



International Journal of Law and Management

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Article information:

To cite this document:

Aparna Bhatia, Khushboo Aggarwal, "Impact of investment in intangible assets on corporate performance in India", International Journal of Law and Management, <https://doi.org/10.1108/IJLMA-05-2017-0127>

Permanent link to this document:

<https://doi.org/10.1108/IJLMA-05-2017-0127>

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Impact of Investment in Intangible Assets on Corporate Performance in India

Abstract

Purpose The current paper aims to evaluate the impact of investment in Intangible Assets on the corporate performance of Indian companies for a period of twelve years from 2001-2012.

Design/Methodology Intangible assets have been measured using the 'Intangible Assets Monitor' method developed by Sveiby (1997).

Findings The results of Panel Data Regression model reveal that Intangible Assets affect performance of companies positively after controlling for firm size, age, leverage, physical capital intensity, market share, risk, industries and year dummy.

Originality/Value Specifically considering India, the research related to the association between Intangible Assets and performance is undersized. Thus, the present study would contribute to the existing literature comprehensively.

Practical implications The study is of immense importance to the corporate managers in improving managerial insight into the significance of investment in Intangible Assets. The results direct Indian managers to understand and realize the importance of Intangible Assets and keenly invest in R&D, technology, software, advertising, CRM and human resources to further augment their performance.

Keywords Intangible Assets, Intangible Asset Monitor Method, Panel Data Regression, Tobin's Q, India

1. INTRODUCTION

There is multiplicity as well as ambiguity in the identification of Intangible Assets. Grojer and Johanson (1999) and Guthrie & Petty (2000) termed these as "Soft" assets and "Weightless Wealth". Fincham and Roslender (2003) and Lev (2001) called these as "Intellectual capital" and "Knowledge assets". Andersen (1992) describes intangible assets as non-physical in nature, capable of producing future economic net benefits. Edvinsson & Malone (1997) calls these as "hidden capabilities" of an organization. Brooking (1997) describes them as the "combination of market based intangible assets, intellectual property, human-centered and infrastructure that enables the company to function". Strassmann (1999) defines intangible assets as the difference between the market value of a company and the book value of its tangible assets.

By whatever name the Intangible Assets are called; these assets for sure have gained high prominence in the operations of companies especially in the contemporary decade. Investment in Intangible Assets helps the companies to be innovatory (OECD, 2008) and hence vie their competitors (Canibano *et al.*, 1999; Boujelben and Fedhila, 2011). These are important components of a firm's strategic planning and operations (Wheelen and Hunger, 2011). These assets enhance company's market value (Mishra and Jhunjhunwala, 2009). These provide a firm with improved customer attainment and preservation (OECD, 2008). These help to build customer loyalty and strengthen the brand image of a company (OECD, 2008). Specifically mentioning the relevance of some of these assets, Goodwill is given due consideration at the time of mergers and acquisitions (PWC, 2014). A higher value is paid by a company with the expectation to take advantage of the existing technology, knowledge and name of an established reputed firm (Canibano *et al.* 1999; Gu and Lev, 2001; PWC, 2014). Investment in R&D helps in producing novel products (Pradhan, 2003). Patents, copyrights and trademarks lead to a superior performance by extending monopoly to the firms (Greenhalgh and Rogers, 2012). Authors like Hirschey and Weygandt (1985); Chauvin and Hirschey (1993); Bosworth and Rogers (1998); Andras and Srinivasan (2003); Lantz and Sahut (2005); Nagaoka (2006); Heiens *et al.* (2007); Ehie and Olibe (2010); Boujelben and Fedhila (2011) have shown that R&D intensity is positively associated with the firm performance. Similarly, Advertising and Customer Relationship Management (CRM), another category of Intangibles, are documented as generator of high profits for the companies. Advertised products are easily recallable and identifiable which minimizes the chances of confusion and boost sales (Sahay and Pillai, 2009). Studies as Hirschey and Weygandt (1985); Chauvin and Hirschey (1993); Sahay and Pillai (2009); Kundu *et al.* (2010); Boujelben and Fedhila (2011) found a positive relation of advertising intensity with firm performance. Last but not the least; human asset these days is regarded as the most vital animate Intangible Asset. It forms intellectual capital of companies that helps in earning high profits through their skills and abilities (Arrighetti *et al.*, 2014). Findings of Pew Tan *et al* (2007); Kamath (2008); Wang (2008); Ghosh and Mondal (2009); Clarke *et al* (2011); Wang (2011); Pal and Soriya (2012); Mondal and Ghosh (2012) confirm that Intellectual Capital enhances the firm performance.

