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Table of Contents

Research Articles

6 **Turkish *AK Parti*'s Posture towards the 2003 War in Iraq: The Impact of Religion amid Security Concerns**
By Alberto Gasparetto

21 **Nigeria and the Great Powers: The Impacts of the Boko Haram Terrorism on Nigeria's Foreign Relations**
By Sunday Omotuyi & Modesola Vic. Omotuyi

37 **Rethinking Key Drivers of Turkey's Immigration Policies in the Wake of the 2016 Turkey - European Union Immigration Deal**
By Israel Nyaburi Nyadera & Billy Agwanda

51 **Intellectual Capital in Islamic Banking Sector: Evidence from Turkey**
By Hakan Uslu

Book Reviews

67 *Joel Mokyr (ed.)*
A Culture of Growth: The Origins of the Modern Economy
By Meltem INCE-YENILMEZ

70 *Eli Berman, Joseph H. Felter, and Jacob N. Shapiro*
Small Wars, Big Data
By Marco Marsili

74 *Sharifullah Dorani*
America in Afghanistan: Foreign Policy and Decision Making from Bush to Obama to Trump
By Rahman DAG

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Intellectual Capital in Islamic Banking Sector: Evidence from Turkey

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ABSTRACT

The Islamic banking sector has experienced a rapid development both in Muslim and non-Muslim geographies. In this study, using a panel dataset spanning the time period 2005-2018 and several econometric estimations, how intellectual capital affects the financial performance of the participation banks, as Islamic banks are called in Turkey is analysed. The Value-Added Intellectual Coefficient model (VAIC), a well-known methodology, is utilised as a measure for intellectual capital performances and return on assets (ROA) and return on shareholders' equity (ROE), in general, financial performances of the banks. The results of the analyses provide evidence for a positive and statistically significant impact of intellectual capital on financial performances of Islamic banks operating in Turkey. The results also suggest that employed capital efficiency and structural capital efficiency in the operations of Islamic banks are the two crucial factors for their profitability, while human capital efficiency has no statistical relationship with their financial performances. The current study contributes to the relevant literature since there is no study on Islamic banks of Turkey in the aspect of intellectual capital and helps Islamic bankers, such as executives, investors and shareholders, or policymakers in understanding and determining their positions regarding intellectual capital.

Introduction

Over the last two decades, the history of the world economy has witnessed a series of local and global economic crises. In developing countries such as Turkey, these adverse economic environments have slowed down economic growth, declined asset prices and volume of trade, increased public debt stock and shrank the balance sheet of banking and real sectors. Although the banking sector of Turkey is one of the sectors that is most affected by these adverse economic conditions, the sector has overcome these crises due to its solid historical background and a number of supportive interventions by the national government (Balaban and Okutan, 2009; Afsar, 2011). Today, the banking sector of Turkey is among the top 15 largest banking sectors in Europe, and it is one of the largest sectors in the country with a total asset size of 732 billion US dollars and 80 billion US dollars shareholders' equity, over 200,000 employees and approximately 12,000 branches (TBA). As of April 2019, a total of 53 banks operating in the Turkish banking system. 34 of these banks are deposit banks, 13 of them are development and investment banks and 6 of them are participation banks. In this study, how intellectual capital affects the financial performance of the participation banks, the leading representative of the Islamic finance system in Turkey, is analysed.

Participation banks represent Islamic banks in the Turkish banking system, while deposit banks and development-investment banks are the representatives of the conventional banking system. The participation banks have operations under the concept of interest-free finance which is generally defined as the system in which all kinds of financial activities and transactions are applied within the framework of Islamic rules (Arslan and Ergec, 2010). The basic characteristics of Islamic banking are its asset-based nature and the financial products containing excessive uncertainty are not allowed in the Islamic banking system. Besides, the financing of the real economy without interest and the sharing of profit or loss equally by the actors in financial operations are the other critical characteristics of the Islamic banking system. Such features led Islamic banks to perform successfully in the global crises and attracted the attention of the international community to the interest-free Islamic banking system. The high growth performance of Islamic banking in the world and the weakness of the conventional financial system that emerged after the 2008 financial crisis, and the fact that Islamic banking institutions are more resilient to adverse economic environments, took attention of the Western economies to examine this system more closely (Khan and Bhatti, 2008; Cihak and Hesse, 2010). Today, Islamic banks manage an asset of $ 2.3 trillion and provide banking services in 92 countries with more than 350 organisations (World Bank Islamic Finance Bulletin, 2019), implemented in a wide geography from Southeast Asia to the United States.

