Exploring the Compliance Analysis and the Determinants of Quality of Integrated Reports : Evidence from India

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Abstract

The research looked into five research questions to determine the factors that determine report quality as well as the compliance of integrated reports of specific Indian companies reported for 2018–2019. Ninety-two questions in the compliance analysis index adhered to the <IR> framework, while the second index, intended for non-financial disclosures, contained 90 KPIs in accordance with the GRI criteria. For in-depth analysis, we rigorously reviewed the top 500 companies listed on NSE/BSE and finally came up with 32 reports for the year 2018–2019. The study revealed that the integrated reports complied with the <IR> framework, and the determinants that were significant and positively associated with the quality of integrated reports are firm size measured by revenue, assurance, and management dialog on IR. However, a negative association was found for the market capitalization with the quality of IR.

Keywords : **firm size, integrated reporting framework, non-parametric test, non-financial disclosures, and Wilcoxon signed rank test**

JEL Classification Codes : M10, M14

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The approach of the <IR> framework is to encourage business entities to report more holistic information, primarily focusing on non-financial performance apart from financial performance. The <IR> framework allows entities to identify and define the materiality, explaining the value created for a particular period, engaging stakeholders, identifying and quantifying risk and converting them into opportunities as per the business model. The innovative and influencing portion of the framework is its six capital model that segregates the input capitals (Natural capital, manufacturing capital, human capital, social & relational capital, financial capital, and intellectual capital). The adoption of <IR> framework is at high momentum all over the world and also in India.

In addition to its six capital models, the <IR> framework intends to stabilize the financial disclosures with the non-financial disclosures, claiming to be an innovative and more holistic framework globally. It is the most evolved form of corporate reporting and is capable of swapping the other forms of reports prevailing universally. Thus, understanding the importance and effectiveness of <IR> framework, the companies in India have started implementing the framework, which gained momentum after (Securities and Exchange Board of India, 2017) guidelines. Till the year 2020, 73 companies[1] have adopted the framework and benefited from it. Furthermore, a

[1] Primary data collected by author in January 2020.

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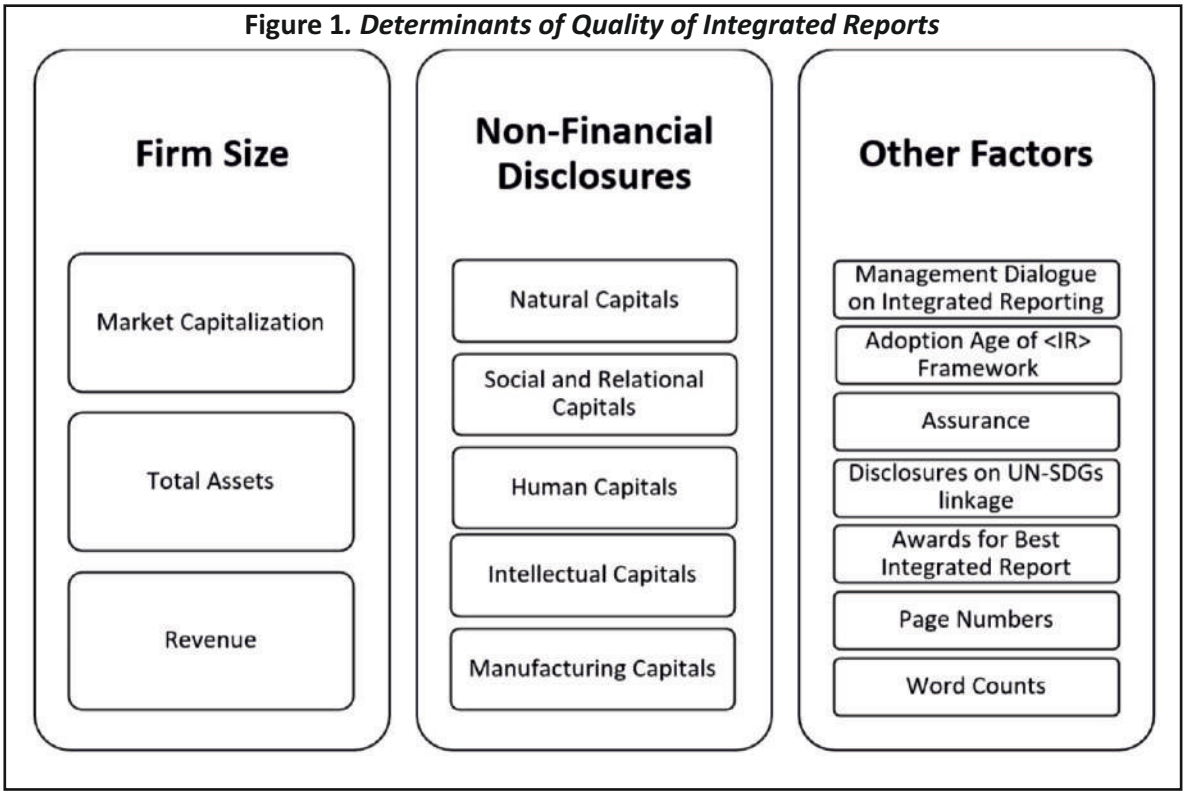
number of studies (Alfiero et al., 2018; Ara & Harani, 2020; Bananuka et al., 2019; Gibassier et al., 2018; Jensen & Berg, 2012; Vitolla & Raimo, 2018; Vitolla, 2019) have contributed to the determinant of adopting the <IR> framework. However, relatively few studies have been conducted to determine how to improve the quality of integrated reports, such as (Rivera-Arrubla et al., 2017).

Determinants of Quality of Integrated Reports

The determinants for the adoption of <IR> framework in India are influenced by various theories such as *diffusion of innovation theory*, *stakeholders theory*, and *signaling* from large organizations, e.g., TATA Groups, Tech Mahindra Ltd, Wipro, which were the early implementers of <IR> framework in India (Ara & Harani, 2020). However, the quality of integrated reports is also a critical aspect (Pistoni et al., 2018), as even after the enactment of the <IR> framework, the information delivered through the integrated reports is partial and does not comply with some of the elements or guiding principles of the <IR> framework (as revealed in our study). Thus, we have conducted additional studies on the factors that determine the quality of IR, which are represented in Figure 1.

Figure 1. ***Determinants of Quality of Integrated Reports***



Research Motivation

India's economy is the fastest-growing in the world and is currently evolving. Given its strong political and democratic traits, it is expected to rank among the world's top three economic powers in the years to come (India Brand Equity Foundation, 2021). In contrast, the GDP of South Asia is expected to increase by 8.3% by 2021–2022, making it the largest in the region (World Bank Group, 2021). In terms of Business Responsibility Reporting, India is the first country to mandate responsibility reporting and amend its Companies Act-2013 for the same in the year 2012 (Ministry of Corporate Affairs, Government of India, 2020). However, in 2017, the Security Exchange Board of India (SEBI) issued guidelines to voluntarily adopt the <IR> Framework-2013 for

the topmost 500 NSE-listed companies (SEBI, 2017), which motivated us to conduct research on integrated reporting practices from the early stage of adoption and implementation to the compliance of published integrated reports since 2017 with the determinants that have association with the compliance of integrated reports. Thus, the study intends to consider the size of the firm, non-financial disclosures, assurance, management dialog on <IR> framework, word count, awards, page numbers and age of adoption for this study to conclude.

