Volume: 4, Issue: 9
Page: 60-78
2020

ISSN 2520-4750 (Online) & ISSN 2521-3040 (Print)

International Journal of Science and Business

Impact of Intellectual Capital Reporting in the Annual Report on Firm Performance:

Empirical Evidence from Listed Pharmaceuticals Companies of Bangladesh

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Abstract:
This paper examines the impact of intellectual capital reporting in the annual reports of Pharmaceuticals company listed at Dhaka Stock Exchange on their performance. This paper uses sample of 31 pharmaceuticals company for the period 2016-2017. To measure the extent of IC disclosure on the annual report a disclosure index (ICDSI) is developed. Information related to firm performance is obtained from annual report. Correlation and regression analysis have been used for data analysis. This paper found positive relation of IC disclosure with two performance measure (ROE and ROA) but negative relation with EPS. However, relationship is not significant. The impact of control variables on firm performance is also mixed and narrow. The reason for limited association among the variables can be lower amount of disclosure, unrelated concept of firm performance and ICDSI. The mean disclosure is only 23%. Overall findings of the paper suggest company disclose human capital information mostly. Further study may include longitudinal study with more sample size and control variable. This study will help academics who want to work in IC literature. Manager of Pharmaceutical will get to know which IC information reporting will give them organizational benefit. Regulator can get useful insights from this paper to formulate and implement IC related guideline. This paper is one the very first paper in Bangladesh to investigate IC disclosures impact on firm performance through developing ICDSI index.

IJSB
Accepted 08 August 2020
Published 12 August 2020
DOI: 10.5281/zenodo.3980888

Keywords: Intellectual Capital, Annual Report, Firm Performance, Dhaka Stock Exchange, ICDSI.

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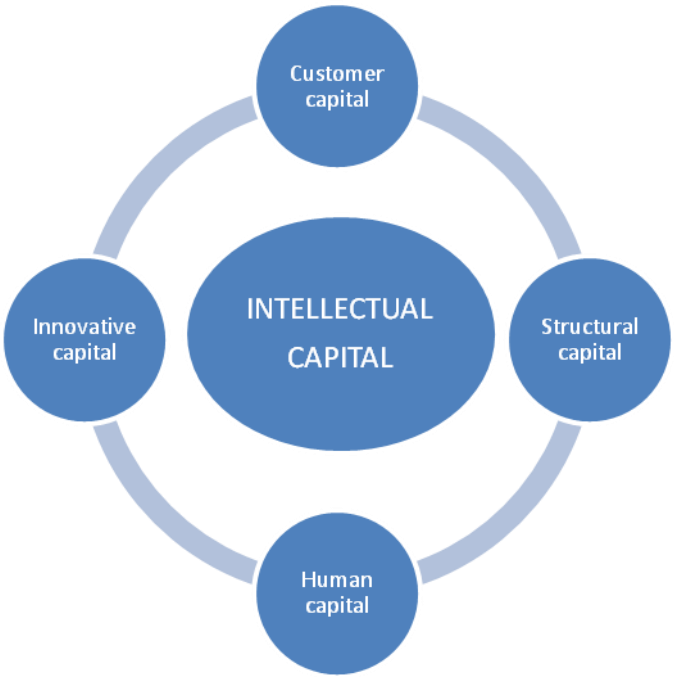
1.Introduction

Today's economy is based on knowledge. Physical capital, human resources and labor are no longer the main sources for the economy. So, today's economy is called knowledge economy. Intellectual capital is the prime catalyst for value creation. Economy that generates, exploits and applies knowledge as a key dynamic force for economic growth is called Knowledge economy (Goh, 2005). Knowledge driven firms creates value by using intangibles resources more and tangibles resources less (Abeysekara,2006). According to (Nahapiet and Goshal,1998), the prosperity of the companies of modern era remains in the capability of unveiling and using its intellectual capital efficiently to ensure utmost organizational benefit. So intellectual capital is now gaining more importance for creating and maintaining competitive benefit and creating of shareholder value. Intellectual capital cannot be possible to define by universal definition. Its definition varies in situations. European Commission defines intellectual capital as the combination of organizational, relational and human and other activities of the organization which includes skill, knowledge, organizational routine R&D, abilities of the organization employee, intellectual property, database, customer list, market value, information system, procedures and all other organizational resource that are closely related to external relationship maintenance with other parties. Having Knowledge and skill, practical and professional knowledge, technological capacities, very good relationship, excellent working skill when applied in an organization can give immense competitive advantage. The possession of knowledge, skill, experience, technological, practical working skill and good relationship maintenance can be called as intellectual capital. Again, intellectual capital can be defined through the value creation perspective. From this view, intellectual capital means using of intangibles asset to create value by developing new process, service and products (Al-ali,2003). Steward (2000) also defined intellectual capital as experience, knowledge, intelligence and intellectual assets that may be utilized for wealth creation.

