4.1 - Introduction

From the last couple of decades, both academic research and managerial practice have shown a growing interest for intellectual capital. The intellectual capital of a company basically comprises of three main components: human capital, organizational/structural capital and relational (Bontis, 1999; Edvinsson & Malone, 1997; Edvinsson & Sullivan, 1996; J. Roos et al., 1998).

At present, knowledge and information & technology, whether embodied in human resources or organizational structures, are become primary production factors. Manufacturing or producing companies use these vital assets to gain superior competitive advantage. But in service companies which belong to sectors like IT, banking and finance, pharmaceutical etc, intellectual resources are the main basis of enhancing sales revenue and the profitability also. They use intellectual resources as a capital to their production system. According to Bornemann, Knapp, Schneider, & Sixl (1999) enterprises, which are able to administer their intellectual capital efficiently will be in a superior position in comparison with other firms. The performance of a firm is directly proportional to the strength of its intellectual capital. Brennan & Connell (2000), stated that the long-run business performance can also be achieved by managing the intellectual capital.

4.2 - Intellectual Capital and Financial Performance

In order to explain the relationship of intellectual capital/intangible assets with financial performance of companies, Lonqvist, Kemppila, Mettanen, Pirttimaki, & Uusi-Rauva (2003) had given the following figure.
Figure 4.1: Impact of Intellectual Capital on Financial Performance

![Diagram showing the relationship between Intellectual Capital, Productivity, and Profitability]

*Source: Lonnqvist et.al (2003)*

The above figure establishes the direct and indirect relationship between financial performance and intellectual capital of a company. Intellectual capital affects the profitability directly or by improving the productivity of the company.

Many empirical researches have been done worldwide to examine the impact of intellectual capital on the financial performance of companies. But most of these studies have been conducted on the knowledge intensive firms such as banking, information technology, and pharmaceutical.

### 4.2.1 – Studies conducted in Taiwan

Yang & Lin (2009) conducted a research to examine the relationship of Human Resource (HR) practices with the performance Taiwanese Healthcare Industry. They had used three components of Intellectual Capital – Human Capital, Relational Capital and Organizational Capital as the mediating variables while the HR practices had been taken as the independent variable and firm performance as dependent variable. They assumed that the HR practices are directly proportional to the performance of the companies. The data had been collected by the help of questionnaire survey method. The Structural Equation Modeling had been applied to access the impact and it was evident from the results that the mediating role of IC in the entire gamut of HR practices and performance of firms.
Chen et al., (2005) conducted a research to study the impact of Intellectual Capital on the market value and financial performance of 4254 companies listed in Taiwan Stock Exchange. The study had been conducted for a period of ten years from 1992 to 2002. The intellectual capital had been measured by the VAIC™ measure and R&D & Advertising expenditure where as market value was calculated with the help of market to book value ratios and financial performance by these three proxy measures ROE, ROA, GR & EP. With the help of correlation and regression analysis the researchers found that the investors were placed higher value on firms with better intellectual capital efficiency and those firms yield greater profitability and revenue growth in both the current and the following years. It was also evident from the study that financial performance and market value both were positively associated with the intellectual capital.

Tseng & Goo (2005) conducted a research to examine the role of intellectual capital in enhancing corporate value. They had proved that the intellectual capital played paramount role in improving the corporate value of High-tech companies as compared to non-High-tech companies. Human and organizational capital had an indirect positive impact on corporate value.

Wang & Chang (2005) conducted a research for explore the cause-effect relationship between the components of intellectual capital and business performance. All IT firms listed during the period of 1997-2001 had been taken to conduct this study. The ROA, ROE, MB, etc had been taken as proxy measures for financial performance while the intellectual capital elements were calculated by different proxy measures. The inferential statistics had shown that except human capital all the other elements had a direct influence on performance. The human capital affected the performance indirectly by affecting the other components of intellectual capital. Human capital had been found as the most significant component of intellectual capital because it affected the performance by affecting customer capital through innovation capital and process capital.

Wang (2006) conducted a study to examine the relationship of Intellectual Capital with the market value of the firms in Taiwanese Electronic Sector. The author had applied Skandia Navigator and Ohlson’s model for the calculation of intellectual
capital. A positive relationship between the components of intellectual capital with the market value of the firms had been confirmed by the results.