Review of Literature

Athma and Rajyalaxmi (2015) conducted a comparative analysis of the integrated report of Metair Investment Ltd with Kirloskar Brother Ltd. Additionally, and the authors also studied the annual reports[2] (which are not based on <IR> framework) of 30 BSE-listed companies, accompanied by a disclosure index prepared by means of focusing on the six capital models of <IR> framework. Barin and Ansari (2016) reflected the theoretical aspects of <IR> framework furthermore to the analysis of financial performance unveiled in non-integrated annual reports of selected petroleum companies and its compliance with <IR> Framework.

Nanjundaswamy and Divyashree (2019) examined the alignment of selected eight integrated reports published by Indian companies. The authors concluded that the reports are in alignment with the <IR> framework. Roman et al. (2019) confirmed that firms that show low financial performance tend to provide low-quality integrated reports, while the age of companies establishment did not have a significant impact on integrated report quality. Whereas revenue has a positive impact on report quality, and the length of the report measured by word count has a negative impact.

Ara and Harani (2020) contributed to the conceptual literature on the <IR> framework. The study revealed the factors and theories that influence the adoption of <IR> in India. Vitolla et al. (2020) examined the determinants of the quality of reports in financial sectors. The author concluded that ROE, firm size, civil law, and leverage of financial institutions positively influence the quality of integrated reports.

Statement of the Problem and Research Gap

From the review of the above literature, it can be understood that the researchers are studying the annual reports of Indian companies in the context of <IR> framework, which is theoretical. Nonetheless, there aren't many works by Indian scholars that discuss the state of authentic, integrated reports in relation to the <IR> framework, backed up by empirical data (Nanjundaswamy & Divyashree, 2019), in which the sample size was very small (i.e., $n = 8$). Additionally, despite various benefits credited to the <IR> framework and the report proper, there are fewer supporting empirical studies presenting evidence on the factors that stimulate the quality of the reports. Also, there is no literature contributed by Indian researchers considering the top 500 listed Indian companies as taken in this study. Thus, the study will fill those gaps and will make a greater contribution to <IR> research from an Indian perspective.

Objectives of the Study

The following research questions have been formulated as the objectives of our study:

↳ ***RQ1 :*** What is the adoption and publication status of <IR> framework and integrated reports, respectively, from 2011 to 2019 in India?

[2] The annual reports implies here the traditional reports which the companies used to present yearly and are not based on the Integrated Reporting Framework 2021.

- ***RQ2 :*** Whether the available integrated reports comply with the Integrated Reporting Framework 2013?

The determinants of the quality of integrated reports are further studies under the following research questions:

- ***RQ3 :*** Whether the size of the firm determine the quality of integrated reports?
- ***RQ4 :*** Whether the non-financial disclosure determines the quality of the integrated report?
- ***RQ5 :*** Whether the other factors[3] support determining the quality of integrated reports?

Hypotheses Statements

Section 1 : Compliance of Integrated Reports

- **H_1 :** The selected Integrated Reports comply with the IR Framework if[4] $\eta > 250$.

Section 2 : Alternative Hypotheses for Determinants of Quality of Integrated Reports

- **H_{R1} :** The size of the firm significantly determines the quality of integrated reports.
- **H_{R2} :** The non-financial disclosures significantly determine the quality of integrated reports.
- **H_{R3} :** The other factors significantly support in determining the quality of integrated reports.

Research Methodology

Research Design

The most appropriate and widely used technique for evaluating the compliance of particular integrated reports is content analysis, as demonstrated by the work of Ali (2017), Eccles et al. (2019), Marchbank (2016), and Sofian and Dumitru (2017).

Source and Reliability of Data

The websites of the corresponding companies have provided links for downloading the integrated reports for the 2018–2019 fiscal year. The legitimacy and dependability of integrated reports and their information are guaranteed by the legal requirements for listing regulations and properly conducted audits.

Research Population and Sampling

The research sample is of the top 500 listed (NSE/BSE) companies who have voluntarily adopted <IR> framework after the guidelines of (SEBI, 2017). In the study, the financial sectors have been excluded as they are less likely to impact the natural environment and sustainability accountabilities as compared to manufacturing or other sectors. The final sampling is presented in Table 1.

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[3] Explained in section: Variables under study.

[4] Where η represents hypothetical median value required for one-sample Wilcoxon signed rank test.

Table 1. *Sampling*

Total Sample	**500**
Less	
Financial sector (Service/Bank)	–84
No integrated reports were found	–384
Final Sample available for analysis	32

Data Collection Method and Analysis Plan

For the study of the first objective, we have thoroughly searched the websites of selected 500 companies and collected available (actual) integrated reports. Second, for the content investigation of the integrated annual report of selected companies and to reveal the compliance of the integrated reporting framework as given by IIRC, a disclosure index (DI) has been prepared, containing 92 questions grounded on the (IIRC, 2013) framework. The featured content analysis has been accomplished via the scoring (or scaling) method as adopted in the previous literature (Eccles et al., 2019; Jeroe, 2016; Marcon & Mancin, 2016; Marchbank, 2016; Sofian & Dumitru, 2017).

Implementation of Scoring/Scaling Method

Two main classifications (i.e., Guiding Principal and Content Element) checklist elements follow a scaling interval of 0–1–2–3, although some subcategories have a 0–1–2 scale. For the third category (preparation and presentation), a 0–1–2–3–4 scale has been applied, as shown in Table 2. A similar methodology has been used by Eccles et al. (2019) and Sofian and Dumitru (2017). Higher scores will result in better compliance with the IR

Table 2. *Methodology*

Elements (IR Framework)	**Scaling method implemented**
GUIDING PRINCIPLES (GP)	0 = no discussion;
For GP-I: Strategic focus and future orientation	1 = cursory/brief description;
GP-II: Connectivity of Information	2 = discussions are primarily focused on current performance;
GP-III: Stakeholder Relationship	3 = discussions are focused in the context of short, medium and long-term
GP-IV: Materiality	
For GP-V: Conciseness	Ranked by word count and page number
For GP-VI: Reliability and Completeness	0 = no assurance;
	1 = internal assurance only;
	2 = assured by internal as well as third-party
For GP-VII: Consistency and Comparability	0 = neither comparable nor consistent;
	1 = consistent over time but not comparable or vice versa;
	2 = comparable and consistent over time
Content Elements (CE)	0 = no discussion;
	1 = cursory/brief description;
	2 = discussions are primarily focused on current performance;
	3 = discussions are focused in the context of short, medium and long-term
Preparation and Presentation (PP)	(0 = Poor P&P; 1 = Fair; 2 = Average; 3 = Good; 4 = Excellent

framework. Exclusively, for analyzing the conciseness of the integrated report, word count and number of pages have been considered.

Additionally, the non-financial disclosure analysis has been furnished by preparing another disclosure index w.r.t. to six capital model of <IR> framework in which we considered ninety KPIs as per the GRI[5] standard. For this, we have excluded the financial capital disclosures and have only considered the five capitals, i.e., social & relational capitals, manufacturing capitals, human capitals, intellectual capitals and intellectual capitals, which are non-financial. The score distribution has been done as 0 = no disclosures and 1 = disclosures made.

Variable Measurement

The variables studied are discussed in Table 3.

