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Nexus between intellectual capital and Firms' Performance: Evidence from the Indian Companies

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Abstract

In the industrialised world, intellectual capital (IC) has acquired respect for boosting the value of businesses and gaining a competitive advantage. Information, knowledge, copyrights, and patents, research and development, human capital, and invention are all examples of intellectual capital (IC), which is also known as intangible assets. According to Forbes, more than 80% of a company's value is generated through inventions and intangibles. In the early days of business, tangible assets were the primary source of corporate value, while intangible assets played a minor role and were mostly used to estimate brand value. However, the current situation has shifted, with intangible assets now accounting for 80% of total assets, because of its growing and developing relevance, corporate value has increased. This paper aims to analyze the association between the intellectual capital efficiency of Nifty 100 companies and market performance over a period of ten years (2009-10 to 2018-19). The study utilized VAIC and the panel regression analysis models for data scrutiny. The study shows that the VAIC market performance of nifty companies is significantly associated with it & human capital or capital effectiveness is significantly associated with market performance (M/B), and structural capital also demonstrates a meaningful relation to the market performance of the listed corporations (M/B). Leverage that contributes more to market values is one of the control factors, although corporate size does not play a significant part in exhibiting market performance progression. Finally, the study revealed that intellectual capital (VAIC) and its dimensions are associated with the market performance of selected firms.

Keywords*:* Intellectual capital efficiency, Value added intellectual coefficient model, Panel regression analysis models, India

Introduction

At present, the knowledge-based and challenging framework had an effect on the productivity of industry sectors, which, in turn, demonstrates the country's progress. Several business sectors claimed that value development was one of the most critical factors in introducing competitive advantages for their businesses. The development of value in a company isn't solely dependent on physical assets; it's also dependent on how well management manages intellectual capital. As a result, in the current business market, a growing number of industries have made adjustments and considerations on non-physical assets or intellectual capital.

Due to advancements in business fields, companies agree that intellectual capital has become a significant factor and asset in measuring and assessing business sector output. According to previous studies, the existing market environment's principles are dependent on intangibles or intellectual resources, as stated by Marr, Gray, and Neely (2003). They assumed that intellectual capital would become a lever for companies and organizations to retain competitive advantage and long-term corporate success. In addition, many businesses and organizations in a variety of industries, including banking, construction, and manufacturing, have changed how they assess and evaluate financial results.

Aside from that, in the modern economy, the success of business industries is further dependent on intellectual capital than on physical assets. Many businesses expected that the efficiency of intellectual capital would have a direct impact on the firm's output, particularly to create a practical issue for managers as well as stockholders. Because of these factors, Wiig (1997) accepted that intellectual capital should be regarded as one of the bases for the company and national growth competitive markets and innovations have resulted in improved country results.

This study's primary objective is to expand the cram of intellectual capital in India by demonstrating how intellectual capital contributes to the firm market value of Nifty 100 companies using the value-added intellectual coefficient model for the span of ten years (2010-2019). This study adds to the body of IC literature since, as Maji and Goswami (2016) point out, a pooled OLS model does not sufficiently explain the link between variables over time within a company, so this study used panel data regression modeling including fixed and random effects, which is more appropriate for longitudinal studies. The context and review of literature are addressed in the following segment followed by the theory, regression models, and testing methods discussed. The final segment includes a thorough review of the findings as well as a conclusion with policy implications.

Review of Literature

Impact of IC on Firms' Market Performance

Castro et al. (2021) return on assets (ROA), market value (MTB), and Tobin's q are used to examine whether the following financial performance indicators have a positive association using the value-added intellectual coefficient VAICTM technique. An OLS regression econometric model was used and findings show that intellectual capital, financial performance, and business value show a weak connection. Weqar et al. (2020) discovered that value-added productivity is considerably and positively related to market growth in a sample of businesses. Human capital efficiency and physical capital efficiency both affect the price to book value, according to Soewarno and Tjahjadi (2020). According to Kasoga (2020), the value-added coefficient has a significant and constructive link with market efficiency. Smriti and Das (2018) discovered that structural and physical capital had a close relationship with market value and firm growth. Sharma (2018) discovered that intellectual capital, structural capital, and capital employed all play a significant role in increasing the market value of Indian firms. Chizari et al. (2016) use a panel regression method to assess the effect of IC on market performance, and the results show that aggregate IC quality, as well as its constituents human and physical resources, have a favorable link with market value measures (M/B, Tobin's Q). According to Wang (2008), there is a meaningful relation between intellectual capital and market value, and the research also shows that US electronic companies are better at using their IC to produce market capitalization. According to Chen et al. (2005), IC is considered a momentous strategic asset because it has a positive effect on business development. The regression results of Riahi-Belkaoui (2003) and Firer and Williams (2003) show a similarity between value-added performance and market value, with corporations with stronger intangible assets being valued better by market investors.