No doubt Intangible Assets bear immense strategic relevance, yet they are not recorded fully in Balance Sheet of companies. Infact these are complex to define and difficult to measure

(Goldfinger, 1997; Sveiby, 1997; Lonnqvist, 2004; Gu and Wang, 2005; Lev, 2005; Austin, 2007; Corrado *et al.*, 2012). They lack both consistent data and uniform definition. These assets are difficult to identify separately and thus fail to match the fundamental requirements for accounting recognition (Canibano *et al.*, 1999). Intangibles are non physical in nature and do not follow the same pattern of depreciation as tangible assets (Canibano *et al.*, 1999). Also, the future benefits derived from Intangible Assets are uncertain (Holland, 2001). As a result, economic rents, growth opportunities, and other factors associated with Intangible Assets are not fully captured in the accounting systems.

Research Gap

As suggested by the review of literature, some authors have found a positive impact of Intangible Assets on performance (Bosworth and Rogers, 1998; Godfrey and Koh, 2001; Firer and Williams, 2003; Lau, 2003; Kamath, 2008; Ehie and Olibe, 2010; Kundu *et al.* 2010; Salamudin *et al.*, 2010, Boujelben and Fedhila, 2011; Maditinos *et al.* 2011) while some others have demonstrated the impact as negative one (Barron *et al.* 2002; Fang and Lin, 2010; Ruiwen and Honghui, 2010; Widiantoro, 2012). Thus, the association between Intangible Assets and performance still stands ambiguous. Also many studies have been conducted extensively in the developed nations like USA (Hirschey and Weygandt, 1985; Chauvin and Hirschey, 1993; Gleason and Klock, 2003; Andras and Srinivasan, 2003; Lantz and Sahut, 2005; Heiens *et al.*, 2007; Ehie and Olibe, 2010; Wang, 2011); UK (Lau, 2003); Japan (Lau, 2003; Nagaoka, 2006; Al-Twajjry, 2009); and Australia (Bosworth and Rogers, 1998; Godfrey and Koh, 2001; Clarke *et al.*, 2011; Su and Wells, 2015). Fewer endeavors have been made in developing nations like China (Ruiwen and Honghui, 2010); Taiwan (Wang, 2008); Malaysia (Huang and Liu, 2005; Salamudin *et al.*, 2010); Serbia (Komnenic and Pokrajic, 2012); Singapore (Pew Tan *et al.*, 2007); and Korea (Shin and Kim, 2010). Even lesser research exploring Intangible Assets is found in India (Kamath, 2008; Sahay and Pillai, 2009; Ghosh and Mondal, 2009; Pal and Soriya, 2012). India is one of the leading emerging economies in the world with GDP of 7% and Exports at 17.5% per annum. But still it has huge dependence on foreign countries in terms of expertise, R&D and technology. Hence India being the most attractive market must be explored.

The evaluation of literature available on Intangible Assets also suggests that Intangible Assets have been studied by researchers in parts and fragments only. Some researchers have studied

only R&D as a vital intangible (Bosworth and Rogers, 1998; Huang and Liu, 2005; Hall and Oriani, 2006; Ehie and Olibe, 2010 and Zhu and Huang, 2012) while a few of them have considered only Advertising Intensity as intangible (Kundu *et al.* 2010 and Shah *et al.* 2011). Several others have studied R&D and Advertising Intensity simultaneously (Hirschey and Weygandt, 1985; Chauvin and Hirschey, 1993; Gleason and Klock, 2003 and Greenhalgh and Rogers, 2012). Sometimes 'Intangible Assets' are also defined as just Balance Sheet Intangible Assets (Godfrey and Koh, 2001; Al-Twajry, 2009; Ruiwen and Honghui, 2010; Boujelben and Fedhila, 2011; and Darabi and Vojohi, 2013) while at other times, these have been considered as the difference between Market Value of equity and Book Value of equity (Lau, 2003; Salamudin *et al.* 2010). Thus Intangibles need to be studied holistically by using methodology that captures every incorporeal aspect of business. In India, this gap is even wider and more evident. Majority of the work has been done on a single component of Intangible Assets, that is, intellectual capital alone (Kamath, 2008; Ghosh and Mondal, 2009; Pal and Soriya, 2012).

Thus there is a dearth of a comprehensive research on Intangible Assets and their impact on financial performance of companies. The present study makes an effort to exhaustively include components of Intangible Assets and evaluate their impact on firm performance; thus bridging the research gap.

2. RESEARCH METHODOLOGY

The study is based on a sample of 346 companies selected from BT- 500 (Business Today, November 11, 2012). The study is conducted for a period of twelve years from 2000-2001 to 2011-2012. Firms belonging to Public Sector and Banking and Financial sectors have been excluded from the sample as the nature and significance of Intangible Assets in these companies is not comparable with those in manufacturing sector or service industries (Guo *et al.*, 2011). The companies not existing over the total study period were eliminated. Also companies for which relevant data was not available were not taken. Hence an effective sample of 346 companies was left out for the final analysis. Data is collected from PROWESS, a database of Center for Monitoring Indian Economy (CMIE). Annual reports of companies have also been consulted.

