

Intellectual Capital: A Strategic Management Perspective

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Strategic management is associated with leveraging the strengths of an enterprise and to cash on the opportunities by overcoming the weaknesses and threats. Realization of the competencies of an enterprise would enable it to establish a competitive edge over its rivals. Since intellectual capital refers to the combined intangible capital which enables the company to function, it is critical for strategic management in knowledge-based industries. In the knowledge-based economy, numerous corporate organizations have utilized intellectual capital as their competitive advantage to create corporate value. The key issue in leveraging intellectual capital, as strategic tool for the business success, lies in the measurement of intellectual capital. As the adage goes, "what can be measured can be managed and what can be managed can be measured." Therefore, measurement of intellectual capital is a precondition for the 'strategic management' of intellectual capital. In this paper, an attempt is made to measure the value of intellectual capital in monetary terms, using the well-established indirect methods. The strength of these methods lies in their ability to utilize publicly available information about the firms. The primary objective of the study is to suggest the availability and reliability of the financial methods for the measurement of intellectual capital of the publicly traded companies, by analyzing the case of the Indian pharmaceutical companies.

Introduction

Innovation is the essence of human endeavor. Since the Stone Age, human beings have been the only creatures on earth who have effectively utilized their intellectual faculty to improve their standard of living through invention and innovation. Innovation is vital for survival and growth and is achieved through investment in intellectual capital. The old economy, as it is referred to, constitute industries that were mainly dependent on visible physical capital. The new economy or the knowledge economy constitute industries that are knowledge-based and knowledge-driven. The rise of the knowledge-based economy has focused the need to reassess the key drivers of economic growth and development. Growth in knowledge economy is contingent upon the capability of a country or a company to adopt or embrace new technologies, techniques, ideas and processes. Traditionally, land, labor and capital were considered to be the most valuable factors of production in economics, whereas in the knowledge economy, intellectual capital eclipses these traditional factors.

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The Preeminence of Intellectual Capital in the Knowledge Economy

The rapid expansion of science and technology established the formal process for innovation, which altered the pattern and structure of production systems. The process of free trade further expanded the diffusion of knowledge, thereby paving way for the establishment of production systems, where knowledge plays an important role. Thus, intellectual capital emerges as a prominent resource in knowledge-based economy. In fact, many companies rely almost completely on their intellectual capital for generating revenues. Intellectual property, an important component of intellectual capital, describes the ideas, inventions, technologies, artworks, music and literature that were intangible when first created, but have become valuable in tangible form as products. In other words, intellectual property is the commercial application of imaginative thought to solve a technical or artistic challenge. Intellectual property is not the product itself, but the special idea behind it, the way the idea is expressed, and the distinctive way it is named and described. Intellectual Property Rights (IPR) legally protect the interests of creators by giving them proprietary rights over their creation, and therefore, enjoy a unique status in the portfolio of corporate capital. Therefore, intellectual property is considered to be the most invaluable of capitals, when compared to movable or immovable property, in knowledge-based industries. Intellectual capital is the manifestation of the collective knowledge, ideas, innovation and wisdom of a company's employees. Companies that recognize the value of intellectual capital have revolutionized the way their businesses are operated. This strategic business approach has also revolutionized the way investors view the firms in which they invest. Intellectual property is becoming an increasingly valuable asset for establishing competitive advantage in virtually all business models. This shift in importance has raised a number of questions that are critical for managing intellectual capital—how an organization assesses the value of such things as brand names, trade secrets, production processes, distribution channels, and work-related competencies; how effectively the intellectual capital can be leveraged for achieving the long-term goals of the company; and how intellectual capital disclosures help in strategic management of knowledge-based companies.

Definition of Intellectual Capital

There is no generally accepted definition of intellectual capital. The terms 'intellectual capital' and 'intangible capital' are used interchangeably as they all represent a non-physical claim to future benefits. Economists call them knowledge capital, management experts refer to them as intellectual capital, and accountants call them intangible capital or intellectual capital. Intangible capital is a generic term used in describing the invisible capital of a firm that generates value for it. Intangible capital, in its evolving forms, is commonly referred to as intellectual capital or knowledge capital or intellectual assets. If intellectual capital is considered as an input, then intellectual assets is referred to as output, in an intangible form. Intellectual assets, when legally protected, become intellectual property. However, many have offered views that provide general concepts.

