

# A REVIEW OF EMPIRICAL STUDIES IN INTELLECTUAL CAPITAL AND FIRM PERFORMANCE

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## ABSTRACT

*The intense review of literature shows that intellectual capital is considered as the basic fundamental strategic knowledge based resource for any kind of organization. The researchers argue that the knowledge based resources in organizations carry more than 75 % worth of any organization, as knowledge resources are the determinants of success in today's world.*

*Intellectual capital is essential for the success and well performance of firms but still there is lack of studies in the context of developing countries. Therefore this study attempts to gather the findings of empirical studies that were conducted in intellectual capital perspective. The findings of the studies encouraged to conduct empirical research in developing countries from intellectual capital.*

**Keywords:** *Intellectual Capital, Organizational Performance, developing countries, capital perspective, knowledge resources.*

## Introduction:

In the present global market, companies face cut throat competition, regardless of industry. To develop a competitive advantage, it is important that firms truly leverage the workforce as a competitive weapon. A strategy for improving workforce productivity and to derive higher value for the firm has gained importance. Firms seek to optimize their workforce through comprehensive human capital development programs not only to achieve business goals but also for a long term survival and sustainability. To accomplish this undertaking, firms need to invest resources to ensure that employees have the knowledge, skills, and competencies they need to work effectively in a rapidly changing and complex environment.

In response to the changes, most firms have embraced the notion that Human Capital could enhance competitive advantage that will in turn facilitate higher performance. Human Capital Development becomes a part of an overall effort to achieve cost-effective firm performance. Although there is a broad consensus that Human Capital has positive effects on firms' performance, the notion of performance for Human Capital remains largely untested.

In the present economy knowledge, information, information technologies are the dominating resources in the knowledge based world. Practitioners and

academicians also have paid significant attention to the role of knowledge for global competitiveness and they believe that intangible assets or intellectual capital (IC) is the lever for maintaining competitive advantage and sustainable corporate performance. In reality the wealth of the modern economy no longer depends on physical assets rather it depends on intangible assets. Intellectual capital is associated with the main source of individual, organizational as well as national competitiveness in today's knowledge economy (Wigg, 1997). Not only that, there are several companies (mainly, service sector companies or knowledge intensive companies) earn profit and maintain their existence in the present economy merely depending upon the intangible assets or intellectual assets. Canadian Institute of Chartered Accountants' survey concludes that intellectual assets are crucial for firm's success (Ghosh and Wu, 2007). Abernathy et al., (2003) estimate that investment in intellectual capital creates twice fruits as compared to the same amount of investment in physical assets. However, benefits of intangibles are difficult to define measure and quantify. This suggests that traditional measures of a company's performance, which are based on conventional accounting principles, may be unsuitable in the new economy in which competitive advantage is driven by intellectual capital (Edvinsson and Malone 1997, Pulic 1998). The use of traditional

performance measurement techniques may lead investors and other stakeholders to make inappropriate decisions when companies have a large proportion of their investment in intangible assets (S. Firer and L. Stain bank, 2003).

According to Roos, Edvinsson, and Dragonetti (1998) firm's value is determined by traditional physical, financial capital and intangible intellectual capital. Lev (2001) suggests that the physical and financial assets of firm can only generate normal earnings; abnormal earnings are created through the development of intangible assets. Therefore, in the knowledge economy intellectual capital plays a vital role to enhance business financial performance as well as market value. The present study is a modest attempt to determine the intellectual capital performance and to examine whether intellectual capital performance related with corporate financial performance of Indian knowledge intensive companies or not.

### Definition of Intellectual Capital:

There are a lot of definitions of intellectual capital:

Intellectual Capital has also been defined as the difference between a firm's market value and the cost of replacing its assets. It is those things that we normally cannot put a price tag on, such as expertise, knowledge and a firm's organizational learning ability<sup>1</sup>. Market value equals book value plus intellectual capital, with book value usually only the tip of the iceberg of wealth.