Shiu (2006) conducted a research to examine the effect of intellectual capital on the financial performance of 80 firms of technological sector. The intellectual capital had been measure by the VAICT™ whereas the ROA, ATO & MB had been taken as proxy variables to measure the financial performance. It was evident from the results that the VAICT™ had a positive association with the ROA and MB whereas it was negatively associated with ATO.

Ghosh & Wu (2007) conducted a study to examine the consequence of structural capital on the value of 144 companies listed in Taiwan Stock Exchange. In this study the value of the firms had been measured by the market to book value ratio and Tobin’s Q while the IT and R&D had been taken as proxy measures for calculating structural capital. The Return on Equity, Economic Growth and Beta had also been taken as control variables. The initial analysis had been conducted by the help of correlation and multiple regression techniques. On the basis of its results the researchers concluded that the market value of the firms had been amplified by the help of structural capital. In the second part of the study the analysis had been done by the help of Scheffe’s comparison test and the researchers found that if the average of financial performance and intellectual capital is above the average of industry than the maximum amount is invested and vice versa.

Peng, Pike, & Roos (2007) conducted a research to recognize the components of Intellectual Capital and their relevancy with the performance of healthcare firms in Taiwan. Among various components of Intellectual Capital only Human Capital had been found relevant.

Chang & Hsieh (2011) conducted a research for examining the relation of intellectual capital with the financial and market performance of 367 Taiwanese semi conductor companies. The Intellectual Capital had been measured by the help of (eVAICT™) in which innovation capital (R&D investments) was also included along with other components of VAICT™. The Pearson correlation and linear multiple regression results showed that the intellectual capital was negatively associated with the financial and market performance of firms.
4.2.2 - Studies conducted in Malaysia

Bontis et al. (2000) had conducted a research to find the interrelationship between various components of intellectual capital of firms in Malaysia. The study based on the primary data collected from 107 respondents through a questionnaire. Nearby 60% of respondents were related from service industry while others from non service industry. The data were analyzed with the help of Partial Least Square technique. Researchers found that the human capital and customer capital had a significantly positive association in both sectors. The customer capital and structural capital had a consistent relationship across different industries. The structural capital and business performance had a positively significant association in service industry but less significant for non service industry.

The study which had been conducted by Sofian, Tayles, & Pike (2006) on more than 100 large Malaysian companies to check the impact of intellectual capital with many other factors. The results showed that the intellectual capital had a positive relationship with industry leadership, future outlook, profit growth, successful new products and some other factors.

Cheukh et al. (2006) had examined the relationship of intellectual capital with the market value of 52 public finance companies. Intellectual had been measure by the VAIC™ while the share prices were taken as the proxy variable for market value. The results confirmed that there was a negative relation between the intellectual capital and market value.

Gan & Saleh (2008) had conducted a study for measuring the effect of various components of intellectual capital on the financial performance of technology-intensive companies. The research sample had drawn from 89 companies listed in Bursa Malaysia under the MESDAQ counters for the years 2004 and 2005. The intellectual capital measured by the help of VAIC™ whereas ROA, MB & ATO had been taken as proxy measures for financial performance. The data had been analyzed by the help of correlation & multiple linear regression. On the basis of inferential statistics the researchers found that the human capital efficiency increased the productivity and physical capital efficiency had significantly associated with the profitability of the company.
Muhammad & Ismail (2009) conducted a research to investigate the impact of intellectual capital efficiency on performance of 18 financial firms listed in Bursa Malaysia for the year 2007. The intellectual capital measured by the help of VAIC™ whereas ROA and profitability had been taken as proxy measures for financial performance. The data had been analyzed by the help of multiple regression analysis. On the basis of inferential statistics the researchers found that the banking institutions in comparison with insurance and securities companies were utilizing their intellectual capital efficiently.

Chen Goh (2005) examined the intellectual capital performance of ten domestic banks and six foreign banks commercial banks in Malaysia from 2001-2003. The intellectual capital of all the banks was calculated by the help of VAIC™. The analysis of results had shown that the HCE was significantly associated with the value creation capability of both domestic and foreign banks in Malaysia. It was also evident from the results that six out of ten domestic banks were incapable in capital utilization even after two years of consolidation exercise.

Kiong Ting & Hooi Lean (2009) conducted a study to check the impact of intellectual capital and its components, on the financial position of 20 financial institutions which were listed in the finance sector of Bursa Malaysia from 1999 to 2007. The intellectual capital measured by the help of VAIC™ whereas ROA had been taken as proxy measures for profitability. The data had been analyzed by the help of spearman’s correlation test & linear multiple regression. On the basis of inferential statistics the researchers found that the human capital and physical capital had significantly positive association with profitability while structural capital had a negative relationship with profitability.

