

## Studying the impact of the intellectual capital on financial performance of state banks in Iran

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### Abstract.

Intellectual capital (IC) can be defined as the intangible assets which are not listed explicitly on a bank or firm's balance sheets, but positively impact the performance of it, thereby revealing the relationship between employees, ideas, and information and measure what is not measured. The aim of this paper is studying the impact of the intellectual capital on financial performance of state banks in Iran. This study uses a sample of 8 state banks in Iran in period of 2010 to 2015. The results show that efficiency in the use of intellectual capital positively affects the financial performance of Iranian's state banks. So, it seems that the development of effective the IC is necessary to adapt to a constantly changing environment.

**Key words:** Intellectual capital, financial performance, state banks, Iran.

### 1. Introduction.

Intellectual Capital (IC) plays an important role in an organization's performance. It represents distinctive characteristics that, *ceteris paribus*, can determinate the success or failure of an organization relative to its peers (see, among others, Pulic, 1998; de Pablos, 2003; El-Bannany, 2008). Thus, it is not surprising that over the last decades, many researchers from different disciplines (particularly, management, accounting and finance) have devoted substantial attention to IC, examining it from different viewpoints and for various research purposes. While several studies (e.g., Stewart, 1998; Roos et al., 1997; Bontis, 1998; Wu and Tsai, 2005) have defined IC from a theoretical perspective, others have developed effective measures of IC-based performance (Stewart, 1998; Pulic, 2000), exploring the relationship between IC efficiency and some key characteristics of firms, industries and regions (El-Bannany, 2008; Liang et al., 2011; Al-Musalli and Ismail, 2012). Finally, a third strand of literature (which includes Chen et al., 2005; Firer and Williams, 2003; Chen et al., 2014; Curado et al., 2014; Janošević et al., 2013 among others) has empirically investigated the relationship between firm IC efficiency and financial performance.

Societies have experienced four different socio-economic phases throughout history which include primitive society, agricultural society, industrial society, and information society in which we currently live. During these periods, hierarchy among production factors varied from one enterprise to another. While prior to the information society, the focus was on traditional factors (labor, capital, natural resources, and entrepreneurship), knowledge, and information technologies and intellectual capital factors took priority after the information society emerged (Kandemir, 2008; Kayacan & Alkan, 2005; Yalama, 2013). Intellectual capital can be defined as the intangible assets which are not listed explicitly on a firm's balance sheets, but positively impact the performance of it, thereby revealing the relationship between employees, ideas, and information and measure what is not measured (Edvinsson, 1997). It is common knowledge that balance sheets do not attempt to provide information on the actual value of an enterprise; instead, they are prepared for reporting purposes. Moreover, the relationship between the data obtained from financial reports (which are produced in line with the traditional accounting systems) and the value of an enterprise has weakened. In addition, traditional accounting systems fail to reflect intangible assets creating value in enterprises (Canibao, Garcia-Ayuso, & Sanchez, 2000; Lhaopadchan, 2010). Thus, practicality of the accounting data obtained from financial reports has been diminishing (Lev & Zarowin, 1999). In today's world, sources of economic value and wealth include not only the products manufactured by enterprises but also their intangible assets, i.e. their intellectual capital (Chen, Cheng, & Hwang, 2005; Goldfinger, 1997). It is widely believed that intellectual capital will play a greater role in creating value (Powell, 2003). In the knowledge based socio-economic period where intellectual capital has become one of the production factors, performance measurements for firm may not be possible with traditional accounting practices anymore. Therefore, there is a growing need to develop new methods taking account of the intellectual capital, as well (Berzkalne & Zelgalve, 2014; Gan & Saleh, 2008).

