Intellectual Capital and Firms' Financial Performance: Empirical Evidence from Pakistan Stock Exchange

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Abstract

This paper intends to investigate the relationship between intellectual-capital and firms' financial performance in the emerging market of Pakistan. This study employs unbalanced panel data of 152 non-financial publicly firms listed at Pakistan Stock Exchange for the period of seven years (2012-2018). Value added intellectual coefficient model initiated by Pulic (1998) is incorporated for measuring and computing intellectual capital. The pooled OLS results revealed that VAIC is highly significant and positively related with FFP in terms of ROA, ROE, and ATO whereas the individual constituents of VAIC such as HCE, SCE and CEE also have significant and positive association with FFP in terms of all the performance measures.

Keywords: intellectual capital, financial performance, Pakistan stock exchange, unbalanced panel data

Introduction

An important perception that emerged throughout the Industrial period, physical resources for instance land, manufacturing plant, equipment and production units were believed to be the sole cause for increasing the capital for firms. With the passage of time the emphasis from physical resources has been transferred to knowledge-resources accompanied by the effect of globalization, presently the business organizations and corporations consider communication and knowledge as their foremost strategical assets. Consequently, due to this transformation and development with regard to globalization effect and knowledge revolution has granted intensification to the necessity to acknowledge and document Intangible-Resources in the financial statements of the organizations and corporations (Cañibano, Garcia-Ayuso, & Sanchez, 2000; Chen Goh, 2005; Joshi, Cahill, Sidhu, & Kansal, 2013).

Due to the discrepancy in market-value of the organization and book-value authenticates the presence of intellectual-capital (IC), as it is not appropriately acknowledged on neither is it documented on the financial statements of the organizations especially the balance sheet of the firm. As argued by Zambon (2004), the annual financial statements of the business must document all those incidents and occasions which are inclined to have an influence and impact on financial performance of the firm (FFP). Even though the firms' want to document IC in the financial statements and reports, however due to severe and rigorous accounting practices enforced by different

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economies foreclose the revelation of IC on the balance sheet of the firm. For instance, in Australia, the Australian-Accounting-Standard-Board (AASB-138), to record and document any Intangible-Resource on the financial statements of the firm, the Intangible-Resource should be capable of detaching and isolating from the organization and business. Due to these strict and inflexible attributes, most of these intangible-resource for instance goodwill, copyrights, charters relatively complex and hard. According to Vergauwen, Bollen, and Oirbans (2007), estimating the Intangible-Resources and its projected losses with regard to competitive gains are the key obstacles and barricades in the disclosure and revelation of IC on the balance sheet of the firm.

IC is regarded as a comprehensive and wide-ranging discipline, comprises of finance, marketing, management, human resource, accounting, and strategic management. Therefore, the notion of IC indicates various features to diverse individuals, since IC is widespread and multidisciplinary discipline, hence the researchers and academicians categorized and distinguished IC in various methods (Morariu, 2014). The author further added that the computation, measurement, and valuation of IC is considered as challenging, prolonged and laborious procedure. However, due to the distinct advantages of IC computation and measurement, fences in valuation of IC are overruled (Morariu, 2014).

Nevertheless, the concept of IC is in its premature stage in the developing economies and very few researchers have conducted studies to measure the impact of IC and firm performance. In developing Asian economies such as Pakistan, the concept of IC is in inception and the research on IC and firm performance in these economies is finite and bounded (Guthrie, Ricceri, & Dumay, 2012). In the same way, unfortunately very limited research has been conducted on IC and FFP. Therefore, in the current study we investigate the impact of IC on FFP in the emerging market of Pakistan and examine that how the individual constituents of IC such as HCE, SCE and CEE influence the FFP.

Review of Literature

Research shows that in the current corporate world, firms are employing business model which is based on usage of intangible assets and the worth of these assets is relatively more than the worth of physical assets (Cohen & Kaimenakis, 2007). Hence, to have competitive advantage in the market the companies must deal the idea that makes IC concept, with excellence and efficiently. The authors added that numerous firms have formulated and utilized the different structures and pattern of IC in the contemporary corporate era. In the case of SME, there is still an excessive necessity to clarify how

different structures and pattern of IC are related with SME and what is the impact of IC on financial performance.