Salleh & Selamat (2007) had examined the intellectual capital management practices of 449 companies from services and manufacturing sector in Malaysia. The data to conduct the study had been collected through a five-point Likert scale questionnaire. It was evident from the results that on average Malaysian firms employ components of intellectual capital.

Saleh, Rehman, & Ridhuan (2009) examined the impact of ownership structure in explaining the variation in the intellectual capital performance of Malaysian companies listed under the MESDAQ market in year 2005 to 2007. The intellectual
capital had been measured by VAIC™ whereas the ownership structure gauged by functioning, governance of the country, kinds of ownership. The results proved that the companies which are being owned by the families always have negative intellectual capital. It is evident from the results that Abidin, Kamal, & Jusoff (2009) conducted a research to investigate the relationship between broad structure and corporate financial performance of 75 companies listed on Bursa Malaysia. Instead of using the financial ratios, the authors used the value added (VA) efficiency of physical and intellectual resources for measuring the financial performance of a firm. It was evident from the results that board composition of employees and board size of a firm both were positively associated with the financial performance of companies.

4.2.3 - Studies conducted in Thailand

Saengchan (2007) conducted a research to gauge the association of intellectual capital efficiency with the financial performance of banking industry in Thailand. It was evident from the results that the intellectual capital efficiency had a strong relationship with the profitability of the banks. While another study which had been conducted by Appuhami (2007) found that the intellectual capital of companies had a positive association with the capital gains of investors.

Jirawuttinunt & Janepuengporn (2012) conducted a research to examine the impact of intellectual capital on the performance of private hospitals in Thailand. The Knowledge Management Effectiveness (KME) and Organizational Innovation (OI) had been used as mediating variables. It was evident from the results that all the components of intellectual capital had significantly influenced the performance of these hospitals.

Phusavat, Comepa, Lutek, & Ooi (2011) empirically investigated the effects of intellectual capital on the industrial operations and performance of the manufacturing firms listed in Thailand Stock Exchange. The ROE, ROA, EG had been taken as proxy measure to gauge the performance of manufacturing firms while the intellectual capital had been calculated by Ante Pulic’s VAIC™. It was evident from the results that the intellectual capital had a significantly positive association with the financial performance of all these companies.
4.2.4 - Studies conducted in China, Singapore & Hong Kong

Zhang, Zhu, & Kong (2006) had conducted a research to analyze the relationship of intellectual capital with the financial performance of automobile companies which were listed in security market of China. It was evident from the results that the intellectual capital had a more significant impact on financial performance rather than physical capital.

Chan (2009a, 2009b) had conducted a research to check the relationship of intellectual capital with the financial performance of companies enlisted in the Hong Kong Stock Exchange. The VAIC™ had been taken as a proxy measure for calculating the intellectual capital while MB, ROA, ATO & ROE had been taken as proxy variables to measure the profitability, productivity and market valuation. The regression analysis concluded that the intellectual capital had no significant association with the financial performance of these companies. It was also evident from the results that among all the components of VAIC™, physical capital was the only component which had a significant association with the financial performance.

Chu, Chan, Yu, Ng, & Wong (2011) conducted a research to check the relationship of intellectual capital with the financial performance of companies in Hong Kong. The study sample included all 151 companies listed in Hang Seng Index over a 4-year period from 2005 to 2008. The intellectual capital had been measured by the VAIC™ where as ATO, ROA, ROE, MB were the proxy variables to measures the financial performance. To check the impact of all the components of intellectual capital on financial performance, the data had been analyzed with the help of multiple regression techniques. On the basis of inferential statistics the researchers found that there was no significant association between the intellectual capital and financial performance of these companies.

Tan, Plowman, & Hancock (2007) examined the relationship of intellectual capital with the financial performance of 150 publicly listed companies in the Singapore Exchange between 2000 and 2002. The intellectual capital had been measured by the VAIC™ where as ROE, EPS & ASR were the proxy variables to measures the financial performance. It was evident from the results that the intellectual capital was significantly associated with the financial performance and the future performance can also be predicted on the basis of it.
4.2.5 - Studies conducted in Italy

Gigante & Previati (2011) investigated the impact of intellectual capital components on performance of Italian Banking Sector during the period 2003-2007. The intellectual capital had been measured by VAICT™ while the performance had been measured by Capital gain on shares. The results showed that the different values may be placed by the investor on all the components of intellectual capital.

