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Investigating the relationship between integrated reporting and firm performance in a voluntary disclosure regime: insights from Bangladesh

Md. Shafiqul Islam
Department of Business Administration, East West University, Dhaka, Bangladesh

Abstract

Purpose – The purpose of this study is observing the disclosure pattern of integrated reporting (IR) and investigating its relationship with a firm's operational, financial and market growth performance measured in the form of return on assets (ROA), return on equity (ROE) and market-to-book value ratio respectively in the voluntary disclosure regime of Bangladesh.

Design/methodology/approach – This research is quantitative, based on a pooled-OLS regression analysis of 20 firms listed under ten different nonfinancial industries of the Dhaka Stock Exchange (DSE) for three financial years from 2015–2016 to 2017–2018, with 60 firm-year observations. A manual content analysis based on a structured integrated reporting disclosure index (IRDIN) measures the extent of disclosure in the corporate annual reports. The practical model consists of the dependent variable IRDIN and the independent variables ROA, ROE and market-to-book value ratio. The natural logarithm of total assets and financial leverage are the two controlling variables used in the model.

Findings – The findings deduced from the empirical results indicate that the IRDIN is positively and significantly related to all three performance variables. Content analysis shows an increasing pattern of disclosure of the constructed index elements by the sample firms.

Research limitations/implications – A Small sample size may deter the generalization of the research findings in other voluntary disclosure regimes. Self-constructed IRDIN index scores may be affected by subjective judgment while assessing the annual reports.

Practical implications – Capital market regulators can gain valuable insights regarding the suitability of implementing IR in Bangladesh as the results show a positive relationship of firm performance with the adoption of this revolutionary paradigm in corporate reporting.

Originality/value – This study adds value to the existing limited literature of IR disclosure and firm performance in Bangladesh by incorporating content analysis and regression analysis to understand how firms respond to the demand of value creation by the stakeholders in a voluntary disclosure regime. This study captures sample firms from all the nonfinancial industries of Bangladesh with a unique IR index, which is the first of its kind.

Keywords Bangladesh, Firm performance, Content analysis, Voluntary disclosure, Integrated reporting, IIRC

Paper type Research paper

1. Introduction

Integrated reporting (IR) as a concept, a practice and an object of research endeavors has grown significantly over the last decade (Rinaldi *et al.*, 2018). More interestingly, IR has gained significant attention from the C-suite managers of progressive companies worldwide (Kassai and Carvalho 2016). From a different angle, IR could be seen as a move away from the profound

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teleological concentration of profit or shareholder value maximization. IR is considered to be a new form of corporate reporting where the short-term focus of value creation for the shareholders is shifted toward the long-term value creation encompassing all the stakeholders of the society while supporting the managers to take decisions prudently and fostering an inclusive organizational culture (Eccles and Kiron, 2012; IIRC, 2013; De Villiers *et al.*, 2014; Hossain *et al.*, 2016; Ahmed and Anifowose 2017). However, recent studies question the IR practices, whether it enhances the annual reports' substance or acts merely as a form of impression management technique (Brown and Dillard, 2014). These studies suggest using multiple theoretical perspectives to understand better corporate reporting practices (Vitolla *et al.*, 2019; Ahmed and Hossain, 2016). With the practice of IR gaining some traction, we are now facing a point where critical reflections on this reporting framework will be a timely intervention. However, the adoption of IR in a developing country characterized by a voluntary disclosure regime is still in a primitive stage. It is necessary to determine whether firm performance has any relationship with the IR disclosure in such voluntary disclosure regimes.