Intellectual Capital encompasses much more than patents, copyrights and other forms of intellectual property. It is the sum and synergy of a company's knowledge, experience, relationships, processes, discoveries, innovations, market presence and community influence<sup>2</sup>.

The most widely used definition of Intellectual Capital is "knowledge that is of value to an organization." Its main elements are Human Capital, Structural Capital, and Customer Capital. That definition suggests that the management of knowledge (the sum of what is known) creates Intellectual Capital<sup>3</sup>.

### Characteristics of Intellectual Capital:

Although Intellectual Capital is similar to tangible assets in its potential for generating future cash flows, it is radically different from tangible capital in the following respects:

Intellectual Assets are non-rival assets. Unlike physical assets which can only be used for doing one

thing at a time, intellectual assets can be multiplexed. For example, a customer support system can provide support to thousands of customers at the same time. It is this ability to scale with need that makes intellectual assets far more superior to physical assets.

Human Capital and Relational Capital cannot be owned, but have to be shared with employees and suppliers and customers. Growing this kind of capital therefore requires careful nurturing.

Structural Capital is an intangible asset that can be owned and controlled by managers. However, it cannot be traded easily since markets do not exist for this purpose. Moreover, Customers do not care about the Structural Capital of their Suppliers since everyone likes dealing directly with real human beings rather than with systems.

Structural Capital, in the form of just-in-time procurement processes and real time inventory control systems can be substituted for expensive capital expenditure such as storage warehouses. Hence the knowledge economy has opened up opportunities for every firm to explore whether inexpensive intangible assets can do the work of costly physical assets.

Firms that leverage their Intellectual Capital to do knowledge work are able to generate higher margin of profits than those who provide mass-produced solutions.

Human, Structural and Relational Capital often work together in judicious combinations to give rise to core competencies that assume strategic significance. Hence it is not enough to invest in people, systems and customers separately, but in combinations that produce end value.

### Review of Empirical Studies of Intellectual Capital:

The main purpose of mentioning and reviewing these previous empirical studies here is to understand and confirm that intellectual capital is the fundamental and crucial asset for organizational survival and success and these studies have proved it. Secondly these studies also confirm that previously intellectual capital and strategic planning are not combined in one single empirical study and in which the intellectual capital mediates the relationship between strategic planning and organizational performance. The review of previous researches and the finding of researchers are presented below.

Kuei – Yang Cheng, (2004), in his research paper entitled, "**Intellectual Capital and Firm Performance of IC Design Companies in Taiwan**", deals with measuring intellectual capital stocks to evaluate and compare the performance of Taiwan IC design companies. Correlation, Linear Regression and Data Envelopment Analysis were used in the study. The results of this study revealed that one third of the companies have excellent efficiency of managing Intellectual Capital. But the efficiency of two thirds of the companies became worse during the study period.

<sup>1</sup> Bontis, Nick, There's a Price on Your Head: Managing Intellectual Capital Strategically, **Business Quarterly**, 60 (4), summer 1996, p. 40-47.

<sup>2</sup> Miller, William, Building The Ultimate Resource, **Management Review**, 88 (1), Jan. 1999, p. 42-45.

<sup>3</sup> Bassi, Laurie, J, Harnessing the power of intellectual capital, **Training & Development**, 51 (12), Dec. 1997, p. 25-30.

V. Murale and Dr.Ashra Fali (2010), in their paper entitled, **“Impact of Intellectual Capital on Firm Value: A Panel Data Analysis of Indian IT firms”**, deal with finding the relationship between Intellectual Capital and Firm Performance, with special reference to Indian Information Technology Industry. The results of Correlation, Regression and Data Envelopment Analysis suggest a positive relationship between Market Value and Book Value. In addition, this study indirectly proves the positive relationship between market value and corporate financial performance.