Veltri & Silvestri (2011) examined the relevance of intellectual capital related information with the investment patterns. Along with this they also investigated the importance of single component of intellectual capital in value creation of financial sector companies listed on the Italian Stock Exchange for the period 2006-2008. It was evident from the results that the information related to human capital attracts more investment rather than information related to other components of intellectual capital.

4.2.6 - Studies conducted in USA

Belkaoui (2003) had conducted a research to study the relationship of intellectual capital with the financial performance 100 most prominent MNCs in the USA during 1991. Intellectual Capital had been measured by the help of trademarks while financial performance was measured by Net Value Added over Total Assets. The data had been analyzed with the help of regression and the results showed that the intellectual capital had a significant association with the financial performance of these MNCs.

Juma (2006) had also examined the association of intellectual capital with performance in high tech ventures of USA. It was evident from the results that the human capital appeared to be the most important component of intellectual capital for predicting operating performance while for predicting the market-based performance the intellectual property used to be the most relevant component of intellectual capital.

Bramhandkar, Erickson, & Applebee (2007) studied the relationship of intellectual capital with the financial performance of 139 pharmaceutical companies in the USA. It was evident from the results that the financial performance is directly associated
with intellectual capital. Those firms who have high intellectual capital were getting better returns with less variation in their stock prices.

Wang (2008) conducted a study to evaluate the relationship of intellectual capital with the market value of the firm. The research had been conducted on the data of 45 information technology and 50 telecommunications companies from 1996 to 2005. The Intellectual Capital and its components were measured by the help of many different variables where as the market values of these firms were calculated normally. The book value, net income, total asset value had been used as control variables. The data had been analyzed by the help of linear multiple regression. On the basis of inferential statistics the researchers found that there was a significant relationship between the components of intellectual capital with the market value of these companies.

Cheng, Lin, Hsiao, & Lin (2010) had conducted a research to analyze the relationship of intellectual capital with the performance of the US healthcare sector. They had taken the VAIC™ as a proxy measure for calculating the intellectual capital while the performance had been measured by the help of traditional variables. The results established a significantly positive relationship of intellectual capital with the performance of healthcare sector.

4.2.7 - Studies conducted in Russia

Volkov & Garanina (2007) had conducted a study to investigate the impact of physical and intellectual assets on the market value of 43 Russian Companies from 2001 to 2005. By the help of econometrics models the author concluded that the role which is being played by physical assets is more important as compared to intellectual assets but the market value of Russian companies depends on the fundamental value of both physical and intellectual assets.

Baiburina & Golovko (2008) determined the intellectual value as the dissimilarity in the market value of equity shares and book value of equity shares. It was evident from the results that the intellectual enterprise value is influenced through expenditures on the training of employees, controlling shareholder, total assets/number of employees, increased (delta) dividend payout and increased (delta) investment.
Andreeva & Garanina (2017) had conducted a research to examine the affect of intellectual capital on the future competitiveness of 401 Russian companies. It was evident from the results that the intellectual capital works as an indicator of future. The VAICTM was positively correlated with inter-firm relationship indicators, innovation activity and structural capital components.

Tovstiga & Tulugurova (2007) had conducted a study to analyze the impact of internal and external factors on the enterprise performance. They had taken qualitative variables as proxy measure for human capital and structural capital which were consisted in internal factors. The socio-political, technological and economical environments had been taken as proxy measure for external factors. The enterprise performance had been measured by performance outcomes and comparative competitiveness.

The authors surveyed in 20 small and medium sized innovative enterprises through a questionnaire of consisted of 62 items in St Petersburg area. They analyzed the data with the help of SPSS. The regression analysis also showed very high R². Finally the intellectual capital had been identified as the most important factor for driving competitive performance in the market.

4.2.8 - Studies conducted in other countries

Pew Tan et al. (2007) had conducted a study to analyze the association of Intellectual Capital with financial performance of 150 companies listed in Singapore Stock Exchange from 2000-2002. Intellectual capital had been measured by VAICTM measure whereas ROE, EPS & ASR had been taken as proxy measures for financial performance. The data had been analyzed with the help of Partial Least Square technique. Researchers found a positive association of intellectual capital with the financial performance and with the future performance as well. On the basis of findings they concluded that the intellectual capital contributes at different level in various companies.