In Turkey, companies in the Islamic finance sector, e.g., participation banks have been in operations since 1983, and the banks had a market share of 6 per cent in 2019. According to participation banks association of Turkey, the market share of the sector is expected to be increased to 15 per cent until 2025 because, for the first time in the world Islamic finance sector, a state itself entered into Islamic finance industry as investors and entrepreneurs. There are six participation banks in Turkey, three of them are established with one hundred per cent state capital (Emlak Katılım Bankası, Vakıf Katılım Bankası and Ziraat Katılım Bankası) and the other three participation banks are privately owned (Albaraka Turk, Kuveyt Turk and Türkiye Finans Katılım Bankası). Participation banks held approximately $45 billion in assets in September 2019 ($ 7.4 billion in 2005) and employed 16,000 personnel in 1154 branches (TPBA).

Participation banks, as well as conventional banks, employ physical, financial and intellectual capitals on their daily operations. Since the early 1990s, the operations in financial sectors have experienced a dramatic shift from traditional physical work to emerging knowledge-based production. As a result of the explosion in the knowledge-based economy, banks have realised that knowledge is vital to surviving in the market since it is considered as a new production factor and a new way of expansion and growth. Therefore, banks shifted their strategic efforts from the management of tangible assets to the management of abstract intellectual assets e.g. intellectual capital (IC).

The concept of IC has been defined by numerous studies in several ways. IC can be simply defined as an asset which transforms raw materials into something more valuable. IC is defined as information, experience and intellectual property in the way of value creation by Stewart (1997). According to IC definition of Marr and Moustaghfir (2005), IC takes account of employer's as well as workers' skills, competencies and abilities of individuals and groups. They also suggest the value of relationships with suppliers, allies and customers constitutes intellectual capital for a company. Pulic (1998) has defined IC as an indicator to measure business efficiency and to represent the intellectual abilities of a company in the value creation process in a knowledge-based economy. Klein and Prusak (1994) define IC as intellectual property of a company, which is shaped, acquired and strengthened to produce higher-value assets. They are also noted that it is not enough to define IC as abstract assets, such as patents, copyrights, licenses, trademarks, methodologies, processes, networks, administrative systems, intellectual property rights and so forth. In a knowledge-based banking sector, traditional methods of measuring corporate success, based on conventional accounting principles for determining profit, such as return on investments, contribution margin, net profit and so forth, are not enough for measuring a bank's financial performances (Edvinsson, 1997; Firer and Williams, 2003; Pulic, 1998, 2000). Therefore, IC is an important and powerful tool to measure the financial performance of the banks. Previous studies mainly used IC to measure the financial performance of the conventional banking sector (deposit and development-investment banks) while the Islamic banking sector (participation banks) got inadequate attention from these studies. Financial operations in Islamic and conventional banking sectors may differ since they have different theoretical conceptualisation and operational differences. Therefore, in this study, by using a well-known methodology in the related literature known as VAIC model (Value-Added Intellectual Coefficient), IC performance of the participation banks is measured and the relationship between IC and the financial performances of the participation banks in Turkey over the time period 2005-2018 is empirically analysed. To the best of the author's knowledge, there is no empirical study

available in the context of examining the role of intellectual capital in the Islamic banking sector of Turkey. Given the rapid development that the Islamic banking sector has experienced in Turkey, the current study concerning the development of Islamic banking in the aspect of IC contributes to the literature.

The rest of the study is organized as follows: the following section reviews the related literature on intellectual capital and financial performance of the banks; the third and the fourth sections provide data and methodology, respectively. In the fourth and fifth sections, empirical results and conclusion are followed subsequently.

Literature Review

The relevant literature on the relationship between intellectual capital and corporate financial performance has many examples. Most of the studies in this literature utilise Value-Added Intellectual Coefficient (VAIC) model since it is a standardised and integrated measurement of intellectual capital and allows researchers to empirically compare firms and countries to understand how intellectual capital impacts the financial performance of firms operating in the banking and finance sectors (Pulic and Bornemann, 1999; Mavridis, 2004; Goh, 2005; Nazari and Herremans, 2007; Yıldız, 2011; Gigante, 2013; Mohammadi and Taherkhani, 2017; Ozkan *et al*., 2017; Tran and Vo, 2018). While some of these studies have shown that IC has positive and significant influence on the financial performance of the corporates in the banking sector (Bassi and Buren, 1999; Chen Goh, 2005; Pew Tan *et al*., 2007; Zeghal and Maaloul, 2010; Ozkan *et al*., 2017), some studies have confirmed no or limited relations (Firer and Williams, 2003; Bharathi, 2008), and some others have found a negative relationship between IC and financial performances of the corporates (Williams, 2001; Maria, 2014; Pitelli *et al*., 2014).