Samuel Kai Wah Chu, Kin Hang Chan, Ka yin Yu, Hing Tai Ng and Wai Kwan Wong (2010), in their paper entitled, **“An Empirical Study of the Impact of Intellectual Capital on Business Performance”**, deal with the Intellectual Capital Performance of Hong Kong Companies and its association with business. Regression was used in this study. The research result shows new insights into the utilization of IC by businesses in Hong Kong. It was found that IC has an impact on business performance in the companies surveyed in Hong Kong.

Dr. Nick Bontis, William Chua Chong keow and Dr.Stanley Richardson (1999), in their paper entitled, **“Intellectual Capital and Business Performance in Malaysian Industries”**, deal with the empirical study to investigate three elements of Intellectual Capital and their inter relationships within two industry sectors in Malaysia. Cronbach’s Alpha Test and Partial Least Squares were the statistical tools used in the study. Human Capital is important regardless of the industry and finally, in this study, development of Structural Capital has a positive relationship with business performance regardless of industry.

S.Firer and L.Stainbank (2003), in their paper entitled, **“Testing the Relationship between Intellectual Capital and Business Performance: Evidence from South Africa”**, analysed whether the performance of a company’s Intellectual Capital can explain organizational performance. Correlation and Linear Regression were used in this study. The result of this study shows that relationship between the performance of a company’s Intellectual Capital and Profitability, Productivity and Market Valuation are informative but varied. The findings suggest that the performance of a company’s Intellectual Capital can explain profitability and productivity but not market valuation.

Biserka Komenic, Danilo Tomic, and Gordona Tomic, in their Paper entitled, **“Measuring Efficiency of Intellectual Capital in Agricultural Sector of Vojvodina”**, deal with measuring the efficient use of Intellectual Capital by Vojvodina Companies operating in Agricultural Foods Sector. VAIC Model and Rank Matrix were the tools used in this study. The results of the study show that Intellectual Capital is a

significant element for generating overall success of their business operations.

Md Khairu, Amin Ismail, and Nik Maheren Nik Mohamed (2009), in their Paper entitled, **“Intellectual Capital Efficiency and Firm Performance: Study on Malaysian Financial Sector”**, deal with the relationship between Intellectual Capital and Firm Performance. VAIC Model and Multiple Regression Analysis were the statistical tools used in this study. The result reveals that banking sector relied more on Intellectual Capital, followed by Insurance Companies and Brokerage Firms. It was also found that Intellectual Capital has positive and significant relationship with companies’ performance.

Martin Clarke, Dyna Seng and Rosalind H.Whiting (2010), in their paper entitled, **“Intellectual Capital and Firm Performance in Australia”**, deal with the effect of Intellectual Capital on Firm Performance. Descriptive Statistics, Correlation and Linear Regression with VAIC Model were the statistical tools used in the study. The results show that there is a direct relationship between Intellectual Capital and Firm Performance, particularly with Capital Employed Efficiency and to a lesser extent, with Human Capital Efficiency. Evidence also suggests the possibility of moderating the relationship between IC and Physical and Financial Capital, which impacts on Firm Performance.

Pina Puntillo (2009), in his paper, **“Intellectual Capital and Business Performance: Evidence from Banking Industry”**, deals with the relation between the value creation efficiency and financial performance. VAIC model and Multiple Regression Analysis were the statistical tools used in this Study. The results did not show any strong relation between the studied variable except for the relation between a component of VAIC, the CEE and different Measures of the Firm Performance.

Steven Firer and S.Mitchell Williams, in their paper entitled, **“Intellectual Capital and Traditional Measures of Corporate Performance”**, deal with the association between efficiency of value added major components of a Firm Performance and three traditional dimensions of Corporate Performance. Correlations, Multiple Regression and VAIC Model were the statistical tools used in this Study. The results of the study reveal that Physical Capital remains the most significant underlying resources of corporate performance in South Africa.

