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Intellectual Capital and Firm Performance of High Intangible Intensive Industries: Malaysia Evidence

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Abstract

In this paper we examine the effect of the aggregate measure of intellectual capital and its component (human capital efficiency, structural capital efficiency and capital employed efficiency) on firm performance (market valuation, profitability, productivity) from the Technology, Trading and Services, Consumer Products and Hotel sectors listed in the main board of Bursa Malaysia. Using value added intellectual capital (VAIC) to measure intellectual capital as well as market to book value (M/B), returns on equity (ROE), returns on asset (ROA) and asset turnover (ATO) for measuring firm performance. The results of this paper revealed that the aggregate measure of intellectual capital (VAIC) has a positive significant effect on M/B, ROE, ROA and ATO. However, when the individual components of VAIC (human capital efficiency, structural capital efficiency and capital employed efficiency) are analyzed, different findings were obtained.

Keywords: intellectual capital, firm performance, VAIC

1. Introduction

In the new economy, also referred to as knowledge-driven economy, the strength of globalization has emerged so strongly that communication and knowledge have become the most essential materials for a company. The revolution into globalization, information technology and computerization has necessitated for a quick need to identify intellectual capital (IC), or intangibles in a firm's financial reports. Regrettably, conventional financial statement of the firms invariably reports most of the tangible assets thereby neglecting intangible assets (Byrnes & Derhovanesian, 2002; McNamee, 2001; Reed et al., 2002). This issue has been a subject of controversy that non-recognition of intangible assets has resulted to a rise in the gap between market value and book value of the firm (Amir & Lev, 1996; Brennan, 2001; Holland, 2003).

According to the resource-based view (RBV) of the organization, companies achieve competitive advantage and better performance through the acquisition, holding and successive use of tactical assets which are essential for competitive benefits and strong economic performance (Wernerfelt, 1984). Both tangible and intangible properties are viewed as future tactical properties. The RBV of an organization, coupled with the advantages of both tangible and intangible assets, is gaining support in the accounting, economic and strategic management literature, due to the positive outcome of association between organization resources and evaluation of performance (Cañibano, Garcia-Ayuso & Sanchez, 2000). The insertion of intangible assets occurs from their ability to possess all of the features of strategic assets. While some intangible assets do not qualify as strategic assets, IC is universally viewed to be a significant strategic asset (Godfrey & Hill, 1995). IC is the particular and worthy knowledge that belongs to the company (Mouritsen et al., 2003). This classification of IC as a strategic asset is due to an anticipated association between IC on one hand and company performance on the other hand. Hence, the objective of this paper is to examine the effect of the aggregate measure of intellectual capital (VAIC) and its component (human capital efficiency, structural capital efficiency and capital employed efficiency) on M/B, ROE, ROA and ATO.

The data for the study were based on annual financial reports, Datastream of firms from the Technology, Trading and Services, Consumer Products and Hotel sectors listed in the main board of Bursa Malaysia from 2006 to

2010. The final sample after excluding firms with missing information and negative operating income comprises of 92 firms and 460 firm-year observations. The results of this study revealed that the aggregate measure of intellectual capital (VAIC) has a positive significant effect on M/B, ROE, ROA and ATO. However, when the individual components of VAIC (human capital efficiency, structural capital efficiency and capital employed efficiency) are analyzed, different findings were obtained.

The remainder of this paper is structured as follows. The next section, Section 2, provides brief overview of prior empirical studies. Followed by Section 3, which presents the hypotheses development of the study, Section 4 is devoted to research methodology applied in this research, while Section 5 describes the variables of the study which include independent variables and dependent variables. Section 6 report the analysis of the data and the empirical results, and the paper concludes in Section 7 with summaries of the findings.