Intellectual capital can be classified into three specific categories mainly. One of the prominent classifications is given by Sveiby (1997) who classified intellectual capital as human competence, external structure and other one is internal structure. This classification is widely adopted by the researcher of intellectual capital literature (Abeysekera and Guthrie, 2000; Gardener and Wong,2005). Some of others researcher used this classification by making slightly modification. They classified intellectual capital as internal, external and human capital category. Internal capital means intellectual capital inside the company. These are intellectual properties that is internally generated intangible property (copyrights, brand names, trademark, license, commerce related rights, commercial secrets), quality, management philosophy, innovation, corporate culture, infrastructural capability, networking system and management information system (Gothrie and Petty 2000; Muttakin,M.B. et al.,2015). Contrarily, external capital mentions to the intellectual capital apart from within the organizational boundary. These includes customer information, supplier information, strategic partnering and alliance, business collaboration, franchising agreement, market share, quality standard, customer satisfaction, shareholder, favorable contract signed, strong supply chain management, market value (Bontis, 2003; Muttakin,M.B.,et al., 2015; Abeysekara,2006; Olsson, 2004). Finally, the last category of intellectual capital is the human capital. Human capital refers to the capital that is related to organizational human resources. This includes employees education, training, vocational skill, work related knowledge, know how knowledge, number of employees and their benefits, union activity, health and safety, equity issues (Bontis, 2003; Muttakin,M.B.,et al.,2015). Another type of intellectual capital

namely innovative capital is identified by Wang (2005). This include patent fee, research and development intensity ratio, income per research and development expense and research and development employee ratio. Chen et.al. (2004) classified intellectual capital into four categories. These are shown below:



Innovative and human capital have already discussed above. Structural capital is closely related to internal capital. According to Steward (1997) structural capital is the values that remains in the workplace when employees left their workplace. On the other hand, Customer capital covers the issues related to business relation and closeness to its clients (Steward,1994). Now a days, customer is very important elements for an enterprise. Customer capital eventually turns into human and organizational capital.

Firm performance is a relevant tool for decision making and it is a complex term. It is frequently used as dependent variable in research. Despite its relevance there is no straight forward and consensus definition about the firm performance. Normally, it means organizational performance that includes producing goods and services, performance of the human resources and their outcomes, functioning of different units of the organization. On the other hand, in the broader context firm performance means development of the firm. Firm performance allows investor to assess the degree to which organizational performance is justified. So basically, firm performance is highly related to the efficiency of the operation. Higher the efficiency of the operation, greater the firm performance. Firm performance can be measured by several tools. These include net profit, EPS, gross margin, ROA, contribution margin, earnings before interest and tax (EBIT), ROE. For the measurement of firm performance ROA, ROE and EPS was used by many prior researchers (M salim,2012; Chen,2005).

This paper is an investigative paper. This paper tests whether there is any impact of intellectual capital disclosure score index has any impact on the firm performance.

Some empirical studies have conducted to identify the impact of intellectual capital reporting on firm performance in the different developed economic country (Dyna Seng ,2011; Bollen,2005; Gosh and Mondal,2009) and they find the relationship significant. Dyna Seng (2011), Gosh and Mondal (2009) used value added intellectual coefficient for the measurement of intellectual capital. This VAIC co-efficient is a quantitively measure and does not depend on extent of disclosure. Few studies conducted on the basis of extent of intellectual capital reporting with market size of the company (Botosan,1997; abdulrahmananam,2011). These studies indicate that when intellectual capital information is disclosed by firm is valued by the market. Very few papers have conducted that examine the impact of IC reporting and firm performance. (Wang,2005) found significant relationship between them. Other similar papers also found the relationship of intellectual capital reporting and firm performance is positive and significant. But in Bangladesh, as a growing economy, there is no such research that examine the relationship between IC reporting and the firm performances. That means there is a gap of intellectual capital related research that is related to firm performance. So, this research is motivated to fill this gap.

On the basis of the needs of discovering the impact of intellectual capital reporting in the annual report on the firm performance, the core purpose of the study is to explore the impact of IC reporting in annual report on the firm performance. This particular paper contributes in several ways. Firstly, it fills the gap of IC reporting and firm performance and thus contributes to the IC literature in Bangladesh. Secondly, empirical evidence of IC disclosure on the annual report on firm performance will help in business policy making. Finally, the result of the studies will help regulator to decide whether intellectual capital disclosure can be made compulsory in the context of Bangladesh. The remainder of this paper is arranged by following ways. Section two is regarding literature review, section three is regarding theoretical framework and development of the hypothesis, section four is related to methodology, section five is related to discussion of the result and findings. Lastly section six by indicating scope for further research brings to end the paper.

2.Literature Review

Though todays economy is rapidly changing to knowledge and technology oriented, still intellectual capital is considered as new concept and thus no uniform definition is found for it. Only a few studies were operated to explore the relationship of IC and firm performance. Some of these are Wang (2005); Dyna Seng (2011). Traditional accounting is failed to make proper disclosure and maintaining the gradual importance of intellectual capital by providing disclosure related to intellectual capital. Zamboon (2004) states that annual accounts must disclose any events that might influence organizational financial position or its future financial strength. Intellectual capital meets this criterion. So, intellectual capital related disclosure should be made. Disclosure can be made voluntarily and non-quantitively. If intellectual capital can be linked to firm performance. Then both the investor and firm will get benefit from this disclosure. But disclosure in quantitative form if a firm wish to make is very difficult because measurement of the value intellectual capital is a tall task. The scarcity of intellectual capital related information disclosure in the annual report comes with a challenge to identify the relationship of IC reporting's impact on firm performances. One easily quantifiable intellectual capital measurement is value added co-efficient (VAIC) which is developed by Pulic in 1998. Researchers found significant and plus relationship between IC and firm performance and market value (Cockburn and Griliches, 1998). Sougiannis (1994) in his study concludes that if one-dollar research and development expenditure incurred it will