Although substantial research has found a connection between intellectual capital and market-based productivity, there is a subset of research that hasn't. Over ten years, Weqar and Haque (2020) discovered that intellectual capital has a poor link with market valuation (M/B) and competitiveness, but a strong relationship with the profitability of selected companies (2009-2018). Intellectual capital had a favorable connection with firm efficiency, but no significant link with firm market value, according to Soetanto and Liem (2020). Hamdan (2018) discovered a significant connection between value-added efficiency and firm value, but not between value-added efficiency and market results. Maditinos et al. (2011) investigated the correlation between the amount added coefficient and the business and financial performance of Greek listed companies and found that empirically tested theories that investors put a higher value on companies with greater intellectual capital were not confirmed.

Except in high-tech industries, Zeghal and Maaloul (2010) found that firms' intellectual capital had a favorable relationship with corporate performance not even with stock market returns. According to Ghosh and Mondal (2009), the efficiency of value-added efficiency offers a clearer understanding of profitability but does not explain the competitiveness or market valuation of Indian pharmaceutical entities. According to Firer and Stainbank (2003), the efficiency of intellectual capital can explain company profitability and competitiveness but just not stock value.

Research Gap

We attempt to find more clear evidence for the correlation between IC, its constituents, and corporate market-based performance due to a lack of consistency and inconclusive results. Furthermore, there is a gap in the current literature in that research on the correlation between value-added efficiency and market value has not been extensively studied, because this field is still in its nascent. As a result, we explored the task of IC in Indian Nifty 100 companies' market value.

Hypothesis of the study

After an extensive literature review, we formed the following hypothesis of the study.

Intellectual capital (IC) and Market- based performance (M/B)

H1: The value-added intellectual capital coefficient has a positive impact on market value.

H1a: The efficiency of capital used has a positive impact on market value.

H1b: The efficiency of human capital has a positive impact on market value.

H1c: The efficiency of structural capital has a positive impact on market value.

Regression models

Model: 1

$$M/B_{it} = \alpha + \beta 1\ (VAIC)it + \beta 2\ (Lev)it + \beta 3\ (Size)it + \varepsilon it$$

Model: 2

$$M/B_{it} = \alpha + \beta 1\ (CEE)it + \beta 2\ (HCE)it + \beta 3\ (SCE)it + \beta 4\ (Lev)it + \beta 5\ (Size)it + \varepsilon it$$

Where:

M/B is an indicator of market-book value (Chizari et al., 2016), α is constant, $\beta 1$- $\beta 5$ are coefficients premeditated for firm i, *over* a period of *t* (2009-10 to 2018-19), ε is the error term.

Research Methodology

Data and Sample Selection

The sampling frame of the present research is dependent on a secondary collection of data, from the uniqueness of secondary resources, including the sample companies' annual (particularly P&L) reports and balances, and the Prowess directory, for a period of ten years (2010-2019). The sample for this interpretation is the NIFTY 100 companies portrayed by CNX Nifty 100 indexed companies.

Variable definitions

In this section, researchers try to explain the different variables used in the study for the analysis purpose.

Table1 Variable definitions

Variables	Measurements
Dependent variable: Market performance (M/B)	Market capitalization divided by the book value of net assets
Independent variable Human Capital Efficiency (HCE)	HCE divides the value-added proportion. Where: added value = operating profit + costs for the employee + depreciation. Where: HCE = Total employee expenses invested.

