

INTELLECTUAL CAPITAL EFFICIENCY AND THE PERFORMANCE OF MUTUAL FUNDS: A PANEL DATA ANALYSES

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ABSTRACT: *The main purpose of this study is to empirically investigate the impact of intellectual capital efficiency on the Pakistani mutual fund companies' performance from 2008 to 2012. Value added intellectual coefficient (VAIC™) model has been used to measure the intellectual capital efficiency. Firm's performance has been measured through ROE (return on equity), ROA (return on assets) and EPS (earnings per share). VAIC (value added intellectual coefficient) model signifies the intellectual capital's performance into four aspects; HCE (human capital efficiency), SCE (structural capital efficiency), CEE (capital employed efficiency) and VAIC (sum of HCE, SCE and CEE). Multiple regression analysis has been used in this context. The empirical results obtained from the study indicate that human capital along with physical resources is the main driver of mutual fund firms' performance. Findings show that HCE (human capital efficiency) is positively and significantly related to ROE. Capital employed efficiency (CEE) has a strong impact on the firm's performance as it positively and significantly influences the ROE and ROA at 1% level. On the other hand, VAIC (value added intellectual coefficient) has a positive and significant impact on all performance measures (ROE, ROA and EPS). It is suggested that mutual fund firms can extend their financial performance through intellectual capital efficiency. On the other side, improvement in VAIC (Value added intellectual coefficient) helps the firm get competitive advantage and superiority.*

Key words: Intellectual capital, VAIC™, Pakistani mutual fund firms, Firm's financial performance, Human capital, Physical capital

1. INTRODUCTION

In the current era, firm's performance consists of more than physical resources. Firms have to look for the value of intangibility. Intellectual capital (IC) is the base and control of firm's intangibility. Firms have to recognize the meaning, assessment, value, measurement and disclosure of IC in this regard. If the firms don't idealize the philosophy of IC, they are out of the competition. Modern studies suggest that every firm has some invisible characteristics. IC is the main driver of the firm's invisibility in this context. Intellectual capital is a basic necessity of the firm. Its perception normally is intangible. It is becoming a firm's major strategic asset which can lead organization towards superiority and success. Moreover, IC is positively related to financial efficiency and competitive advantage [1]. IC is a lot more than what it seems to be. IC and its various parts act in the best interest of the organization [28]. [21], in a study have narrated that firm's value mostly consists of IC resources. These resources are normally invisible to the firm. Chen et al. IC is the main source to drive the both firm's value and firm's efficiency [9]. The significance and value of IC has become a strong and successful path for the various organizations. The balanced and well composed IC provides high value creation and future prosperity to a firm [16]. If IC is understood rightly by the organization, it becomes a dominant intangible asset which provides survival and dignity. IC can affect the firm's performance to a great extent. The new economy has shifted towards innovation from traditional methods. Searching reasons for this improvement, IC is at the top of the list [6]. Industrialists and practitioners are much linked with strategic role of IC and they believe that IC is now becoming a substantial business asset that affects the firm's performance.

IC has acted in both ways; it has created competitive advantage as well as it has indicated a sustainable environment for the firm [33]. Moreover, with the passage of time, IC has taken place of physical assets as the primary need of the various organizations. This all shows that development and recognition of IC acts in the best interest of the organization [13].

In reality, IC can be recognized as a knowledge resource which can provide superiority and dignity to a firm. IC leads the role of intangible assets of the corporate. It is now considered a major asset which is strongly associated with invisible characteristics of the firm. [3,11]. There are four main parts of IC; human capital, process capital, innovative capital and relational capital [31]. So, if we summarize the various parts of IC, human capital contains the employee experience and expertise [32].

While, structural capital measures the policies and processes of the firm. It also enables human capital to perform [15]. Finally, the relational capital measures the value of firm's relations with its stakeholders [4].

Financial firms have a strong impact on a country's economy. In recent years, financial institutions have faced a changing and challenging atmosphere. Improved performance of mutual fund sector is very necessary to stabilize the dynamic economy. Reliable and efficient performance of mutual fund firms in intellectual capital perspective is needed strongly in this context. This study discloses the effect of intellectual capital efficiency on the financial performance of listed close ended mutual fund firms at KSE (Karachi stock exchange) from 2008 to 2012. The particular study describes the role of IC and its components along with importance of tangible

resources. This is the first empirical research regarding mutual fund industries in intellectual capital perspective.