2. Literature Review

There are significant studies on the relationship between IC and corporate performance. For instance, with the adoption of the sample of listed firms in Bursa Malaysia, Abdullah and Sofian (2012) examined the correlation between four dimensions of IC (human, structural, relational, and spiritual capital) and corporate performance. The researcher reported a significant and positive relationship between all four IC dimensions and corporate performance. They also show that among these dimensions, relational capital has the strongest correlation. An investigative study of the Indian pharmaceutical and textile industry was carried out by Pal and Soriya (2012). The research considered the linkage between intellectual capital with market valuation and monetary performance. Its outcome showed that IC is positively associated to profitability but it does not correlate significantly between IC and market valuation and profitability in the two sectors. Furthermore, Kamath (2008) studied 25 Indian pharmaceutical firms and results did not indicate any significant positive association between the company's performance in terms of profitability, productivity and market valuation with any of the independent variables of intellectual capital except human capital (HC) which was found to have the highest influence on the profitability and productivity of the companies. Maditinos *et al.* (2011) examined the impact of intellectual capital on both market and financial performance of the organizations. The researchers used data from 96 Greek firms listed in the Athens Stock Exchange (ASE). The outcome rejected many of the hypotheses concerning the impact of intellectual capital on organization performance. The study rounded up with a statistically significant association between human capital efficiency (HCE) and economic performance. The outcome varies from that of Chen *et al.* (2005) in Taiwan who find an acceptance of the proposition that organization's IC has a positive relationship with market value and economic performance. Komnenic and Pokrajcic (2012) examined whether intellectual capital has influence on company performance. The findings revealed that human capital is significantly and positively correlated to all three corporate performance dimensions (ROA, ROE and ATO). They also reported that structural capital (SC) has a positive correlation with profitability (ROA and ROE) and partial association with productivity (ATO). Furthermore, Gan and Saleh (2008) assessed if there is a correlation between IC and corporate performance of technology-intensive firms (Malaysian Exchange of Securities Dealing & Automated Quotation, MESDAQ) listed on Bursa Malaysia by analysis market valuation, profitability, and productivity on one hand and value creation efficiency which calculates the Value Added IC on the other hand. The results indicated that technology-intensive firms still rely very much on physical capital efficiency. The outcome also showed that physical capital efficiency is the most significant dimension associated to profitability while HC efficiency is of great relevance in improving the productivity of the firm. The research undertaken by Chan (2009) examined the correlation between intellectual capital which is estimated through VAIC method, and the four dimensions of financial performance (market valuation, ROA, ROE, and productivity) in Hong Kong. The research found that there is no specific evidence to support the hypotheses. Chu *et al.* (2011) followed the research of Chan (2009) and utilized same sample with the extended time between 2001 to 2009. They reported that intellectual capital, as determined by the VAIC, particularly SC is positively related with the company's' profitability. Mondal and Ghosh (2012) used data from 65 Indian banks for the purpose of understanding scientifically the association between IC and economic performance. The authors clearly identified that intellectual capital is an essential determinant of the banks productivity and profitability. The outcome also showed that human capital plays an important roles in increasing the earnings of banks. However, a similar research was carried out in Malaysia by Goh (2005) in commercial banks, it was found that generally, all banks have comparatively higher HC efficiency than structural and capital efficiencies. Muhammad and Ismail (2009) revealed that in the financial industry in Malaysia, Banking subsector is more dependent on IC. It was also found that there is a significant and positive connection between intellectual capital and performance of firms determined by return on assets and profitability. The study by Ting and Lean (2009) on financial companies in Malaysia between 1999 to 2007 indicated that the three elements of VAIC are related with profitability of these firms. The findings is consistent with Shiu (2006) where the