Measurement of Intangible Assets

The Intangible Asset Monitor Method developed by Karl- Erik Sveiby (1997) is used for measuring Intangible Assets. Under this method, Intangible Assets from the liability side of the Balance Sheet are measured as the difference between market value and book value of equity

and from the asset side the Intangible Assets are divided into three parts External Structure (brands, customer and supplier relations); Internal Structure (the organisation management, legal structure, manual systems, attitudes, R&D); and Individual Competence (education and experience). Extending the method, Sveiby (1997) proposed market value of a company as a direct reflection of its Invisible Balance Sheet. The same is presented in Figure 1 as follows:

(insert Figure 1 about here)

Thus, Sveiby (1997) through his well defined and robust model states that Intangible Assets can be visible and invisible. The assets that can be seen in the Balance Sheet and are quantified in monetary terms are the Visible Intangible Assets. These may vary from purchased goodwill, patents, licenses and copyright etc. The assets that form a part of 'under the surface' in the Balance Sheet are Invisible Intangible Assets. These include External Structure, Internal Structure and Individual Competencies. Hence in the present study Intangible Assets are taken as the aggregate of Visible Intangible Assets and Invisible Intangible Assets.

Performance Variables

Following performance variables have been used in the current study:

- (i) **Return on Assets (ROA):** ROA is the widely used indicator for measuring the profitability of a firm. ROA measures the overall efficiency of the management in generating profits given the level of assets at its disposal (Pandey, 2009, pp. 530). ROA has been calculated by dividing the earnings before interest and taxes (net of prior period and extraordinary items) by total assets.
- (ii) **Return on Equity (ROE):** This ratio indicates how well the firm has used the resources of owners. This ratio is most important in financial analysis and is of immense importance to present as well as prospective shareholders as it indicates the extent to which shareholder's wealth maximisation objective has been achieved (Pandey, 2009, pp. 532). ROE has been calculated by dividing the profits after taxes (net of prior period and extraordinary items) minus the preference dividend by the net worth.
- (iii) **Tobin's Q:** This ratio is based on the belief that the combined market value of all the companies on the stock market should be equal to their replacement cost. So, if the value of Q is greater than 1 then the firms will have the incentive to invest and they

will be unwilling to invest when the value of Q becomes equal to 1 (Pandey, 2009, p. 533). Thus, Q greater than unity indicates efficient use of assets, while Q less than unity shows the inability of the firms in using their resources efficiently. Tobin's Q has been calculated by dividing market capitalization plus debt by the book value of total assets. Debt includes both short term and long term borrowings.

Explanatory/ Independent Variables

Besides Intangible Assets, there are certain other factors that may affect the performance of the firms. Hence, it becomes imperative to control all these variables. The variables used are:

- (i) **Size:** Log of market capitalisation has been used as a surrogate for firm size. Log transformation helps in easy interpretation of results and it also makes data closer to a normal distribution.
- (ii) **Age:** Age has been calculated as difference between 2001 (base year) and the year of incorporation.
- (iii) **Leverage:** Leverage has been measured as a ratio of total debt to total assets.
- (iv) **Physical Capital (PC):** PC is measured as the ratio of company's fixed assets to total assets.
- (v) **Risk:** Risk denotes the systematic risk. It has been calculated as the standard deviation of earnings per share over the period 2000-2012.
- (vi) **Market share:** Market share is calculated by dividing the company's sales over the period by the total sales of the industry over the same period.
- (i) **Industry:** It has been taken as a dummy variable. A sample of 346 companies has been divided into sixteen industries based on the Standard Industrial Classification (SIC). A code of 1 has been assigned to a firm in a particular industry and 0 for otherwise. Other Manufacturing Industry is taken as the reference dummy.
- (ii) **Time:** It has been taken as a dummy variable. Year 2001 is taken as the base year and therefore eleven time dummies have been inserted in the model.

Hypotheses of the Study

Based on the review of literature and the conceptual framework the following research hypotheses has been framed and tested:

- H₁ -Intangible Assets have significant impact on the performance of the companies.
H₂ -Firm size has a significant impact on the performance of the companies.

- H₃ -Age of a firm has a significant impact on the performance of the companies.
- H₄ -Leverage has a significant impact on the performance of the companies.
- H₅ -Physical Capital has a significant impact on the performance of the companies.
- H₆ -Risk has a significant impact on the performance of the companies.
- H₇ -Market Share has a significant impact on the performance of the companies.
- H₈ -Nature of industry to which a firm belongs has a significant impact on the performance of the companies.
- H₉ -Time has a significant impact on the performance of the companies.