In the case of the Islamic banking sector, the relevant literature does not have a comprehensive and sufficient number of studies that have particular attention to the importance of IC in a rapidly growing Islamic banking industry. A recent study concerning intellectual capital in the Islamic banking sector has been published by Nawaz and Haniffa (2017). Using VAIC methodology and Bankscope database for the period 2007-2011, they empirically analyse the impact of intellectual capital on the financial performance of 64 Islamic financial institutions operating in 18 different countries. Their empirical results provide evidence for the value creation of Islamic financial institutions is highly influenced by human capital efficiency and employed capital efficiency. Musibah and Alfa (2013) empirically examine 53 Islamic banks operating in the countries comprising the Gulf Cooperation Council (Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain, and Oman). Their results suggest that intellectual capital has a negative relation with the corporate social responsibility of Islamic banks in the study region. Specifically, while capital employed efficiency has a positive impact on banks' corporate responsibility, human capital efficiency has a negative relationship with it. Nawaz (2017) also focuses on the Islamic banking sector in the countries of the Gulf Cooperation Council and examines 47 Islamic banks in pre- and post-financial crisis period. He suggests that intellectual capital is a key factor for Islamic banks to improve their odds of survival at the crisis and that higher intellectual capital efficiency helps Islamic banks to maintain their profitability.

Since countries with Muslim population, such as Malaysia, Indonesia, and Pakistan etc., have experienced rapid development in the Islamic finance sector in the last 30 years, several studies have been recently employed on the development of Islamic banks in the aspect of intellectual capital. For example, Husnin and his colleagues (2014) analyse the financial and intellectual capital performances of 15 Islamic banks in Malaysia for the time period 2008-2012. Using VAIC methodology and a panel dataset, their empirical results suggest a direct relationship between intellectual capital and financial performance of Islamic banks in Malaysia. Khalique *et al.* (2013) conducted a similar study on Islamic banking sector operating in Malaysia to examine the influence of intellectual capital on the organisational performance of Islamic banking sector. They obtain data from 120 individuals participated in their study and utilise Pearson correlation and multiple regression analysis. Their empirical results suggest intellectual capital has a significant influence on the organisational performance of Islamic banking sector in Malaysia.

Similarly, Ousama and Fatima (2015) measure IC for corporate efficiency performance of the Islamic banking sector in Malaysia and examine the relationship between IC efficiency and financial performance. They use data from the annual reports of the study banks for the years 2008, 2009 and 2010 and their results provide an empirical evidence that human capital efficiency, a component of VAIC, has an important impact on the profitability of Islamic banks and that the optimal utilisation of IC and resources lead to higher bank

profitability. Setianto and Sukmana (2016) empirically analyse and compare IC and financial performance of Islamic banks in Malaysia and Indonesia for the period from 2010 to 2014. They find that Islamic banks in Malaysia have exhibited better intellectual efficiency scores as compared to that of Islamic banks in Indonesia. Their results also suggest that banks with better human capital efficiency and employed capital efficiency tend to exhibit higher profitability levels while structural capital efficiency is not related to Islamic banks' financial performance both in Indonesia and Malaysia. Setyawati *et al.* (2019) analyse the relationship between intellectual capital and financial performance of 11 Islamic banks in Indonesia over the period 2013-2016. They find that intangible assets including the standard operating procedures, storage of all data, structural procedures, etc., significantly affect the return on assets and the growth of assets in the Islamic banking sector of Indonesia. Rehman *et al.* (2011), Rehman *et al.* (2012) and Khan *et al.* (2015) focus on intellectual capital in Islamic banking sector of Pakistan and find the results similar to the studies applied on Islamic banking sector in Malaysia and Indonesia.

The relevant literature has no empirical study available in the context of looking at the role of IC in the Islamic banking sector of Turkey. It may be the reason Islamic banking is relatively a new concept in the country compared to the conventional banking system which has been in existence since the1800s (Ziraat Bankasi established in 1888)[1]. On the other hand, some studies provide information about the development of the Islamic banking sector in Turkey or compare them with the conventional banking system. Yılmaz and Güneş (2015), for example, empirically examine and compare the efficiencies of participation and conventional banks in Turkey. Using data envelopment analysis with a sample of 4 Islamic banks and 28 conventional banks, they compare technical efficiency, pure technical efficiency and scale efficiencies of these banks. Their results confirm that conventional banks are more efficient in the creation of the same amount of output compared to Islamic banks in Turkey. There are also studies in the literature that focus on the overall banking sector of Turkey and empirically examine the relationship between intellectual capital (VAIC) and financial performance of the banks. In a few words, results of these studies generally suggest intellectual capital has a positive impact on financial performance of the banks operating in Turkey (Yalama and Coşkun, 2007; Karacan and Ergin, 2011; Yıldız, 2011; Çalışkan, 2015; Avci and Nassar, 2017; Ozkan *et al.*, 2017; Arslan and Kızıl, 2019).