This paper contributes to the existing literature on the determinants of banks' profitability (e.g., DeYoung and Rice, 2004; Bonin et al., 2005; Valverde and Fernández, 2007; Albertazzi and Gambacorta, 2010). Previous papers show that the profitability of a bank depends on both exogenous factors, such as macroeconomic conditions, bank taxation, deposit insurance regulation and banking market structure (among others, Demirgüç, -Kunt and Huizinga, 1999; Albertazzi and Gambacorta, 2010; Mirzaei et al., 2013) and bank characteristics: size, capital ratio, business models and corporate governance structure (among others, Aebi et al., 2012; Berger and Bouwman, 2013; Lee and Hsieh, 2013; Mergaerts and Vander Vennet, 2016). We extend this literature by

documenting that an effective way that banks have, to sustaining their profitability, is to increase their IC efficiency.

## **2. Literature review research hypotheses.**

After it has been realized that intellectual capital has an impact on creating value and increasing the financial performance of firms, various methods have been developed to measure it (Edvinsson, 1997; Kaplan & Norton, 1996; Roos, Roos, Dragonetti, & Edvinsson, 1997; Steward, 1991; Sveiby, 1997). Most of the recent studies analyzing the relationship between the intellectual capital performance and financial performance of the firms use the value added intellectual coefficient (VAIC) model developed by Pulic (1998, 2004), Chen et al. (2005), Ercan, Oztu`rk, & Demirgu`nes, (2003), Joshi, Cahill, Sidhu, & Kansal (2013), Kayacan & Ozkan (2015), Mondal & Ghosh (2012), and Yalama (2013). Firer and Williams (2003) state that IC is an easily applicable and effective model to measure firms' intellectual capital performance and make comparisons between firms.

Researchers define the concept of intellectual capital in different ways. Therefore, there is no single definition explaining the concept of intellectual capital. However, intellectual capital may be interpreted as the intangible assets which are not listed explicitly on a firm's balance sheets but positively impact the performance and success of it (Brooking, 1996; Kayacan & Alkan, 2005; Mondal & Ghosh, 2012). As there is no consensus in the literature on the definition of intellectual capital, researchers have not agreed upon the components of intellectual capital, either. Yet, it is widely acknowledged that intellectual capital encompasses three components, i.e. human capital, structural capital and relation/ customer capital. Human capital can be defined as know-how which leaves an organization when people leave and it includes skills, capabilities, experience and expertise of employees. Structural capital covers the system, structure and processes of an organization and it involves non-physical components such as databases, organization chart, management processes and business strategies. However, customer capital refers to all intangible assets which regulate and manage the relationships of an organization. It comprises the organization's relationships with its customers, suppliers, shareholders and other stakeholders (Joshi et al., 2013; Kurt, 2008; Mondal & Ghosh, 2012). After it has been realized that intellectual capital has an impact on creating value and increasing the performance of firms, various methods have been developed to measure it. Methods used to measure intellectual capital includes market-to-book ratio, Tobin's Q ratio, calculated intangible value (Steward, 1997), balanced scorecard (Kaplan & Norton, 1996), Skandia IC Navigator (Edvinsson, 1997), intellectual capital services' IC-index (Roos et al., 1997), the technology broker's IC audit (Brooking, 1996), the intangible asset monitor (Sveiby, 1997), economic value added (Steward, 1991), market value added, and value added intellectual coefficient (VAIC) model (Çelikkol, 2008; Karacan & Ergin, 2011; Pulic, 1998, 2004; Yalama & Coskun, 2007).