Statistical Tools Used

In order to evaluate the impact of Intangible Assets on performance Panel Data Regression Model has been used. This is the most appropriate technique as it gives more informative data, less collinearity among variables and more degrees of freedom (Hsaio *et al.*, 2014). Furthermore, the panel data has the capacity to detect and measure the effects that cannot be observed in the pure time series and cross sectional data. Panel data deals with time series and cross sectional simultaneously and gives efficient estimates (Gujarati and Sangeetha, 2009). For this STATA software 11 has been used.

Econometric Specification

To determine whether the Intangible Assets have any significant impact on the corporate performance of the companies, Panel Data Regression model in the following form has been estimated:

$$Y_{it} = \alpha_t + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \beta_8 X_{8(2-16)it} + \beta_9 X_{9(2002-2012)it} + e_{jt}$$

Y_{it} = one of the performance measures (ROA, ROE or Tobin's Q) and is the observation of a company i in a particular year t ;

α_t = the value of the constant

β_{1-8} = the slope of the regression equations

X_1 = Intangible Assets

X_2 = Size

X_3 = Age

X_4 = Leverage

X_5 = Physical Capital

X_6 = Risk

- X_7 = Market Share
 X_8 = Industry Type for which fifteen industries were taken and Food Industry was taken as the reference dummy
 X_9 = Year dummies where 2001 is taken as the base dummy
 e_{jt} = represents the error term
 i = individual company and
 t = year

3. RESULTS AND ANALYSIS

Multivariate Panel Data Regression analysis has been employed to examine the impact of Intangible Assets on performance. The basic assumptions of the panel data models have been checked and the data is found to be normal. The stationarity of the data has been established and the data is free from the problem of multicollinearity. But the data has the problem of autocorrelation and heteroskedasticity. Therefore, to account for these problems, the data has been clustered and the robust standard errors are reported. Table 1 shows the result of Panel Data Regression where ROA, ROE and Tobin's Q are the dependent variable and Intangible Assets are the independent variables. Also, the effect of size, age, leverage, physical capital, risk and market share are controlled for. Industry and year are used as dummy variables and are controlled for. The results are presented in Table 1 as follows:

(insert Table 1 about here)

The results of Table 1 reveal that the value of Wald Chi2 for all the models is significant at 1% level of significance. The overall R^2 has been 31.39%, 17.87% and 46.76% in case of Model I (ROA), II (ROE) and III (Tobin's Q) respectively. Also the results of Table 1 state that Intangible Assets have a positive and significant relation with all the three dependent variables at 1% level of significance. Size as measured by market capitalisation is found to have a positive and significant relation with ROA and Tobin's Q, but is insignificantly related to ROE. Further, age is found to have a significant relation only with Tobin's Q. Leverage is found to be related negatively significant with ROA and ROE but is insignificant with Tobin's Q. Physical capital is found to have significant and positive relation with profitability measures but is insignificantly related with the market performance. Risk is found to have a negative and significant relation with ROA and positive with Tobin's Q but it is insignificant with ROE. On the other hand, market share fails to establish any significant relation with the dependent variable. However,

year dummies and industry dummies are found to be significantly related with the dependent variable. The bird's eye view of results is presented as follows in Table 2:

(insert Table 2 about here)

From Table 2 it can be seen that the Model III represented by Tobin's Q is the most suitable Model with the highest value of R^2 (46.76) implying that 46.76% variation in Tobin's Q are significantly explained by Intangible Assets, size, risk, year and industry. Overall the results reveal a positive and significant relationship between Intangible Assets and performance. Therefore, H_1 is accepted at 1% level of significance. Intangible Assets provide competitive advantage (Boujelben and Fedhila, 2011). Al-Twaijry (2009) also opined that Intangible Assets are fundamental resources of wealth creation and progress of the companies as these assets are unique, rare and difficult for the competitors to imitate (Denicolai *et al.* 2015). Investment in physical assets is subject to diminishing marginal returns, but investment in Intangible Assets is portrayed by increasing returns over time (Denicolai *et al.* 2015). Intangible Assets as Patents, Copyrights, Goodwill and Licenses etc. enhance the market value of the firms (Greenhalgh and Rogers, 2012). Similarly, investment in R&D grants monopoly to the innovator and brings superior performance (Zhu and Huang, 2012). Intangibles as brand names and Customer Relationship Management (CRM) play a vital role in grabbing the market share and help in improving the performance of companies (Lee and Choi, 2015).

Our results support the findings of Godfrey and Koh (2001). The study claimed that Intangible Assets like brands and technological development have growth options and these give opportunities to earn abnormal returns. Similarly, Heiens *et al.* (2007) supports our results by advocating in his empirical work that Intangible Assets like patents, copyrights, licenses and trademarks positively influence shareholder value. Sahay and Pillai (2009) claimed that investment in advertising helps companies in building corporate image that result in enhanced performance. Even Shah *et al.* (2011) found that advertising enhances performance by promoting brand image. Akin to our findings, Kamath (2008) found that Intangible Assets as human resources establishes the name of the company and brands them among better performers. Ehie and Olibe (2010) also found intangible assets to be positively related to performance. They attributed that investment in R&D elevates the innovative capabilities of the firms and helps them to perform better. Supporting the results of our study Lee and Choi (2015) too found that

investment in Intangible Assets as R&D results in new technologies, enhances the productivity and reduces the cost leading firms towards mounted profitability.