Overall review of the related literature suggests that intellectual capital is an essential element for the competitiveness and the profitability of Islamic banking sector. On the other hand, this crucial element has not attained adequate attention from the researchers for the Islamic banks operating in Turkey. In this aspect, findings of the current study are likely to contribute to the relevant field as the first research on this subject.

Data

The Turkish banking sector is one of the largest sectors in the country with 11,576 domestic branches, 206,000 employees and an asset size of 732 billion dollars. In 2019, there are 34 deposit banks, 13 development and investment banks and 6 participation banks in the Turkish banking system. Three of the six participation banks, Albaraka Türk, Kuveyt Türk and Türkiye Finans banks, have foreign-private owners as main shareholders and they have been in operations in Turkey since the mid-1980s. Albaraka Türk bank is the oldest participation bank in the country and a part of The Albaraka Banking Group (ABG), one of the strongest capital groups in the Middle East. The bank was established in 1984 under the leadership of the Islamic Development Bank (IDB) and a local industrial group and had been serving to the Turkish economy for more than half a century. The bank's share of foreign ownership is approximately %66 and it has 230 domestic branches and 3,884 employees in 2019. Kuveyt Türk bank is another participation bank established in 1989 and has been operating in the Islamic banking sector since then. The bank is a subsidiary of Kuwait Finance House and approximately 80% of its shares are owned by foreign parties. The bank continued to operate with 5,871 employees 417 branches in 2019. Türkiye Finans bank was established in 2005 with a merger between Anadolu Finans and Family Finans which are two interest-free corporates operating in the Islamic finance sector of Turkey. The bank's main shareholder is the National Commercial Bank of Saudi Arabia. Türkiye Finans bank operates in the Islamic banking sector of Turkey with 487 domestic branches and 3,487 employees in 2019.

[1] https://www.tbb.org.tr/tr/bankacilik/banka-ve-sektor-bilgileri/banka-bilgileri/tarihsel-bilgiler/68

The rest of the participation banks in Turkey are entirely owned by the government. For the first time in the world Islamic finance sector, a state itself entered into Islamic finance industry as investors and entrepreneurs, and the government opened Ziraat Katılım bank in 2015, Vakıf Katılım bank in 2016 with a hundred per cent state capital. In 2019, to expand the sector, the government converted state-owned Emlak bank into Emlak Katılım bank which specialises in the construction and real estate sector as an Islamic participation bank.

In this study, using a panel dataset, a sample of 3 privately owned participation banks in the Islamic banking sector over the 2005-2018 fourteen-year periods is analysed. 3 state-owned participation banks are excluded from the study due to the lack of data for the study time period. The total number of observations included in the analyses is 42. The dataset for the empirical analyses is produced using the statistical reports of the banks that are available in websites of the Participation Banks Association of Turkey[2]. The analyses of this study have been completed using STATA 14.0 statistical software. Table 2 provides detailed information about the banks used in the current study. The variables are summarised on the summary statistics in Table 4.

Methodology

Value-Added Intellectual Coefficient (VAIC) Model

Many techniques have been developed in the related literature to measure intellectual capital (IC) performances of the corporates. Organizational Intellectual Capital, introduced by Edvinnsson (1997), is a well-known technique for measuring IC performance of companies. It provides pieces of evidence for how efficiently an investment has been used in a specific time period. This technique is composed of earnings obtained from new business activities and investments in markets, education and training, patents and so forth. Using several indexes including satisfied customer index, research and development index, leadership index, motivation index and so on, this technique calculates an intellectual capital coefficient of efficiency for a firm. Sveiby (1997) develops another IC measurement technique known as Profit per Professional which is calculated by the proportion of profit created by the number of professionals in a company. This technique utilises sales and personnel efficiency indicators to measure a company's IC performances. VAIC™ (Value Added Intellectual Coefficient) technique, proposed by Ante Pulic and his colleagues at the Austrian IC Research Centre (Pulic, 1998, 2000; Pulic and Bornemann, 1999), is the most common and effective method for measuring IC performances of companies. VAIC model is a well-accepted method in the literature and has been increasingly used in business and academic practices to understand the efficiency of business operations and how much value-added has been created with a given amount of physical and financial capital in a company.

VAIC model has three components that are human capital efficiency (HCE), structural capital efficiency (SCE) and employed capital efficiency (CEE). Following equations algebraically formalise VAIC model and its components.