The research paper contains literature review in the next part. Literature review is followed by hypotheses development and then research method is illustrated. Last part of the paper summarizes the results and conclusions.

2. LITERATURE REVIEW

Various studies have depicted the effect of IC on the performance and value of the organization. IC is the core need of an organization. A firm can't move smoothly without understanding its IC [1], [8], in a study have elaborated that IC has a strong and significant impact on firm's performance. IC along with the combination physical assets can justify the firm's performance. VAIC (value added intellectual coefficient) model to measure IC is now widely used because of its measurement reliability. [24]. In another study, [25], has also described that firm's market price is influenced by IC and its components. Grater performance of VAIC (intellectual capital) leads an organization towards more prosperity and success. [14], in a study took on 75 listed companies in South Africa to check the significance of IC. They suggested that IC has a strong impact on profitability of the firm. IC is being considered a dominant and major strategic asset in IT firms of Taiwan. [7], [30], in a research have realized that IC has a big role to play in the financial performance of 150 listed firms at Singapore stock exchange. Firm's performance is strongly attached with the role of IC and intangible assets. A significant effect of IC is realized on the performance of 30 listed firms at Istanbul stock exchange in this context [23]. [10], in a further research have analyzed the role of IC in the health care industry of Taiwan. Their empirical findings showed a significant relationship between IC and firm's performance. They suggested that firm's success is strongly linked with the efficient performance of human capital. IC has a strong and significant control over Australian firms' performance; empirical findings showed that tangible resources have more influence on firm's performance than human capital [12]. [22], in a study relating to Indian banks have estimated the impact of IC and its components (HCE, SCE, CEE and VAIC) on the financial performance of 65 Indian banks. They suggested bank's performance is strongly linked with efficiency of IC and its parts.

A few studies in Pakistan have analyzed the impact of IC on the firm's performance. Such as, there is a significant relationship between IC and firm's performance of 25 listed firms at Lahore stock exchange [7]. [26] have indicated that IC has a strong influence over Modaraba sector of Pakistan. They illustrated that HCE (Human capital efficiency) and CEE (Physical capital efficiency) have a reliable impact on the performance of Modaraba firms. [17] have depicted that IC is a core need and prime asset of a firm. Working on SMEs operating in Pakistan, they suggested that IC and its components have a reliable connection with efficient performance. On the other hand, performance of Islamic and conventional banks of Pakistan is strongly associated with IC efficiency. HCE (Human capital efficiency) has a strong effect on Islamic banks' performance. While CEE (Capital employed efficiency) has a significant impact on conventional banks' performance [19]. [18] have also fund an

impressive impact IC's efficiency on the performance of Pakistani banking sector. [27] have described the impact of IC on the insurance sector of Pakistan. They illustrated that human capital efficiency is very important for the improved performance of Pakistani insurance firms. They also depicted a negative relationship between physical capital and ROI (Return on investment) in this context.

Various studies have strongly illustrated that IC has a strong influence on the performance of the firm. Specially, financial sector has perceived the impact and recognition of IC and its components (HCE, SCE, CEE and VAIC) to a great extent. In Pakistan, mutual fund firms have a reliable impact on economy along with banks, insurance firms and modaraba sector. So, the reliable and smooth performance of mutual fund firms in intellectual capital perspective is very necessary to negotiate.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Literature review has shown a positive and significant impact of IC on the firm's performance. IC leads the role of intangible assets. It provides strong and reliable base to a firm where success rate becomes high. It is a useful tool to gain value, competitive advantage, reliable financial performance and dignity. It is helpful to extract the invisible characteristics of the firm. The efficient performance of IC and its components (HCE, SCE, CEE and VAIC) acts in the best interest of the organization [2, 5, 18, 22, 24, 34,]. So, it is hypothesized that:

H1. HCE (Human capital efficiency) is positively related to mutual fund firm's financial indicators (ROE, ROA and EPS).

H2. SCE (Structural capital efficiency) is positively related to mutual fund firm's financial indicators (ROE, ROA and EPS).