One of the most succinct definitions of intellectual capital is given by Stewart (1997), as 'packaged useful knowledge'. He explains that this includes an organization's processes,

technologies, patents, employees' skills, and information about customers, suppliers and stakeholders. Various other definitions use concepts such as ability, skill, expertise, and other forms of knowledge that are useful in organizations. A comprehensive definition of intellectual capital is offered by Brooking (1996), which says: "Intellectual capital is the term given to the combined intangible capital which enable the company to function." Petty and Guthrie (2000) observed that "intellectual capital is instrumental in the determination of enterprise value and national economic performance."

Components of Intellectual Capital

The classification of different components of intellectual capital facilitates to apply the concept at strategic and operational levels. According to Edvinsson and Malone (1997), intellectual capital takes three basic forms—human capital, structural capital and customer capital.

Human capital includes knowledge, skills, and abilities of employees. It is an organization's combined human capability for solving business problems. Human capital is inherent in people and cannot be owned by organizations. It also encompasses how effectively an organization uses its people resources, as measured by creativity and innovation.

Structural capital is everything in an organization that supports employees (human capital) in their work. It is the supportive infrastructure that enables human capital to function, and includes traditional things such as buildings, hardware, software, processes, patents and trademarks. In addition, structural capital includes things such as the organization's image, organization, information system, and proprietary databases. Because of its diverse components, Edvinsson and Malone (1997) classified structural capital further into organizational, process and innovation capital.

Organizational capital includes the organization philosophy and systems for leveraging the organization's capability. Process capital includes the techniques, procedures and programs that implement and enhance the delivery of goods and services. Innovation capital includes intellectual properties and intangible capital. Intellectual properties are protected commercial rights such as patents, copyrights and trademarks. Intangible capital is all the other talents and theories by which an organization is run.

Customer capital is the strength and loyalty of customer relations. Customer satisfaction, repeat business, financial well-being and price sensitivity may be used as indicators of customer capital. The notion that customer capital is separate from human and structural capital indicates its central importance to an organization's worth. The relationship with customers is distinct from other relationships either within or outside an organization.

Brooking (1996) suggested that intellectual assets are comprised of four types of assets—market assets, intellectual property assets, human-centered assets, and infrastructure assets. Market assets consist of such things as brands, customers, distribution channels, and business collaborations. Intellectual property assets include patents, copyrights, and trade secrets. Human-centered assets include education and work-related knowledge and competencies.

Infrastructure assets include management processes, information technology systems, networking, and financial systems.

Measurement of Intellectual Capital: A Precondition for Strategic Management

Business organizations that have used their intellectual capital as a tool for strategic management, have established lead over their competitors and have successfully generated wealth of their shareholders. However, the key issue in leveraging intellectual capital, as a strategic tool for business success, lies in the measurement of intellectual capital. An adage goes thus, “what can be measured can be managed and what can be managed can be measured.” Therefore, measurement of intellectual capital is a precondition for the ‘strategic management’ of intellectual capital.

External Purposes for the Measurement of Intellectual Capital

An analysis of a company’s intellectual capital should be able to give external stakeholders reliable information concerning both the company’s current situation and its future potential. It is important in all industries that the external view of a company reflects the true abilities of the company. One critical area is the company’s ability to reach its goal. There has arisen, due to changes in the competitive environment, a gap between the knowledge that a company has about itself and the information that the surroundings get. It is important to reduce this gap in order to provide external stakeholders with the necessary information to form the correct opinion about the company (SND, 1998). The idea is not to provide the external stakeholders with as much information as possible, but rather to provide information that can increase the awareness about a company’s strengths and possibilities.

Measuring and reporting intellectual capital is not meant to be a substitute for the traditional measurement and accounting practices, but rather a supplement. If intellectual capital reports are publicized together with traditional financial reports, external stakeholders would have a better foundation and ability to make the right decisions concerning that company, whether these stakeholders are potential investors, government, credit-firms, customers, potential employees, or competitors. This will, to some extent, close the gap between internal and external knowledge about the company’s abilities. It is, of course, important not to disclose information that might harm the competitiveness of the company. The value of comparing and benchmarking intellectual capital reports will increase when intellectual capital has been measured over years and when the information adds knowledgeable value about the situation. It is important that the indicators are held somewhat stable and are comparable among different companies.