(Eq. 1) $VAIC = HCE + SCE + CEE$

(Eq. 2) $VA = OP + EC + D + A$

(Eq. 3) $HCE = VA / HC$

(Eq. 4) $SCE = SC / VA$

(Eq. 5) $SC = VA - HC$

(Eq. 6) $CEE = VA / CE$

[2] http://www.tkbb.org.tr/statistical-reports

In Equation (1), *HCE* represents human capital efficiency coefficient which shows how much a bank creates one monetary unit invested in its human resources. *SCE* stands for structural capital efficiency, which demonstrates a firm's structure type consisting of some indicators like technical know-how, customer and supplier relations, information technology and firm reputation. *CEE* shows capital employed efficiency coefficients indicating how much value a bank creates in one monetary unit invested in their financial or physical capital. Equation (2) exhibits *VA* which has to be determined first to be able to calculate the components of *VAIC*. *VA* stands for the measure of the sum of value added which reports the ability of a bank to create value. *VA* has four components comprising *OP* refers to operational profits; *EC* shows employee costs and *D* and *A* show depreciation and amortisations, respectively. Equation (3) shows the calculation of *HCE* and *HC* refers to total salaries and wages distributed to personnel in a bank. Equation (4) and (5) are for the calculation of structural capital efficiency coefficient and for the structural capital, *SC*, of a bank which is calculated as the difference between *VA* and *HC*. Equation (6) calculates capital employed efficiency coefficients and displays *CE* which is for the book value of net assets for a bank.

VAIC model is more appropriate for the present study and has some advantages in empirical analyses compared to other IC measurement techniques. First, VAIC model utilises simple equations and is based on publicly available simple data while alternative techniques are based on complex equations, models and principles which can be understood only by executives or accountants in a company. VAIC model can be easily computable and understandable by everyone inside and outside of a company. Second, for empirical and comparative analyses, VAIC model encompasses a standardised and consistent basis for measurement of IC. Alternative techniques are limited to measure IC consistently to employ a comparative analysis between two sectors. Third, the alternative techniques have been exposed to harsh criticisms regarding their calculation methods and subjectivity. The calculation method of VAIC is based entirely on accounting and financial reports which makes it wholly objective and verifiable (Gigante, 2013).

Empirical Model

The objective of this study is to examine the impact of intellectual capital on the financial performance of participation banks in Turkey. In order to measure the financial performances of participation banks, return on assets (ROA) and return on equity (ROE), two of the most common method of financial performance measures, are utilised in the current study. The Value-Added Intellectual Coefficient (VAIC) method is used to represent the IC performances of the banks.

Essential statistical tests are conducted on the panel dataset before estimating the association between IC and financial performance of the banks. First, the Hausman test is used to determine whether a fixed effect or a random effect model is appropriate for the estimation models. Hausman test is a statistical hypothesis test which evaluates a more efficient model against the less efficient by checking the significance of an estimator versus an alternative estimator (Hausman, 1978). The random effect model is used in the estimations as the Hausman test results strongly suggest that the random effects models are more appropriate for the dataset. Second, since the group-wise heteroskedasticity is a big problem in panel data models which causes to have biased estimators, the LBF test (Levene-Brown-Forsythe) is also conducted to check this problem. The test results indicate no heteroskedasticity problem in the estimation models. Lastly, Pesaran test is conducted on the dataset to check cross-sectional correlation in the models. As the test results indicate sectional dependence in the models, the models are employed with robust standard errors.

The impact of intellectual capital on the financial performances of the banks is estimated based on the following models:

Model (1) $$FP_{i,t} = \beta_o + \beta_1 VAIC_{i,t} + \beta_2 X_{i,t} + \varepsilon_{i,t}$$

Model (2) $$FP_{i,t} = \beta_o + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t} + \beta_4 X_{i,t} + \varepsilon_{i,t}$$

Where $FP_{i,t}$ is the main dependent variable of both models and represents financial performance measures for bank i in year t. $FP_{i,t}$ includes two financial performance measures which are $ROA_{i,t}$ (return of assets) and

$ROE_{i,t}$ (return on equity), two different dependent variables symbolised as $FP_{i,t}$. Calculation of $ROA_{i,t}$ and $ROE_{i,t}$ for a certain bank i and a year t is presented in the following equations;

$$(7) \qquad ROA_{i,t} = Net\ Income\ /\ Total\ Assets$$

$$(8) \qquad ROE_{i,t} = Net\ Income\ /\ Shareholders'\ Equity$$

Return on assets and return on shareholders' equity are two strategic measures of corporate profitability and have been widely used in numerous studies on the financial performance of the banks. ROA is a popular method for smaller banks to compare banks to each other and monitors banks' own performance or overall size in a specific time period. ROE indicates how effectively banks handle shareholders' equity and it is preferred by larger banks since it is not an asset dependent measure of financial performance. Asset independency feature of ROE provides some advantages to the banks, such as comparing different asset structures to each other, comparing themselves to other types of business, comparing internal product line performance to each other and looking at the comparative profitability of lines of business. Since ROA and ROE address different purposes for financial performance measurement, both measures are included in the models as dependent variables to see if IC has different impacts on these financial performance measures.