Maditinos, Chatzoudes, Tsairidis, & Theriou (2011) conducted a research to study the relationship of intellectual capital with the market value and financial performance of 96 companies from four different economic sectors listed in Athens Stock Exchange. The study had been conducted over a period of three years from 2006 to 2008.
intellectual capital had been measured by the VAIC™ measure where as market value was calculated with the help of market to book value ratios and financial performance by these three proxy measures ROE, ROA & GR. With the help of correlation and regression analysis the researchers found that the intellectual capital had no significant relationship with the financial performance of these companies, albeit human capital efficiency and ROE had a significant relationship.

Zeghal & Maaloul (2010) had compared the role of value added as an indicator of intellectual capital and value added capital employed coefficient and their impact on the firm’s economic, financial & stock market performance. This study was based on all UK companies which were listed on the London Stock Exchange in 2005. The value added intellectual capital coefficient and value added capital employed coefficient were measured by the help of VAIC™ whereas OI/S, ROA, MB had been taken as proxy measures for economic, financial and stock market performance, respectively. The size of the company and leverage were also taken as control variables. The data had been analyzed by the help of correlation & linear multiple regression. The inferential statistics had shown that the association of value added intellectual capital coefficient & value added capital employed coefficient with economic, financial and stock market performance is a significantly positive.

Calisir, Gumussoy, Bayraktaroğlu, & Deniz (2010) had conducted a study to compare the efficiencies of all the components of VAIC™ in the IT & Communication sectors of Turkey. The authors found that the efficiency of Human Capital was higher in comparison to the efficiencies of Structural and Physical Capital.

Firer & Williams (2003) conducted a study to examine the relationship of intellectual capital with the financial performance of 75 publicly traded firms in South Africa in 2001. The intellectual capital had been measured by the VAIC™ measure where as ATO, ROA, MB were the proxy measures for financial performance. The size of the firm, leverage, ROE and industry type had been taken as the control variables. The analysis of data had been done by the help of correlation and linear multiple regression. On the basis of inferential statistics the researchers found that except physical capital all the components of intellectual capital had an insignificant relationship with the financial performance.
Clarke et al. (2011) had conducted a research to analyze the effect of intellectual capital on the financial performance of Australian companies. The study carried out on the data collected from 1676 listed companies between 2004 and 2008. The intellectual capital had been measured by the VAICTM measure where as ROA, ROE, RG, EP were the proxy measures for financial performance. The analysis of data had been done by the help of multiple regression technique and ANOVA. Leverage, research intensity, year and industry had also been taken as control variables. The time-lag issues had also been treated. On the basis of inferential statistics the researcher found that the physical capital is the only component of intellectual capital which had a positively significant relationship with the financial performance of underlying companies.

Joshi, Cahill, Sidhu, & Kansal (2013) had examined the relationship of intellectual capital with the financial performance of top 40 financial companies listed in Australian Stock Exchange from 2006-2008. The intellectual capital measured by the help of VAICTM whereas ROA and profitability had been taken as proxy measures for financial performance. The data had been analyzed by the help of multiple regression analysis and ANOVA. On the basis of inferential statistics the researchers found that the similar value creation capabilities of various sub-sectors and the VAICTM had no relation with the profitability of these companies.

Morariu (2014) had conducted a research to analyze the relationship of intellectual capital with the financial performance of 72 Romanian firms which were listed at Bucharest Stock Exchange (BSE) on 31 December 2010. The intellectual capital measured by the help of VAICTM whereas ROE, MB & ATO had been taken as proxy measures for financial performance. The size and industry had also been taken as control variables. The data had been analyzed by the help of multiple linear regression and ANOVA. On the basis of inferential statistics the researchers found that the relationship of intellectual capital with financial performance is insignificant.

Young, Su, Fang, & Fang (2009) had conducted a study of public commercial banks in eight economies from 1996 to 2001. The data had been extracted from the Bank Scope database. In the sample only 1187 observations were left behind after eliminating incomplete data. The physical capital efficiency (VACA) and human capital efficiency (VAHC) had been taken as independent variables along with the
loan quality (LQ), finance utility (FU) and Asian financial crisis (CRIS) as control variables. They set a dummy variable for CRIS, whose value is 1 for 1997-1998 and zero for other years. The VACA & VAHC expected to be greater than 0 while the LQ expected to be smaller than 0.

The researchers found while measuring the intellectual capital performance of banks, the role which has been played by the human capital efficiency is much more relevant as compared to the role of physical capital efficiency.

