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The Impact of Firm Size, Leverage, and Profitability on the Disclosure Level of Intellectual Capital

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ABSTRACT

The transformation of the economy from a production-based economy to a knowledge economy has increased the relevance of Intellectual Capital (IC). With the emergence of the Integrated reporting framework, the corporates have started reporting intellectual capital in annual reports, business responsibility reports. The present study **aims** to examine the relationship between the IC disclosure (ICD) and variables like Firm Size, Leverage, and Company Profitability. To find the relationship, a sample of 30 Bombay stock exchange-listed non-financial firms have been taken into consideration for three years, 2018–2020. The study **concludes** that firm size positively impacts the disclosure of IC. It can be inferred that the medium and small firms will not disclose much information related to Intellectual capital than large corporations. However, leverage negatively affects the disclosure of IC. It is rightly supported as higher the leverage; low disclosure will be there as investors wouldn't be willing to invest in the organization. To attract investments, organizations wouldn't disclosure the debt level. There is no influence of profitability on the ICD. The authors believe that the government should spread awareness about the disclosure of Intellectual Capital at the macro level and train the employees and management at all levels and sizes to increase the disclosure level.

Keywords: disclosure; intellectual capital; content analysis; leverage

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1. INTRODUCTION

Enterprises' adoption of innovative and knowledge-based organizational techniques has heightened competitiveness among today's firms. This competitive edge is generated by the effectiveness of internal processes, corporate culture, information exchange methods, employee efforts, customer relationships and satisfaction, and other comparable assets. Together referred to as intellectual assets, these assets comprise a firm's intellectual capital (IC).

Nowadays, IC is viewed as a backbone for ensuring enterprises' value creation, maintaining competitive advantage, and achieving business goals 1. Since traditional financial disclosures do not include intangible assets, stakeholders have expressed concern for the voluntary disclosure of information about their non-physical assets to more accurately analyze organizational performance and future growth pathways. To meet stakeholders' expectations and maintain relationships, corporations have disclosed IC information via financial statements, business responsibility reports, and corporate social responsibility (CSR) reports [2]. However, it is worth emphasizing whether these documents contain information about IC or overlook the relationship between a firm's intangible and tangible assets. While allowing for the inclusion of (IC) [3], the framework suggested by the Global Reporting Initiative (GRI) falls short of explaining how intangible information interacts with physical assets and adds to a company's business strategy [4]. However, this model does not directly address IC information, which corporations merely include in integrated reporting.

However, in recent years innovation has evolved in the realm of Integrated Reporting disclosure. More precisely, the International Integrated Reporting Council's (IIRC) introduction of integrated reporting provided a new method for corporations to communicate IC information [5]. Based on the integrated reporting, the organization effectively started representing six forms of capital divided

into three tangible capitals: financial, natural, and manufactured capital, and three intangible capitals, namely, human, social, and relationship capital.

The present study is a modest attempt to examine whether the Firm Size, Leverage, and Profitability impact ICD under the three heads, human, internal, and external capital. To capture this impact of the variables on Intellectual Capital Disclosure (ICD), Bombay Stock exchange (BSE) 30 non-financial firms have been considered for 2018–2020. BSE is regarded as one of the world's top security exchange platforms [6]. The S&P BSE Index is a basket of 30 companies representing a sample of large companies, popularly known as blue-chip companies. The companies selected for the study are as per market capitalization value on 31.03.2021.

The structure of the study is as follows. The second section of the study outlines the review of the literature. The third section provides information related to Research Methodology, followed by the Discussion and Results in the fourth section. The last section of the study presents the conclusion, limitation, and future scope.

2. LITERATURE REVIEW

Since 2000, companies' annual reports have included disclosures of their intellectual capital (ICD) [7–9]. Content analysis as a research method to better comprehend intellectual capital disclosure [7] According to their findings, content analysis is one of the most commonly utilized methodologies for determining the frequency and kind of IC reporting. To communicate to their stakeholders that their company's resources are of high value, management teams, including those at IC, will include more IC information in their financial statements. As a result, the stock's value will rise due to investors' reactions to this information. Disclosure of IC information can also help investors better assess the company's value in the future, which could boost the stock price on the market [10]. The signal hypothesis was proposed, which stated that companies are encouraged to provide prospective investors with complete information about their companies to raise stock prices [11]. Using this principle as a guide, companies would use various means, such as financial statements and annual reports, to send signals to the market [12]. Therefore, disclosure of intellectual capital can aid in the company's value and lessen investors' perception of investment risk. It is suggested that information's significance can be judged by its ability to provide positive news to increase investment [13].