independent variables have the directional signs for capital employed efficiency (+) human capital efficiency (+) and structural capital efficiency (-) related with profitability. The researchers recommended that in order to maximize the firm's profit for financial organizations it is important to increase the utilization of resources, particularly IC. Firer and Williams (2003) adopted similar method of IC measurement, VAIC, and discovered a relationship between the efficiency of value added by a company's main resource bases and productivity, profitability, and market valuation are generally limited and mixed. Bontis (1998b) examined the building of numerous measures and models relating to IC and their influence on commercial performance in Canada. They found a valid, reliable, significant and substantive causal correlation between components of IC and commercial performance. Bontis *et al.* (2000) is among the earlier authors who studied intellectual capital in Malaysia. They analyzed the connection between intellectual capital and company performance for service and non-service firms. The researchers reported that not minding the type of industry, human capital has a positive linkage with customer capital (CC), CC has a huge impact over SC regardless of industry and SC has positive linkage with firm performance irrespective of industry. Another authors, studied the pharmaceutical sector of Jordan and opined that a statistical support for hypothesis of positive correlation exist between three elements of IC and company performance in Egypt (Sharabati et al., 2010). Recently, Suraj and Bontis (2012) evaluated how IC can be considered as a resource to create competitive advantage in Nigerian telecommunications companies. Result indicated that most companies focus on the use of customer capital to enhance their business performance. As discussed above, many researchers reveal positive and significant connection between IC and company performance, but there are a few researches with different outcome (Chan, 2009; Firer & Stainbank, 2003; Maditinos et al., 2011). F-Jardón and Martos (2009) mentioned that utilizing varying frameworks in determining intellectual capital on company performance usually result to different results. They recommend that an adequate use of a variety of variables of firms to measure the connection between intellectual capital and company performance. For instance, companies characteristics (Cabrita & Bontis, 2008), level of country and method of IC measurement (F-Jardón & Martos, 2009).

3. Hypotheses Development

Economic theorists assert that land, labour and money are three significant resources that contribute to the success of corporate enterprises (Sullivan, 1998). However, the last two decades witnessed the transition as the emphasis has shifted from traditional economic system to knowledge intensive system. This change in emphasis created the hype for service industries all over the world. The dominance of service industries in terms of swiping the major share of value creation process has led the world to recognize intellectual capital as another decisive actor of knowledge-based economy, as it plays pivotal role in the firm overall growth. Intellectual capital in recent years has turned to a major source of firm competitive advantage (Holland, 2003). Thus, growth patterns in knowledge intensive economy require re-evaluating the key drivers of growth, as traditional accounting practices have failed to recognize in full the knowledge elements as assets of the firms in financial reporting system. Therefore, the non-recognition of intellectual capital resulted in increasing the gap between market and book values of firms (Amir & Lev, 1996; Brennan, 2001; Holland, 2003; Lev, 2001). The RBV of an organization is gaining support in the accounting, economic and strategic management literature, due to the positive outcome of association between IC as the vital organizational resource and evaluate performance (Abdullah & Sofian, 2012; Pal & Soriya, 2012; Kamath, 2008; Maditinos et al., 2011; Komnenic & Pokrajcic, 2012; Gan & Saleh, 2008; Chu et al., 2011; Mondal & Ghosh, 2012; Goh, 2005; Muhammad & Ismail, 2009; Ting & Lean, 2009; Shiu, 2006; Bontis, 1998; Bontis et al., 2000; Sharabati et al., 2010; Suraj & Bontis, 2012). Accordingly, this paper examines the effect of VAIC and its components on market valuation (mesures by M/B value), profitability (measures by ROA and ROE) and productivity (measures by ATO). To achieve this aim, the following hypotheses are examined:

H_1: There is a significant effect between VAIC and M/B value.

H_{1a}: There is a significant effect between human capital efficiency (HCE) and M/B value.

H_{1b}: There is a significant effect between structural capital efficiency (SCE) and M/B value.

H_{1c}: There is a significant effect between capital employed efficiency (CEE) and M/B value.

H_2: There is a significant effect between VAIC and ROE value.

H_{2a}: There is a significant effect between HCE and ROE.

H_{2b}: There is a significant effect between SCE and ROE.

H_{2c}: There is a significant effect between CEE and ROE.