During the last decade, the topic of IC has been at the center of much attention, this attentiveness managed to determine IC as a distinguished area of research and measures. In recent years there has been a growing number of publications focusing on IC and firm performance, yet the topic of IC is in inception, and recent developments in IC have heightened the need for measuring the magnitude of contribution in an adequate manner, to problematic organizational and strategy disputes in the knowledge-intensive economy (Ståhle & Bounfour, 2008).

Joshi *et al*. (2013) assessed the association amidst numerous IC components and firm performance in the banking sector of Australia during 2006-2008. The authors used VAIC approach developed by Pulic (1998) and employed financial data of the Australian banks for computing IC components. They originated that VAIC, Value Addition and Human Costs have a substantial and significant association in the banks. In the same way, all the banks have considerably better HCE than CEE and SCE. On the other hand, IC performance of the Australian banks has inferior and insignificant relationship with number of personnel working in the banks, total assets and total equity of shareholders. This paper, however, makes no effort to offer a satisfactory justification about using sample of 11 banks only and fail to distinguish between private banks and government owned banks. This study would have been more beneficial if the authors had mentioned how this study can be used by other countries with parallel banking structure and classification (Joshi *et al*., 2013).

Scafarto *et al.* (2016) examined the relationship of IC and firm performance of 18 worldwide agriculture-industries during the period of 2010-2014 and employed correlation analysis and regression methodology on the sample data. The current study found that, when HC connects with other constituents of IC, its performance turns out to be significant and substantial. In this regard, considerable and substantial relationship between HC and innovation-capital was established regarding performance of the firm. However, this paper suffers from the lack of justifiable IC proxies for examining the relationship. The lack of reliable instruments is particularly problematic for this study as they used only one-single index for measuring and computing the value of IC. The scope of this research was relatively narrow, being primarily concerned with agriculture-industry firm only. The findings of their study might have been far more fascinating if the author had conducted this study using a sample of diversified firms from the sample countries by incorporating a prolong time frame for the analysis.

Nadeem *et al.* (2017) investigated the relationship between IC and firm performance using dynamic panel data models and Financial data of BRICS countries. The authors employed financial data of 6045 listed firms between 2005 to 2014 in the BRICS stock markets for measuring the dynamic association applying GMM model. The findings of the current study reveal that ICE has meaningful and substantial relationship with firm's ROA and ROE. In the same way, physical-capital, HC, and SC is also has significant influence on firm performance. The meaningful outcomes also supported the use of RBV and RD theories for highlighting the significance of IC for firm performance. However, this study might have been more useful if the authors had used control variables for determining the influence of IC on firm performance in the sample markets. Further work is required to reconsidered VAIC for establishing attainable results. In the same way, further research could also be conducted to determine the effectiveness of IC using the new constituents such as SsC and RC.

Sardo and Serrasqueiro (2018) discussed two questions in their research: in the first question, they investigated the relationship of IC and increase in firms financial performance and impact of IC as a moderating variable and its relationship with financial performance, in the second question they discussed how IC have influence on growth opportunities. They incorporated annual data of non-financial firms operating in 14 Western European nations from 2004-2015. They found that IC effectiveness has a positive relationship with financial performance of these; high, medium and low technology firms. They further added that by using IC in an effective way, financial performance and growth occasions will be boosted. The findings propose that high firms will have huge growth chances if they know the effective method for utilizing the IC. However, in this study the authors made no attempt to simplify the results of each country whereas they performed the analysis mutually for all the 14 nations. A widespread research will have evaluation for each country according to the accounting practices, legal system and same sector firm's comparison and analysis respectively for each accounting period.

Research Methodology

According to Kolachi and Shah (2013), IC is significant and imperative for all kinds of organizations for instance large firms, small firms, private firms and public firms, however, one benefit in choosing Publicly-Listed-Firms is that financial and accounting data of these listed firms is publicly accessible and obtainable. In the same way, another benefit is that since the annual financial statements are always examined and audited by the trustworthy and dependable sources, hence, it increases the trustworthiness of the results and finding (Chen, Cheng, & Hwang, 2005). As reported by Kolachi and Shah (2013), IC

is vital and critical for all the "big firms with as many as 500,000 employees as well as for small firms with 50 employees" (p.47), this study has selected all the Publicly-Listed-Firms non-financial firms in Pakistan Stock Exchange. The current study has incorporated time period of seven years (2012-2018) and employs the VAIC model by Pulic (1998). The VAIC model has been extensively applied in immeasurable experimental studies and researches performed worldwide. This VAIC model is comparatively easy and plain. This model suggests a numerical and quantitative methodology which uses accounting data and generates efficiency index or indicators which are equivalent and similar amongst firms inside the business industry. Due to these features and characteristics this method is admired and extensively exercised (Nimtrakoon, 2015).