F. Cerbioni et al. [14] investigate the relationship between a company's corporate governance qualities and its disclosure of insider information. Their research indicates that CEO duality, the percentage of independent directors, and board structure contribute significantly to the IC disclosure presented in annual reports by European biotechnology businesses. Additionally, firm-specific variables like ownership structure, firm size, country-related variables, leverage, age, and profitability substantially impact IC disclosure. G. White et al. [15] quantify intellectual property disclosure in the biotechnology sector of Australia and extend their findings by comparing the form and amount of intellectual property disclosures in the UK and Australian biotechnology sectors [16]. The two analyses share a common denominator: the link between IC disclosure and several critical business-specific factors, including ownership concentration, size, board independence, leverage, and firm age. The findings indicate that board independence, leverage, and size all significantly impact the level of IC disclosure [15]. Additionally, a strong leverage impact is proven regarding the type of intellectual property disclosure in the United Kingdom and Australia's biotechnology sectors [16]. A previous study on IC disclosure in initial public offerings has been conducted in Denmark [17], Italy [18], India [19], and Singapore [18].

2.1. Meaning of ICD and its Components

Intellectual Capital Disclosure (ICD) is a report intended to meet the information needs of users who cannot prepare reports about Intellectual Capital [20]. The ICD report is tailored to meet all of the information requirements by stakeholders [20] specifically. Intellectual Capital Disclosure is a methodology for quantifying intangible assets and describing the outcomes of a business's knowledge-based activities.

It is important to note here that, while much emphasis has been placed on IC, there are no

Table 1

Definition of IC Components

IC Components	Substitute Names	Meaning
Human Capital	Employee Competence	Means the set of knowledge, skills, education, the experience of workforce/employees
External Capital	Relational Capital External Relations Customer Capital	Refers to the relationship with customers, suppliers, government, competitors
Internal Capital	Structural Capital Internal Relations Organisational Capital	Comprises information that stays with the organization like database, processes, structure

Source: Schneider A., Samkin G. Intellectual capital reporting by the New Zealand local government sector [21].

standard methods for disclosing it. It is a voluntary and unregulated practice in nature throughout the world. As the concept gained traction, particularly among knowledge-intensive firms, management of several large firms deemed it beneficial to disclose IC. As a result, the models, nature, and extent of disclosure varied significantly between firms, industries, and countries.

The research on the relationship between firm variables and disclosure extent also concludes that firm size, management composition, leverage, and type of ownership all affect the pattern and amount of disclosure. It was pointed out that one of the most challenging aspects of reporting is reaching a consensus on three critical issues: the need for reporting, what to report, and how to report (*Table 1*).

2.2. Firm-Specific Contents

2.2.1. Firm Size

According to previous research, the company's size is a significant factor that positively affects corporations' level of IC disclosure[18, 19, 22]. As a result, it has been asserted that big corporations have a high level of disclosure than small corporations. In addition, large corporations can afford information preparation for reporting, have better internal and management processes, and are mandated to do social responsibility. In the absence of a scientific theoretical foundation for determining the size of a company, total assets, sales, and market capitalization are frequently utilized to estimate the size of businesses in the marketplace. Revenue has been employed to measure the business size in this study since it is unaffected by accounting rules and can be used as a proxy for size. In light of this argument, the current study investigated if there is a positive association between the size of the organization and the degree of ICD. The hypothesis is mentioned below:

H_1: Size bears a significant positive association with ICD.

2.2.2. Profitability

Profitability is one of the key measures of firm performance. The present study has used Return on Assets (ROA) as a proxy to measure profitability. Studies have suggested this as an important factor in determining ICD. For example, [19, 23] witnessed no association between ICD and firms. On the contrary, [24, 25]. observed a positive association between ICD and profitability. Many studies have used ROA as the proxy for profitability, calculated using Earnings Before Tax (EBT) divided by Total assets. In the current study, the alternate hypothesis for profitability is:

H_2: ROA bears a significant positive association with ICD.

2.2.3. Leverage

The level of leverage used by a company is regarded as an essential variable in examining the level of disclosure. Enterprises willing to take on

the additional debt will be subjected to increased disclosure as per International standards [16]. According to the findings of [4, 16], leverage has a negative yet significant relationship with ICD. However, studies [8, 11] have no relationship between leverage and a firm's disclosure level. In past research, the ratio of the book value of total debt to the book value of total assets was frequently used to measure the level of leverage in a company. The current study used this ratio as a proxy for a firm's leverage, and it looked into whether there was a relationship between a company's Leverage and ICD. The hypothesis is as follows:

H_3: Leverage bears a significant positive association with ICD.