In Model *(1)*, $VAIC_{i,t}$ stands for the main independent variable of the model and represents a measure of IC performances of bank i in year t, as detailed above section. An increase in $VAIC_{i,t}$ is related to a rise in IC performances of the banks in the models. Model *(2)* consists of the components of $VAIC_{i,t}$, that are Human Capital Efficiency ($HCE_{i,t}$), Structural Capital Efficiency ($SCE_{i,t}$) and Capital Employed Efficiency ($CEE_{i,t}$) for bank i and year t. The model estimates the impact of these components of VAIC on the financial performances of the banks. Model *(1)* and *(2)* include some control variables symbolised as $X_{i,t}$. Bank size is one of these control variables and calculated as the natural log of total assets. The other control variable is leverage, the ratio of long term debt to total assets. β_0 -β_4, in Model *(1)* and *(2)*, are the parameters to be estimated and $\varepsilon_{i,t}$ represents idiosyncratic heteroskedasticity consistent robust error terms. Lastly, Model *(1)* and *(2)* are estimated without the control variables and other specifications ($X_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$) to see the direct relationship between $VAIC_{i,t}$ and $FP_{i,t}$, then these control variables are added to the models to analyse their impact on $FP_{i,t}$.

Empirical Results

Pearson correlation analysis results which display the correlation coefficients among the study variables are presented in Table 1. According to the results, VAIC has a pretty strong and statistically significant positive correlation with both dependent variables, ROA and ROE (r=0.6515* for ROA and r=0.6173* for ROE). The components of VAIC also have positive and statistically significant correlations with ROA and ROE. CEE is the variable with the highest correlation with ROA (r=0.6763*) and ROE (r=0.8614*) and SCE is the second highest correlation with both ROA and ROE. HCE is the variable with the lowest correlation with both ROA and ROE. This confirms that the financial performances of the banks (measured with ROA and ROE) are more dependent on capital employed efficiency and structural capital efficiency comparing to human capital efficiency. The results also provide evidence for statistically significant correlations among independent variables, but these correlations are not strong which prevent multicollinearity problem within the independent variables.

Table 2 provides results of comparative analysis on the variables of the three banks used in the analyses, such as establishment years, asset size, ROA, ROE, VAIC and its components. The Table reports both the 14 year average values (2005-2018) and 2018 values of intellectual capital and financial performance scores of the study banks. In the year 2018, Kuveyt Türk is the bank with the largest asset size of approximately 14 billion US dollars among the participation banks. In the same year, Kuveyt Türk also has the highest intellectual capital scores (VAIC=4,764) and financial performance scores (ROA= 0.0117, ROE=0.1599). This implies that a bank with higher (lower) intellectual capital scores has also higher (lower) financial performances. Average values of financial performance and intellectual capital scores for the period 2005-2018, Türkiye Finans bank is the bank with the highest scores. Among other banks, Türkiye Finans bank's highest average

VAIC (3.410), HCE (2.475) and SCE (0.588) scores can be related to the bank's highest average ROA (0.0169) score. Similar to the facts in the year 2018, banks with higher (lower) financial performance has also higher (lower) intellectual capital scores during the period 2005-2018. The overall results of the comparison analysis displayed in Table 2 suggest a strong relationship between intellectual capital and financial performance of the participation banks operating in Turkey.

The results obtained from the econometric analyses for the relationship between intellectual capital and financial performance of the banks are reported in Table 3. The Table consists of two panels with respect to the dependent variables in the models. Panel A provides the estimation results based on ROA as the dependent variable, while panel B includes ROE as the dependent variable and the results are provided accordingly. In panel A, Model (1) shows a direct impact of VAIC on ROA and Model (3) estimates the direct impact of the components of VAIC on ROA, respectively. Model (2) and (4) incorporate the control variables to the estimation models. Most of the estimation results reported in Panel A are statistically significant and have expected signs. For example, the results of Model (1) and (2) suggest a positive and statistically significant relationship between VAIC and ROA. Specifically, one unit change in VAIC is related to 0.008 unit change in ROA (return on assets) in Model (1) and 0.006 unit change in Model (2). This finding implies that VAIC has a positive impact on the financial performance of the participation banks of Turkey. Most of the components of VAIC (except HCE) have also positive and statistically significant relations with ROA. These results suggest that an increase in SCE and CEE causes a rise in ROA. However, the impact of HCE on ROA is unexpectedly negative, but this impact is not strong and statistically significant. Among the components of VAIC, CEE has a greater impact on ROA in Model (3) and SCE is the component with the highest impact on ROA in Model (4). These results provide a clear indication that the financial performances of the participation banks in Turkey is mostly affected by CEE and SCE and if the banks want to achieve higher financial profitability, they should concentrate more on CEE (capital employed efficiency) and SCE (structural capital efficiency) rather than HCE (human capital efficiency). In other words, if the participation banks of Turkey use their structural capital efficiently, this means improving technical know-how, information technology, bank's reputation and customer-supplier relationship, that increases the banks' profitability. The results also imply that satisfied customers, especially the external stakeholders of the business, are crucial for the financial success of the banks.