The VAIC model calculates and determines the value-added by the firm along with single share and contribution of all assets group towards the organization's value. These asset groups comprise of intangible and tangible resources for instance the Intellectual-Resources (Chan, 2009). In contrast to other valuation and estimation-based methods which are vulnerable to estimate and calculate the asset worth of IC of an enterprise, the VAIC model is regarded as an Indicator-Based method which employs the annual financial information and data for estimating and calculating the asset worth and value and IC efficiency of an organization, which is valuable and constructive for decisiveness by the enterprise administration and executive (Ulum, Ghozali, & Purwanto, 2014). The VAIC methodology is comparatively easy and plain with regard to computational measures and simple to comprehend by the stakeholders, the management, and the shareholders who are acquainted and conversant with the financial data and reports. Moreover, those who have basic undertesting and acquaintance of financial and accounting methods can understand the findings and outcomes of the VAIC methodology (Nimtrakoon, 2015).

$$FFP(ROA, ROE, ATO)_{it}: \alpha_{it} + \beta_1 VAIC_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \mu_{it} \quad \ldots (1)$$

$$FFP: \alpha_{it} + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_7 SIZE_{it} + \beta_8 LEV_{it} + \mu_{it} \quad \ldots (2)$$

Table 3.1. Description of the variables

Variables	Variables Measurement
Dependent Variable	
Return on Asset (ROA)	Net Income / Total Assets (Kamath, 2008)
Return on Equity (ROE)	Net Income / Total Equity (Pal & Soriya, 2012)
Asset turnover (ATO)	Total sales / Total Assets (Kamath, 2008)
Independent Variables	
Human Capital Efficiency (HCE)	VA / HC (Pal & Soriya, 2012; Pulic, 2000)

Capital Employed Efficiency (CEE)	VA /CE (Pal & Soriya, 2012; Pulic, 2000)
Structural Capital Efficiency (SCE)	VA-HC (Pal & Soriya, 2012)
Value Added Intellectual Efficiency (VAIC)	HCE + CEE + SCE (Pulic, 2004; Tasawar Nawaz, 2017)
Control Variables	
Firm Size (Size)	Log of Sales (Pal & Soriya, 2012)
Leverage (Lev)	Ratio between debt and equity (Goswami, 2016)

Empirical Results

Table 1. The Impact of IC on FFP- OLS Model Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	ROA	ROE	ATO	ROA	ROE	ATO
VAIC	0.121***	0.246***	0.069***			
	(0.020)	(0.029)	(0.016)			
Leverage	0.109***	0.209***	0.249***	-0.318***	0.162*	0.313***
	(0.038)	(0.054)	(0.030)	(0.054)	(0.088)	(0.038)
FS	0.602***	-0.233***	0.261***	0.456***	-0.079	0.341***
	(0.032)	(0.046)	(0.026)	(0.030)	(0.049)	(0.021)
HCE				0.990***	0.306***	0.401***
				(0.061)	(0.099)	(0.043)
SCE				0.002	0.092***	0.243***
				(0.014)	(0.023)	(0.010)
CEE				0.337***	0.227***	0.322***
				(0.050)	(0.081)	(0.035)
_cons	0.256***	0.691***	0.047	0.263***	0.663***	-0.076***
	(0.046)	(0.066)	(0.037)	(0.042)	(0.068)	(0.029)
Obs.	1071	1071	1071	1071	1071	1071
R-squared	0.400	0.064	0.246	0.508	0.028	0.533
Adjusted R_2	0.398	0.061	0.244	0.505	0.024	0.531
F	237.078	24.243	115.945	219.635	6.160	243.066