increase its profit eight times and its market value seven times. Human capital and customer capital are very important tools and play pivotal role in business performance and its existence. According to Lee and Witteloostuijn (1998) company with higher longevity, more experienced and highly educated employee, higher connectivity with the customer are about to face less risk of going bankrupt. As intellectual capital is a key driving force for creation of value, so we can predict that this value creation will result in frim performance. Although impact of IC and firm performance is positive found in prior studies but performance of a company does not only derive from a common item. So, for value creation a company needs to assemble suitable combination of IC related elements. (Edvinsson,1997). Assembling and combining IC items is very important for value creation. Balance scorecard states there is presence of correlation among financial, customer, internal process, learning and growth perspective and there is a causal connection among these four indicators. Among this four except the financial perspective all the others are related to IC. Human capital is a prime and one of the core intellectual capital because human skill, knowledge and professional experience is the cornerstone several elements which ultimately helps to create value for the particular firm. Few problems arise when to measure intellectual capital. First of all, information regarding intellectual capital is mostly less available to the outside of the firm. Secondly, disclosed information is qualitative and quantified the information into dollar values required judgement. But maximum researcher uses VAIC to measure the intellectual capital. Because this measure does not have to face those problems as it uses publicly available audited information. So VAIC measure is used for several studies to explore the connection of firm performance and intellectual capital. These studies (Nitrakon,2015; Dimatrio Maditinio et al.,2011; Lij Pike RH and Haniffa,2008; Firer and William,2003; Chen,2005; Ting,2005) are uniform in one aspect because all these studies found positive connection between IC and firm performance. But nature of relationships differs across the studies. Such as, Mavridis (2004) concluded that Japanese banking firms with greater human capital efficiency having greater performance even though they were less efficient in their asset utilization. But Bontis et al. (2006) showed existence of a plus or direct connection of structural capital with companies' performance and company with higher degree of structural capital efficiency get competitive advantage over other firms in Malaysia. Another study from Germany conducted by Bolen (2005) found out different elements of intellectual capital have high degree impact on intellectual property. In return intellectual property have positive influence over the firm performance. This can be interpreted as intellectual capital has indirect influence over intellectual capital as well. Shiu (2005) found that there exits positive relationship between current and prior VAIC with return on asset. Few studies found the relationship is positive among IC, firm value and firm performance. Chen (2005) stated intellectual capital is the main catalyst for both firm value and firm performance while Shiu (2006) found weak form of relationship between VAIC and firm performance. Firer and William (2003) and Chan (2009) found firm place more emphasize on structural capital than intellectual capital. But these diversified result does not lessen the evidence of positive relationship of intellectual capital and firm performance. The summary of previous paper is submitted in Table 1.

Table 1: A Summary of literature

Study	Sample Size	Time period	Dependent Variables	Independent Variables	Control Variables	Measurement of Intellectual capital Disclosure	Findings
Muttakin,M.B. et al.(2015)	Total 116 non-financial firm listed in Dhaka stock exchange. Sample comprised a total 580 firm year observations.	2005-2009	Intellectual Capital disclosure Index (ICDI)	Family Ownership, Family Duality, CEO Duality, Board Independence, Audit Committee Foreign ownership,	Firm Size, Firm Age, ROA, Leverage	Measured through "Disclosure Occurrence "approach to develop intellectual capital disclosure Index (ICDI). A checklist with 32 items is developed. If a company disclosed an item, it is awarded by 1. And if an item is not disclosed, then 0 is awarded. ICDI is calculated through ratio of the disclosure score obtain divided by maximum score (32)	- Family ownership non-linearly and significantly related with ICDI. -Positive connection between foreign ownership and ICDI. -Family duality negatively related with extent of ICD disclosure. -No significant between CEO duality and ICD disclosure. - ICD disclosure depends on governance mechanisms.
Craig et al.(2017)	A Total 15 companies listed in the Lisbon stock exchange is selected as sample. Sample comprised total 75 firm year as observation	2007-2011	Intellectual Disclosure Index (ICI)	Board size, Board activity, Proportion of independent director, CEO duality, Board Composition as measured by number of female directors, Governance model	Company Size, Industry Listing in the sustainability index, Ownership Concentration.	ICI is developed by using contend analysis. Codifying Information into pre-defined categories. It assumed all items are relevant for all company and calculable derived by dividing Total sum of disclosure by maximum possible items a company can disclose.	-IC disclosure is increased with company size, Increased board size, listing in the sustainability reporting index. -IC disclosure is reduced by CEO duality. -IC disclosure is reduced by increasing independent director. -The year of reporting is not significant.
Dimattrios Maditino et.al.(2011)	Total 96 listed companies listed in the ASE	2006-2008	Market to book value ratio, ROE, ROA, sales growth	Efficiency of structural, human and capital employed efficiency, Sum of three types of efficiency.		Ratios are used to measure IC score	- Only human capital and financial performance positively related -IC is an important tool for competitive advantage.
Abdolrahamnanam (2011)	Sample for the study was the main board listed companies	For the Year 2002 and 2006	MCAP (Market Capitalization)	EICD (Extent of Intellectual Capital Disclosure)	Net profit, Book Value, Leverage, Size of Firm	Measured through disclosure index that contains 101 items. If any item is disclosed, score assigned 1 and if item is not disclosed score assigned 0.	-EICD and MCAP positively connected. -Size of the firm, net profit and book value is significantly associated.
Li J, Pike RH and Haniffa RM (2008)	Listed 100 UK firms	2004-2005	ICDI (Intellectual capital disclosure index), ICDW (Intellectual capital disclosure Word Count),	Board Composition, Ownership Structure, Role duality, Internal Audit mechanisms, Role duality	Firm Size, Listing age, Profitability (ROA)	Dichotomous procedure is used for scoring for measuring ICDI.	-Positive relationship between ICDI and board composition, Positive relationship of ICDI with ROA, Firm Size and Internal audit mechanisms. - Stronger association between ICDI, Board Composition, Ownership Structure and Firm Size -ROA and Listing Age is