H_3: There is a significant effect between VAIC and ROA.

H_{3a}: There is a significant effect between HCE and ROA.

H_{3b}: There is a significant effect between SCE and ROA.

H_{3c}: There is a significant effect between CEE and ROA.

H_4: There is a significant effect between VAIC and ATO.

H_{4a}: There is a significant effect between HCE and ATO.

H_{4b}: There is a significant effect between SCE and ATO.

H_{4c}: There is a significant effect between CEE and ATO.

4. Data and Methodology

The data for the study were based on annual financial reports, Datastream of firms from the Technology, Trading and Services, Consumer Products and Hotel sectors listed in the main board of Bursa Malaysia from 2006 to 2010. The initial companies selected consisted of 354 companies. The selected companies from the list were the ones existed from 2006 to 2010. The resultant sample was 136 firms. The final sample after excluding firms with missing information and negative operating income comprises 92 firms and 460 firm-year observations. The study employed multiple regressions to analyze data. Once data collected was coded and entered into the statistical software STATA 12 for processing and developing information patterns related to the context of testing of study hypotheses. The study employed the following multiple regression to analyze data.

Models 1, 2, 3 and 4 examine the association between intellectual capital (measure by VAIC) as independent variable and M/B value, ROA, ROE and ATO as dependent variables.

$$M/B_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (2)$$

$$ROE_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (3)$$

$$ATO_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (4)$$

Moreover, this paper employed Model 5, 6, 7 and 8 to examine the relationship between the individual components of VAIC (HCE, SCE and CEE) as independent variables and M/B value, ROA, ROE and ATO as dependent variables.

$$M/B_{it} = \alpha_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \varepsilon_{it} \quad (5)$$

$$ROA_{it} = \alpha_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \varepsilon_{it} \quad (6)$$

$$ROE_{it} = \alpha_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \varepsilon_{it} \quad (7)$$

$$ATO_{it} = \alpha_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \varepsilon_{it} \quad (8)$$

5. Measurement of Variables

5.1 Dependent Variables

M/B value, ROA, ROE and ATO are classified as dependent variables. In this study M/B is applied as the measure of market valuation, ROA and ROE as the measures of profitability and ATO as the measure of productivity, where;

1) Market to book value (M/B): Market value of equity to book value of equity. Market value of equity computes from the number of shares outstanding multiply by the current stock price at the end of the year. And book value of equity is book value of stockholders' equity

2) Returns on Assets (ROA): ROA is a company's net income divided by total assets

3) Returns on Equity (ROE): Ratio of net profit to shareholders' equity

4) Asset turnover (ATO): It is calculated by dividing total revenue by book value of assets

5.2 Independent Variables

This study employed "value added" as an indicator of IC measurement in a firm. This classification is based on the "value added intellectual capital" (VAIC) method, which was advocated by Pulic (1998). Pulic (1998) defined IC as "how much and how efficiently IC and capital employed create values in the firm". Pulic (1998) categorized IC into three main components:

• Human Capital (HC)

• Structural Capital (SC)

• Capital Employed (CE)

The process to calculate VAIC involves six steps procedure (presented in Table 1).

Table 1. The process of calculating VAIC

Steps	Label	Formula	Description
1	Value Added (VA)	VA = OUT – IN	OUT = revenues and include all products and services sold in the market IN = all expenses for operating a company (exclusive of employee costs which are not regarded as costs)
2	Human Capital Efficiency (HCE)	HCE= VA/HC	HC = total investment in terms of salaries and wages of the staff
3	Structural Capital Efficiency (SCE)	SCE = SC/VA	SC = VA-HC
4	Intellectual Capital Efficiency (ICE)	ICE =HCE +SCE	
5	Capital Employed Efficiency (CEE)	CEE = VA/CA	CA = book-value of net assets
6	Value Added Intellectual Coefficient (VAIC)	VAIC=ICE +CEE	

Source: Pulic (1998, 2004)

As presented in Table 1, human capital efficiency (HCE) creates by one unit of investment in the employees, while structural capital efficiency (SCE) shows the value added efficiency of structural capital. Capital employed efficiency (CEE) indicates how much new value has been created by one unit of investment in the capital employed. On the other hand, intellectual capital efficiency (ICE) shows how efficiently intellectual capital has created value. Finally, value added intellectual coefficient (VAIC) presents how much and how efficiently IC and capital employed create values in the firm.