IC does not create value without required quantity of tangible capital. It is realized that physical and tangible resources also have a significant impact on firm's performance [9, 24]. So, it is hypothesized that:

H3. CCE (Capital employed efficiency) is positively related to mutual fund firm's financial indicators (ROE, ROA and EPS).

H4. VAIC (sum of HCE, SCE and CEE) is positively related to mutual fund firm's financial indicators (ROE, ROA and EPS).

4. RESEARCH METHODOLOGY

4.1 Sample Size and Data Sources

Sample size consists of eight close ended mutual fund firms listed at KSE (Karachi stock exchange). Data has been collected from the published annual reports of various firms and from "Mutual fund association of Pakistan".

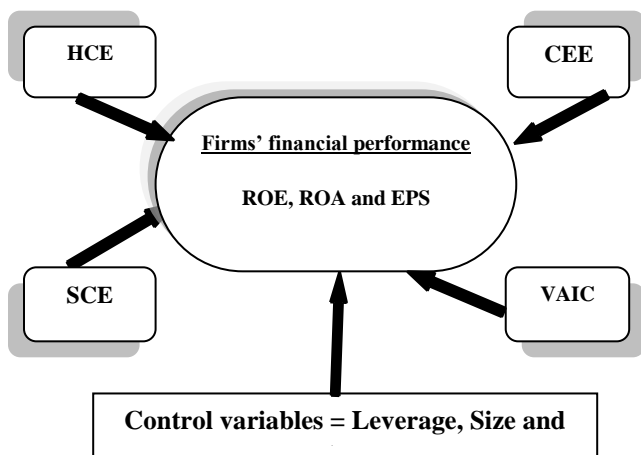
4.2 Regression models

1- ROE it = $\beta_0 + \beta_1$ (HCE) it + β_2 (SCE) it + β_3 (CEE) it + β_4 (Control variables) it + ϵ it (1)

2- ROA it = $\beta_0 + \beta_1$ (HCE) it + β_2 (SCE) it + β_3 (CEE) it + β_4 (Control variables) it + ϵ it (2)

3- EPS it = $\beta_0 + \beta_1$ (HCE) it + β_2 (SCE) it + β_3 (CEE) it + β_4 (Control variables) it + ϵ it (3)

3.1 Conceptual model of the relationship between IC's components and firm's performance



4- ROE $it = \beta_0 + \beta_1 (VAIC)_{it} + \beta_2 (Control\ variables)_{it} + \epsilon_{it}$ (4)
 5- ROA $it = \beta_0 + \beta_1 (VAIC)_{it} + \beta_2 (Control\ variables)_{it} + \epsilon_{it}$ (5)
 6- EPS $it = \beta_0 + \beta_1 (VAIC)_{it} + \beta_2 (Control\ variables)_{it} + \epsilon_{it}$ (6)

Where:

- HCE, SCE, CEE and VAIC= Independent variables
- ROE, ROA and EPS= Dependant variables
- Control variables= leverage, size and age
- ϵ = The error term
- β_0 = Constant
- i = Firm
- t = Time

4.3 Definition of variables

4.3.1 Dependant variables

Current study contains the following financial measures to assess the firm’s performance:

- (1) Return on equity (ROE): Annual net income to shareholders’ funds
- (2) Return on assets (ROA): Net income to book value of firm’s total assets
- (3) Earnings per share (EPS): Income available for common stock holders to weighted *average common stocks*

4.3.2 Independent variables

Literature has stressed upon the fact that IC and its components (HCE, SCE, CEE and VAIC) have a strong impact on the firm’s performance. The VAIC model designed by [24] divides IC’s performance into four parts; human capital efficiency (HCE), structural capital efficiency(SCE), physical capital efficiency(CEE) and value added intellectual coefficient (VAIC). Current study contains these four aspects of IC as independent variables. Following are the equations which narrate the all independent variables:

- VA (Value added) = Output – Input
- Output = Operating revenues
- Input = Operating expenses excluded labor cost
- HC (Human capital) = Total cost spent on employees
- HCE (Human capital efficiency) = VA/ HC
- SC (Structural capital) = VA– HC
- SCE (Structural capital efficiency) = SC/ VA

- CE (Capital employed) = Firm’s financial and tangible assets
- CEE (Capital employed efficiency) = VA/ CE
- VAIC (Value added intellectual coefficient) = HCE + SCE + CEE

