI present the results for *H2* and *H3*. The findings show that the CEE and the HCE have a positive and significant relationship with the ROE and the ROA. The explanatory powers (adjusted R^2) of the models (Models 2 and 3) are also high.

These results suggest that using the capital efficiently and combined with the efficient use of HC in Islamic banks have a positive influence on their financial performance. Therefore, *H2* and *H3* are supported. The findings of the CEE and the HCE are consistent with the findings of previous studies (Latif *et al.*, 2012; Al-Musali and Ku Ismail, 2014; Ousama and Fatima, 2015; Setianto and Sukmana, 2016; Nawaz and Haniffa, 2017).

Nonetheless, the empirical investigation failed to support any significant relationship between the SCE and both financial performance proxies as showed in Table VII. Therefore, *H4* is not supported by the empirical data. This finding aligns with the results of the correlation analysis of the SCE reported in Table III. In addition, it is consistent with the findings of Setianto and Sukmana (2016) and Nawaz and Haniffa (2017).

	ROA		ROE	
Variables	Coefficient	*t*-statistic	Coefficient	*t*-statistic
(Constant)	−0.079	−4.434	−0.102	−3.473
VAIC	0.575	6.508***	0.463	5.034***
SIZE	−0.015	−0.165	0.045	0.486
LEVERAGE	0.140	1.575	0.221	2.397**
Adjusted R^2	0.365		0.312	
F value	18.432***		14.744***	
Notes: *** significant at 0.01 level; ** significant at 0.05				

Table IV.
Regression analysis results: Model 1 (A and B) for financial performance and VAIC

	ROA		ROE	
Variables	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Constant	−0.039	−2.677	−0.048	−1.884
CEE	0.749	10.849***	0.637	8.317***
SIZE	−0.006	−0.089	0.047	0.599
LEVERAGE	0.116	1.649	0.196	2.508**
Adjusted R^2	0.598		0.504	
F value	46.042***		31.786***	
Notes: *** significant at 0.01 level; ** significant at 0.05				

Table V.
Regression analysis results: Model 2 (A and B) for financial performance and CEE

5.3 Discussion of results

The results of this study reveal how Islamic banks pay attention to their IC. First, the empirical analysis shows that Islamic banks reported a lower level of IC efficiency compared to other studies in countries such as Malaysia (Ousama and Fatima, 2015) and Pakistan (Latif *et al.*, 2012). This result should be interpreted with caution as the study is examining different settings, with different regulations and legal systems. Malaysia, for instance, has positioned itself as the hub for Islamic finance. Also, several universities and institutes offer undergraduate (diploma and bachelor) and postgraduate (Masters and PhDs) studies in Islamic finance. The abundance of skilled manpower in Islamic banking in Malaysia has made its HC stronger than other parts of the world.

For the GCC countries, despite the presence of Islamic laws in several aspects of daily life, the presence of a skilled workforce in Islamic finance is still lagging. The education alternatives in Islamic finance are scarce and not up to the level of more established universities and programs such as in Malaysia and Indonesia for instance. Nevertheless, looking closely at the relationship between the overall IC (i.e. VAIC) and financial performance (i.e. ROA and ROE), the results indicate that IC positively affects banks' financial performance. Islamic banks have specific requirements regarding the CE and human resources they require. Besides the financial background, the ideal profile of human resources in Islamic banks is somebody with a background in Islamic finance, law and legislation. Both Islamic and conventional banks strongly emphasise the importance of IC as a booster of their financial performance. More specifically, the study of how the components of IC affect profitability showed that only the CE and the HC positively affect the banks' financial performance. The analysis failed to confirm a positive relationship between the SC and the financial performance. These findings reveal that the capacity of Islamic banks to create value mainly depends on the HC and the CE. This is not

	ROA		ROE	
Variables	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Constant	−0.073	−4.082	−0.094	−3.204
HCE	0.574	6.458***	0.462	4.999***
SIZE	−0.017	−0.185	0.044	0.469
LEVERAGE	0.137	1.539	0.219	2.367**
Adjusted R^2	0.362		0.310	
F Value	18.195***		14.606***	