Table 3. ***Description of the Variables***

Dependent Variable	
Ln($IR_{TotalScore}$)	Total score of integrated reports analysis
Predictor Variables	
	Firm Size
Ln(*Size_Mcap*)	Market capitalization at the year-end 2018–2019
Ln(*Size_TA*)	Total assets at the year-end
Ln(*Size_Revenue*)	Revenue for the year
Ln(*IR_NFD*)	Total score of non-financial disclosure analysis
	Other Factors
Ln(*MGM_D*)	Management dialog on <IR>
Ln(*Adoption_Age*)	Adoption age of <IR> Framework
Ln(*Assurance*)	Assurance
Ln(*Award_IR*)	Awards for best IR
Ln(*Page_N*)	Page Number
Ln(*SDGs_L*)	Disclosure of sustainable development goals (SDGs) linkage
Ln(*Word_Counts*)	Words Count (in 100s)

Hypothesis Analysis Method

RQ2 : Compliance Analysis

Considering the size of the sample ($n = 32$) and distribution (non-normal), a one-sample Wilcoxon signed rank test has been conducted in IBM SPSS. The alternate hypothesis shall be accepted if the observed median is better than the hypothetical median, i.e., $(\eta) \geq 250$.

RQ3, RQ4, and RQ5 : Determinants of Quality of Integrated Reports

We have implemented a regression analysis approach on data collected from a sample size of thirty-two[6]

[5] As <IR> framework is a principle-based framework which does not provide the standard KPIs, so we have referred to the GRI standard to prepare the non-financial disclosure index. The selected KPIs are general KPIs which are applicable to all the sectors and have been subsequently segregated as per the six capital model of <IR> framework.
[6] Till 2018–19, only 32 companies (from top 500 listed) have adopted the <IR> framework.

integrated reports of Indian companies for the year 2018–2019. For the set research questions, three different models have been constructed, i.e., for RQ3 and RQ5, multiple regression analysis has been conducted, while for RQ4, simple linear regression has been implemented.

Regression Model Equations

- **Model for RQ3 :** $\mathrm{Ln}(IR_{TotalScore}) = \delta 0 + \delta 1 \mathrm{Ln}(Size_{Mcap}) + \delta 2 \mathrm{Ln}(Size(T_{assets})) + \delta 3 \mathrm{Ln}(Size_{Revenue}) + \varepsilon$ ..... (1)
- **Model for RQ4 :** $\mathrm{Ln}(IR_{TotalScore}) = \delta 0 + \delta 1 \mathrm{Ln}(IR\_NFD) + \varepsilon$ ..... (2)
- **Model for RQ5 :** $\mathrm{Ln}(IR_{Total\,Score}) = \delta 0 + \delta 1 \mathrm{Ln}(MGM_D) + \delta 2 \mathrm{Ln}(Adoption_{Age}) + \delta 3 \mathrm{Ln}(Assurance) + \delta 4\ \mathrm{Ln}(Award_{IR}) + \delta 5 \mathrm{Ln}(Page_N) + \delta 6 \mathrm{Ln}(word_{Count}) + \delta 7 \mathrm{Ln}(SDGs)$ ..... (3)

Regression Equation Prediction

The regression analysis depicts the predicted equation as follows:

$$\acute{Y} = \delta_0 + \delta_1 X_1 + \delta_2 X_2 + \ldots\ldots \delta_k X_k + \epsilon \quad \ldots\ldots\ldots (4)$$

where $\acute{Y}$ is the predicted dependent variable, δ_1, $\delta_2 \ldots$ δ_k are unstandardized regression coefficients, δ_0 is the constant, $X_1, X_{2\ldots\ldots} X_k$ is the predicted value of independent variables, and ϵ is the standard error.

Criteria for Accepting/Rejecting the Alternative Hypotheses

H_0: $\delta_1 = \delta_2 = \ldots = \delta_k = 0$; at p-value > 0.05.

H_1: at least one of $\delta_k \neq 0$; at p-value < 0.05.

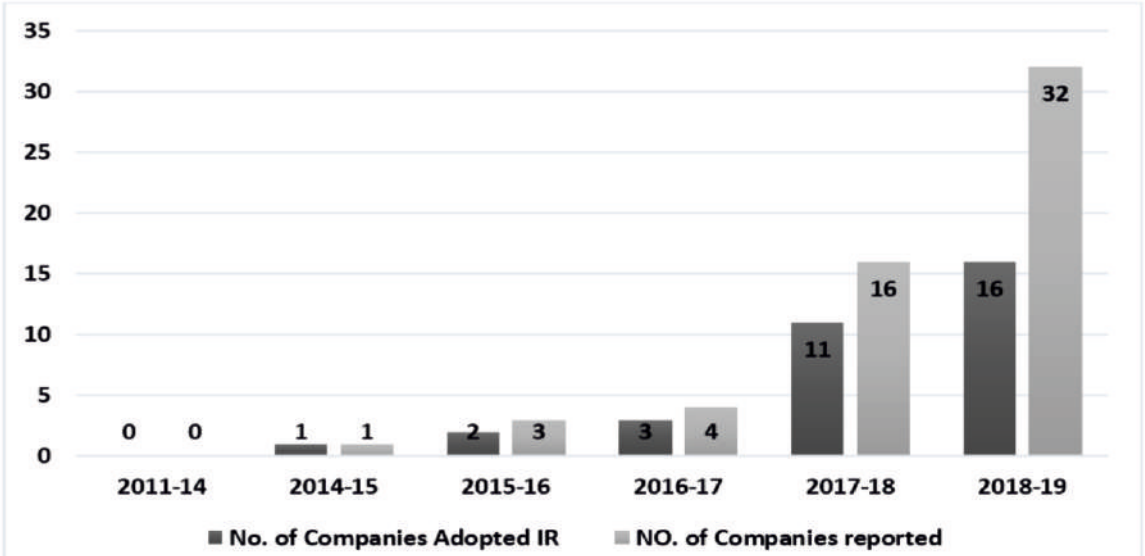
Scope of the Study

We have addressed omissions happening in complying with <IR> framework, individually highlighted the omissions happening with guiding principles and the content elements and the supporting factors that are mandatory according to the framework, which will be useful for the report preparers to overcome the deficit area. In addition to that, the methodology adopted to study the determinants of quality of integrated reports (as mentioned above) is unique and has not been done so far by any researchers in our knowledge. Thus, the results of this study will help institutions and report preparers to understand the hits and misses of published integrated reports and the determinants that will improve their quality. Additionally, it will benefit the Indian researchers in providing avenues for further research in <IR> framework and will also add literature in contributing to the study of determinants of high-quality integrated reports from the Indian perspective, which is not available till the present date.

RQ1 : Status of <IR> Framework and Integrated Report, Respectively, from 2014 To 2019

During the earlier announcement phase of (IIRC, 2013), the Indian companies were less attentive towards the adoption of the framework and also it was away from the Indian researchers. Nevertheless, the course of action (SEBI, 2017) became the game changer factor for embracing the framework as well as fascinated the researchers to explore more about this framework. It is somewhat depressing that, in India, from 2011 to 2014, the framework

Figure 2. ***Year-Wise Adoption and Publication of Annual Integrated Reports in India***



was completely overlooked. But in the year 2014–2015, an initiative to adopt the framework was taken up by Kirloskar Brothers, followed by TATA Groups which contributed the first integrated report from India. The other corporations began adopting the paradigm as a result, and integrated report releases increased starting in 2015–2016. Eleven additional businesses adopted the framework, and 16 integrated reports were released throughout the momentum phase, which ran from 2017 to 18. A total of 32 reports were produced, and 16 additional firms were adopted in the base year of 2018–2019 for this study (see Figure 2).