6. Results and Analysis

The data analysis of this study comprises of descriptive statistic, correlation analysis, and multiple regression.

6.1 Descriptive Statistic and Correlation Analysis

Table 2 indicates the descriptive statistics related to the different variables of objective of the study which is assessing the effect of VAIC and its components (HCE, SCE and CEE) on M/B value, ROE, ROA and ATO. As presented in this table, the mean (median) of HCE, SCE and CEE are 2.399 (1.994), 0.483 (0.491) and 0.350 (0.296), respectively. With regard to VAIC, the mean (median) values are 3.267 (2.817). In terms of M/B value, ROE, ROA and ATO, the mean (median) values are 1.220 (0.632), 0.102 (0.094), 0.064 (0.055) and 1.022 (0.910).

Table 2. Descriptive statistics analysis

Variables	N	Minimum	Maximum	Mean	Median	Std. Deviation
HCE	460	0.057	10.870	2.399	1.994	1.526
SCE	460	-.975	0.994	0.483	0.491	0.219
CEE	460	0.006	1.624	0.350	0.296	0.239
VAIC	460	-0.252	17.181	3.267	2.817	1.869
M/B	460	0.066	17.893	1.220	0.632	1.812
ROE	460	-0.315	0.660	0.102	0.094	0.097
ROA	460	-0.106	0.371	0.064	0.055	0.060
ATO	460	0.080	3.67	1.022	0.910	0.651

N = 460 (number of observations)

HCE = human capital efficiency; SCE = structural capital efficiency; CCE = capital employed efficiency; VAIC = value added intellectual coefficient; M/B = market to book value; ROE = returns on equity; ROA = returns on assets; ATO = asset turnover.

Table 3 reveals the correlation matrix between variables. The findings in Table 3 indicate that HCE, SCE, CEE and VAIC are significantly positively related to M/B, ROE and ROA. This means that HCE, SCE, CEE and VAIC are positively correlated to market valuation, profitability and productivity. In terms of ATO, the result in Table 3 shows that there is a significant and positive correlation between ATO with CEE and VAIC. This indicates that when CEE and VAIC increase, it is expected that productivity will also increase. The results of Table 3 also present that there is no issue of multicollinearity between predictor variables in each model. This is verified by the results below which indicate no issue of high correlation between the explanatory variables (HCE/SCE = 0.747, HCE/CEE = 0.163 and SCE/CEE = -0.020).

Table 3. Pairwise correlation matrix

Variables	**HCE**	**SCE**	**CEE**	**VAIC**	**M/B**	**ROE**	**ROA**	**ATO**
HCE	1.000							
SCE	**0.747**	1.000						
CEE	**0.163**	-0.020	1.000					
VAIC	**0.925**	**0.760**	**0.235**	1.000				
M/B	**0.194**	**0.242**	**0.499**	**0.253**	1.000			
ROE	**0.345**	**0.425**	**0.508**	**0.387**	**0.683**	1.000		
ROA	**0.506**	**0.491**	**0.523**	**0.535**	**0.559**	**0.795**	1.000	
ATO	0.063	-0.027	**0.619**	*0.111*	**0.289**	**0.394**	**0.448**	1.000

Correlation in bold are significant at p<0.01, in italic are significant at p<0.05 and in underline are significant at p<0.10.