			ICDW% (% of intellectual capital wordings relatives to total word of the annual report)				not significant for ICDW -ROA and Listing age is significant for ICDW%
Bontis et al.(2003)	107 Malaysian selected firm	2003	Firm Performance	Structural capital, Human capital and Relational capital	Not used	(VAIC) coefficient	- IC and firm performance positively related.
Bollen et al.(2005)	Based on the responded 41 questionnaire of Pharmaceuticals company of Germany	2005	Firm Performance.	Structural capital, Human capital and Relational capital	Not used	Measured through questionnaire survey.	-Intellectual item has positive relationship with the firm.
Firer and Stainbank (2003)	65 listed South African company	2001	ROA, ATO MV	VAIC score	Fixed Asset, Size, Market Risk, Industry	VAIC coefficient	-VAIC can predicts the profitability.
Tovstiga (2007)	20 Russian firm which have total employee less than 180	2007	VAIC coefficient score	Firm Performance.	Not used	(VAIC) coefficient	-IC is the most important differential variable for competitive advantage.
Firer and Williams (2003)		2001	VAIC score	Return on Asset (ROA), Market to Book value ratio,	Firm size, Leverage, Return on equity (ROE)	Value added intellectual capital coefficient	-Positive relation with ROA and market to book value ratio.
Chen (2005)	Listed companies of Taiwan	1992-2002	VAIC score	ROE, Productivity per employee, Revenue growth	Book value of common Stock, Research and development expenditure	(VAIC) coefficient	-VAIC has positive relationship with ROA, ROE, revenue growth and productivity per employee.
Ting (2005)	Malaysian Listed companies.	1999-2007	VAIC score	Return on asset (ROA)		Value added intellectual capital coefficient	-Positive relationship between VAIC and ROA
Nimtrakoon (2015)	Total 2968 listed companies across five countries	2011	CEE, HCE, SCE RCE, MVAIC score	Mark to Book ratio, Profit Margin, ROA	Size of the firm, Firm age, inflation rate	Modified Value-added intellectual capital coefficient	- IC and MV positively related. - IC positively related with both ROA and Profit Margin. -Human capital and capital employed efficiency are the most influential value driver. - SCE and RCE are less influential value driver compared to the other two.

Bangladesh is an agrarian country. It has population of over 160 million. The economy of Bangladesh is going through a transitional period from agrarian to industry and service intensive economy. The growth rate of GDP of Bangladesh is in increasing trend and she maintains sustainable GDP growth. Increasing the GDP is the result of structural adjustment policy in favor of private ownership. Arif et al. (2005) due to the rapid development of IT to get maximum benefit knowledge driven economy is must. Listed companies of Bangladesh recently witnessed higher level of volatility in terms of total revenue and its growth. This reduced net profit margin for the big firm. So, in this situation firms can make investment in intellectual capital and choose and materialize proper intellectual strategy can play a significant role. Very few numbers of research paper on intellectual capital are existed in Bangladesh. Ali et al. (2008) dealt with intellectual capital reporting practices of the randomly chosen firm in an exploratory manner through contend analysis and found that firms disclosed very small number of intellectual capital item. They also found that human capital information is most extensively disclosed item. According to Khan and Ali (2010) not only human capital but also other components of intellectual capital is important for ensuring maximum benefit in the process of globalization and without the total combination of all intellectual capital will lose much of its competitiveness. So, firms need to invest in the IC and implementing proper strategy to reap the benefit of the investment and make higher level IC related disclosure to ensure firm is operating legitimately and according to interest of the stakeholder. Therefore, clearly Bangladesh lacks in intellectual capital reporting literature. Previous research in Bangladesh was based on banking companies and pharmaceuticals company is one the knowledge-based sector. Bangladesh's pharmaceuticals company is an interesting sector for number of reasons. Firstly, Bangladesh's economy is now moving into knowledge-based economy at very fast pace. Bangladesh is currently 42nd largest economy and will be 26th largest economy by 2026. Traditional sector and knowledge-based sector are both getting lots of priority in the economy. Secondly, Bangladesh is one of the less-studied in terms of intellectual capital literature and so here presence a huge scope to add values. In Bangladesh there is no study that investigate relationship between intellectual capital and firm performance that reflects third reason to study with Bangladesh data. Finally, there is availability of annual report and data for the pharmaceuticals sector in Bangladesh.