4.3.3 Control variables

Financial leverage, firm size and age can also affect firm’s performance, so they are considered as control variables. “Mutual fund firm” and “time” (2008-2012) has been recognized as dummy variables to perceive their impact. Following measures consist of control variables description:

- Leverage= Total debt to Total assets
- Firm’s size= Natural Log of the firm’s total assets
- Firm’s age= Formation year of organization – Current financial year

5. RESULTS

5.1 Descriptive Statistics

Table 1 interprets the results of descriptive statistics. Results elaborate that HCE (Human capital efficiency) has greater mean than SCE (Structural capital efficiency) and CEE (Physical capital efficiency). It shows that performance of human capital is more than SCE and CEE. On the other side, the mean of CEE is smaller than all other components of IC, which suggest that mutual fund firms have not used their physical assets to their best. VAIC (value added intellectual coefficient) has a mean of 2.58 with a range of -30.87 to 17.45. It indicates that mutual fund firms have generated 2.58 (PKR) on average in term of IC’s performance. Due to a number of loss making firms, ROE and ROA have negative means.

Table 1: Descriptive Statistics

Variables	n	Min.	Max.	Mean	SD
HCE	40	-31.2	14.77	1.34	10.82
SCE	40	-3.40	17.52	1.22	2.74
CEE	40	-0.61	0.26	0.02	0.22
VAIC	40	-30.8	17.45	2.58	11.25
Leverage	40	0.01	0.06	0.02	0.02
Size	40	8.32	10.06	9.06	0.44
Age	40	2	32	15.13	9.28
ROE	40	-0.66	0.25	-0.01	0.22
ROA	40	-0.63	0.25	-0.02	0.22
EPS	40	-8.26	4.23	0.05	2.36

5.2 Intellectual capital performance

Table 2 shows the performance of IC’s components (HCE, SCE, CEE and VAIC) regarding various mutual fund industries from 2008 to 2012. Findings signify that the performance of human capital is relatively superior to SCE (structural capital efficiency) and CEE (capital employed efficiency). Pak Oman Advantage fund limited is the main performer of human capital (HCE=43.37), followed by Golden Arrow Selected funds limited (HCE= 9.57) and Safe Way Mutual fund limited (HCE= 9.49). The performance of SCE is better than CEE. CEE (physical capital efficiency) performance is low than all other IC’s components, it shows that firms haven’t generated more value from their physical

Table2: Intellectual Capital performance (2008-2012)

HCE	SCE	CEE	VAIC	VA*
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Mutual fund firms	(Ranking)	(Ranking)	(Ranking)	(Ranking)	(Ranking)
Pak Oman Fund Ltd.	43.37(1)	4.42(5)	0.53(1)	47.32(1)	599.29(1)
Golden Arrow Funds Ltd.	9.57(2)	4.29(6)	0.17(2)	13.41(3)	295.22(2)
Safe Way Mutual Fund Ltd.	9.49(3)	21.23(1)	0.15(3)	29.62(2)	179.23(5)
Asian Stock Fund Ltd.	9.10(4)	4.05(7)	0.09(4)	12.14(4)	190.11(4)
Namco Balance Fund Ltd.	0.56(5)	-0.19(8)	0.02(5)	0.35(7)	17.95(7)
PICIC Growth Fund Ltd.	-0.11(6)	5.20(3)	-0.01(6)	4.11(5)	220.05(3)
PICIC Investment Fund Ltd.	-0.98(7)	5.32(2)	-0.03(7)	3.98(6)	29.98(6)
First capital mutual fund ltd.	-17.20(8)	4.75(4)	-0.36(8)	-10.62(8)	-70.15(8)

Note: * indicates value added in millions.

Table 3: Multiple regression analyses

Independent variables	ROE		ROA		EPS	
	β	Sig.	β	Sig.	β	Sig.
Model(1,2,3)						
Constant	0.0239	0.739	-0.0281	0.246	3.5570	0.382
HCE	0.0025	0.007*	0.0001	0.674	0.1468	0.212
SCE	-6.4614	0.990	-0.0001	0.332	-0.0154	0.830
CEE	0.8837	0.000*	0.9963	0.000*	2.2612	0.692
Adjusted R ²	0.8984		0.8965		0.7779	
F-value	274.69*		480.31*		115.59*	
Model(4,5,6)						
Constant	-1.2908	0.678	-2.6079	0.407	2.7449	0.531
VAIC	0.0146	0.000*	0.0140	0.000*	0.1788	0.000*
Adjusted R ²	0.8532		0.8641		0.7252	
F-value	41.45*		40.26*		92.36*	

Notes: * indicates significant at 1 percent level; Control variables: leverage, size, age, time and firm.

resources. It signifies that firms should use the tangible resources to their best in order to get valuable results.