Chung – Fah Huang and Sung – Lin Hseueh (2007), in their paper entitled, **“Intellectual Capital and Business Performance in the Engineering Consulting Industry: A Path Analysis”**, deal with relationship between Intellectual Capital and Business Performance and seek to understand the acquisition and development status of Intellectual Capital in the Engineering Consulting Industry. Correlation and Path Analysis were the tools used in the study. The result

of the study reveals that, among the Engineering Consulting Firms, the Structural Capital and Relational Capital showed better performance while Human Capital registered poorer performance.

Ste Fania Veltri (2009), in his research paper entitled, **“The Impact of Intellectual Capital Measurement on the Financial Markets: A Meta – Analysis Approach”**, probes the association between Intellectual Capital and Firm Performance. Meta Analysis and Moderator Analysis were used. The result shows that there was positive correlation between Intellectual Capital & Firm Performance.

Tashfeen Hussain, Liton Chakra Borty and Sheehan Rahman, in their paper entitled, **“Testing the Relationship between Intellectual Capital and Firms Market Value and Firm Performance: Evidence from Bangladeshi Industries”**, investigated the relation between Intellectual Capital and Financial performance of firm. Multiple Regression Analysis was the tool used in this study. The empirical study suggests marginal evidence regarding the significance of Intellectual Capital in influencing market value and Financial Performance in Bangladesh.

Amrizah Kamaluddin and Rashidah Abdul Rahaman (2009), in their paper entitled, **“Enhancing Organization Effectiveness through Human, Relational and Structural Capital: An Empirical Analysis”**, investigated the relationship between Intellectual Capital and Organizational Effectiveness. Descriptive Statistics, Correlation and Regression Analysis were the statistical tools used in this study. It was found that among the Intellectual Capital Components, Structural and Relational Capital significantly influenced the organization's effectiveness, with Structural Capital being the strongest predictor.

Paula Kujansivu and Antti Lonnqvist (2005), in their Paper entitled, **“How Investments in Intellectual Capital do create Profits?”**, probed how investments in Intellectual Capital was transformed through various stages into profits. The Correlation Results show no linear relationship between the investments in Intellectual Capital.

Nadine Lybaert, Marc Tiri and Sigrid Vandemaele (2008), in their Paper entitled, **“In search for a link between Innovation, Intellectual Capital and Company Performances”**, explored the relationship between Innovation/Intellectual Capital and Economic Performance. The result did not confirm the relation between innovation and growth.

Muhammad Abdul Majid Makki and Suleman Aziz Lodhi (2008), in their Paper entitled, **“Impact of Intellectual Capital Efficiency on Profitability (A Case Study of LSE25 Companies)”**, explored the relationship between Intellectual Capital Efficiency and Firm's Profitability. The results of regression show that IC Efficiency contributed significantly to

the Firm's Profitability. It can also be developed as a management tool to create a sustainable comparative advantage in the competitive global knowledge economy.

Syed Najibullah (2005), in his paper entitled, **“An Empirical Investigation of the Relationship between Intellectual Capital and Firms' Market Value and Financial Performance in Context of Commercial Banks of Bangladesh”**, employed Correlation and Regression (both standardized and Stepwise) Analysis to establish that there was no strong association between the studied variables.

Saudah Sofian, Mike Tayles and Richard Pike, in their research paper entitled, **“The Implications of Intellectual Capital on Performance Measurement and Corporate Performance”**, examined the impact of the degree and form of IC on management accounting practices, specifically performance measurement and corporate performance. The study explored both the role of management accounting information and that of the management accountant. Results suggest some evolution in performance measurement approaches due to the impact of IC and they also indicate that IC did influence Corporate Performance.

Mu Shun Wang (2011), in his paper entitled, **“Intellectual Capital and Firm Performance”**, tested the relationship between Intellectual Capital and Firm Performance. OLS, Panel Data Regression were the tools used in the study. This paper concludes that firm ought to put emphasis on the human training, customer related management and research development input to cope with the regression period.