However, there exists empirical literature that is contradictory to our results. The results of Cazavan-Jeny (2004) negate our results. The difference was perhaps due to a short time period of six years taken in their study. Intangible Assets being a long term investment require some time to grow and then show its impact on performance. Perhaps a period of six years is insufficient to assess the same. Contrary to our findings Huang and Liu (2005) claimed that R&D shows a positive effect at the beginning but when it reaches its optimal level of performance, it starts declining and thus an inverted U-shaped curvilinear relation is found. Also, Zeghal and Maaloul (2010) opined that there is a high degree of risk and uncertainty involved in Intangible Assets and for this reason the financial risk may lower the performance of the company. The results of the study are also in contrast with the results of Al-Twaijry (2009) who suggested that investments like Intangible Assets need time to reap results and hence may give negative results. Contrary to our results Rao *et al.* (2013) found that R&D investment in initial years showed a negative impact on performance. They mentioned that R&D investment occupies a large amount of capital and resultantly the corporate performance is worsened. The results of our study are in contrast with the findings of Lantz and Sahut (2005). The probable reason of the differences is that they have evaluated only the companies in Technological Sector and that too for just one year. Investment in R&D is a long term process and no immediate benefits can be expected.

The results of Panel Data Analysis reveal that the Size of a company as measured by log of Total Market Capitalisation has positive and significant relation with the performance of the company in terms ROA and Tobin's Q and insignificant in case of ROE. Thus H₂ is accepted at 1% level of significance. This implies that the large sized firms are more profitable than the small firms and hence perform better. The positive impact also states that the large sized firms enjoy economies of scale. They are in a position to easily adapt themselves to the modern technologies and have easy access to working capital and long term finances (Riahi-Belkaoui, 2003). The large sized companies have more funds which in turn lead to corporate development (Fang and Lin, 2010). They have ample resources to employ in the market and enjoy the benefits of diversified portfolios (Lee and Choi, 2015). The loss from one investment avenue gets set off from the income of other investment avenue and hence the large firms have lesser risk. As a result, the financial position of the large firms is stronger than that of the smaller firms.

Moreover, they get better interest rate and discount rate for the bulk purchases (Arrighetti *et al.* 2014). Additionally, large firms have an advantage of specialisation and division of labour (Pervan and Visic, 2012). These factors contribute towards reduction in the overall cost of production and hence are more profitable. The results of the present study corroborate the past studies. Fang and Lin (2010) and Wang (2011) in Taiwan found that the large sized firms have increased performance. Besharati *et al.* (2012) in Tehran and Jasour and Rezazadeh (2013) in Iran also supported the similar findings. However, our results are contradictory with the results of Ho *et al.* (2005). The reason for variation may be due to the reason that Ho *et al.* (2005) have made a comparison of manufacturing and non-manufacturing firms and that too for a very long time period of 40 years from 1962-2001. Chu *et al.* (2011) and Rao *et al.* (2013) also found a negative association between size and performance thus contradictory our findings. They believed that as the size of the firm increases, the transaction cost, agency cost and organizational cost also increases. Therefore, these costs at a certain point of time overpower the economies of scale and the firms' profitability begins to decline.

The results of Panel Data Regression show that Age of a firm is positively and significantly related with ROA and Tobin's Q. But it is found to be negatively related to ROE though the results are insignificant. Therefore, H₃ has been accepted. This suggests that year of foundation has a significant effect on the performance of companies. Older companies have established themselves over years in the market and have more experience (Nagaoka, 2006). They have earned a good reputation and standing in the market (Lee and Choi, 2015). They are not prone to the liabilities of newness and can hence enjoy superior performance (Stinchcombe, 1965). They also take the benefit of customer loyalty and their relationships with the old customers. But the negative results with ROE to some extent reveal that old firms are perhaps inflexible in promptly adapting to the changes in the dynamic era. Also, the old firms have already invested a substantial amount of capital in their existing technologies and perhaps a recurring capital investment for the purpose of technological upgradation becomes difficult for such firms. The results of the study commensurate with the results of Lee and Choi (2015) but are in contrast with the findings of Al-Twaijry (2009).