The IC model is widely utilized to measure the intellectual capital performance of firms in various countries and within different sectors. Therefore, there is a wide range of studies investigating the impact of intellectual capital on the performance of firms by means of the VAIC model. While some of these studies (Chen et al., 2005; Chu, Chan, & Wu, 2011; Gan & Saleh, 2008; Kamath, 2008; Pal & Soriya, 2012; Tan et al., 2007) suggest that intellectual capital has positive impacts on the financial performance of firms, others (Chan, 2009a, 2009b; Ghosh & Mondal, 2009; Oztu`rk & Demirgu`nes., 2007) fail to produce adequate evidence showing this positive relationship. In the international literature, studies using the IC model predominantly focus on the banking and finance sectors. The very first study sifting through the impacts of intellectual capital on the banking sector by using the VAIC model belongs to Ante Pulic and Manfred Bornemann. In their study, the authors offer valuable information on the efficiency of the intellectual capital held by 24 major banks operating in Austria between 1993 and 1995. The authors claim that increasing the efficiency of intellectual capital is cheapest and safest way to ensure sustainable functioning of banks. Pulic (2004) emphasizes that there is a strong link between the intellectual capital and success of an organization. Additionally, the author argues that banks investing heavily in the intellectual capital and its components improve their performance (Joshi et al., 2013; Mondal & Ghosh, 2012; Ting & Lean, 2009).

Unfortunately, although the literature has emphasized the positive effects of IC on organizational performance, some studies have challenged this hypothesis. Using the VAICTM methodology as a measure of IC efficiency, Yalama and Coskun(2007) analyse the impact of IC on bank profitability in a study of Turkish banks. On the one hand, their findings appear to confirm an explanatory role of IC efficiency in banks' financial performance. On the other hand, the authors cannot generalize these results due to instability across their sample. In other words, they find that only a portion of Turkish banks exhibit a positive correlation between financial performance and IC efficiency. In the another study, Puntillo (2009) analyses the Italian market and finds no significant relationship between ROA (return on assets), ROE (return on equity) and IC efficiency(VAICTM). However, the worst-case scenario is found in Chang and Hsieh (2011). The authors examine the role of innovation capital on value creation in an organization. The results document a negative relationship between capital used in innovation and organizational financial performance. Given this literature picture, it is clear that the question of whether the efficiency in the use of IC can explain the financial performance of organizations and, in particular, the financial performance of banks remains open. This motivates the present study to

undertake an empirical analysis in order to re-examine this relationship in a large and complex market. Therefore, I hypothesize the following:

Hypothesis: There is a significant positive relationship between the intellectual capital of the state banks in Iran and their financial performance measure (ROA).

**3. Research methodology.**

This research is inductive in logic used and applied in purpose and deductive statistical models and methods (cross sectional correlation) are used to carry it. The subjects are all Iranian’s state bank from 2010 to 2015. In the present study, return on assets (ROA), one of the traditional performance measures, is used to represent the financial performance of banks as dependent variable. ROA is the key measure of bank profitability (Dietrich & Wanzenried, 2011; Pasiouras & Kosmidou, 2007), and often utilized in similar studies (Joshi et al., 2013; Ting & Lean, 2009; Yalama, 2013). ROA is calculated by dividing the net profit (the loss) for the current year by total assets.

Components of the VAIC model are used as independent variables in this study. VAIC is calculated as follows (Ghosh & Mondal, 2009; Pulic, 1998, 2004; Yalama, 2013):

$$VAIC_i = CEE_i + HCE_i + SCE_i$$

where VAIC<sub>i</sub> refers to the value added intellectual coefficient of the bank i, CEE<sub>i</sub> refers to the capital employed efficiency coefficient of the bank i; HCE<sub>i</sub> refers to the human capital efficiency coefficient of the bank i, and SCE<sub>i</sub> refers to the structural capital efficiency coefficient of the bank i. In order to calculate these variables, the total value added (VA<sub>i</sub>) created by banks needs to be calculated. Total VA<sub>i</sub> is calculated as follows (Al-Musalli & Ku Ismail, 2014; Alipour, 2012; Chu et al., 2011; Pulic, 2004):

$$VA_i = OP_i + EC_i + A_i$$

where VA<sub>i</sub> refers to the total value added created by the bank i; OP<sub>i</sub> refers to the operating profit of the bank i; EC<sub>i</sub> refers to the employment cost of the bank i, and A<sub>i</sub> refers to the amortization and depreciation of the bank i. Following the calculation of the total VA<sub>i</sub>, the components of VAIC<sub>i</sub> (CEE<sub>i</sub>, HCE<sub>i</sub> and SCE<sub>i</sub>) are calculated. CEE<sub>i</sub>, the first component of VAIC<sub>i</sub>, is calculated as follows:

$$CEE_i = VA_i / CE_i$$

where CE<sub>i</sub> refers to the capital employed (book value of assets) of the bank i; in other words, equity value of the bank i. HCE<sub>i</sub> and SCE<sub>i</sub> are calculated as follows:

$$HCE_i = VA_i / HC_i$$

$$SC_i = VA_i - HC_i$$

$$SCE_i = SC_i / VA_i$$

**4. Experimental results.**

Following models is used to test the hypothesis:

$$ROA_{it} = b_0 + b_1 VAIC_{it} + \epsilon_{it}$$

Table 1 show the average value of the variables concerning the intellectual capital performance of the banks in the 2010 to 2015 period.

Table 1. IC and its components for the sample banks

Bank name	EE	CE	CE	AIC
Bank Melli	.2925	.2684	.7914	.3523
Bank Sepah	.2493	.7293	.6940	.6727
Export Development Bank of Iran	.3464	.9705	.7414	.0584
Bank of Industry and Mine	.2822	.2606	.6886	.2315
Keshavarzi Bank	.2880	.6648	.5842	.5370
Bank Maskan	.3715	.2440	.5478	.1633
Post Bank of Iran	.3271	.0603	.4627	.8501
Tosee Taavon Bank	.2176	.5215	.3318	.0709

Pearson correlation analysis results related to the variables used in the analysis are shown in Table 2. There is a statistically significant positive correlation between ROA and VAIC, CEE and HCE. Among independent variables, HCE is the variable with the highest correlation with ROA. SCE has a negative but statistically insignificant relationship with ROA. It is observed that there is no strong correlation between independent variables. This result suggests that multi co-linearity problem between independent variable is weak or non-existent.

Table 2. Pearson correlations between variables.

	OA	C	EE	CE	CE
OA					
C	.3275				
EE	.3875	.1533			
CE	.5595	.6144	.2599		
CE	0.385	.07857	0.679	0.0075	

Table 3 shows the results concerning the model which show the relationships between the profitability of the state banks in Iran and their intellectual capital performance. Regression results suggest that model put forward in the study is statistically significant.

Table 3. Regression results of model

C	IC	Adjusted R <sup>2</sup>	F-statistics	p-value
0.0099 (1.4278)	0.0029 (1.2726)	0.0 819	4 0.2168	.0000

This result proves that the components of IC are better at explaining the profitability of banks than the IC alone (Chen et al., 2005; Joshi et al., 2013; Ku Ismail & Karem, 2011). Results of the Model presented in Table 3 shows there is a positive but statistically insignificant relationship between IC and the financial performance indicator (ROA) for the period 2010 to 2015. This finding implies that IC has no impact on the profitability of state banks of Iran.

**5. Conclusion.**

The relationship between intellectual capital and financial performance of banks has been the subject of countless studies. If the literature on this subject is reviewed, it is observed that the intellectual capital has a positive impact on financial performance of banks. In this study, I have provided empirical evidence regarding the contribution of IC efficiency and its sub-components to explain banks' financial performance, using the state bank of Iran as an experimental setting. IC efficiency of banks was measured using the VAICTM methodology. The study was conducted on a sample of 8 state banks of Iran over the time period 2010 to 2015. The findings of the study suggest that intellectual capital of the Iranian banking sector is primarily affected by human capital efficiency coefficient (HCE). On the other hand, capital employed efficiency coefficient (CEE) and structural capital efficiency coefficient (SCE) is less effective in creating value in the banking sector compared to HCE. I am aware that our study could be affected by bias before any generalization of the results can be made. Specifically, I conduct empirical tests on a low state bank of Iran sample, which raises the question: what about other countries? Further research should be undertaken in other countries to obtain a more generalizable result and to capture differences that may exist between different countries.

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