M. A. Majid Makki, Suleman Aziz Lodhi and Rashid Rahman (2008), in their paper entitled, **“Intellectual Capital Performance of Pakistani Listed Corporate Sector”**, evaluated the IC performance of the second largest stock exchange of Pakistan, the Lahore Stock Exchange Index Companies (LSE-25). The study employed popular IC Model, Value Added Intellectual Coefficient (VAIC<sup>TM</sup>), developed by Ante Pulic in 1998. Findings indicate that oil & gases, chemical and cement sectors registered top performance while banking sector showed average performance and public sector companies showed least performance.

Shu-Lien Chang, in his research paper entitled, **“Valuing Intellectual Capital and Firms' Performance – modifying Valued Added Intellectual Coefficient (VAIC<sup>TM</sup>) in Taiwan IT industry”**, deals with a broad, analytical perspective for adding two fundamental subcomponents (R&D expenditure and intellectual property) in Pulic's (2000) Value Added Intellectual Coefficient (VAIC<sup>TM</sup>) Method that measures the “value creation efficiency” of a company. It examines the relationship between firms' Intellectual Capital (including human capital, structural capital, and social capital), R&D expenditure, intellectual property, and market

performance. Tests of modified VAIC and measures of corporate performance suggest that R&D expenditure and intellectual property may capture additional information that is omitted from the Pulic's VAIC approach and underline the importance of R&D expenditure and intellectual property in enhancing firms' market performance.

Fayez Abdulsalam, Hameed Al-Qaheri, Ridha Al-Khayyat, in their research paper entitled, **"The Intellectual Capital Performance of Kuwaiti Banks: An Application of VAIC™ Model"**, measured the Intellectual Capital Efficiency of the Kuwaiti Banks. Regression and VAIC Model were the tools used in this study. The results of the rankings of the banks showed that the top two performers in the study were the Commercial Bank of Kuwait, followed by the Gulf bank while the worst performer was Kuwait Real Estate Bank. The results of ranking based on Human Capital Efficiency (HCE), showed similar results as that of VAIC™. However, the ranking results based on Capital Employed Efficiency (CEE) showed the top two performers to be National Bank of Kuwait, followed by the Gulf Bank and the worst performer was still the Kuwait Real Estate Bank.

Sarayuth Saengchan (2010), in his research paper entitled, **"The Role of Intellectual Capital in creating Value in the Banking Industry"**, investigated empirically the relation between the Value Creation Efficiency and Firms' Financial Performance by capturing the perception of Intellectual Capital in the banking industry. Regression and VAIC Model were the tools used for this study. The study confirms the existence of Intellectual Capital in the performance of the Banking Industry in Thailand.

Kate Walsh, Cathy A. Enz and Linda Canina (2008), in their research paper entitled, **"The Impact of Strategic Orientation on Intellectual Capital Investments in Customer Service Firms"**, studied the influence of Intellectual Capital on performance in customer service firms, pursuing different strategic orientations (e.g., low-cost leader, differentiation). Descriptive Statistics, Correlation and Regression were the tools used in this study. The findings reveal a path to financial success for customer service firms through investing in some types of Intellectual Capital. The results have implications not only for those who study the impact of Intellectual Capital Investments on performance but also for those who study the role of knowledge in customer service firms. In addition, the findings are useful for firms making strategic resource allocation decisions, especially when faced with the simultaneous challenge of delivering a service concept while hiring and retaining a labor pool in an industry, notorious for its high turnover.

Fethi Calisir, Cigdem A. Gumussoy, Faruk Cirit and A. Elvan Bayraktaroglu (2011), in their paper entitled,

**"Intellectual Capital in Development and Investment Banks of Turkey"**, compared the development and investment banks in Turkey in terms of Intellectual Capital Performance by using VAIC. The development and investment banks recorded decreasing trend for all type of efficiencies. They concluded that Investment Banks in Turkey began to gather strength.