6.2 Empirical Results of Multiple Regression

Model 1 examines the effect of the aggregate measure of intellectual capital (VAIC) on M/B. The result reveals that the F statistic is highly significant (F = 31.56, p < 0.000), signifying that VAIC can be considered to be influencing M/B. The adjusted R^2 of 0.062; indicates that the VAIC in the model explain only 6.2% of the variation in M/B. As expected, the VAIC is significantly and positively (coefficient = 0.246, p-value = 0.000) affecting M/B, suggesting that firms with high VAIC are expected to have high market valuation. Therefore, it can reasonably be concluded that Hypothesis H_1 is accepted.

Model 2 investigates the effect of the aggregate measure of intellectual capital (VAIC) on ROE. The result of the pooled sample regression in Table 4 presents that the F statistic is highly significant (F = 80.97, p < 0.000).

Therefore, the VAIC as predictor variable can be considered to be influencing ROE. The adjusted R^2 of 0.148; suggests that the VAIC in the model explains only 14.8% of the variation in ROE. Table 4 reveals that the VAIC is positively and significantly (coefficient = 0.020, p-value = 0.000) influencing ROE. Hence, it can safely be concluded that Hypothesis H_2 is accepted.

The F statistic of Model 3 which assesses the effect of the aggregate measure of intellectual capital (VAIC) on ROA is highly significant (F = 184.20, p < 0.000), signifying that the VAIC as independent variable can be considered to be affecting ROA. The adjusted R^2 of 0.285 shows that, the VAIC in the model explains 28.5% of the variation in ROA. Model 3 reveals that VAIC is significantly and positively (coefficient = 0.017, p-value = 0.000) affecting ROA. Therefore, the finding of Model 3 is supporting Hypothesis H_3.

Model 4 examines the effect of the aggregate measure of intellectual capital (VAIC) on ATO. The F-Value of 5.79 is significant at 0.000, indicating the influence of the VAIC as predictor variable on ATO. Significant and positive influence of VAIC (coefficient = 0.038, p-value = 0.016) on ATO signifies the enhancing of productivity via the increasing the VAIC. With regard to the finding of Table 4, Hypothesis H4 is accepted.

Table 4. The result of multiple regression of VAIC as independent variable and M/B, ROE, ROA and ATO as dependents variables

Variables	**Model 1** Coefficient (p-value)	**Model 2** Coefficient (p-value)	**Model 3** Coefficient (p-value)	**Model 4** Coefficient (p-value)
Intercept	0.415**	0.036 ***	0.007*	0.985***
VAIC	0.246***	0.020 ***	0.017***	0.038 **
Adj. R^2	0.062	0.148	0.285	0.010
R^2	0.064	0.15	0.286	0.012
F-Value (Sig. F)	31.56***	80.97***	184.20***	5.79***
Log likelihood	-910.4633	454.239	717.9427	-452.0125

*** are significant at p < 0.01, ** are significant at p < 0.05 and *at p < 0.10.

As presented in Table 5, Models 5, 6, 7 and 8 are examined the effect of HCE, SCE and CEE as components of VAIC on M/B value, ROE, ROA and ATO.

Model 5 investigates the effect of HCE, SCE and CEE on M/B. Model 5 shows the F statistic is highly significant (F = 74.26, p < 0.000), signifying that HCE, SCE and CEE can be considered to be effecting M/B. The adjusted R^2 of 0.323 indicates that the HCE, SCE and CEE as independent variables in the model explains 32.3% of the variation in M/B. Under this model, as expected SCE (coefficient = 3.272, p-value = 0.000) and CEE (coefficient = 4.085, p-value = 0.000) are significantly and positively affecting M/B. While, HCE is negatively and significantly influenced (coefficient = -0.224, p-value = 0.000) M/B. Therefore, it is concluded that Hypotheses H_{1a}, H_{1b} and H_{1c} are accepted.