ROE (return on shareholders' equity) is substituted for ROA as the dependent variable in Panel B of Table 3. In Panel B, similar to Panel A, VAIC and its components have positive and statistically significant effect on ROE. However, the magnitude of the effect of VAIC on ROE is much greater in Panel B. For example, while the impact of VAIC on ROA is 0.008 in Panel A, the impact of VAIC on ROE is approximately 0.06 in Model (5) and (6) of Panel B. Similarly, impact of CEE and SCE on ROE is much larger than their impact on ROA in Panel A. This finding implies effective usage of intellectual capital in the banking sector has more positive effect on ROE compare to its positive impact on ROA. The estimation results report that HCE has an unexpected negative relationship with both ROA and ROE. However, this unexpected result is not statistically significant except Model (7). This provides evidence for recruiting and preserving talented personnel and training them continuously do not significantly influence the profitability level of the participation banks in Turkey.

Conclusion

In this study, the impact of intellectual capital on financial performances of the Islamic banking sector of Turkey is analysed. Specifically, three participation banks, as Islamic banks are called in Turkey, (Albaraka Türk, Kuveyt Türk and Türkiye Finans banks) are studied over the time period between 2005 and 2018. Return on Assets (ROA) and Return on Shareholders' Equity (ROE) are used as the measures for the financial performance of these banks. Value-Added Intellectual Coefficient (VAIC) method is used to measure intellectual capital performances of the banks. The current study utilises multiple econometric estimation models, comparison and correlation analyses to investigate the relationship between VAIC and financial performances of the participating banks.

In general, it can be concluded that the estimated models have provided evidence to support the notion that intellectual capital creates positive and significant impacts on the financial performance of Islamic banks of Turkey. This implies that the Islamic banks operating in Turkey should definitely concentrate on improving their intellectual capital level to boost their financial success. With regard to the components of VAIC, results indicate that capital employed efficiency and structural capital efficiency are the most important component

of intellectual capital for the profitability of these banks. This provides a clear indication that in order to increase the profitability, the Islamic banking sector of Turkey should use their structural capital efficiently, which means improving technical know-how, information technology, bank's reputation and customer-supplier relationship. In addition, satisfied customers, especially the external stakeholders of the business, are crucial for the financial success of the Islamic banks in Turkey. The empirical results show no evidence for the relations between human capital efficiency and the financial performance of Islamic banks. This may show that expenses on training employees and having talented personnel do not significantly impact the financial performances of Islamic banks in Turkey. According to the empirical results, intellectual capital has more statistical relations with return on shareholders' equity compared to its relations with return on assets. This finding may imply that effective usage of intellectual capital in the Islamic banking sector has a more positive financial impact on return on shareholders' equity rather than return on assets.

Finally, the Pearson correlation analysis and the comparison analysis support the econometric estimation results suggesting a strong positive link between Intellectual capital and the financial performance measures, ROA and ROE. The results of the correlation analysis also suggest strong interrelations among the components of VAIC. This evidence implies that when banks improve their human capital, their structural capital or employed capital will be positively affected.

The study contributes to the relevant field since it can be considered as the first comprehensive study on testing the effect of intellectual capital on the financial performance of corporates in the Islamic banking sector of Turkey. Since the understanding and development of the intellectual capital concept is still a debatable issue in emerging economies, the findings of the present study may shed light upon the discussion. The findings may serve as a useful input for Islamic bankers, such as executives or shareholders in understanding and determining their positions regarding intellectual capital. The results may assist them to develop strategic plans and establish priorities for knowledge-based management. The findings also help politicians for planning intellectual capital development in the Islamic banking sector in Turkey. Finally, the findings can also be utilised from the investors of the Islamic banking sector to modify their future investment strategies.

The present study concentrates only on a small part of the financial sector. Intellectual capital is an important factor not only for the Islamic banking sector but also for other types of financial institutions. Therefore, future research should incorporate other types of banks and businesses into the analyses, such as deposit banks, insurance companies, investment funds, real estate firms and other companies in the financial sectors of Turkey. In addition, the present study utilises the VAIC methodology to measure the intellectual capital performance of the banks. Although VAIC method is a well-known and well-accepted method in the literature, future studies may use other methods of intellectual capital measures, such as Tobin's Q ratio, Profit per Professional, Organizational Intellectual Capital or Market-to-Book ratio etc.