The embracing of <IR> framework in India is moderately low as compared to other countries. The Kirloskar Brothers first adopted the framework in 2014, followed by TATA STEELs. In the year 2016–2017, Tata Motors Ltd, Tech Mahindra Ltd., and Wipro Ltd successfully adopted the framework. While, in 2017–2018, 11 more companies stepped toward implementation. The embracing of <IR> was gaining momentum rapidly owing to the innovative <IR> framework (SEBI, 2017) guidelines, as well because of signaling from the organizations that have already adopted it. In the year 2018–2019, 32 integrated reports were published (see Figure 2). Consequently, these 32 reports have been analyzed and discussed in the following section.

RQ2 : Content Analysis Results

In this section, first, we have made a discussion on descriptive analysis of the guiding principles, content elements disclosure, and the preparation and presentation as per the methodology discussed above and later, there is an interpretation of hypothesis test analysis.

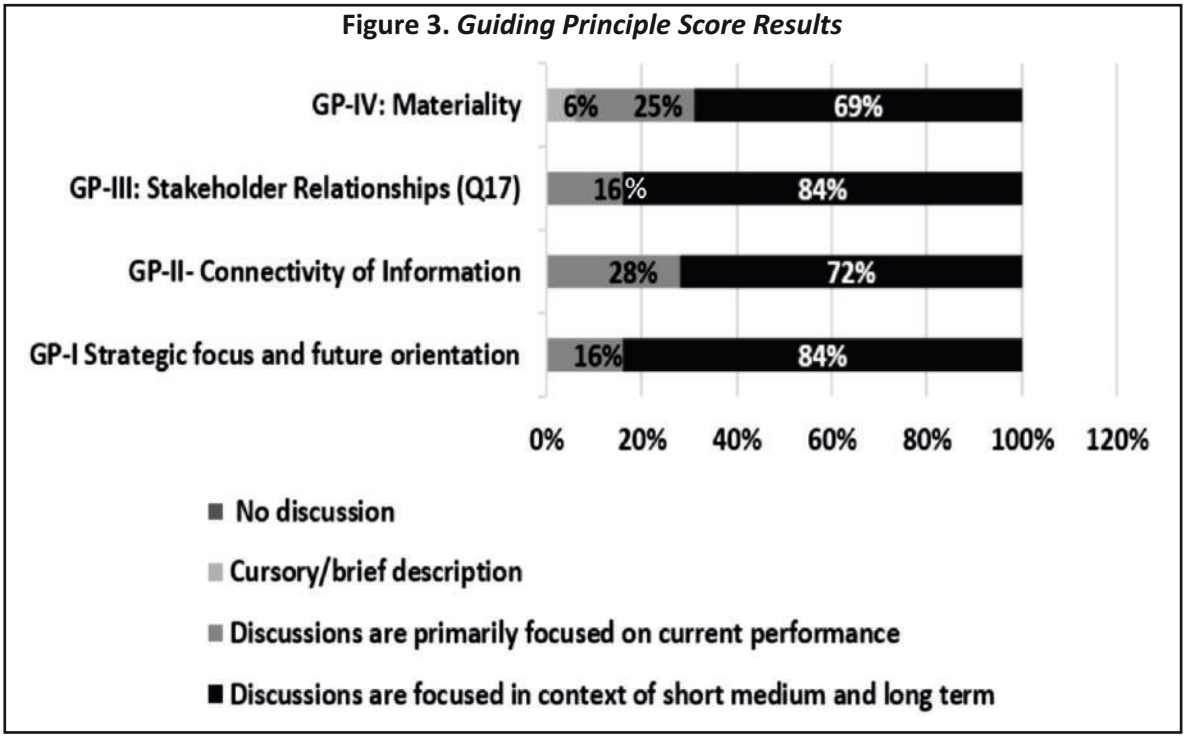
Guiding Principle Score Results

The guiding principles score results are represented in Figure 3, and the revelation is made under the following headings:

Discussion in Context of Time Frame (Long-term, Medium, and Short-term)

For GP-I and GP-III, 84% of companies have followed the time frame as prescribed in <IR> (IIRC, 2013), while

Figure 3. ***Guiding Principle Score Results***



72% of companies connected the disclosed information with the frame, and 69% have disclosed the materiality in terms of long-term, medium, and short-term.

Discussion in Context of Current Performance only

Few companies missed out on time frames and have provided disclosures primarily focused on the current performance.

Cursory/Brief Discussion

While just 6% of businesses have superficially disclosed materiality. The conciseness of integrated reports is measured by considering the word count and number of pages (refer to Table 4 for correlation matrix) with the total score simultaneously (see Figure 4). Subsequently, rank has been allotted and represented in Figure 5.

IIRC (2013) recommended getting external assurance for measuring the reliability and completeness of integrated reports. In Figure 6, it is to be noted that 56% of companies have attached external assurance statements, while 41% have given internal assurance. However, 3% of companies did not present any assurance statements. As presented in Figure 7, 50% of reports were found consistent and comparable, while 50% did not match the comparability and consistency guidelines.

Table 4. ***Correlation Matrix***

	Words Count (in 100s)	Total Score	No. of Pages
Words Count (in 100s)	1		
Total score	0.397473839	1	
No. of pages	0.798781046	0.533673647	1