Structural capital Efficiency (SCE)	The value-added proportion of SCE. Where: SCE = added value – HCE.
Capital Employed Efficiency (CEE)	The value-added proportion is split by CE. Where: CE = Equitable and Long-term liabilities.
Value Added Intellectual Capital (VAIC)	The index of the dimensions of intellectual capital. Where: HCE+SCE+CEE= VAIC
Control Variables	
Leverage	Calculated as total debt divided by total assets
Size	natural log of total assets

Source: Compiled by authors

Findings and discussions

Descriptive Statistics

Table 2 shows the variable summary statistics and provides insight into the variable distribution. Over the period included for the analysis, the average M/B value is 0.10 percent, with a standard deviation of 0.11 percent. Regarding independent variables, VAIC has the biggest standard deviation (13.30), indicating that the VAIC ratings of sample companies differ. HCE has the highest average score (8.56) among the elements of value creation efficiency. This suggests that the corporations in the sample are more concerned with intangible resources than material resources.

Table2. Summary Statistics of Variables

Variables	Observation	Mean	SD	Minimum	Maximum
M/B	760	0.10	0.10	0	0.77
HCE	760	8.56	13.3	1.45	91.9
SCE	760	0.77	0.18	0.30	0.99
CEE	760	0.22	0.19	0.03	0.95
VAIC	760	9.53	13.30	2.10	92.92
LEV	760	0.14	0.18	0	0.82
SIZE	760	13.38	1.59	10.26	17.43

Source: Stata 15.0

Diagnostic Tests

As mentioned, to use the panel data regression, the article described the multicollinearity problem of VIF/Tolerance and observed that multicollinearity is not an issue as all VIF levels are lower than 10, as shown in the Table2, by Gujarati and Porter (2010). In addition, the modified Wald and Wooldridge tests are often used to control heteroscedasticity and autocorrelation. The results show the lack of both the problems in models because the outcome supported the null hypothesis.

Table3. Multicollinearity test results: VIF and Tolerance

Variables	VIF	1/VIF
VAIC	1.28	0.774
HCE	1.38	0.720
SCE	1.02	0.992
CEE	1.47	0.676
LEV	1.81	0.549
SIZE	1.26	0.785

Source: Stata 15.0

Panel Data Regression Analysis

Table 4 presents the results of the regression of Model 1 and Model 2 in connection to the market-book value dependent variable. Model 1 shows that the VAIC market performance of nifty companies is not significantly associated with it. Model 2 shows that human capital or capital effectiveness is significantly associated with market performance (M/B), but structural capital does not demonstrate any meaningful relation to the market performance of the listed corporations (M/B). Model 2 shows the result of intellectual capital elements. Therefore, based on the statistical result, hypothesis H1-H1c is accepted. The control variables include a corporate size that is negatively associated with market values while leveraging plays an important role in demonstrating market performance progression. These findings favor Weqar and Haque (2020), Liem and Soetanto (2020), and Firer and Stainbank (2003), which shows that intellectual capital & its elements play a vital role in improving the market performance.

Table4. Impact of VAIC and its components on M/B: Regression Results (Models 1 and 2)

Independent variables	Model (1) M/B FE coefficient (t-value)	Model (2) M/B FE coefficient (t-value)
Constant	30.78 (2.76) ***	21.21 (1.93) *
VAIC	0.05(0.75) *	
HCE		0.21 (2.21) **
SCE		0.05 (0.30) *
CEE		17.52 (2.67) ***
SIZE	−1.88(−2.27) **	-1.46 (-1.75) *
LEV	6.47(1.21)	9.55 (1.76) *
R2	0.215	0.198
Rho	0.835	0.846
F-Statistic/ Wald $\chi 2$	19.39	19.36
Model appropriate	Fixed Effect Model	Fixed Effect Model

Source: Stata 15.0

Conclusion and Policy Implications

Researchers and scholars around the globe have gathered prominence because of its distinctive importance for value-added efficiency in the company's market performance. This research aims to explore the link between IC and its aspects and market performance using data from 100 firms over ten years (2010-2019). The sample for this interpretation is the NIFTY 100 companies portrayed by CNX Nifty100 indexed companies. Companies with negative values and incomplete data were eliminated from the finalized sample size by the researcher. The study shows that the VAIC market performance of nifty companies is significantly associated with it. Model 2 shows that human capital or capital effectiveness is significantly associated with market performance (M/B), and structural capital also demonstrates a meaningful relation to the market performance of the listed corporations (M/B). Therefore, based on the statistical result, hypothesis H1-H1c is accepted. Leverage that contributes more to market values is one of the control factors, although corporate size does not play a significant part in exhibiting market performance progression. Finally, the study revealed that intellectual capital (VAIC) and its dimensions are associated with the market performance of selected firms.

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