3. RESEARCH METHODOLOGY

This section explains the sample information, data gathering procedures, and variables calculation.

3.1. Sample Information

The research conducts the study on BSE-listed non-financial top 30 firms. The author has used annual reports for collecting data, as annual reports are the primary tool for organizations to report relevant information. The study has been conducted from 2018 to 2020.

3.2. Formulation of the disclosure index

The items for the disclosure index have been formulated using a two-step process.

3.2.1. Step 1: In this step, a list of 52 items was gathered based on prior literature. The list of the items is mentioned in *Table 2* below.

3.2.2. Step 2: Then, a questionnaire was formed to take the opinion of the stakeholders on the relevance of the items. A five-point Likert scale was used to take the opinion where one represents not relevant to disclose, and five represents highly important to disclose. The stakeholders suggested removing a few items or merging a few items. The suggestions were discussed with all the stakeholders. After incorporating the suggestions, a list of 42 items was formed. The list of items is mentioned in *Table 3* below.

3.3. Scoring of the disclosure Index

Numerous past studies on IC disclosures have used content analysis [19, 26]. The study codes the items mentioned (*Table 3*) for calculating disclosure scores. For the calculation, a score of 0–1 is used. Score 1 is given when the item is disclosed in annual reports, and 0 is given if it is not disclosed in the annual report. The disclosure score is calculated by dividing the number of items disclosed by the total number of items.

$$Disclosure\ Score = \frac{\Sigma d}{N}.$$

Where d denotes the score of 1 if the item is disclosed and 0 if not disclosed, N denotes the total number of items, i.e., 42.

3.4. Variables Calculation

This section gives details about the variables that have been used in the present study with their calculation. The details are mentioned in *Table 4*.

3.5. Research Framework

Figure comprehends the study's objective and provides information related to the hypothesis development.

3.6. Regression Equation

$$ICD_{it} = \alpha + \beta_1 (SIZE_{it}) + \beta_2 (ROA_{it}) + \beta_3 (LEV_{it}) + \varepsilon_I,$$

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The results of the descriptive are presented in *Table 5* below. It can be observed that size has the maximum average value of 3.96, whereas ROA has the minimum average value. The average disclosure score of three years is 0.57, which is moderately high. However, the minimum disclosure score is 0.28, which is very low. However, the highest disclosure is 0.86, which is very high for the organization. This can be inferred from the analysis that the maximum number of firms are moderately reporting the items of IC in the annual reports.

4.2. Correlation

Table 6 represents the correlation matrix which denotes that there is no explanatory variable that

Table 2

List of items based on prior literature

Internal Capital	External Capital	Human Capital
1. Intellectual Property (17)	1. Business collaborations/ partnership (16)	1. Know-how (17)
2. Management processes (16)	2. Customers (16)	2. Education (15)
3. Networking System (16)	3. Brands (16)	3. Training and development (14)
4. Corporate culture (16)	4. Distribution channels (16)	4. Employees (12)
5. Management philosophy (13)	5. License/contract/agreement (16)	5. Entrepreneurial spirit (12)
6. Financial relations (12)	6. Customer satisfaction and loyalty (14)	6. Employee Expertise (3)
7. Infrastructure Assets (4)	7. Company names (8)	7. Employee satisfaction (2)
8. R &D (4)	8. Market Share (5)	8. Knowledge sharing (2)
9. Information technology (3)	9. Corporate reputation/images (3)	9. Safety and Health at Work (2)
10. Innovation (3)	10. Stakeholder Relationship (2)	10. Employee Remuneration & incentive schemes (1)
11. Research projects (3)	11. Research collaboration (2)	11. Equality (1)
12. Business Model/Strategy (2)	12. Goodwill (2)	12. Management Team (1)
13. Corporate Governance (1)	13. Government & other relationship (1)	13. Employee communication (1)
14. Knowledge-based infrastructure (1)	14. Market presence (1)	14. Working Environment (1)
15. Leadership (1)	15. Environmental (1)	
16. Organisational & management structure (1)	16. Brand recognition (1)	
17. Quality (1)	17. Brand development (1)	
18. Subsidiaries (1)	18. Suppliers (1)	
19. Communication system (1)	19. R&D (1)	

Source: author's compilation.

is highly correlated. Therefore, there is no problem of multicollinearity as no variable in the correlation matrix has a coefficient of more than 0.8 [30]. Also, the Variance Inflation Factor (VIF) is calculated to look for the issue of multicollinearity. *Table 7* shows the value of VIF and tolerance level. For multicollinearity to not exist, the VIF value should be less than 10, and the tolerance level should be 0.10 [31, 32]. In this data, the highest VIF value is 1.45, which is less than 10, and the highest tolerance level is 0.908, which is greater than 0.1. Therefore, the results confirm that multicollinearity is absent from the data.