Kujansivu & Lönnqvist (2007) had conducted a study in Finland to check the relationship between the monetary value of intellectual capital (IC) and its intellectual efficiency and total efficiency. They had taken 15252 companies that cover 11 largest industries in Finland during the period 2001-2003. In addition, companies are categorized by size as SMEs (less than 250 employees) and large companies (at least 250 employees). Most of the companies involved were SMEs (98 percent in 2003).

To determine the monetary value of a company’s IC, Calculated Intangible Value (CIV) had been used. It was evident from the results that the VAIC™ and ICE are directly proportional to each other.

They actually studied the relationship in three stages; in first stage they studied the relationship among all companies; in second stage they compared SMEs and large companies on same parameters and in the last stage they analyzed the relationship on industry basis. The Pearson’s correlation coefficient (r) used to gauge the relationship of IC (CIV) with the efficiency of IC (VAIC™ & ICE). The highest values of IC were in the electronics industry and business services industry which is completely acceptable because both were knowledge-intensive industries in which intangible assets plays very important role. According to the results, among all companies there was a week positive correlation between the CIV & ICE and no correlation between CIV and VAIC™. In case of SMEs and large companies; there was a significant positive correlation between VIC & ICE and no association between CIV & VAIC™ in SMEs but a very weak positive correlation in large companies. In third case; there was a significant positive (weak) correlation between CIV & ICE in 8 industries whereas there was a significant correlation between CIV and VAICTM™.
However, CIV had no relationship with the VAIC™. The results showed that high CIV indicates only high ICE but not high VAIC™.

Guthrie, Petty, & Ricceri (2006) conducted a study for IC reporting firms. Actually they had done three different researches in their study by the help of content analysis technique. In their first study they had taken a sample of 20 largest companies which were listed in Australia in 1998. In their second and third study they had taken the sample of 50 largest Australian companies and 100 companies of Hong Kong for the financial year 2002. All the data had been extracted from the annual financial reports of the firms.

In 1998 study they coded the information contained in the annual reports in accordance with a selected framework of IC indicators. They took 24 variables in which 9 related to internal capital, 9 to external capital and 6 to human capital. After analyzing the data the researchers found the issues of identifying, managing and reporting of intellectual capital components.

In 2002 study the researchers had changed some variables for Australian companies as they had taken for 1998 but the grouping was remained on the pattern of 1998. The results had shown that the intellectual capital information had been disclosed more by Australian companies in 2002.

This research provided an overview of the evolution of intellectual capital and suggested the growing awareness of the need to report IC. It also suggested about the standardization of intellectual capital reporting framework.

Al-Twaijry (2009) had conducted the study about the investments in intangible assets (ITA). He divided the study into two parts. In the first part the author empirically investigated the relationship between ITA and future growth in earnings while in the second part he examined the effect of various variables on the level of investment in ITA. For conducting the study the author had taken a data from 2001-2005, of 384 Japanese companies which were founded before 2001. Slightly more than 30% companies are large (over ¥100 millions), while 16% were of mid size firms and almost 54% were small size firms (less than ¥50 millions).

For investigating the impact of investment in ITA on future growth the author had taken the changes in the company’s annual sales and changes in company’s market
value as proxy variables for growth (in different models) while $\Delta$ITA is the annual changes in ITAs. The regression analysis suggested that investments in ITAs are not always positively associated with near future growth.

On the other hand the author had taken natural log of the total assets, sector and base year as an independent variable that affects the investment in ITA. In another model LV, growth, DPS and natural log of net cash flows were also taken as independent variables to check their impact on investment in ITA. The researchers found that except age, all other variables and their lags had a significant relationship with the ITA or $\Delta$ITA at least in one year. The age of the company had an insignificant relationship with the dependent variables.

Cohen & Kaimenakis (2007) had conducted a research to check the relevance of intellectual capital (IC) in small and medium sized knowledge intensive Greek companies. They divided the IC into three sub-domains (i.e. human capital, organizational capital and customer capital). Human capital sub-domain further contains four elements; organizational capital sub-domain comprises three elements while customer capital sub-domain contains only two elements. Total nine elements were there. The first three hypotheses were about the positive relationship of these three sub-domains with each other. They further distributed these nine elements into three categories hard intellectual assets, soft intellectual assets and functional intellectual assets. The categorization of these elements was based on their absolute value. Both hard and soft intellectual assets included four elements each while functional intellectual assets included only one element. The next three hypotheses were about the positive relationship of soft, hard & functional intellectual assets with corporate performance.