Internal Purposes for the Measurement of Intellectual Capital

Intellectual capital is most importantly a tool for management, to improve a company’s performance. The most important areas where measuring intellectual capital can add value internally are—assisting in strategic choices, analyzing changes both internally and externally,

resource allocation, and motivation of employees. It is important to realize that working with intellectual capital is not something that should be done only at the top level. It should involve employees from all layers in the organization who should be involved in all the phases of development, implementation and day-to-day work with the measuring of intellectual capital. Employees who are a part of this process will more easily develop an understanding of the firm's goals and visions; this will increase the possibility of getting everyone to work in the same direction (SND, 1998). Research has shown that employees feel motivated when their value for the firm is documented (Danish Trade and Industry Development Council, 1998). Their everyday performance is improved because they are recognized and highly appreciated. The most important internal users of a measurement system for intellectual capital are, along with the employees, management and shareholders. If incorporated properly in the philosophy, culture, and vision of the firm, the intellectual capital framework can be used to drive competitive advantage (e.g., Skandia AFS and Celemi Consulting). It is important to keep some information internally and only disclose those information externally that will improve the outside world's view of the firm. Sensitive information that an analysis of a company's intellectual capital uncovers, should stay internal and not be disclosed. Exactly what information is sensitive and what is not, needs to be decided on an individual basis for each company.

Empirical Evidence in Support of the Need for Measuring Intellectual Capital

Some reliable research has been conducted on the effects of measuring a company's intellectual capital. One of the most important and widely referenced empirical researches is the one by the Danish Trade and Industry Development Council (1998). This study on 10 firms working on measuring intellectual capital, found that measuring and actively managing intellectual capital was important for a company's long-term success. Companies measuring and managing their intellectual capital clearly outperformed other companies. The study identifies three reasons for measuring intellectual capital. They are:

1. Implementation of a specific strategy (Consultus, ABB, Skandia, Sparebanken and Rambøll);
2. Upgrading the work with human resources (PLS Consulting, Telia and SCAA); and
3. Supporting or maintaining various parties' awareness of the company (Spar Nord and WM-Data).

A study by Bontis (1998) showed a valid, reliable, significant, and substantive causal link between dimensions of intellectual capital and business performance. The study used statistical analyses of survey data to investigate the causal relationship between a company's investments in intellectual capital and its performance.

Skyrme and Amidon (1997) argued in their international best practice study that there are three main motivations why managers want to embark on measuring their intellectual capital. They are:

1. It provides a basis for company valuation (asset focus);
2. It stimulates management focus on what is important (action focus); and
3. It is a base line for justifying investing in knowledge management activities (benefit focus).

Ferrier and McKenzie (1999), in their study on Australian companies and the benefits that they experienced when focusing on intellectual capital, concluded with the following main areas of benefits:

- Improvements in information provided to shareholders, supporting investment;
- Increased information to support and guide decision making;
- Supporting and providing guidance in the management of human resources; and
- Supporting and providing guidance in the management of customer relationship.

These benefits are information intensive. They can be indirect results of focusing on intellectual capital, and therefore, difficult to logically explain as results of measuring a company's intellectual capital.

Apart from the above, other empirical evidences justify the reasons given below on the need for measuring intellectual capital. The reasons for valuing intellectual capital externally include:

- Growing demand for effective governance of intangibles. Social and environment reporting are examples of this;
- It truly reflects the company's actual worth;
- Improving stock prices by providing a more accurate picture of a firm's capital to current and potential customers;
- It supports the corporate goal of enhancing shareholder value;
- Corporate governance;
- It supports or maintains awareness about the company;
- It helps bridge the present and the past, and stimulates the decentralized development on the need for constant development and attention towards change;
- Strategic positioning; and
- Its effect on the cost of capital (Department of Industry, Science and Resources, Australia, 2001).

Ben-Zion (1984) found that the difference between market value and book value is correlated with R&D expenditures. Thus, his results provide evidence that investors attach a high value to investments aimed at improving the competitive position of companies, and pay little attention to the conservative earnings figure resulting from the full expensing of R&D.