Standard errors are in parenthesis

**** p<0.01, ** p<0.05, * p<0.1*

The OLS results reveals that VAIC is highly significant and has positive relationship with FFP in terms of ROA, ROE and ATO. Furthermore, VAIC is significant and contributes positively in terms

of ROA in KIFs in PSX-Pakistan. Moreover, in LIFs in PSX-Pakistan, VAIC is highly significant and positively corelated in terms of ROA, ROE and ATO. These results of VAIC are consistent with the findings of prior studies such as Zéghal and Maaloul (2010) determined that VAIC is significant and have positive relationship with FFP in terms of ROA, ROE and ATO. Likewise, in model 4 to model 6 the individual constituents of VAIC results reveals that HCE,SCE and CEE are highly significant and contributes positively to FFP in terms of ROA, ROE and ATO whereas in terms of ROA, SCE is insignificant in model 4. Likewise, in model 4 to model 6 the individual constituents of VAIC results reveals that HCE, SCE and CEE are highly significant and positive in terms of ROA, ROE and ATO.

Table 2. The Results of the Breusch-Pagan Test for Heteroscedasticity

Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
ROA		ROE		ATO		ROA		ROE		ATO	
Chi2(1)	Prob > chi2	Chi2(1)	Prob > chi2	Chi2(1)	Prob > chi2	Chi2(1)	Prob > chi2	Chi2(1)	Prob > chi2	Chi2(1)	Prob > chi2
15.85	0.000	2.35	0.1255	203.56	0.000	12.97	0.000	2.00	0.1573	131.89	0.000

Source: Author's calculations

The P-values in table 2 illustrates that we cannot reject the null hypothesis with regard to all three FFP measures, hence this implies that in our dataset there is no presence of heteroscedasticity.

Table 3. The Woolridge Test for Autocorrelation

Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
ROA		ROE		ATO		ROA		ROE		ATO	
F(1, 178)	Prob > F	F(1, 178)	Prob > F	F(1, 178)	Prob > F	F(1, 178)	Prob > F	F(1, 178)	Prob > F	F(1, 178)	Prob > F
1.002	0.3184	47.541	0.9188	34.879	9.095	3.513	0.0628	56.299	0.0720	44.905	0.1729

Source: Author's calculations

To perform the Woolridge test for serial correlation in unbalanced panel data, we apply this test with the user written

command "*xtserial"* in Stata[†]. The P-values in table 3 shows that in our dataset the problem of autocorrelation is not present.

Discussion and conclusion

It is now well established from a variety of studies, that in the past two decades the contribution of intangible-assets in the value-creation mechanism has been disregarded and mistreated as the balance sheet of the organizations were dominant by the physical-resources (Jhunjhunwala, 2009) consequently, the organizations continuously attire the physical resources as these resources impact and determine the net profit of the organization (Jhunjhunwala, 2009). Nowadays, nevertheless, the accomplishments of the organizations primarily dependent on the efficient utilization of their Intangible-Resources such as proficiency, competence, prior job experience, satisfaction, faithfulness and devotion of the employees and other impalpable and imperceptible resources for instance copyrights, charters, and patents (Itami & Roehl, 1991). According to Jhunjhunwala (2009), these impalpable, imperceptible, and intangible resources encompass Two-Thirds of the overall Gross-Domestic-Product of the United States of America. This study reveals that VAIC is highly significant and positively related with FFP in terms of ROA,ROE, and ATO whereas the individual constituents of VAIC such as HCE,SCE and CEE also have significant and positive association with FFP in terms of all the performance measures.

The notion of IC is mostly disregarded and unobserved as an imperative component in strengthening the firm's financial performance (Nadeem *et al.,* 2017). Due to the traditional accounting system, the revelation of Intangibles is confined on balance-sheet of the firm, which have caused the disregarding and ignorance of IC (Joshi et al., 2013; Wang & Chang, 2005). Recent research has revealed that IC has gained significant attentiveness from researchers and corporations due to acquirement of competitive edge and gains. According to Choo Huang (as cited in Nadeem *et al.,* 2017), IC includes all the proficiencies, competences, and experiences which are possessed by the personnel and they use these skills and experiences for creating value and worth for the firm. Generally, these skills and proficiencies are not documented on the balance-sheet of the organization (Nadeem *et al.,* 2017).

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[†] STATA version 14

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