4.3. Diagnostic Test

Before applying Ordinary Least Square or Panel Data, the following diagnostic test was run:

1. Stationarity Test — To check the unit root in the data, Levin, Lin, and Chu test was applied. The p-value is less than 0.05, thus rejecting the null hypothesis, which means that the data is stationary.
2. Multicollinearity — From *Table 6*, it can be witnessed that the mean VIF is less than 10, and the tolerance level is above 0.10 [31].
3. Heteroscedasticity — To check the heteroscedasticity, Breusch pagan test was

Table 3

Final list of items for the disclosure of IC

Internal Capital	External Capital	Human Capital
Infrastructure Assets	Licence/contract/agreement	Employees
Business Model	Corporate reputation/images	Entrepreneurial spirit
Financial relations	Market presence	Know-how
Information technology	Market Share	Knowledge sharing
Innovation	Stakeholder Relationship	Management Team
Intellectual Property	Suppliers	Training and development
Knowledge-based infrastructure	Brands	Working Environment
Leadership	Brand recognition	Education
Management philosophy	Brand development	Employee Expertise
Management processes	Customers	Employee communication
Organisational & management structure	Distribution channels	Employee Remuneration & incentive schemes
Quality	Environmental	Employee satisfaction
R &D	Business Partnership	Safety and Health at Work
Research projects		
Subsidiaries		
Corporate culture		

Source: author's compilation.

Table 4

Variables Calculation

Variables	Formula	References
Dependent Variable		
ICD	$ICD_{it} = \Sigma d_{it} / N$	[19]
Independent Variables		
Firm Size	Natural log of Total Sales	[27]
ROA	$ROA = \frac{\text{Operating Income}}{\text{Total Assets}} \times 100$	
Leverage	Total Debt / Total assets	[28, 29]

Source: author's compilation.

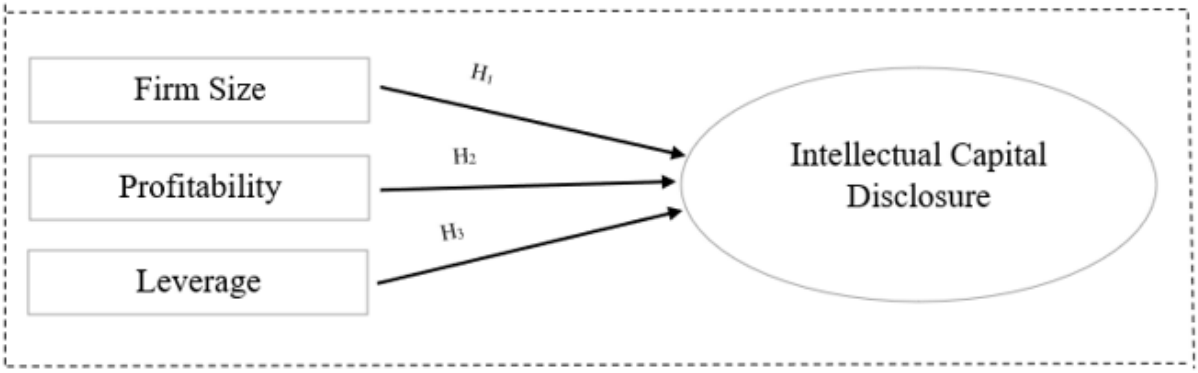

Fig. **Hypothesis development**

Source: author's compilation.

Table 5

Descriptive Statistics

Variable	Observations	Average	Standard Deviation	Minimum	Maximum
Size	90	3.96	0.54	2.50	5.53
ROA	90	0.25	0.16	–0.09	0.84
Leverage	90	0.39	0.55	0.00	2.41
ICD	90	0.57	0.12	0.28	0.86

Source: author's compilation.

Table 6

Correlation Matrix

	Firm Size	ROA	Leverage	ICD
Firm Size	1			
ROA	–0.0886	1		
Leverage	–0.2073	–0.4972	1	
ICD	0.3617	–0.1324	–0.0748	1

Source: author's compilation.

Table 7

VIF and tolerance level

Variable	VIF	1/VIF
Leverage	1.45	0.689
ROA	1.4	0.714
FirmSize	1.1	0.908
Mean VIF	1.32	

Source: author's compilation.