The results of Panel Regression analysis exhibit that Leverage has a negative association with the performance of a company and is significantly related with ROA and ROE, but has insignificant relation with Tobin's Q. Therefore, hypothesis (H₄) is accepted for the present study. As debt is a

cheaper source of finance, the high leveraged firms should outperform the low leveraged firms. But leverage is a double edged sword. The firms are able to earn profits only when the return is greater than the cost of capital. The results of the study are in confirmation with the results of Huang and Liu (2005); Fang and Lin (2010); Libo *et al.* (2013) suggested that leverage was negatively related to performance. Even in the Indian context, Kundu *et al.* (2010) found leverage to be negatively related to performance. Shin and Kim (2010) too reported a negative relation between leverage and performance and claimed that leverage leads to increase in cost of debt. However, contrary to our results Lau (2003) found a positive association between leverage and performance of the companies in UK and Japan. Even Ehie and Olibe (2010) found that leverage was positive and significant in case of manufacturing sector but negative and insignificant in case of service sector. But when the full model (both manufacturing and service sector) was run, a positive and significant relation was seen. The results of Greenhalgh and Rogers (2012) and Widiatoro (2012) also showed that leverage was positively related to performance but was insignificant. Rao *et al.* (2013) too found leverage to be positively associated to performance as contradictory to our findings.

Physical Capital Intensity measures fixed assets in proportion to total assets. The results of Panel Regression reveal that Physical Capital Intensity has a positive and significant relation with ROA and ROE but insignificant relation with Tobin's Q. This leads to the acceptance of the research hypotheses (H_5) that there is a significant association between Physical Capital Intensity and performance of the companies. The results of the study are contrary to the findings of Pal and Soriya (2012) and Ghosh and Mondal (2009).

The results of Panel Data show that Risk is negatively related to ROA and ROE, though insignificant. But a positive and significant relation is found between Risk and Tobin's Q at 1% level of significance. Therefore, H_6 is accepted purpose of the current study. The results fully support the convention that risk and return are positively related. Empirical literature discussing relationship between risk and performance is very scanty. Yet a few empirical studies are in line with our results. Hirschey and Weygandt (1985); Aboody and Lev (1998) and Ghosh and Wu (2007) found that risk had a positive impact on market value. Contrary to the results of our study, Chauvin and Hirschey (1993) found risk to be negatively related to performance of the companies in USA.

The results of Panel Data Regression highlight that the Market Share fails to establish any significant relation with any of the dependent variable. It is positively related to ROA and negatively related to Tobin's Q. Therefore, it leads to the rejection the hypotheses (H₇) that there exists no significant relation between Market Share and performance for the purpose of the present study. High Market Share may lead to lower financial performance. The firms having exposure to a large market have economies of operations, have advantage of synergetic effects and therefore can recover their fixed costs early. But sometimes the increased market share leads to the problem of reduced gross margins because to capture the market share, firms need to lower the prices while the production cost does not decrease (Ehie and Olibe, 2010). It is also argued that if the market share gets too large then the firm may start suffering from diseconomies of scale which may tend to negate the benefits of large Market Share (Hirschey and Weygandt, 1985). Also when the Market Share enlarges without giving consideration to other factors like intellectual capabilities of human beings, organizational structure and capacity utilization etc. the performance gets negated (Parameswaran, 2010). The results of the present study are in line with those given by Chauvin and Hirschey (1993) and Nagaoka (2006). However contrary to our findings, Hirschey and Weygandt (1985) reported mixed results with Non-Durable Goods Industry showing a positive relation of market share and performance while the Durable Goods industry a negative one. However, when the full model was run Market Share showed a negative and insignificant impact. Similarly, Ehie and Olibe (2010) found mixed evidences regarding the relationship between Market Share and performance. The association was positive when the full model was run without considering time. But the results of pre-crisis and post-crisis time period altered the relationship from positive to negative.

The results of Panel Data Regression show that many industries are significantly related to performance. Largely, H₈ is accepted. Certain industries like Food industry, Chemicals industry and Automobile industries are always in demand. Also the industries like Electricity Generation and Distribution industry get support from the Government. Rubber and Plastic Products industry, Other Non-Metallic Mineral Products industry, Metals industry, Automotive industry, Construction and Accommodation and Other Related Services industry have significant relation with Tobin's Q at 5% level and Textile industry is significant at 10% level. This indicates that these industries are more profitable than the other industries. The firms which are new and are operating in expanding industries, outperform the old and the declining industries (Shergill and

Nargundkar, 2005). Clarke *et al.* (2011) admit that in high-tech and knowledge intense companies, Intangible Assets are of immense importance in value creation process of firms. The nature of industry definitely affects the performance of the companies. Some industries depend on highly qualified professionals with great degree of knowledge while some others require brand names and customer loyalty (Sahay and Pillai, 2009). In certain industries investment in R&D is more important while in some, investment in fixed assets is required (Ehie and Olibe, 2010). The results corroborate with the results of Chen *et al.* (2005) who found that Taiwan plays an important role in global supply chain of the Electronics Industry and showed that industry plays an important role in increasing the performance of the companies. Pew- Tan *et al.* (2007) in Singapore divided the sample into four sectors. He found that the contribution of Intellectual Capital is higher in Services and Property Sector and less in Manufacturing Sector.