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Tables

Table 1: Pearson correlation analysis

	ROA	ROE	VAIC	HCE	SCE	CEE	Leverage	Banksize
ROA	1							
ROE	0.8929*	1						
VAIC	0.6515*	0.6173*	1					
HCE	0.5821*	0.5156*	0.9898*	1				
SCE	0.6242*	0.5479*	0.9622*	0.9652*	1			
CEE	0.6763*	0.8614*	0.5520*	0.4322*	0.3981*	1		
Leverage	-0.5931*	-0.1825	-0.3429	-0.3664	-0.4347*	0.0428	1	
Banksize	-0.7746*	-0.6923*	-0.2202	-0.1364	-0.1688	-0.5701*	0.4793*	1

Table 2: Financial Performance and Intellectual Capital in Participation Banks

Banks:	**Albaraka Türk**	**Kuveyt Türk**	**Türkiye Finans**	**Sector Average**
Established Year	1985	1989	1991	
Total Assets (2018, Million US $)	7,997	14,059	8,911	10,322
Return on Assets (ROA) (2018)	0.0032	0.0117	0.0094	0.008
Return on Assets (ROA) average (2005-2018)	0.0155	0.0136	0.0169	0.015
Return on Equity (ROE) (2018)	0.0411	0.1599	0.1029	0.101
Return on Equity (ROE) average (2005-2018)	0.1578	0.1445	0.1566	0.153
VAIC (2018)	2.182	4.764	4.282	3.743
VAIC average (2005-2018)	3.281	3.25	3.41	3.314
HCE (2018)	1.564	3.535	3.251	2.783
HCE average (2005-2018)	2.363	2.319	2.475	2.386
SCE (2018)	0.361	0.717	0.692	0.591
SCE average (2005-2018)	0.56	0.558	0.588	0.569
CEE (2018)	0.257	0.512	0.339	0.369
CEE average (2005-2018)	0.359	0.373	0.347	0.362

Table 3: Estimation Results

	Panel A				**Panel B**			
Variables:	**ROA**	**ROA**	**ROA**	**ROA**	**ROE**	**ROE**	**ROE**	**ROE**
Models:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
VAIC	0.008**	0.006***			0.068***	0.064***		
	(0.004)	(0.000)			(0.025)	(0.001)		
CEE			0.045***	0.032***			0.570***	0.348***
			(0.007)	(0.008)			(0.052)	(0.080)
HCE			-0.011	-0.003			-0.107**	-0.073
			(0.014)	(0.007)			(0.053)	(0.053)
SCE			0.095	0.041**			0.733***	0.656**
			(0.059)	(0.043)			(0.225)	(0.311)
Leverage		-0.048*		-0.104***		1.064***		0.525***
		(0.025)		(0.013)		(0.281)		(0.150)
Banksize		-0.004***		-0.002***		-0.042***		-0.024***
		(0.001)		(0.000)		(0.012)		(0.003)
Constant	-0.012	0.103***	-0.028***	0.119***	-0.072	-0.332	-0.213***	-0.252*
	(0.012)	(0.018)	(0.004)	(0.018)	(0.080)	(0.221)	(0.007)	(0.150)
Observ.	42	42	42	42	42	42	42	42

Note: Robust standard errors are in parentheses and ***, **, and * indicate *P-values*, *** p<0.01, ** p<0.05, * p<0.1.

Models:

(1) $ROA_{i,t} = \beta_o + \beta_1 VAIC_{i,t}$	(5) $ROE_{i,t} = \beta_o + \beta_1 VAIC_{i,t}$
(2) $ROA_{i,t} = \beta_o + \beta_1 VAIC_{i,t} + \beta_2 X_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,}$	(6) $ROE_{i,t} = \beta_o + \beta_1 VAIC_{i,t} + \beta_2 X_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,}$
(3) $ROA_{i,t} = \beta_o + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t}$	(7) $ROE_{i,t} = \beta_o + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t}$
(4) $ROA_{i,t} = \beta_o + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t} + \beta_4 X_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$	(8) $ROE_{i,t} = \beta_o + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t} + \beta_4 X_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$

Table 4: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	42	0.015	0.007	0.003	0.034
ROE	42	0.153	0.058	0.041	0.322
VAIC	42	3.314	0.523	2.182	4.764
HCE	42	2.386	0.409	1.564	3.535
SCE	42	0.569	0.075	0.361	0.717
CEE	42	0.360	0.082	0.223	0.609
Leverage	42	0.901	0.020	0.855	0.932
Banksize	42	16.409	1.024	14.493	18.123

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