5.3 Regression analyses

Table 3 contains the multiple regression results. The results of regression models 1, 2 and 3 indicate that HCE has a positive and significant impact on ROE. On the other hand, CEE's coefficient is positive and significantly (1%) related to ROE and ROA. So, only H1 and H3 are accepted. SCE is not significantly related to any of the performance measures. Moreover, it has negatively affected the all dependant variables. This indicates that H2 should be rejected.

Similar to, [12], efficient performance of human and physical capital is strongly associated with organization's success and value. It is suggested that firms can achieve efficient financial performance by enhancing the value of their human capital. Firms should extract best out of their employees by spending more on them. On the other side, improvement in physical resources can help the mutual fund industries to accelerate smoothly.

Findings of model 4, 5 and 6 verify that VAIC (sum of HCE, SCE and CEE) has a significant and positive impact on all dependant variables (ROE, ROA and EPS). Hence, H4 is accepted. VAIC is the main measurement of IC. So, its significant impact on the financial performance shows that IC has reasonable involvement in the success of Pakistani mutual fund industry. *Adjusted R²* is 0.85, 0.86 and 0.73 for ROE, ROA and EPS. The significance of *adjusted R²* grows when the IC is divided into various parts (HCE, SCE and CEE). Results are consistent with the findings of [20]. Literature has shown that there is a reliable link between IC's efficiency (VAIC) and the firm's performance. So, if the firms are able to enhance their IC's efficiency, reliable and stronger results can be generated.

6. DISCUSSIONS AND CONCLUSIONS

In this challenging and dynamic environment, intangible assets play a bigger role than physical assets. Intellectual capital leads the role of intangible assets. Assessment and practice of intellectual capital (IC) is very important for a firm to enhance its reliable performance. Intellectual capital takes the organization towards superiority and recognition of invisible characteristics. Now a days, firm's performance and success rate is attached with the efficiency of IC and its various aspects.

This study focuses the impact of intellectual capital (IC) and its components on the financial performance of Pakistani mutual fund industries from 2008 to 2012. Mutual fund industry has a big role to play in the country's economy along with other financial firms. This is the first empirical research regarding Pakistani mutual fund industries in context of intellectual capital. IC has been measured with the help of a well renowned technique (VAIC). "VAIC" model was developed by [24] and it is followed by many researchers thereon. Findings suggest that IC's performance is very important for the survival and reliability of mutual fund industries. The financial indicators (ROE, ROA and EPS) of mutual fund firms have strongly perceived the impact of IC and its components (HCE, SCE, CEE and VAIC). Human capital has a positive and significant impact on the financial performance of the firm. This suggests that firms should recognize the value of their employees. Firms are in need of raising the reliability of their human capital by investing more on its labor. On the other side, structural capital hasn't any significant impact on the performance of mutual fund industries.

A firm can't be run without physical resources. Findings of the study indicate that tangible capital has a reliable and significant impact on the financial performance of the firm. All the financial indicators (ROE, ROA and EPS) are in favor of tangible capital efficiency. So, the firms are advised to raise their physical resources along with other parts of IC. Physical capital has a direct influence on the firm's performance. This suggests that physical resources should be utilized to their best. VAIC (sum of HCE, SCE and CEE) is the main indicator of IC. The results signify that VAIC has a reliable and significant effect on the performance of the firm. This stresses upon the fact that firms should raise the intellectual capital's performance. IC can provide the assurance of success and ideas to compete in this challenging atmosphere. IC signifies the firm's invisibility, human power, processes' reliability and better performance of physical resources. So, if the mutual fund industries are going to challenge their competitors and stakeholders, they will have to keep a close eye on the efficiency of their intellectual capital. The main limitation of this study is the less availability of the data. On the other side, a better measurement model for the assessment of IC can be used.

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