Table 8

Panel Data Regression

Independent Variable	DV–Intellectual Capital Disclosure							
	Fixed Effect				Random Effect			
	Coefficient	t value	Robust Standard Error	p-value	Coefficient	z value	Robust Standard. Error	p-value
Constant	−0.085	−0.26	0.329	−0.26	0.312	2.18**	0.143	0.029
Firm Size	0.187	2.22	0.084	2.22	0.079	2.36**	0.033	0.018
ROA	−0.181	−0.92	0.196	−0.92	−0.127	−1.12	0.113	0.261
Leverage	−0.102	−2.76	0.037	−2.76	−0.060	−2.12**	0.028	0.034
R Square (Within)	0.3765				0.371			
Hausman Test	Prob>chi2 = 0.154							
Model Appropriate	**Random Effect**							

Source: author's compilation.

applied. The p-value is less than 0.5, thus accepting the alternate hypothesis. Hence, there is the problem of heteroscedasticity.

4. Serial Autocorrelation — To diagnose autocorrelation, the Wooldridge test is applied. The results show that the p-value is more than 0.05. Thus, null hypothesis was accepted. Thus, there is no problem of autocorrelation in data.

5. Poolability Test — To check whether OLS needs to be applied or Panel Data, the poolability test was applied. P-value is less than 0.5, thus rejecting the null hypothesis. Thus, panel data regression was applied.

To address the problem of heteroscedasticity, robust standard errors were shown in the results.

4.4. Panel Data Regression

The effect of Size, ROA, and Leverage was examined on ICD using panel data regression. The results show H_1 has been accepted as the p-value is less than 5%, thus accepting the alternate hypothesis. It means that the firm size has an impact on ICD. H_2 has been rejected in our case, which shows that the null hypothesis has been accepted. It means that profitability has no impact on the disclosure level of the organizations. H_3 has been accepted, that leverage impacts the disclosure level. This finding supports the hypothesis that high-leveraged firms will adopt voluntary value-added IC disclosures to meet current and future debt providers [16]. Also, the companies with high leverage costs will have high agency cost due to the risk [33]. Hence, the external parties or the debt providers demand disclosure to reduce information asymmetry. As witnessed in *Table 8*, The value of R^2 is 0.371, which shows that the explanatory variables explain the observed variable by 37%. It means that some of the variables that explain the observed variable lie in error terms. The low R square doesn't mean that the model is unfit. Sometimes, unexplained variables are not easy to calculate, thus giving a low R^2.

5. CONCLUSION

The paper's objective was to examine the disclosure of IC in the top 30 BSE indexed non-financial firms for a period of three years ranging from 2018–2020. The results were obtained by applying Content Analysis to the 30 firms

on Annual Reports. The disclosure score was calculated, and the panel data regression was used in the analysis. The Firm Size is positively related to ICD, as confirmed by studies [19, 34]. It can be concluded that larger firms disclose more IC content than medium or small firms [19]. There is a need to develop a proper framework for disclosing IC in their annual reports. The results show that the leverage is negatively related to the disclosure of IC, which is confirmed by [4, 16]. Another important factor is to examine whether profitability impacts the disclosure of IC. The results revealed that profitability measure ROA has no impact on the disclosure of IC, which is confirmed by [19] in the Indian Study. The findings reveal that not much information is being disclosed in annual reports; only information beneficial for the organization is revealed.

The most disclosed items in Internal Capital were "R&D", "Knowledge-based infrastructure" and "Financial relations" in all three years. In the case of external capital, the best three reported were "Corporate reputation/images", "Market Presence" and "Stakeholder Relationship". Finally, the three best-disclosed items in the case of human capital are "Employees", "Training & Development" and "Working Environment".

The academia, management, regulators, and policymakers will benefit from the present study. This study is an addition to the existing literature as a new list of variables has been introduced. Results indicate that the disclosure level is not very high in the Indian Scenario. The policymakers will understand that voluntary reporting on IC is not benefitting the stakeholders. Only information that will benefit the organization is being disclosed. Hence a proper framework needs to be designed for the reporting of IC.

The research offers room for improvement by carrying out cross-country comparisons and examining each country's level of disclosure. Even the researchers can use the information available on websites, business reports, internet to examine the impact of disclosure on IC. The proposed list of IC items can be used to study the disclosure practices in other countries along with the weighted index.

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S. Singhal — identified the problem, developed the framework, review of literature, collected data, performed analysis, and wrote the conclusion.
S. Gupta — discussed the research results and wrote the conclusion.
V.K. Gupta — discussed the analysis techniques.

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