Model 6 examines the effect of HCE, SCE and CEE on ROE. The F statistic of Model 6 is highly significant (F = 129.52, p < 0.000), signifying that the three independent variables can be considered to be affecting ROE. The adjusted R^2 of 0.456 shows a strong model explanatory power. Model 6 reveals that SCE (coefficient = 0.248, p-value = 0.000) and CEE (coefficient = 0.224, p-value = 0.000) are significantly and positively affecting ROE. Whereas, HCE is negatively and significantly affected (coefficient = -0.010, p-value = 0.000) ROE. Hence, with respect to findings of Model 6, Hypotheses H_{2a}, H_{2b} and H_{2c} are accepted.

Table 5 also presents the result of Model 7 which examines the influence of HCE, SCE and CEE on ROA. Model 7 shows the F statistic is highly significant (F = 172.38, p < 0.000), signifying that HCE, SCE and CEE can be considered to be effecting ROA. The adjusted R^2 of 0.528 shows the strong model explanatory power. As expected HCE (coefficient = 0.004, p-value = 0.000), SCE (coefficient = 0.115, p-value = 0.000) and CEE (coefficient = 0.129, p-value = 0.000) as three components of VAIC are significantly and positively affecting ROA. Hence, it can safely be concluded that Hypotheses H_{3a}, H_{3b}, H_{3c} are accepted.

Model 8 investigates the influence of HCE, SCE and CEE on ATO. The result shows the F statistic is highly significant (F = 95.62, p < 0.000), signifying that HCE, SCE and CEE can be considered to be effecting ATO.

The adjusted R^2 of 0.382 indicates that the HCE, SCE and CEE in the model explains 38.2% of the variation in ATO. Model 8 reveals that only CEE is positively and significantly (coefficient = 1.720, p-value = 0.000) affecting ATO. Therefore, Hypothesis H_{4c} is accepted. In term of HCE and SCE, the results reveal that no evidence on the relationship between HCE and SCE with ATO. Hence, Hypotheses H_{4a} and H_{4b} are rejected.

Table 5. The result of multiple regression of component of VAIC as independent variables and M/B, ROE, ROA and ATO as dependent variables

Variables	**Model 5** Coefficient (p-value)	**Model 6** Coefficient (p-value)	**Model 7** Coefficient (p-value)	**Model 8** Coefficient (p-value)
Intercept	-1.252***	-0.070***	-0.047***	0.436***
HCE	-0.224***	-0.010***	0.004**	-0.028
SCE	3.272***	0.248***	0.115***	0.106
CEE	4.085***	0.224***	0.129***	1.720***
Adj. R^2	0.323	0.456	0.528	0.382
R^2	0.328	0.460	0.5314	0.386
F-Value (Sig. F)	74.26***	129.52***	172.38***	95.62***
Log likelihood	-834.299	558.541	814.543	-342.6541

*** are significant at $p < 0.01$, ** are significant at $p < 0.05$ and *at $p < 0.10$.

7. Conclusion

According to the RBV of the organization, companies achieve competitive advantage and better performance through the acquisition, holding and successive use of intangible assets which are essential for competitive benefits and strong economic performance. Therefore, this paper examines the effect of VAIC and its components (HCE, SCE and CEE) on M/B, ROE, ROA and ATO. The findings of this study illustrated that the aggregate measure of intellectual capital (VAIC) has a positive significant effect on M/B, ROE, ROA and ATO. This suggests that increasing of VAIC leads to enhancing the market valuation, profitability and productivity. In terms of HCE, SCE and CEE as components of VAIC, the results of the study shows that: (1) HCE has a positive and significant effect on M/B, signifying that profitability of organization will be enhanced due to an increased of HCE. The finding also reveals HCE has negative and significant influence on M/B and ROE; (2) SCE has a positive and significant effect on M/B, ROE and ROA, suggesting an enhancement of market valuation, profitability via the increasing of the SCE; and (3) as expected, CEE is significantly and positively have an effect on M/B, ROE, ROA and ATO. This signifies that increasing of CEE leads to enhancing the market valuation, profitability and productivity.

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