Figure 4. ***GP-V : Rank of Concise Integrated Reports***

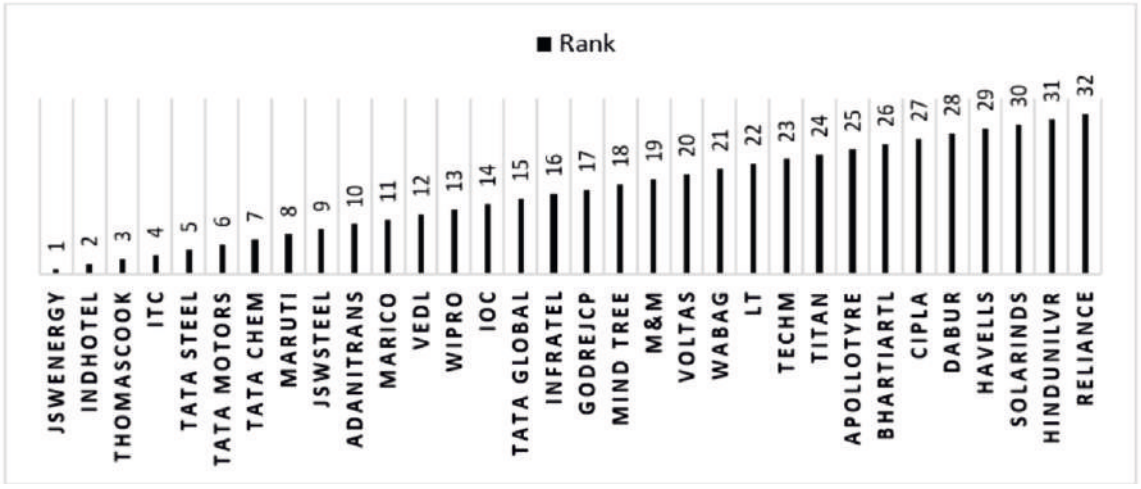


Figure 5. ***Guiding Principle-V : Conciseness***

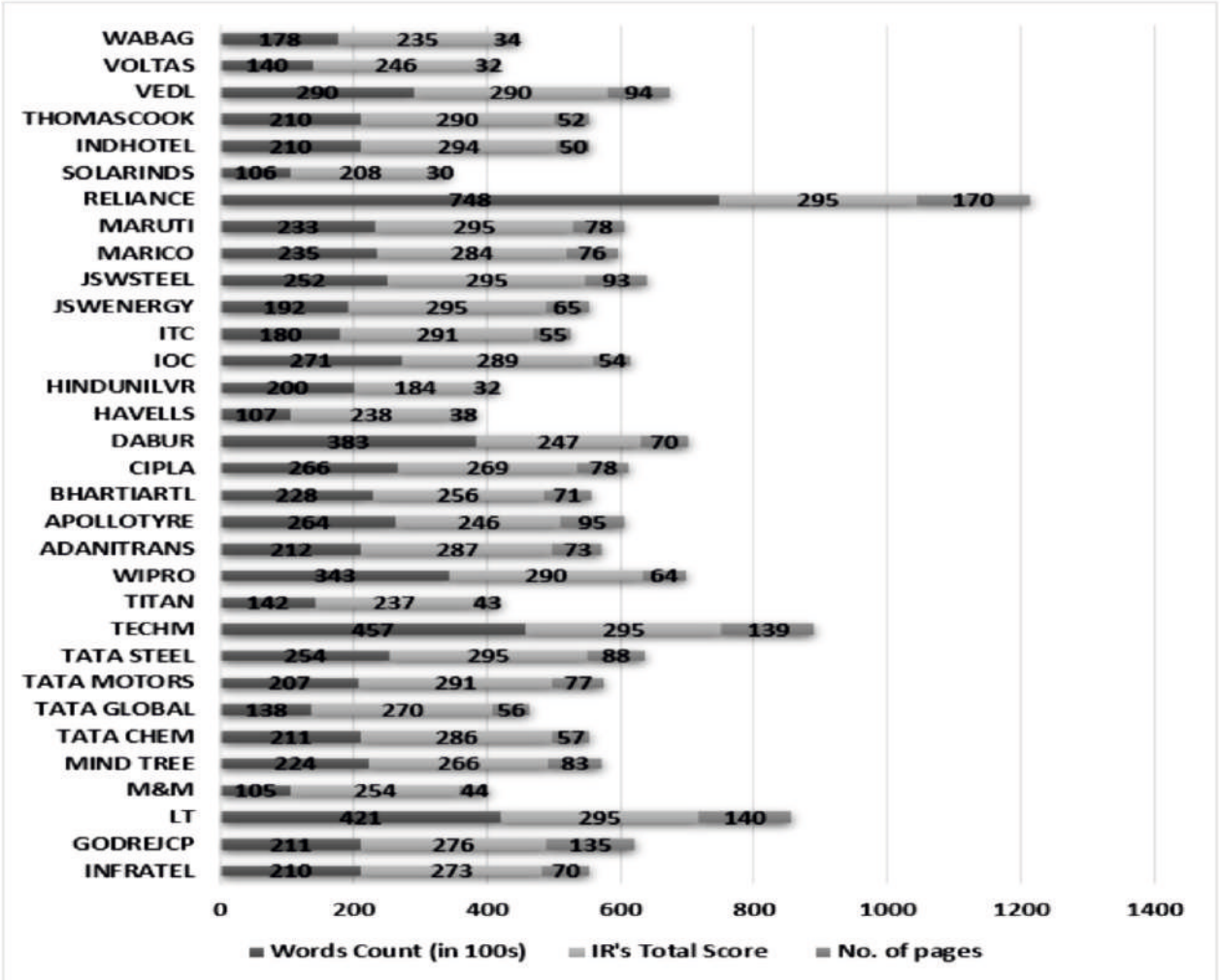


Figure 6. *GP-VI : Reliability and Completeness*

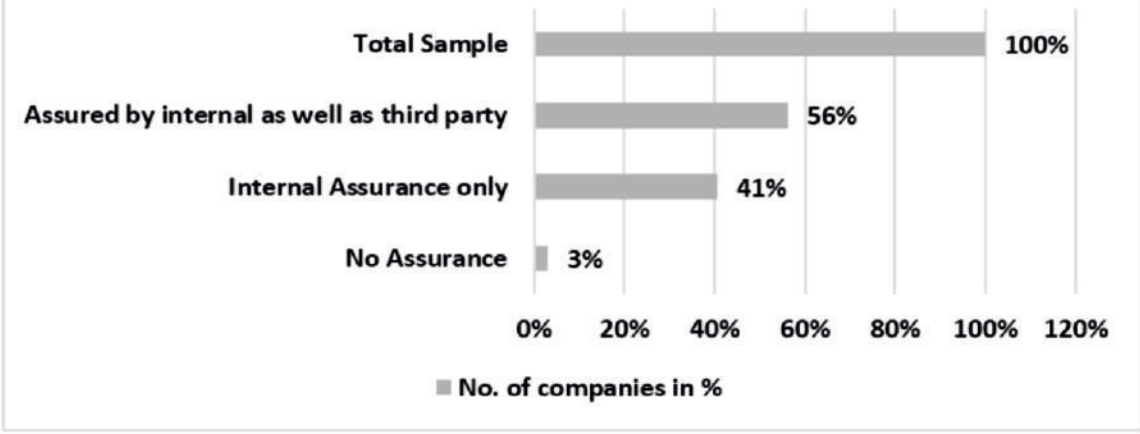
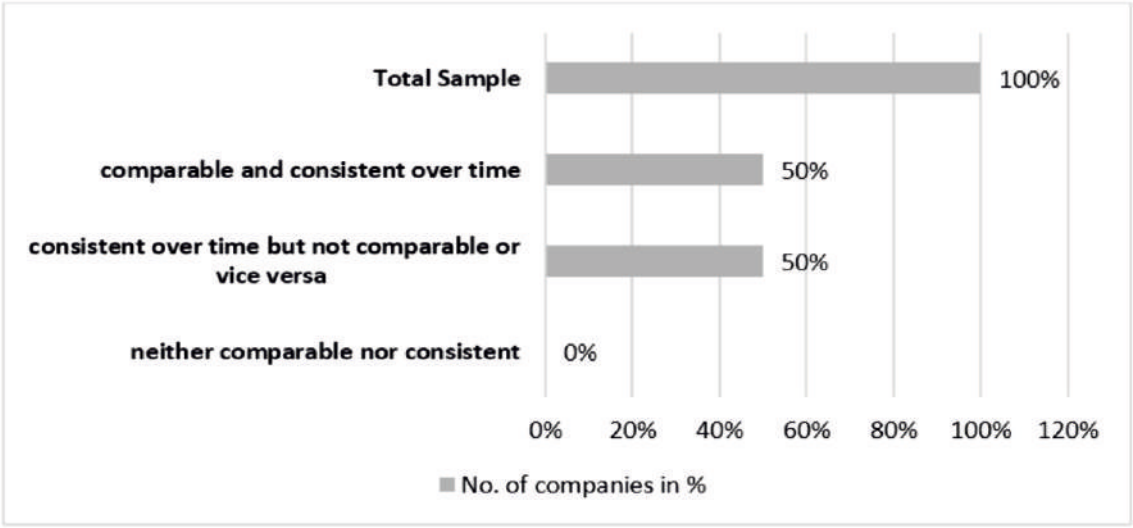


Figure 7. *GP-VII : Consistency and Comparability*



Content Elements' Score Results

The results for content elements scores are summarized (see Figure 8) under the following headings:

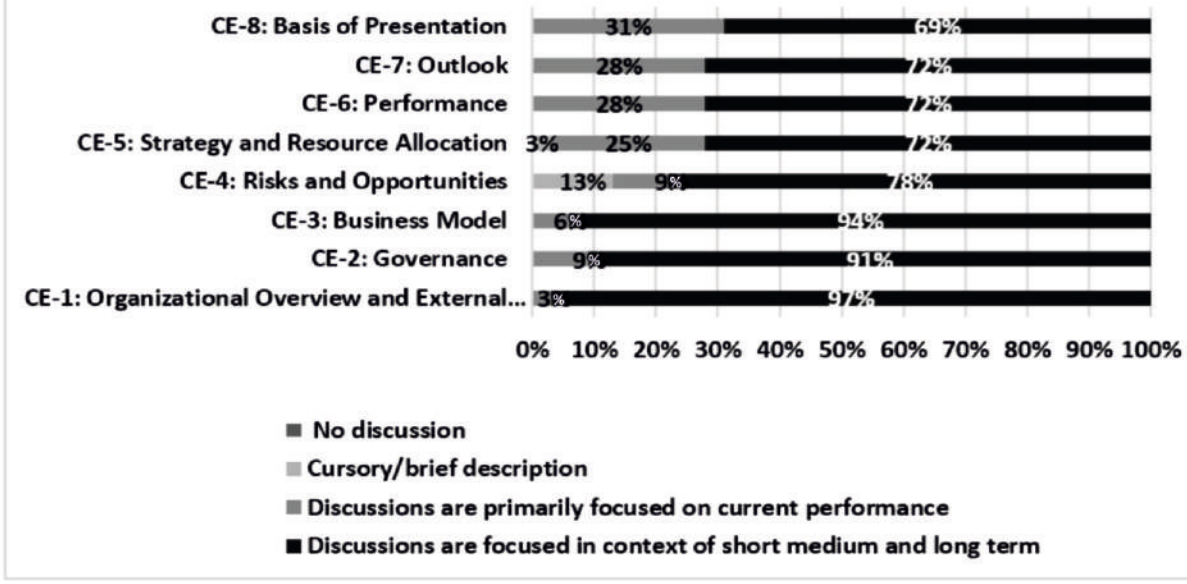
Discussion in Context of Time Frame (Long-term, Medium, and Short-term)

A total of 97% of businesses have disclosed CE-1 in accordance with the long-, medium-, and short-term time frames; 91% have disclosed CE-2; 94% have described their business models (CE-3); 78% have explained risks and opportunities (CE-4); and 72% have described CE-5, 6 and 7. Conversely, 69% for CE-8.

Discussion in Context of Current Performance Only

Few companies missed out time frame and have provided the disclosures primarily focused on the current performance.

Figure 8. ***Content Elements' Score Results***



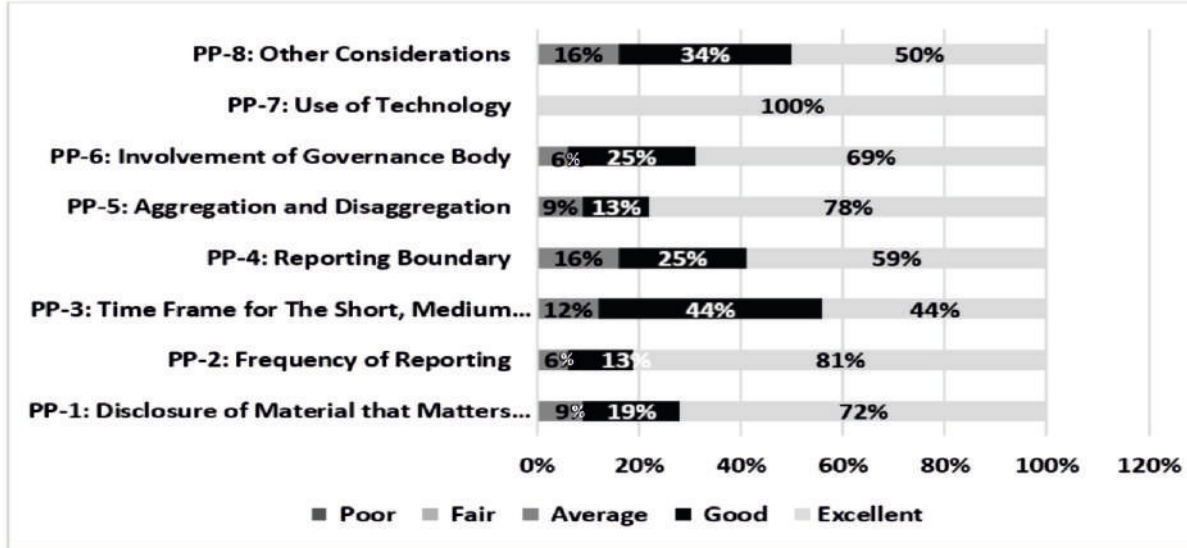
Cursory/Brief Discussion

However, just 13% of businesses have disclosed the opportunities and dangers superficially. Moreover, 3% for CE-5.

Preparation and Presentation

The results for preparation and presentation are summarized in Figure 9, which shows that most of the companies have made *Excellent* presentations, while some were good and few were found to be average.

Figure 9. ***Preparation and Presentation Score Results***



Hypotheses Results : Compliance of Selected Integrated Reports with <IR> Framework

The total scores of selected (n = 32) integrated reports were passed through the one-sample Wilcoxon Signed Rank test (Figure 10). The summary of the result is presented in Tables 5 and 6, which provide enough evidence to reject the null hypothesis at $p < 0.001$. Thus, the observed median value is 285, which is greater than the hypothetical median, i.e., $\eta > 250$, satisfying the condition for accepting that the selected integrated reports comply with the <IR> framework (Table 7).

Table 5. ***Hypothesis Test Summary***

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The median of the Total score of Integrated Reports Analysis equals 250.00	One-Sample Wilcoxon Signed Rank Test	0.001	Reject the null hypothesis

Note. [a.] The significance level is 0.050.

[b.] Asymptotic significance is displayed.

Table 6. ***One-Sample Wilcoxon Signed Rank Test Summary***

Total *N*	32
Test Statistic	445.000
Standard Error	53.403
Standardized Test Statistic	3.389
Asymptotic Sig. (2-sided test)	0.001