Time plays an important role in determining the performance of companies. The results of Panel Data Regression show that year 2002 is negatively related to ROA whereas the years 2007 and 2008 are found to be positively related with ROA. The years 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2012 are positively related to ROE. However, the years 2002, 2003, 2004 and 2009 are negatively related to Tobin's Q; whereas the years 2005, 2006, 2007, 2008, 2010, 2011 and 2012 are positively related to Tobin's Q. The findings reveal that in comparison to the year 2001 (base year), the financial performance of the companies has fallen in the years 2002, 2003, 2004 and 2009. Year 2001 represents technology boom and tech bubble bursting period. By this year the companies had already adjusted to the economic policy and were taking the benefits of liberalization and globalization. But the year 2011 and 2012 are marked as the worst years for the Indian economy due to the double dip recession of USA and the looming collapse of the Eurozone. Thus a negative impact on ROA is seen. Again the year 2006 represents investment boom period, especially for the developing and emerging markets. The results show that time is an important variable that captures the general or industrial level changes. It also helps in controlling the macroeconomic fluctuations like the changes in the expectations, industry level growth and technological changes etc (Nagaoka, 2006; Clarke *et al.* 2011).

4. Conclusion

The present study evaluates the impact of Intangible Assets on the performance of Indian companies. The results report a positive and significant relation between Intangible Assets and performance. Resultantly the study is of immense importance to the corporate managers in

improving managerial insights into the significance of investment in Intangible Assets. The results direct Indian managers to understand and realize the importance of Intangible Assets and keenly invest in R&D, technology, software, advertising, CRM and human resources to further augment their performance. Gone are the days when investment in fixed assets carried supreme importance. Rather the unobserved and unscathed assets bear equal relevance and significance. Also such investment would be more fruitful to large sized companies, older in age and with high physical capital intensity. Investment in Intangible Assets should be a part of strategic intent of managers. In order to be distinct and inimitable they should encourage investment in Intangible Assets. Such investment would definitely strengthen their internal resources and capabilities and become a source of sustained competitive advantage.

Since there is less empirical work available on intangibles in India, so the researchers can definitely look for exploring corporate attributes affecting investment preferences of managers towards intangible assets. Also managerial perception towards investment in intangible assets can be evaluated. Research can also be conducted across countries to know the differences in managerial behavior and other factors leading to investment in intangible assets.

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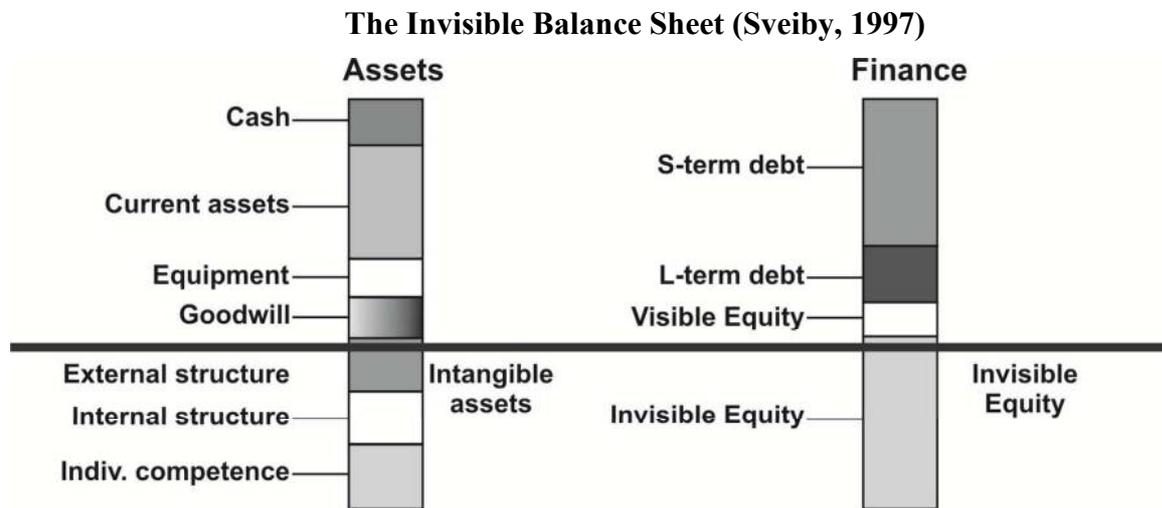
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Figure 1



(Source: Sveiby, 1997)