Only those small and medium sized knowledge intensive companies had been taken into which were dealing with three sectors: advertising, information technology and consultancy. On the basis of random sampling 52 firms (18+18+16) that had at least 20 full-time employees were identified. The accounting data used in the analysis refer to year 2003. The profit after tax and sales per employee had been taken as the proxies to measure the corporate performance.

The Cronbach Alpha test measured the reliability of all nine elements and all three IC sub-domains and found that all the values are above 0.60. With the help of both zero-
order and partial correlation analysis the researchers found the significant positive linear correlation between human capital and organizational capital even after taking the customer capital into consideration. They found a positive linear correlation between human capital and customer capital even after the inclusion of organizational capital in the analysis. But they didn’t find any such relationship between organizational capital and customer capital.

In order to check the next three hypotheses, researchers used the logarithm transformation because both financial ratios were highly skewed. On the basis of OLS regression models the researchers concluded that both hard and functional intellectual assets had a positive significant relationship corporate performance. Hard intellectual assets were related to profit after tax while functional intellectual assets were related to sales per employee.

Akdere (2009) had conducted a research to empirically examine the relationship of quality-focused human resource practices (QHRP) with the organizational performance outcomes. The Human Resource (HR) system had two measures, knowledge management and strategic management while the organizational performance had been measured by employee satisfaction & consumer satisfaction (intangibles) and profit (tangible). It was evident from the results that the relationship of human resources with employee and customer satisfaction is significantly positive. In fact the focus of employees is also positively related to the employee satisfaction.

Mehralian, Rajabzadeh, Reza Sadeh, & Reza Rasekh (2012) empirically analyzed the impact of intellectual capital on the financial performance of pharmaceutical companies listed in Iranian Stock Exchange (ISE) from 2004-2009. The VAIC™ had been used to measure the intellectual capital while financial performance had been measured by ROA, ATO & MB. It was evident from the results that only the profitability can be explained by the intellectual capital. Among all the components of intellectual capital only physical capital had impacted the profitability of the companies.

Mavridis & Kyrmizoglou (2005) conducted a study on 17 banks of Greece from 1996 to 1999. The author examined the impact of the use of Human Capital and the Physical Capital on the Value Added based performance. The regression analysis
confirmed that the variations in the value added (VA) based performance of banks is because of different physical and intellectual capital.

Mavridis (2004) analyzed the relationship of intellectual capital with the financial performance of Japanese Banking Industry for one financial year 2000-2001. The intellectual capital had been measured by the help of VAIC™ and the value added had been taken as the dependent variable. It was evident from the results that the difference in the performance of banks is significant. In fact the significant difference also existed in the performance of Japanese banks in comparison with some European banks (Greece and Austria).

4.2.9 - Studies conducted in India

Tandon (2016) conducted a study to investigate the relationship of intellectual capital with the measures of financial performance. Their study is based on the sample comprised 50 publicly listed companies in India represented by CNX Nifty for the period 2004–2014. The authors selected VAIC™ as a measure to calculate the IC while the ROA, ATO & MB had been taken as proxy variables to measure the financial performance. They revealed an interesting fact about the general belief that the concept of VAIC™ is more relevant for knowledge-intensive industries. They showed that some of the top IT companies have the least VAIC™ scores. After analyzing the data with the help of eviews, the author concluded that the overall VAIC™ is found to have a significant positive influence on all the measures of corporate performance, ROA, ATO & MB. On evaluation of the individual components of VAIC™, the authors found CEE as a value driver for improving overall corporate performance. HCE is found to be only significant in its relation with profitability, while SCE failed to have any significant association with any measure of performance.

Pal & Soriya (2012) had conducted a research for measuring the impact of intellectual capital on pharmaceuticals and textile industries in India. The data had been collected from 105 pharmaceuticals and 102 textile companies listed in BSE & NSE both. The sample had been taken for 10 years which was from 2001-2010. The intellectual capital had been measured by the VAIC™ measure where as ATO, ROA, ROE, MB were the proxy measures for financial performance. The analysis of data had been done by the help of correlation and ordinary least square method. On the basis of
inferential statistics the researchers found that the intellectual capital in both the industries was not playing any significant role in the productivity, profitability and in the market valuation of the companies whereas the intellectual capital played a strong factor in influencing return on equity only in pharmaceutical companies.