Griliches (1990) observed that for large public corporations, there is a practically linear relationship between investment in research and development, the number of patents obtained, and the rise in the value of intangible capital. It should be noted that in this context, the value of intangible capital was obtained as the difference between the market capitalization and net worth.

Hall (1993), in a study using 2,500 US companies, found that the stock market valuation of R&D capital has fallen from 1979-1983 to 1986-1991. While analyzing this phenomenon, it was found that during this period, there were large-scale mergers and acquisitions of industries involving consumer products, where advertisement was considered to create relatively more value than R&D.

Hall and Hall (1993) observed stock market valuation of the US companies between 1964 to 1991 and estimated the effects of different ratios, namely R&D, advertising, tangible investment, and debt. They found that companies with higher levels of R&D and tangible investment had lower discount rates.

Sougiannis (1994) found that, on an average, a one dollar increase in R&D expenditures leads to a two dollar increase in profit over a seven-year period. From the results of the valuation model, he analyzed that investors place a high value on R&D investments. On an average, a one dollar increase in R&D expenditure produces a five dollar increase in market value.

Sveiby (1995) observed that share prices are the only reasonably reliable measure of the market value of intangible capital. Companies rich in intangible capital tend to have high share prices, relative to their tangible capital. He stated that the trouble is that the value of intangible capital cannot be deduced, like the value of tangible capital, from routine market transactions. It only emerges in an indirect way, or when a company changes hands. Pharmaceutical companies are generally rated even more highly than service companies. The intangible capital of pharmaceutical companies lies in their R&D portfolios and brand names.

Bosworth and Rogers (1998), in a study on 35 Australian firms covering 1991 to 1994, found that intangible capital, and not R&D, was related to company value. They included lagged revenue growth as a proxy for accumulated intangible capital not captured in the other variables. However, this factor may also directly influence market value because of its influence on share traders' expectations.

Hall (2000) surveyed the limited literature on the market value of intangible capital associated with innovation and found that R&D capital is valued by financial markets. In this survey, it was found that R&D is a better variable than patents in explaining market value. This survey also highlighted that citation-weighted patents are slightly more informative than patents. It summarized the empirical researches undertaken related to innovation and market value.

Hall *et al.* (2000), in the literature on IPR and market value, maintained that investors have rational expectations concerning the relationship between firms' knowledge capital and stock of knowledge. In other words, financial markets (stock market) are assumed to

price shares correctly. Investors' estimate of the future dividend payments will be a function of the stock of tangible and intangible capital owned by a company. The Intellectual Property Rights (IPR) is one of the components of a firm's intangible capital. It may be inferred that there is a close association between intellectual property and market value.

Core *et al.* (2001) researched on the stock prices of new economy companies and found that the mean Market value to Book value Ratio (M/B Ratio) was slightly above one in the mid-1970s and above 5.2 in 1999. For US high technology companies, they even found higher figures—starting with 1.81, where high technology companies reached a mean M/B of 10.8 in 1999, indicating the growing importance of intellectual capital for high-tech companies.

Lev (2000) reported a dramatic increase in the mean M/B ratio of US stocks, rising from one in the late 1970s, to almost six in March 2001, indicating that five of every six dollars of corporate market value are missing from the balance sheet. He attributed the gap between the balance sheet value and the market value of the company to the value of intellectual capital. He further observed that balance sheets need not mimic market caps, but they should not trivialize them either.

Gu and Lev (2001) conducted a study to identify and quantify the drivers of intangible capital, and in turn, corporate value, and found that various measures reflecting human resource practices are strongly correlated with intangibles earnings and capital.

Gerken (2003) observed that approximately 60% to 80% of the value of some companies emanates from intangible capital, including intellectual property capital. He maintained that proactive management of this capital creates competitive edge for companies.

Czarnitzki *et al.* (2005) adopted the hedonic regression approach to measure the market value of the knowledge capital owned by a firm. They used data on market value, capital, R&D, and patents, to assess the effect on performance of the companies. According to their results, in most countries, one dollar of additional R&D spending adds slightly less than a dollar to market value.

Kavida (2008) assessed the effect of the factors associated with intellectual capital like R&D, marketing and advertisement, and goodwill, on the market value of leading pharmaceutical companies in India. The study revealed that R&D, advertisement and marketing capital were not only significant in explaining the market value of the sample firms, but also the coefficients indicated a strong returns on these investments.