3. Theoretical Framework and Hypothesis Development

So many theories in social science disclosure literature explains the reason for disclosing any information voluntarily. These social science and environment literature can also be used in intellectual capital literature. Disclosure of intellectual is not compulsory in Bangladesh. Different companies voluntarily disclosed intellectual capital information in their annual reports. In this paper legitimacy theory and stakeholder theory is discussed in light of the company's efforts regarding the intellectual capital reporting. Legitimacy theory states that firm always attempts to ensure that it is conducting its operation among the bounds and established societal norms of the particular societies. That means firms want to make sure outside parties perceived the activities of the companies as legitimate. Legitimacy theory assumes there exist a social contract between firm and the people of the societies. Social contract is maintained by the firms to be legitimate. But norms and bounds of the society are not fixed. They are changing continuously. Firms try to meet the social contract. Because firms have no inherent right to get resources, so to get those scarce resource firms have to earn their access through legitimation. Legitimacy theory highlights companies would voluntarily disclose their activities in response to meet the social expectation to increase the image of the respective companies. According to Guthrie et al. (2004), firms with higher level

of intellectual capital are more likely to disclose more information since they can not legitimize their operation by disclosing traditional corporate strength and tangible resources. Lindblom (1994) proposed that IC disclosure making in annual report can be the forceful strategy for a firm whose legitimacy is in the declining trend.

Another theory that is used in this paper is stakeholder theory. Stakeholder theory proposes a notion that an organization will report and disclose the information related to activities anticipated by its stakeholder (Guthrie et al.,2004). Organizations provided the information that may affect its stakeholder and how may they be affected. Stakeholder theory can be thought like an umbrella. Because it combines the number of other theories. It addresses issues like relationship of with stakeholder that includes rights of stakeholder, power of stakeholder and effective management of the stakeholder. Guthrie et al. (2006) opines that by following stakeholder theory organization will decide to disclose more intellectual, social and environmental information over the compulsory requirement of the various bodies to meet the needs of the real stakeholder. So, it is clear that above theories are very closely related to intellectual capital reporting decisions that call for making voluntarily disclosure in the annual reports of the firms. Due to conservatism principle of accounting firms can not able to show investment in intellectual capital in the financial statements. Thus, an information asymmetry occurs between the firm's internal management and its stakeholder. However, investor valued a firm with high intellectual capital highly when market is efficient (Firer and Williams,2003). Few other prior researches argued that strategic asset can be used to gain superior firm performance. Strategic asset includes both tangible and intangible asset. Among them intellectual capital is one of the vital strategic asset.So, this study expects intellectual capital plays vital role for financial performance. This paper hypothesizes;

H: There is a positive impact of intellectual capital disclosure score index (ICDSI) and firm performance. For performance measurement this paper uses ROE, ROA and EPS. So, hypothesis of this paper;

H(a): There is a positive impact of ICDSI on ROE.

H(b): There is a positive impact of ICDSI on ROA.

H(c): There is a positive impact of ICDSI on EPS.

4. Research Methodology

4.1 Sample and Data

The sample of this paper includes 31 pharmaceuticals company listed at DSE for the period 2016-2017. The period 2016-2017 is selected because it is the year for which latest annual reports for all the listed pharmaceuticals company's available. Latest annual report is selected because intellectual capital reporting is relatively a new phenomenon in Bangladesh. Data is collected from the annual reports. Annual report is collected from the company website.

4.2 Empirical model

Multiple regression analysis is used to explore the impact intellectual capital reporting index on firm performance while controlling leverage, firm size and firm year. Dependent variables are firm performance. Prior studies (Chen etal.,2005; Shiu,2006; Firer and Willim,2003) used ROA and ROE as their profitability measure. This study uses ROA, ROE and EPS as independent variable. Three control variables are selected that might distort the empirical relationship between the ICDSI and Firm performance. These are leverage, firm size and firm age.

Following model is used:

FPERFM=β0+β1 Intellectual Capital Disclosure Score Index +β2 Firm Size +β3 Firm age. +β4 Leverage +ε

Where,
FPERFM=Firm Performance. In this study ROA, ROE and EPS has been used to measure performance of the firm.
E= Random error term. It measures the extent of coefficient of non-determination factor. That means how much regression model failed to explain by the deterministic factor.
This model is run for three times. Each time dependent variable (firm performance) is replaced with each performance measure.
Three performance measure is used in this paper. So, total three equation is used. These equations are given below:

$$ROA=\beta0+\beta1ICDSI+\beta2LNASSET+\beta3LNAGE+\beta4LEV+\varepsilon \quad (1)$$

$$ROE=\beta0+\beta1ICDSI+\beta2LNASSET+\beta3LNAGE+\beta4LEV+\varepsilon \quad (2)$$

$$EPS=\beta0+\beta1ICDSI+\beta2LNASSET+\beta3LNAGE+\beta4LEV+\varepsilon \quad (3)$$