Table 1
Panel Data Regression Models

Independent Variables ↓ Dependent Variable →	Model I (ROA)	Model II (ROE)	Model III (Tobin's Q)
	Coefficient	Coefficient	Coefficient
Intangible Assets	0.000000804* (5.50)	0.00000183* (5.22)	0.0000436* (16.09)
Size	0.0017416** (2.07)	0.00015 (0.07)	0.1588625* (9.33)
Age	0.0082169 (1.41)	-0.01507 (-1.27)	0.2476483* (3.64)
Leverage	-0.1390052* (-6.48)	-0.10573** (-2.2)	-0.086503 (-0.39)
Physical Capital	0.0687284* (3.64)	0.107479** (2.89)	0.1248116 (0.67)
Market Share	0.1703262 (1.25)	-0.00687 (-0.03)	-1.540446 (-0.76)
Risk	-0.0145798** (-1.89)	-0.01778 (-0.78)	0.4345486* (4.59)
2002	-0.0078202*** (-1.71)	-0.01505 (-1.02)	-0.067866** (-2.76)
2003	0.0016052 (0.29)	0.001282 (0.08)	-0.170109* (-4.91)
2004	-0.0012173 (-0.2)	0.036733** (1.97)	-0.115668** (-2.17)
2005	0.0074264 (1.27)	0.095081* (5.09)	0.0601337 (0.93)
2006	0.0085201 (1.32)	0.094135* (4.48)	0.4729851* (6.16)
2007	0.0209615** (3.23)	0.092038* (4.77)	0.3980516* (5.16)
2008	0.0185048** (2.65)	0.081976* (4.41)	0.063777 (0.8)
2009	0.0110842*** (1.77)	0.064265* (3.4)	-0.087158 (-1.14)
2010	0.0067467	0.047667* (1.77)	0.0077122

	(0.94)	(2.58)	(0.09)
2011	0.0053378 (0.77)	0.025555 (1.47)	0.1974918** (2.13)
2012	0.0034855 (0.5)	0.033869*** (1.76)	0.2426729** (2.43)
Food and Beverages	0.0301827 (1.49)	0.0250982 (0.63)	0.3128355 (0.91)
Textile	-0.0244878 (-1.36)	-0.04161 (-1.09)	0.407755*** (1.79)
Chemicals	0.0015515 (0.1)	0.027736 (0.74)	0.0218947 (0.08)
Drugs & Pharmaceutical	0.017139 (1.23)	0.012677 (0.43)	0.1067826 (0.46)
Rubber and Plastic Products	-0.026683** (-1.94)	-0.01788 (-0.61)	-0.537287** (-2.85)
Other Non- Metallic Mineral Products	0.02340*** (1.8)	-0.0384 (-1.34)	-0.642614** (-3.29)
Metals	-0.0024193 (-0.17)	-0.03091 (-0.99)	0.689092** (3.24)
Electrical Equipment	0.0116707 (0.66)	0.038532 (1.11)	-0.250599 (-1.07)
Machinery and Equipment	-0.0191604 (-1.32)	0.003997 (0.13)	-0.294814 (-1.29)
Automotive	-0.0203332 (-1.12)	-0.01588 (-0.44)	0.73699** (3.03)
Electricity Generation and Distribution	0.0276321*** (1.73)	0.05893*** (1.82)	-0.468926 (-1.56)
Construction	0.0264556** (1.92)	-0.02759 (-0.9)	-0.579529** (-2.91)
Transportation Services	0.0471297** (2.16)	-0.06936 (-1.45)	-0.305735 (-1.21)
Accommodation and Other Related Services	0.0474004** (3.09)	-0.06318 (-1.31)	0.508614** (2.12)
Information and Communication	0.0027734 (0.15)	-0.00949 (-0.29)	0.0035567 (0.02)
Constant	0.0929275* (0.94)	0.154947* (2.58)	0.3782468 (0.09)

	(4.36)	(3.54)	(1.53)
R² (Overall)	31.39%	17.87%	46.76%
Wald Chi2 value (33)	265.79*	195.82*	954.98*
* 1% level of Significance, ** 5% level of Significance and *** 10% level of Significance Figures in parentheses indicate the z-values			

Table 2
Summary of Results of Panel Data Regression Models

Model	Dependent Variable	Significant Variables	R²	Wald-Chi2 Value
I	ROA	<ul style="list-style-type: none"> • Intangible Assets, Size, Physical capital, 3 Years, 5 Industries (Positive) • Leverage, Beta, 1 Year, 1 Industry (Negative) 	31.39%	265.79*
II	ROE	<ul style="list-style-type: none"> • Intangible Assets, Physical capital, 8 Years, 1 Industry (Positive) • Leverage (Negative) 	17.87%	195.82*
III	Tobin's Q	<ul style="list-style-type: none"> • Intangible Assets, Size, Age, Risk, 4 Years, 4 Industries (Positive) • 3 Years, 3 Industries (Negative) 	46.76%	954.98*
* Significant at 1% level of significance				