Kavida and Sivakoumar (2008) has persuasively argued that measurement of intellectual capital is the utmost requirement for corporate governance. The study also analyzed the available methods of valuation and convinced the need to measure intellectual capital for corporate governance in knowledge-based companies, in an attempt to explain the huge gap between the accounting value and market value of companies.

It is important to understand that the goal of measuring intellectual capital is not just for the sake of measuring it. Measuring intellectual capital should be a part of a knowledge-

focused strategy where the goal is to clarify and take advantage of the benefits mentioned above. “Intellectual capital measurements have the largest utilitarian value when they are comparable in both time and space” (SND, 1998).

Measurement of Intellectual Capital

Skandia AFS, the Scandinavian insurance company, has been a pioneer in measuring and reporting intellectual capital. It has been providing intellectual capital information in a supplement to its annual report, since 1994. This supplement covers information on a range of categories, called foci. The company’s current customer focus, its structural process focus, as well as its future renewal and development foci are provided, in addition to the historical financial data. Also included is the human focus that interacts with all other foci.

However, the approaches for measuring intellectual capital fall into at least three categories—indirect methods, Direct Intellectual Capital (DIC) methods, and Scorecard (SC) methods. These categories are an extension of the classifications suggested by Luthy (1998) and Williams (2000). The indirect methods adopt the rate of return method and the market capitalization method.

Indirect methods are financial measures of evaluating intellectual capital. Return on capital methods and market capitalization methods offer monetary valuations which are useful in mergers and acquisitions and in stock market valuations (Sveiby, 2001). These measures can also be used for comparisons between companies within the same industry and they are good for illustrating the financial value of intellectual capital. Because they build on long-established accounting rules, they are easily communicated in the accounting profession. Their disadvantages are that by translating everything into money terms, they can be superficial. However, these methods are extremely useful for investors to assess the value of the intellectual capital of the companies in which they are investing. Moreover, the information related to intellectual capital can be deciphered from the publicly available information like financial statements.

On the other hand, direct intellectual capital methods are based on an estimation of the monetary value of intangible capital by identifying its various components. Identification of the various components is cumbersome and is purely an internal affair of the company. SC methods are usually reported in scorecards or as graphs. They are very similar to the direct intellectual capital methods, except that they do not seek to measure and present monetary value of the intangible capital.

As the indirect methods are easy to compute and upholds the principle of transparency, the study uses the Return on Capital (ROA) and Market Capitalization Method (MCM). To summarize the suitable method of valuation, the following quote can be a guiding principle: “No single method can fulfill all purposes; one must select method depending on purpose, situation and audience” (Sveiby, 2001). Some of the financial measures of valuing intellectual capital are discussed below.

M/B Ratio

This method adopts the MCM approach. The M/B ratio assumes that a company's approximate worth (tangible capital plus intangible capital) is indicated by its market value. Therefore, the difference between the book value shown on the company's balance sheet and the market value gives an approximate measure of the intellectual capital.

$$M/B \text{ Ratio} = \text{Market Value} / \text{Book Value}$$

$$\text{Intellectual Capital} = \text{Market Value} - \text{Book Value}$$

Tobin's Q Ratio

This method also adopts MCM approach. Tobin's Q is essentially the same as the market to book ratio except that Tobin's Q uses replacement cost of tangible capital, rather than book value of tangible capital, in the calculation. The theory is that if Q is greater than one and greater than competitors' Q, then the company has the ability to produce higher profits than other similar companies. The company has something intangible—intellectual capital—that gives it an advantage. The difference between the market value and the replacement cost of tangible capital represents the value of intellectual capital.

$$Q \text{ Ratio} = \text{Market Value} / \text{Replacement Cost of Asset}$$

$$\text{Intellectual Capital} = \text{Market Value} - \text{Replacement Cost of Tangible Capital}$$

Market Value Added

Market Value Added (MVA) is the difference between the market value of a company (both equity and debt) and the capital that investors have entrusted to it over the years, in the form of loans, retained earnings and paid-up capital. As such, MVA is the difference between 'cash in' (what investors have contributed) and 'cash out' (what they could get by selling at today's prices). If MVA is positive, it means that the company has increased the value of the capital entrusted to it and has, thus, created shareholder wealth. If MVA is negative, the company has destroyed wealth. MVA is also used as a way of benchmarking market performance between companies. This method also follows the MCM approach.