4.3 Definition of Variables

Table 2. Definition of Variable

	Variables	Variables Explanation	Expected Relationship
Performance	ROA ROE EPS	Net Income After Tax/Total Asset Net Income After Tax/Total Equity Net Income Distributable to Common Shareholder/ Number of Outstanding Share	
Intellectual Capital	ICDSI	Sum of total intellectual capital disclosure is divided by maximum score of disclosure.	Positive
Firm Characteristics	LNAGE LNASSET LEV	Firm age since establishment (in natural log form) Total asset (in natural log form) Total debt /Total asset	Positive Positive Negative

4.4 Sources of Data

The main source of this study is annual report which are available at corresponding pharmaceuticals company's website. This study's data set comprised of the intellectual capital disclosure score index (ICDSI), three performance measurement tools namely ROA, ROE and EPS and three control variables namely leverage, firm size and firm age. All of the information of the data set except ICDSI is collected from different parts of annual report. ICDSI calculation procedure is as follows:
Intellectual Capital Disclosure Scores Index is used here as independent variable. Nurahayati, Brown and Tower (2006) opined that ICDSI is suitable for under developed countries where disclosure supposed to be lower. To measure the degree of disclosure regarding intellectual capital in the annual reports of pharmaceuticals company a checklist that contains 40 items is prepared. A content analysis is carried out by reading the annual reports three times and the scoring them on the basis of selected 40 items from the checklist. Content analysis is the system of epitomizing the text or the theme of a fragment of literature into different groups or classes on the basis of chosen item. It means reading and storing information on the basis of check-listed items. Content analysis is vastly applied in the field of social science where nature and extent of disclosure have to measure very often. Content analysis has been used in prior studies related to disclosure of information (Guthrie et al., 2004; Abeysekara and Guthrie,2005; Niamh Brenan,2001). In this study if any of the item in the checklist is reported in the annual report, score "1" is rewarded and if item is not reported in the annual report,

score"0" is rewarded. As this study has selected 40 intellectual capital items, so maximum score of disclosure is 40. So, total ICDSI for a company is:

ICDSI=

$$\left(\sum_{i=1}^{M} d_i \div M\right) \times 100$$

Where,
di=1 (if item is disclosed)
M=Score of maximum disclosure i.e. 40(because this study selects 40 intellectual items)
ICDSI=Intellectual capital disclosure score index
Similar model is used by Craig (2017) for calculating the intellectual capital disclosure index.

5. Analysis of Result and Research Findings

5.1 Pattern of intellectual capital disclosure

Intellectual capital reporting is voluntary for the firm listed at DSE in Bangladesh. Nevertheless, pharmaceuticals company of Bangladesh listed at DSE (Dhaka Stock Exchange) is reporting intellectual capital voluntarily. Generally, all pharmaceuticals company disclose intellectual capital information in chairman's statement, director's statement, vision and mission statement, notes and disclosure segment, company overview, sustainability reporting statement and strategic report. Few companies report intellectual capital through separate statement under the heading of intellectual capital. Among the 40 check-listed intellectual capital item, risk management, business vision, utilization of input, employee, employee benefit and their work-related knowledge are mostly disclosed. Risk management, business vision, utilization of input, employee, employee benefit and their work-related knowledge are respectively disclosed by the 67.74%, 77.72%, 64.52%, 58.06% and 61.41% of the pharmaceuticals firm listed at DSE. Franchising agreement, trade unions, vocational skill and number of website visits are the irrelevant items in the context of Bangladesh as their disclosure is 0%. Intellectual capital item-wise disclosure pattern is given in the appendix-2.

5.2 **Descriptive Statistics:**

Table 3 represents descriptive statistics for each of the variable of this study. This statistic is based on 31 listed pharmaceuticals company listed at DSE for the period 2016-2017. Intellectual capital disclosure score index (ICDSI) is shown in percentage form. The mean ICDSI is 23.04% and it ranges from maximum 62.5% to minimum 5% with the standard deviation of 14.36%. The median of ICDSI is 20%. Average disclosure of intellectual capital in pharmaceuticals company listed at DSE is 23.06 % which is much lower than the developed countries. According to Rahman and Khatun (2016) firms have a general tendency of not to disclose intellectual capital information. Nurunnnabi et al. (2011) argues that poor disclosure is due to absence of regulatory guideline, proper patent and copyright guideline and weak form of corporate governance. The mean ROE is 16.53% and it ranges from -26.23% to 123.3% with the standard deviation of 26.48%. The mean of ROA is 8.26% and it ranges from maximum 38.38% to minimum -7% with the standard deviation of 8.85%. The mean of EPS is 14.75 and ranges from -2.62 to 106.4 with standard deviation of 25.62. The mean of total asset for the listed pharmaceuticals industry at DSE is 9681.82 million and it ranges from 94.45 million to 52531.05 million with a standard deviation of 14509.41 million. The average of leverage ratio is 40.5% and it ranges from 2% to 86.6% with a standard deviation of

23.9%. The mean of firm age is 30.39, ranging from maximum 61 years to minimum 7 years and its standard deviation is 16.05 year.