Mondal & Ghosh (2012) conducted a study on Indian banks to check the impact of intellectual capital on their financial performance. The data had been collected from 65 banks including nationalized, scheduled commercial and foreign banks for ten years, from 1999 to 2008. The intellectual capital had been measured by the VAICT™ measure whereas ATO, ROA, ROE were the proxy measures for financial performance. The analysis of data had been done by the help of correlation and multiple regression techniques. Leverage and size of the firm had also been taken as the control variable. On the basis of inferential statistics the researchers found that the relationship of intellectual capital was significant with the ROA and ATO whereas not the same with the ROE.

Ghosh & Mondal (2009) had conducted a study to investigate the relationship of intellectual capital with the financial performance of Indian pharmaceuticals and software companies. The sample of the present study consisted of 80 leading firms listed on the BSE and the NSE for the financial years 2002-2006. The intellectual capital had been measured by the VAICT™ measure whereas ROA, ATO & MB were the proxy measures for profitability, productivity & market valuation respectively. Leverage, physical capital intensity and size of the firm had also been taken as control variable. On the basis of linear multiple regression the researchers found that the relationship of intellectual capital was significant with profitability only.

Kamath (2008) had conducted a research to investigate the relationship of intellectual capital with the financial performance of 25 Indian pharmaceutical companies listed in the BSE. These 25 companies constitute around 70% of total pharmaceutical industry sales. The study was conducted for the period 1995-1996 to 2005-2006. The intellectual capital measured by the help of VAICT™ whereas ROA, MB & ATO had been taken as proxy measures for financial performance. ROE, market capitalization and leverage had been taken as control variables. The data had been analyzed by the help of correlation & multiple linear regression. On the basis of inferential statistics
the researchers found that the relationship of intellectual capital with financial performance is insignificant.

Kamath (2008) had conducted a study to analyze the extent of voluntary intellectual capital disclosers in India’s emerging sectors. The study sample consisted of 30 technologies, entertainment, communication and other knowledge (TecK) companies listed on the BSE for the financial year 2005-06. The analysis of the results had been done in terms of whether the searched terms were found or not. If yes, in which section they were generally found and in how many companies they were found. On the basis of content analysis the researcher found that only 13 terms were found in the annual reports of the firms out of the 39 terms searched. Only 10 firms out of 32 firms did not disclose these terms.

V, R, & Ashrafali (2010) evaluated the relationship of intellectual capital with the value of 13 Information Technology firms representing BSE and for the period 2003 to 2009. The intellectual capital measured by the help of VAIC™ whereas MB had been taken as proxy measures for firm’s value. The data had been analyzed by the help of correlation & linear multiple regression. On the basis of inferential statistics the researchers found that the relationship of intellectual capital with the market value is significantly positive.

Vishnu & Gupta (2014) examined the relationship of intellectual capital with the financial performance of 22 large pharmaceutical firms in India. The authors used the extended and modified VAIC™ model (e-VAIC™) to measure the intellectual capital while financial performance had been measure by the ROA & Sales. It was evident from the results that relationship of intellectual capital with the financial performance is positively significant.

Choudhury (2010) had conducted a research on Indian information technology sector. The author had taken Human Capital, Structural Capital & Organizational Capital all the components as independent variables while Customer Satisfaction, Product Quality & Innovation as dependent variables to measure the performance of the firms. It was evident from the study that all three components of intellectual capital are positively linked with these measures of performance.
Vishnu & Gupta (2015) had conducted a study to compare the relationship of intellectual capital measured by VAIC™ and extended VAIC™ with the financial performance of healthcare firms in India. The financial performance had been measured by these proxy variables - returns on assets, return on equity and return on sales. The literature criticizes the VAIC™ for non-inclusion of relational capital. So the authors had included the Relational Capital in Extended-VAIC™. It was evident from the results that the relationship of intellectual capital measured by e-VAIC model is positively significant with the financial performance.

This chapter includes many of these studies which have been conducted across the globe. These studies are related to the impact of intellectual capital on the financial performance of different kind of companies. The results of these studies don’t follow a particular trend; in fact some studies have concluded a significant impact of intellectual capital on the financial performance while others have shown an insignificant impact.

In the light of the above mentioned reviews, it can be concluded that only a few studies have been conducted as yet, to examine the relationship of intellectual capital with the financial performance of information technology sector in India. The IT sector falls under the knowledge driven sector and its financial performance depends majorly on the intangible assets rather than on tangible assets.