$$MVA = \text{Intellectual Capital} = \text{Market Value} - \text{Book Value}$$

Economic Value Added

This method adopts the ROA approach. As defined by Stern Stewart, Economic Value Added (EVA) is the difference between a company's Net Operating Profit After Taxes (NOPAT) and its Cost of Capital (C) of both equity and debt (Chen and Dodd, 2001). EVA is essentially the surplus left after making an appropriate change for the capital employed (IC) in the business. It may be calculated in any of the following ways:

$$EVA = \text{NOPAT} - (C * IC)$$

Since $R = NOPAT/IC$, EVA can also be expressed as:

$$EVA = (R - C) * IC$$

where R is the return on invested capital.

If a company's EVA is negative, the firm is destroying shareholders wealth, even though it may be reporting positive and growing earnings per share or return on equity. In order to have positive EVA, an organization's rate of return on capital must exceed its required rate of return.

Future Growth Value

Future Growth Value (FGV), as proposed by Stern Stewart and others, reflects the value of the expected growth of EVA in future. It is the difference between the market value and the book value of the firm, together with the current level of EVA, referred to as the Current Operations Value (COV). Future Growth Value directly places a value for future growth expectations, accounted by the intellectual capital of a company. This method also follows the ROA approach. Simply, FGV is the difference between MVA and EVA, expressed as follows.

$$FGV = MVA - EVA$$

Objective of the Study

As observed earlier, measurement is the precondition for management, and hence this paper analyzes the various methods of measurement of intellectual capital. To suggest the availability and reliability of the financial methods for the measurement of intellectual capital of the publicly traded companies, this paper takes up the case of the Indian pharmaceutical industry.

Case Study of the Indian Pharmaceutical Industry

Worldwide, pharmaceuticals is one of the most intense 'knowledge-driven' industries, which is continually in a state of dynamic transition. The amazing growth of the Indian pharmaceutical industry—virtually from that of a non-existent entity during the 1940s to that of the world's leading exporter of drugs and medicines during the 1990s—owes its success to the innovation (patent) system of India. The expertise gained and the technological capabilities built, if quantified, would qualify to a new genre of capital called as intellectual capital, worth billions of dollars. Recently, the Government of India has recognized the pharmaceutical sector as an intellectual industry. The area of intellectual capital is gaining importance and will play a key role in the success of the Indian pharmaceutical industry. Therefore, in this study, the intellectual capital of the Indian pharmaceutical industry is evaluated by applying the above-mentioned financial measures.

Methodology

The organized sector of the Indian pharmaceutical industry can be classified into Multinational Companies (MNCs) and Indian companies on the basis of management control. However, the share of MNCs declined from about 90% in 1970 to about