Table 3. Descriptive Statistics

VARIABLE	MEAN	MEDIAN	MAXIMUM	MINIMUM	STANDARD DEVIATION	OBSERVATION
ICDSI	23.06	20	62.5	5	14.36	31
ROE (%)	16.53	11.17	123.3	-26.23	26.48	31
ROA (%)	8.26	5.85	38.38	-7	8.85	31
EPS	14.75	3.69	106.4	-2.62	25.62	31
Total Asset (in million)	9681.82	2546.64	52531.05	94.45	14509.41	31
Firm Age	30.39	25	61	7	16.05	31
LEVARAGE (%)	40.5	41.4	86.6	2	23.9	31

5.3 Correlation Matrix:

Table 4 shows correlation between each of the variable. ICDSI is positively related with ROA (.1330) and ROE (.1873) which indicates the higher disclosure of intellectual capital, the higher the performance of the firm in the listed pharmaceuticals firms of Bangladesh. However, ICDSI is negatively related with the EPS (-.0169). ROA is positively associated with ROE (.8099) and EPS (.3615) which indicates the higher the ROA, the higher will be ROE and EPS. ROE and EPS is also positively related. Total asset (Natural log) is negatively correlated with ROE (-.0088) but positively associated with ROA (.0770) and EPS (.1956). Total asset (natural log) is positively correlated with ICDSI (.4542) indicating higher the asset for the listed pharmaceutical firm listed at DSE, higher is the intellectual capital disclosure.

Table 4. Correlation Matrix

	ROE (%)	ROA (%)	EPS	ICDSI (%)	LNASSET (Natural log of total asset)	LNAGE (Natural log of firm age)	LEVARAGE (%)
ROE (%)	1.000						
ROA (%)	.8099	1.000					
EPS	.5627	.3615	1.000				
ICDSI (%)	.1330	.1873	-.0169	1.000			
TOTALASSET (Natural log)	-.0088	.0770	.1956	.4542	1.000		
FIRMAGE (Natural log)	.1958	-.0051	.2014	.2888	.2264	1.000	
LEVARAGE (%)	.3186	-.0906	.4635	.0979	.0112	.3224	1.000

FIRMAGE (Natural log) is positively associated with ROE (.1958), EPS (.2014), ICDSI (.2888) and TOTAL ASSET (natural log) (.2264). That means the more is the age of the firms, the more they report intellectual capital information. But FIRMAGE (natural log) is negatively associated with ROA (-.0051). There is positive association between LEVARAGE and ROE (.3186), EPS (.4635), ICDSI (.0112), TOTALASSET (natural log) (.3224). But their presence negative relationship between LEVARAGE and ROA (-.0906). VIF test has been done to check whether there is any multicollinearity problem among the variables. The result indicates there is no significant multicollinearity problem because average of VIF is less than 10.

Table 5. VIF Test Result

Name of Variable	VIF	1/VIF
ICDSI	1.14	.8795
LNASSET	1.11	.9009
LNAGE	1.07	.9345
LEV	1.06	.9433
Mean VIF	1.095	

5.4 Regression result:

This study examined relationship between firm performance and intellectual capital disclosure score index (ICDSI). Table 5,6 and 7 represents the result of impact of ICDSI on firm performance.

5.4.1 Regression result of impact of ICDSI on ROE

In this study ICDSI is measured through percentage form and it is the independent variable. Table 6 represents the regression results of equation-1, ROE is positively related with ICDSI as expected but relationship between them is not significant at 5 % level. So, this study rejects the hypothesis H(a). This indicates the ROE is not is not determined by ICDSI. Total asset (natural log) is negatively associated with ROE but relationship is not significant. Firm age (natural log) form and leverage have also positive relationship with ROE but not significant at 5% level. Fit of the equation 1 is 12.10% which indicates variability in ROE is explained by the equation.

Table 6. ICDSI and ROE

	Expectation	Coefficient with probability
Constant		.1705
		(.820)
ICDSI	+	.2167
		(.582)
LNASSET	+/-	-.0141
		(.686)
LNAGE	+	.0399
		(.669)
LEV	+/-	.3071
		(.164)
R^2		.1210
Observation		31

5.4.2 Regression result of impact of ICDSI on ROA

Table 7 shows the regression result of the equation-2. This study finds positive relationship between ICDSI and ROA but relationship is not significant at 5% level of significance. Therefore, this study rejects the hypothesis H(b). Total asset (natural log), firm year (natural log) and leverage are negatively and insignificantly related with ROA. This indicates independent variable and control factor are the poor deterministic factor in the regressed variable.

Table 7. ICDSI and ROA

	Expectation	Coefficient with probability
Constant		.0975
		(.707)
ICDSI	+	.1326

		(.331)
LNASSET	+/-	-.0007
		(.948)
LNAGE	+/-	-.0048
		(.881)
LEV	+	-.0315
		(.674)
R^2		.0478
Observation		31

5.4.3 Regression result of impact of ICDSI on EPS

Table 8 represents the result of regression equation-3. It shows there is negative relation between ICDSI and EPS but not significant at 5% level of significance. So, this study rejects the hypothesis H(c). There is positive relation between control variables (natural log of total asset, natural log of firm year, leverage) and EPS. Relationship between leverage and EPS is significant while relationship between other two variable and EPS is not significant. Fit for the equation is 28.15% indicating variability in the EPS explained by the equation.