Figure 10. ***One-Sample Wilcoxon Signed Rank Test***

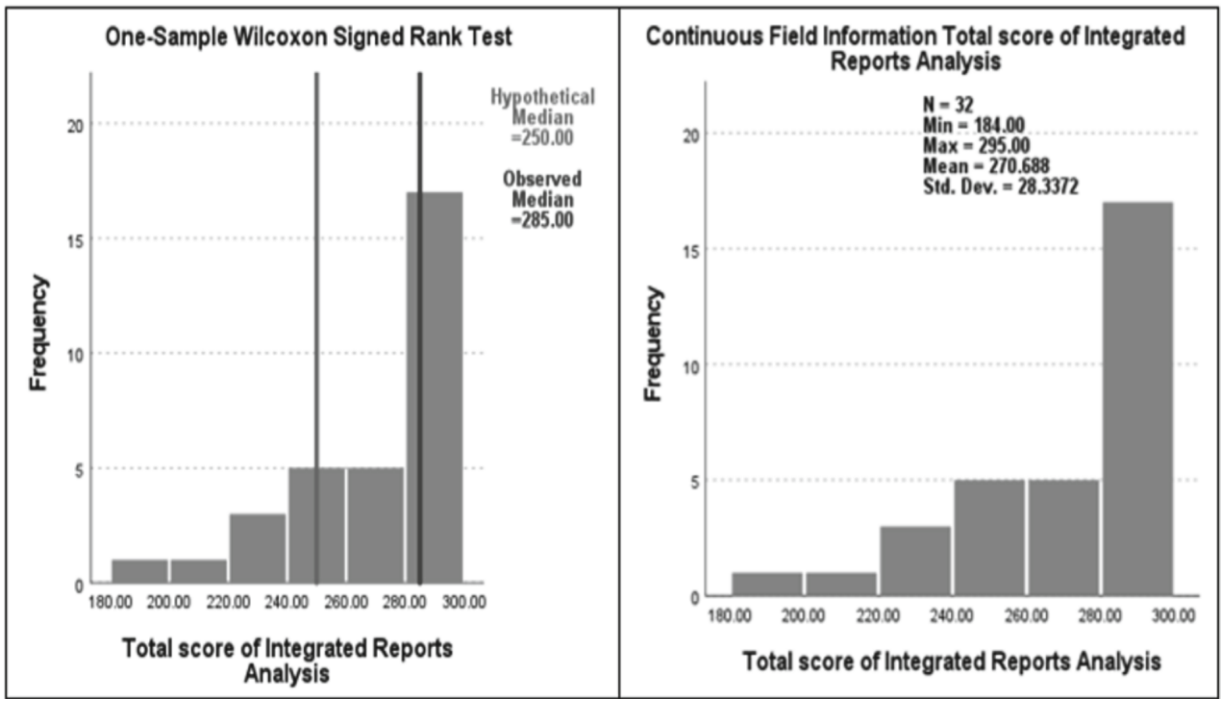


Table 7. *Variables Entered/Removed*[a]

Model	Variables Entered	Variables Removed	Method
1	Size_Revenue		Forward (Criterion: Probability-of-F-to-enter < = 0.050)
2	Size_MCAP		Forward (Criterion: Probability-of-F-to-enter <0=0.050)

Note. [a.] Dependent variable: Total score of integrated reports analysis.

Discussion

Determinants of Quality of Integrated Reports

- ***RQ 3 :*** Whether the size of the firm determines the quality of integrated reports?
- **H_{R1} :** The size of the firm significantly determines the quality of integrated reports.

$$\mathrm{Ln}(IR_{TotalScore}) = \delta 0 + \delta 1 \mathrm{Ln}(Size_{Mcap}) + \delta 2 \mathrm{Ln}(Size(T_{assets})) + \delta 3 \mathrm{Ln}(Size_{Revenue}) + \varepsilon \quad \ldots\ldots\ldots (1)$$

- ***RQ4 :*** Whether the non-financial disclosure determines the quality of the integrated reports?

$$\mathrm{Ln}(IR_{TotalScore}) = \delta 0 + \delta 1 \mathrm{Ln}(IR\_NFD) + \varepsilon \quad \ldots\ldots\ldots (2)$$

- **H_{R2}:** The non-financial disclosures significantly determine the quality of integrated reports.
- ***RQ5 :*** Whether the other factors[7] support determining the quality of integrated reports?

$$\mathrm{Ln}(IR_{Total\,Score}) = \delta 0 + \delta 1 \mathrm{Ln}(MGM_D) + \delta 2 \mathrm{Ln}(Adoption_{Age}) + \delta 3 \mathrm{Ln}(Assurance) + \delta 4\ \mathrm{Ln}(Award_{IR}) + \delta 5 \mathrm{Ln}(Page_N) + \delta 6 \mathrm{Ln}(word_{Count}) + \delta 7 \mathrm{Ln}(SDGs) \quad \ldots\ldots\ldots (3)$$

- **H_{R3}:** The other factors significantly support in determining the quality of Integrated Reports.

Regression Equation Predicted

The predicted regression equation is as follows:

Model-1 : $IR\_Total\ Score = 2.949 + 0.492(Size\_Revenue) - 0.214\,(Size\_MCap) + 0.424 \quad \ldots\ldots\ldots (5)$

Model-2 : $IR\_Total\ Score = 2.669 + 0.044\,(IR\_NFD) + 1.071 \quad \ldots\ldots\ldots (6)$

Model-3 : $IR\_Total\ Score = 174.965 + 22.41\,(MGMT\_D) + 13.12\,(Assurance) + 48.884 \quad \ldots\ldots (7)$

Assessing the Strength of the Predicted Equations

From the result of the first research question analysis, the power of the predicted equation is measured by the *coefficient of determination,* commonly known as *R*-square. It can be observed in Table 8 that the forward method represents two models, where the second model explains better fitness than the first one, in which $R^2 = 0.801$ at $p < 0.000 < \alpha = 0.05$, which implies that the predictor variables Size_Revenue and market capitalization explain 80% variance in the dependent variable IR_Total Score. Additionally, the ANOVA provided in Table 9 supports adequate evidence to accept the H_{R1} at *F*-value (58.198, 2) at $p < 0.000 < \alpha = 0.05$. Thus, the firm size has a

[7] Explained in section: Variables under study.

Table 8. *Model Summary*[c]

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin–Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	0.873[a]	0.762	0.754	0.51509	0.762	96.216	1	30	0.000	
2	0.895[b]	0.801	0.787	0.47991	0.038	5.559	1	29	0.025	1.725

Note. [a.] Predictors: (Constant), Size_Revenue.

[b.] Predictors: (Constant), Size_Revenue, Size_MCAP.

[c.] Dependent variable: Total score of integrated reports analysis.

Table 9. *ANOVA*[a]

	Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	25.528	1	25.528	96.216	0.000[b]
	Residual	7.959	30	0.265		
	Total	33.487	31			
2	Regression	26.808	2	13.404	58.198	0.000[c]
	Residual	6.679	29	0.230		
	Total	33.487	31			

Note. [a.] Dependent variable: Total score of integrated reports analysis.

[b.] Predictors: (Constant), Size_Revenue.

[c.] Predictors: (Constant), Size_Revenue, Size_MCAP.

Table 10. *Coefficients*[a]

	Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	95.0 % Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.533	0.424		3.617	0.001	0.667	2.399		
	Size_Revenue	0.403	0.041	0.873	9.809	0.000	0.319	0.486	1.000	1.000
2	(Constant)	2.949	0.719		4.103	0.000	1.479	4.419		
	Size_Revenue	0.492	0.054	1.066	9.149	0.000	0.382	0.601	0.506	1.975
	Size_MCAP	–0.214	0.091	–0.275	–2.358	0.025	–0.399	–0.028	0.506	1.975

Note. [a.] Dependent Variable : Total score of integrated reports analysis.

significant association with the quality of the report, individually, as provided in Table 10. The predictor variable revenue explains 49.2% of the variance and is positively associated with the total score of an integrated report. At the same time, market capitalization explains 21.4% of the variance and is negatively associated with the total score of our independent variable, i.e., the total score of an integrated report.

From the results of analysis for RQ4, the strength of the predicted equation can be observed in summary Table 11, which represents $R^2 = 0.201$ at $p < 0.010 < \alpha = 0.05$. Thus, the predicted variable IR_NFD explains 20% of the variance in the dependent variable IR_Total score. Additionally, in Table 12, ANOVA gives enough

Table 11. *Model Summary*[b]

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change
1	0.451[a]	0.203	0.177	0.94300	0.203	7.658	1	30	0.010

Note. [a.] Predictors: (Constant), Total score of non-financial analysis.

[b.] Dependent variable: Total score of integrated reports analysis.

Table 12. *ANOVA*[a]

	Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	6.810	1	6.810	7.658	0.010[b]
	Residual	26.677	30	0.889		
	Total	33.487	31			

Note. [a.] Dependent Variable: Total score of Integrated Reports Analysis.

[b.] Predictors: (Constant), Total Score of Non-Financial Analysis.