Name of the Sample Companies	MV		MCAP:NV		MV:RC		MV:BV		EVA		FGV	
	Rs. (cr)	(%)	Rs. (cr)	(%)	Rs. (cr)	(%)	Rs. (cr)	(%)	Rs. (cr)	(%)	Rs. (cr)	(%)
Aurobindo Pharma Ltd.	1,073.53	39.85	427.75	39.85	653.06	60.83	427.75	39.85	50.98	4.75	376.77	35.10
Aventis Pharma Ltd.	1,451.23	81.72	1,185.91	81.72	1,188.58	81.90	1,185.91	81.72	36.44	2.51	1,149.47	79.21
Cipla Ltd.	5,403.61	83.11	4,491.11	83.11	4,830.86	89.40	4,491.11	83.11	114.11	2.11	4,377.00	81.00
Dr. Reddy's Laboratories Ltd.	4,449.90	72.12	3,209.25	72.12	3,880.55	87.21	3,209.25	72.12	72.87	1.64	3,136.38	70.48
FDC Ltd.	432.42	283.01	283.01	65.45	326.35	75.47	283.01	65.45	15.76	3.64	267.25	61.80
Glaxosmithkline Pharmaceuticals Ltd.	3,651.17	85.21	3,110.99	85.21	3,394.89	92.98	3,110.99	85.21	98.62	2.70	3,012.38	82.50
Ipca Laboratories Ltd.	442.72	166.17	166.17	37.53	193.79	43.77	166.17	37.53	26.28	5.94	139.89	31.60
Lupin Ltd.	1,186.87	55.18	654.86	55.18	737.43	62.13	654.86	55.18	54.45	4.59	600.40	50.59
Matrix Laboratories Ltd.	782.28	570.27	570.27	72.90	610.17	78.00	570.27	72.90	33.87	4.33	536.40	68.57
Nicholas Piramal India Ltd.	2,005.07	1,440.24	1,440.24	71.83	1,549.51	77.28	1,440.24	71.83	71.59	3.57	1,368.65	68.26
Novartis India Ltd.	1,533.29	1,265.75	1,265.75	82.55	1,384.64	90.31	1,265.75	82.55	37.40	2.44	1,228.35	80.11
Orchid Chemicals & Pharmaceuticals Ltd.	829.35	119.02	119.02	14.35	57.46	6.93	119.02	14.35	49.84	6.01	69.18	8.34
Pfizer Ltd.	1,152.47	976.83	976.83	84.76	1,046.32	90.79	976.83	84.76	22.04	1.91	954.78	82.85
Ranbaxy Laboratories Ltd.	10,006.96	8,213.89	8,213.89	82.08	8,888.71	88.83	8,213.89	82.08	179.09	1.79	8,034.80	80.29
Sterling Biotech Ltd.	783.18	251.74	251.74	32.14	327.94	41.87	251.74	32.14	22.06	2.82	229.68	29.33
Sun Pharmaceutical Inds. Ltd.	4,044.30	3046.64	3046.64	75.33	3,692.06	91.29	3,046.64	75.33	61.45	1.52	2,985.19	73.81
Torrent Pharmaceuticals Ltd.	653.70	285.92	285.92	43.74	377.68	57.78	285.92	43.74	33.04	5.05	252.88	38.68
Unichem Laboratories Ltd.	306.72	157.11	157.11	51.22	159.87	52.12	157.11	51.22	15.05	4.91	142.06	46.32
Wockhardt Ltd.	2,286.40	1,515.14	1,515.14	66.27	1,829.89	80.03	1,515.14	66.27	50.39	2.20	1,464.75	64.06
Wyeth Ltd.	733.92	562.34	562.34	76.62	657.97	89.65	562.34	76.62	15.96	2.17	546.38	74.45
Average	2,160.45	1,596.70	1,596.70	63.70	1,789.39	71.93	1,596.70	63.70	53.07	3.33	1,543.63	60.37

20% in 2000, consequent to the enactment of the Indian Patent Act, which recognized only process patent in food and drugs. At present, the market is concentrated at the top with the top 30 players controlling about 70% of the market share. These 30 companies form the BSE Healthcare Index—a sector-specific index devoted to the pharmaceutical industry. The first 20 companies are selected from these 30 companies on the basis of their R&D intensity. The data was sourced from PROWESS, the database of the Center for Monitoring Indian Economy (CMIE). A decade (1997-2006) was observed for this study as this period witnessed some remarkable breakthroughs by Indian pharmaceutical companies in the research of new chemical molecules.

Observation and Findings

Table 1 presents the value of intellectual capital possessed by the sample companies, computed through the above-mentioned methods. From the table, it can be seen that almost 60% of the market value is accounted by the intellectual capital of the sample companies. It can also be seen that the value of intellectual capital moves in a similar pattern with that of the market value, even when adjusted with EVA, an outcome of the ROA approach. This indicates that the 'stock of knowledge' possessed by the sample companies is reflected in the stock market. This observation further strengthens the theory laid down by Griliches (1981), that the stock market implicitly or explicitly values the firm as a bundle of tangible and intangible capital; and the observation made by Petty and Guthrie (2000), that intellectual capital is instrumental in the determination of enterprise value and national economic performance. The values in the table, which are an integral part of the market value, explains the gap between the value of these companies, as recorded in their financial statements, and the value that these companies command in the market. Though the methodologies differ, the substantial value of intellectual capital possessed by the sample companies point out that intellectual capital could not be left unrecognized. Since this study has presented the availability and reliability of the measurement methods, further studies need to be undertaken on the effect of the strategic management of intellectual capital on the performance of companies. ■

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Reference # 29J-2009-09/11-03-01

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