Dimitrios Maditinos, Željko Šević and Charalampos Tsairidis (2009), in their paper entitled, **"Intellectual Capital and Business Performance: An Empirical Study for the Greek Listed Companies"**, empirically examined the four elements of Intellectual Capital (human capital, customer capital, structural capital and innovation capital) and their relationship with business performance in the Athens Stock Exchange (ASE). Confirmatory Factor Analysis and Structural Equation Model were used as statistical methods to analyze the five hypotheses developed. The results confirmed that (a) Human Capital is important and positively associated with Customer Capital in both service and non-service industries; (b) Customer Capital did not influence non-service industries; (c) Innovation Capital seems to have an important and positive relationship to Structural Capital, regardless of the industry type; and (d) Structural Capital has positive relationship with business performance in both industry types, and especially in non service industries.

Sarayuth Saengchan, in his research paper entitled, **"The Impact of Intellectual Capital on Efficiency: A Comparative Study between Foreign Banks and selected Thai Commercial Banks"**, compared the cost efficiency of domestic and foreign banks in Thailand. Stochastic Frontier (SFA) Model was the tool used in the study. It was found that incomes from bank products including loans, fees and commission and labor costs are significant factors in determining the cost efficiency. In addition, the VAIC and Ownership Coefficient were significantly negative, which supports the effects of Intellectual Coefficient and the different ownership structure.

Ji Yi- Cheng and Fu Chuan – Rui (2010), in their research paper entitled, **"Empirical Study on the Relationship between Intellectual Capital and Corporate Value: A Quantile Regression Model"**, investigated the relationship between various resources and corporate value. Descriptive Statistics, Correlation and Quantile Regression were the statistical tools used in this study. The results show that the Physical Capital had significant positive impact on all listed companies' value, and the impact became stronger when the company's value went up. Human Capital had stable positive effect on corporate value for most companies, but it did not significantly influence the companies with high value. Structural Capital only positively affected those companies with median value.

Kin Gan and Zakiah Saleh, in their paper entitled, “**Intellectual Capital and Corporate Performance of Technology-Intensive Companies: Malaysia Evidence**”, studied the association between Intellectual Capital (IC) and Corporate Performance of technology-intensive companies (MESDAQ) listed on Bursa Malaysia by investigating whether value creation efficiency, as measured by Value Added Intellectual Capital (VAICTM), can be explained by market valuation, profitability, and productivity. Correlation and Regression Models were used to examine the relationship between corporate value creation efficiency and firms’ market valuation, profitability and productivity. The findings from this study show that technology-intensive companies still depend very much on physical capital efficiency. This study concludes that VAIC can explain profitability and productivity but fails to explain market valuation. Taliyang et al. (2011) conducted a study in Malaysia with data from a sample of 150 companies listed in Bursa Malaysia that consist of five industries: information technology, consumer product, industrial product, trading/services and finance and reported that about 72.6 percent of the companies selected disclosed intellectual capital in their annual reports. The data showed that their variables were determinants of intellectual age, size, director ownership and growth. Fatoki (2011) conducted a study in South African SMEs and reported that a significant positive relationship between human, social and financial capital and the performance of SMEs. Pierre and Audet (2011) conducted a study in Canadian and French manufacturing SMEs that participated in a business diagnostic activity and stated that SMEs that adopt different strategies organize their intellectual capital in a particular and adapted way.

### Conclusion:

This paper has presented the review of empirical studies conducted from intellectual and organizational performance perspective. The in-depth review of literature in this context shows that intellectual capital plays an important and fundamental role in the organizational performance and it is considered as the basic fundamental strategic knowledge based resource for any kind of organization. Thought the review of this literature proves that intellectual capital have significant positive impact on organizational performance but a wide literature is present in the context of large organizations and is in western context, and thus this review also shows that there is lack of studies in the context of intellectual capital from developing countries context and more. Therefore the empirical studies should be encouraged in developing countries as Pakistan and Malaysia from intellectual capital and SMEs performance perspective.

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