Table 8. ICDSI and EPS

	Expectation	Coefficient with probability
Constant		-100.00
		(.138)
ICDSI	+	-35.5902
		(.306)
LNASSET	+/-	4.379
		(.163))
LNAGE	+/-	2.1439
		(.794)
LEV	+	49.6419
		(.014)
R^2		.2815
Observation		31

From these results it is clear that firm performance is not properly explained by the independent and control variables of this study. So, this study rejects the hypothesis that firm performance and ICDSI is positively related. This result is consistent with Firer and William (2003) and Najibullah (2005).

6. Conclusion and suggestion for future research

This empirical study has failed to find strong association of intellectual capital reporting in the annual report on firm performance. At best, it has found only weak form of positive association between firm performance and ICDSI. Although empirical correlations matrix shows there is positive relationship among ICDSI, ROE and ROA. But empirical regression analysis does not support this result as it fails to find significant relationship among the variables. These findings are consistent with Firer and William (2003) and Najeebullah (2005) Weak form of association may be resulting from the concepts of firm performance and ICDSI. Because two variables cover definite and unrelated issues of company performance. Firm performance is perceived as financial and accounting perspective which focus on firm owners return and it is perfectly monetary term. On other hand ICDSI covers all the issues that increase firm wealth both directly and indirectly. ICDSI includes items which are non-monetary in nature. So, these items don't increase firm performance directly. Another reason for lack of association may be the voluntary reporting pattern of intellectual capital in the

Bangladesh. So, Pharmaceutical firms listed at DSE voluntarily disclose intellectual capital information. But disclosing information requires to incur additional cost. So, the benefit arises from reporting intellectual capital in the annual report may get offset. Findings of this study might be very interesting to the academics and manager who wants to work in intellectual capital literature. Result of this study will help the manager of pharmaceuticals company to identify the intellectual item to disclose. This study might help practitioner and regulator to formulate and to implement the plan for the intellectual capital development. This study has some limitation mainly because it is an initial study in Bangladesh to find the impact of intellectual capital reporting on firm performance. Firstly, this paper used one-year data. Secondly, this study took sample of only listed pharmaceutical firms at DSE from the population of listed companies. Thirdly, the regression model this study only used three control variables. Further study, therefor, may take into account including time series analysis, increasing the sample size and taking more control variable to better explain the relationship between the intellectual capital reporting in the annual report on firm performance.

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Appendix:

1.Listed Pharmaceuticals company in Dhaka Stock Exchange (DSE)

Observation	Company Name
1	ACI Limited
2	ACI Formulation Limited
3	The ACME Laboratories Limited
4	Active Fine Chemicals Limited
5	Advent Pharma
6	Agro Biotech Limited
7	Ambee Pharmaceuticals ltd.
8	Beacon Pharmaceuticals Ltd.
9	Beximco Pharmaceuticals Ltd.
10	Beximco Synthetics Ltd.
11	Central Pharmaceuticals Ltd.

12	Far Chemical Industries Ltd.
13	Global Heavy Chemicals limited
14	GSK Bangladesh Ltd.
15	The Ibn Sina Pharmaceuticals Ltd.
16	Indo Bangla
17	Imam Button
18	JMI Syringes & Medical Devices Ltd.
19	Keya Cosmetics Ltd.
20	Kohinoor Chemicals Company (Bangladesh) Ltd
21	Libra Infusions Limited
22	Marico Bangladesh Limited
23	Orion Infusion Ltd.
24	Orion Pharma Ltd
25	Pharma Aids
26	Reckitt Benckiser (Bd.) Ltd.
27	Renata Ltd.
28	Salvo Chemical Industry Limited
29	Silva Pharmaceuticals Limited
30	Square Pharmaceuticals Ltd.
31	Wata Chemicals Limited

2.Item-wise Disclosure Pattern

Intellectual Item	% of pharmaceuticals firm making disclosure
Intellectual Asset	9.68
Management Philosophy	25.82
Corporate Working Culture	16.13
Process Management	6.45
Information System	16.13
Availability of Networking System	6.45
Strategic Alliance	6.45
Utilization of Inputs	67.74
Quality Statements	29.03
Risk Management	77.72
Business vision	64.52
Organizational Culture	6.45
Policy of Competence Development	16.13
Description of the Brand Owned	45.16
Customer Loyalty	9.68
Global Recognition	22.58
Favorable Contract Signing	3.23
Informal Collaboration	3.23
Collaborative treaty with another firm	6.45
Franchising Agreement	0
Supply Chain Management	12.90
Competitive Position	12.90
Environmental Investment	25.81
Corporate Reputation	19.35
Job Rotation Opportunity	9.68
Equity Condition	12.90

Health Safety Measure	12.90
Profit Sharing	32.26
Employee Benefits	58.06
Option Benefit	19.35
Employee Involvement	25.81
Trade Unions	0
Entrepreneurial Spirit of the Employee	6.45
Practical Working Knowledge	58.06
Education	41.94
Training Program	25.81
Vocational qualification of the employee	0
Special Skill of Directors	6.45
Number of Employees	61.41
Number of visits in the Company Website	0

Cite this article:

Md Masukor Rahaman (2020). Impact of Intellectual Capital Reporting in the Annual Report on Firm Performance: Empirical Evidence from Listed Pharmaceuticals Companies of Bangladesh. *International Journal of Science and Business, 4*(9), 60-78. doi: https://doi.org/10.5281/zenodo.3980888

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