Table 13. *Coefficients*[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	95.0 % Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.669	1.071		2.493	0.018	0.482	4.855		
	Total Score of Non-Financial Analysis	0.044	0.016	0.451	2.767	0.010	0.012	0.076	1.000	1.000

Note. [a] Dependent Variable: Total score of Integrated Reports Analysis.

Table 14. *Model Summary*[b]

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin–Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	0.847[a]	0.717	0.602	17.88307	0.717	6.204	7	24	0.000	2.039

Note. [a.] Predictors: (Constant), Management dialog on <IR>, Adoption Age of <IR> Framework, Assurance, Awards for best IR, Page Number, Disclosure on Sustainable Development Goals (SDGs), Words Count (in 100s).

[b.] Dependent Variable: Total score of Integrated Reports Analysis.

evidence to accept H_{R2} at $p < 0.010 < \alpha = 0.05$. It is concluded from Table 13 that the total score of integrated reports is significantly as well as positively associated with non-financial disclosures. Thus, the quality of integrated reports is also determined by the non-financial disclosures.

From the results of the RQ5 analysis, the strength of the predicted equation can be observed in Table 14, which indicates that $R^2 = 0.717$ at $p < 0.000 < \alpha = 0.05$, which implies that the predictor variables explain 72% variation in

Table 15. *ANOVA*[a]

	Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	17857.180	7	1984.131	6.204	0.000[b]
	Residual	7035.695	24	319.804		
	Total	24892.875	31			

Note. [a.] Dependent Variable: Total score of Integrated Reports Analysis

[b.] Predictors: (Constant), Management dialog on <IR>, Adoption Age of <IR> Framework, Assurance, Awards for best IR, Page Number, Disclosure on Sustainable Development Goals (SDGs), Words Count (in 100s).

Table 16. *Coefficients*[a]

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	95.0 % Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	174.965	48.884		3.579	0.002	73.585	276.345		
	Words Count (in 100s)	0.026	0.050	0.114	0.534	0.599	–0.076	0.129	0.280	3.568
	Page Number	0.100	0.168	0.124	0.595	0.558	–0.248	0.448	0.297	3.363
	Awards for best IR	10.565	15.225	0.092	0.694	0.495	–21.010	42.140	0.736	1.359
	Management dialog on <IR>	22.410	7.369	0.482	3.041	0.006	7.129	37.692	0.512	1.953
	Disclosure of Sustainable Development Goals (SDGs)	9.590	10.326	0.169	0.929	0.363	–11.824	31.004	0.389	2.573
	Assurance	13.119	5.934	0.311	2.211	0.038	0.812	25.427	0.650	1.538
	Adoption Age of <IR> Framework	3.931	5.055	0.099	0.778	0.445	–6.553	14.415	0.788	1.269

Note. [a.] Dependent Variable: Total score of Integrated Reports Analysis.

the dependent variable IR_Total score. Additionally, in Table 15, ANOVA gives enough evidence to accept H_{r3} at $p < 0.000 < \alpha = 0.05$. Thus, the other factors also have a significant association with the quality of integrated reports. Individually, as provided in Table 16, it confirms that the predictor variable management dialog of <IR> framework and assurance has a positive association.

Independent Relationship Identification

The standardized coefficient beta identifies the independent relationship, which is presented in Tables 10, 13, and 16. These tables confirm that there is no multicollinearity as VIF<5 and also tolerance > 0.200. The beta value (obtained in Table 5) for Size_Revenue is positive with a *t*-statistic (9.149) and negative for Size_MCap with a *t*-statistic (–2.358) at $p < 0.000 < \alpha = 0.05$. Thus, an increase in revenue will increase the quality of the integrated report, but an increase in market capitalization will decrease the quality. Table 13 shows the positive beta for IR_NFD and is significant with *t*-statistic (2.767) at $p<0.010$, which implies that an increase in non-financial disclosures will positively improve the quality of integrated reports. Moreover, Table 13 predicted a significant

Table 17. *Cook's Distance*

	Minimum	Maximum	Mean	Std. Deviation	*N*
Cook's Distance: Model-1	0.000	0.334	0.046	0.082	32
Cook's Distance: Model-2	0.000	0.536	0.041	0.094	32
Cook's Distance: Model-3	0.000	0.461	0.087	0.132	32

beta for assurance and management dialog on <IR> framework with *t*-statistics 2.211 at *p*-value 0.038 and 3.041 at $p<0.006$, respectively. In comparison, no evidence has been found for other variables, i.e., word count, page numbers, UN-SDG linkage, the award for best-integrated report and age of adopting of <IR> framework.

Durbin–Watson Test and Cook's Distance

The Durbin–Watson test values (are less than two) indicate that the models are suitable for linear regression, whereas Cook's distance presented in Table 17 indicates that there are no persuasive cases to bias the regression model.

Conclusion and Recommendations

The approach of <IR> framework is to encourage business entities to report more holistic information with its innovative framework following the six capital model. In India, the embracing of <IR> is at the momentum phase and is surrounded by the theory of innovation, legitimacy, stewardship, signaling from large organizations and more emphasizing by stakeholder demand (Ara & Harani, 2020). In this study, we found that the selected integrated reports are significantly in compliance with the framework, however, we would suggest some improvement avenues to the report preparers. In most of the integrated reports, the time frame of long-term/medium/short-term goals and connectivity was overlooked, especially in materiality assessment, which is crucial as per the <IR> framework. Additionally, there is a need to maintain consistent KPIs for meeting the requirement of Guiding Principle-7 (Consistency and comparability), and also third-party assurance is required to obey Guiding Principle-6 (Reliability and Completeness). Furthermore, our investigation on determinants of quality of integrated reports reveals that the size of the firm measured in terms of Revenue, non-financial disclosures, management dialogue on <IR> framework and assurance have a significant association with the quality of the report, i.e., one unit change in the disclosure will positively improve the report quality. However, market capitalization is significant but negatively associated with the quality of the report, which implies that one unit change in market capitalization will decrease the report quality.

Limitations of the Study and Directions for Future Research

In India, the <IR> framework is being used more widely and is still in its developmental stage. As a result, there are not enough integrated reports available for doctorate research; in 2017–2018, there were just 12 integrated reports available. So, 2018–2019 has been chosen as the base year of the study. Consequently, all the reports have been collected only for the year 2018–2019. Additionally, there is also a lack of literature by Indian researchers contributing to empirical research. The findings of this result will consequently fill these limitations. Another limitation encountered was the data were not normally distributed. So, to overcome this, we have transformed the data by taking the natural logarithms of the original data for regression analysis as done in previous studies, e.g. (Barth et al., 2017). Besides that, we could not validate our empirical findings with other previous research, as there is no empirical study contributed by any Indian researcher on the relevant objectives to date. However, there

is evidence from foreign studies (Beretta et al., 2020; El-Deeb, 2019; Pistoni et al., 2018; Vitolla et al., 2020) which have not been used as the study is from an Indian perspective.

One of the limitations of our study is the small sample size, so the first avenue for future research would be to increase the sample. Second, our study is limited to non-financial indicators; however, there is also an avenue to consider financial variables like profitability ratios, share ratios, etc., as determinants of the quality of integrated reports.

Authors' Contribution

Musarrat Ara conducted the whole research under the supervision of Dr. Harani B.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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Abbreviations

SEBI : Security Exchange Board of India

MCA : Ministry of Corporate Affairs

KPIs : Key Performance Indicators

GP : Guiding Principle

CE : Content Element

PP : Preparation and Presentation

<IR> : The Integrated Reporting Framework

IR : The Integrated Report

NSE : National Stock Exchange of India

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