Notes: *** significant at 0.01 level; ** significant at 0.05

Table VI.
Regression analysis results: Model 3 (A and B) for financial performance and HCE

	ROA		ROE	
Variables	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Constant	−0.047	−1.384	−0.055	−1.052
SCE	−0.118	−1.151	−0.111	−1.111
SIZE	0.098	0.930	0.134	1.313
LEVERAGE	0.235	2.210**	0.295	2.866***
Adjusted R^2	0.073		0.126	
F value	3.397**		5.368***	

Notes: *** significant at 0.01 level; ** significant at 0.05

Table VII.
Regression analysis results: Model 4 (A and B) for financial performance and SCE

surprising as the banking industry is a service-based sector where HC is an essential asset. In addition, the findings shed light on the urgent need to give more attention to SC. The value creation of SC is vital for the banks if they are seriously seeking sustainable growth. Realising the value of technological knowledge (the know-how) and how to maintain it is one of the important dimensions that should be taken into consideration (Mehralian *et al.*, 2012).

The findings of the study can be inserting and beneficial to the relevant policymaking authorities (e.g. legislators, central banks, standards setters and stock exchanges) in the GCC countries. They could use them for policy reforms to enhance the efficiency of resource usage and performance improvement.

Overall, the findings of this research suggest that more effort should be addressed to IC to improve financial performance in the Islamic banking industry in the GCC countries. The research provides a preliminary seed to further explore the place of IC in the finance industries such as Islamic banking. Further studies are needed at this level.

6. Conclusion

The Islamic banking industry is a fast-growing sector catching researchers' attention from a variety of perspectives. Financial performance remains one of the key issues that regulators and managers alike are looking into and striving to list the variables that could boost performance. IC has a proven influence on the financial performance of conventional (Goh, 2005) and Islamic banks (Al-Musali and Ku Ismail, 2014; Ousama and Fatima, 2015). To date, few studies explored this subject with the attention it deserves. The current study adds to this stream by investigating the impact of IC efficiency on the financial performance of the Islamic banks operating in the GCC countries. It was found that IC has a significant positive impact on the financial performance of Islamic banks. Also, CE and HC have significant impacts on the financial performance compared to SC which has no effects.

The study has implications for knowledge, practice and policymaking. Concerning the field of knowledge, the study adds to the literature by focusing on Islamic banks in a highly concentrated Islamic banking industry (i.e. GCC countries). For practice (i.e. practitioners in the Islamic banking industry in the GCC countries), the findings reflect the current extent of IC and its components. This will help to understand the strength of Islamic banks to improve performance and create value through efficient use of IC. The Islamic banks in the GCC can use their CE and HC efficiently. However, their inability to optimise their SC requires specially formulated strategies. For policymaking, the findings guide the relevant authorities (e.g. legislators, central banks and stock exchanges) towards emphasising strategic reforms. This is important as most of the GCC countries plan to diversify their economies and transform to a knowledge-based economy where IC will play a major role in improving firm performance. In addition, the results help regulators in Bahrain, Qatar and UAE, especially as they are looking forward to becoming financial hubs for Islamic finance.

The study has several limitations. Firstly, the research sample excluded banks operating in Oman because of non-availability of data at the time of the research. Even though the Omani market is not as developed as its peers in the other GCC countries, the addition of the few Omani banks in the future could improve the findings. Secondly, the research period is limited to three years. Longer periods would possibly offer more conclusive results. Thirdly, the findings relied on quantitative analysis (regressions) which is insufficient for a rich picture of the GCC markets. GCC countries are fast emerging, and the strategies adopted by financial institutions are heavily influenced by chief executive officers and decision-makers who are often appointed to concretise the government's economic strategies. Therefore, more qualitative analysis is required (interviews with key decision-makers) to understand the position of IC in the financial industry better.

Notes

1. The model has been used in several prior studies. For example: Chen *et al.* (2005), Maditinos *et al.* (2011) and Al-Musali and Ku Ismail (2014).

2. Prior to performing the regression analysis, multicollinearity was checked. Table III (i.e. correlation analysis) shows that the highest correlation coefficient was 0.779 which is less than 0.80; hence the problem does not exist.

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