Primary incentives behind this research's undertaking are the vacuum of scholarly research in IR in the context of Bangladesh and the presence of a unique institutional setting. Bangladesh experienced the emergence of IR when some banks listed in the Dhaka Stock Exchange (DSE) applied the IR framework voluntarily in 2013. The momentum accelerated in 2015 when the Institute of Chartered Accountants of Bangladesh (ICAB), the national accounting and auditing standards-setting body, circulated a disclosure checklist following the International Integrated Reporting Framework (IIRF). Surprisingly, one year later, International Integrated Reporting Council (IIRC) announced that the annual report of 2016 published by Bangladesh-based leasing company IDLC Finance Ltd. won the title of the "Best Integrated Report" in Asia in the financial service category. Since then, the IR concept has gained massive attention among the manufacturing companies listed in the DSE, and many of those companies are voluntarily publishing annual integrated reports. Bangladesh is an emerging economy attracting foreign agencies to develop the capital market, and the corresponding economic scenario after the independence is characterized by the massive inflow of foreign loans and grants (Kamal and Islam, 2018). However, Khan and Islam (2020) found that accounting is perceived as excessively technical, less forward-looking and number-crunching discipline by nonaccountants in Bangladesh. Hence, it is crucial to observe how investors value the presence of forward-looking information under IR disclosure. Thus, an attractive voluntary disclosure regime is present in Bangladesh, and as a representative of a developing country, it provides the perfect institutional setting to observe the relationship of firm performance with the IR disclosure. As IR is a growing area of interest, this research will work as an impetus for the related stakeholders to scrutinize the concept and will help them find a way forward in the question of benefits and costs associated with embracing this new form of corporate reporting. This research investigates the current form of corporate annual reports of the Bangladeshi listed nonfinancial companies in line with the IIRF by developing a self-constructed integrated reporting disclosure index (IRDIN). Furthermore, through the pooled-OLS method, an in-depth investigation of IR and firm performance is carried out.

This research's primary objective is to figure out the relationship of firm performance and growth with the IRDIN among the sample nonfinancial firms of the DSE. Secondary research objectives are:

(1) analyzing the sample firms' annual reports to understand the extent to which they are following the IIRC's prescribed framework voluntarily;

(2) figuring out the year-to-year change in the sample companies' reporting format and whether there is any tendency among the firms to embrace new forms of corporate reporting, such as the IIRC framework.

Empirical analysis shows that firm performance has a significant positive relationship with the IR disclosure in a voluntary disclosure regime like Bangladesh. Another significant finding is that the framework's compliance rate has been 65.97, 65.83 and 70.69% in 2016, 2017 and 2018. Over the three years' time, this study has observed a growing interest among the nonfinancial companies in Bangladesh to adopt the IR framework either fully or partially.

This research adds several scholarly contributions. First, the study used the pooled-OLS regression on 20 firms listed under ten different nonfinancial industries for three years, accumulating a sample size of 60 firm-year observations. Hence, it is the first study in Bangladesh to capture fresh insights from the nonfinancial sectors. Second, the manual content analysis shows the continuous progress to adopt the IR framework in Bangladesh supported by a robust analysis of the literature in this field and a dynamic combination of theoretical and practical implications that help to relate the regression analysis findings to the mainstream IR framework. Finally, due to the application of both content and regression analysis, this research fills the vacuum of a mixed type of research (combining both the qualitative and quantitative methods) in the IR literature from Bangladesh's perspective.

This research is organized into six sections. The following section discusses the literature review, hypothesis development and the theoretical frameworks related to this research. Section 3 highlights the research methodology covering sample selection, sample periods and the study models used. Next, Section 4 explains the descriptive statistics and correlation matrix of the variables and the content analysis results. Section 5 runs a discussion on the empirical results gathered using the robust pooled-OLS method after controlling the effect of heteroscedasticity. Section 6 concludes the study drawing on some implications, limitations and future research avenues.

2. Literature review

2.1 Theoretical underpinnings

In this section, several theories are discussed that strengthen the theoretical support behind this research's findings.

2.1.1 Institutional theory and legitimacy theory. Institutional theory (DiMaggio and Powell, 1983) and legitimacy theory (Guthrie and Parker, 1989) are frequently cited in addressing the issues of voluntary corporate disclosure (see Adams *et al.*, 2016; Ntim *et al.*, 2017; Zappettini and Unerman, 2016). Institutional theory is used to understand the frameworks used by different companies and organizations in firm-specific industry contexts (Adams *et al.*, 2016). This theory explains how organizations use a similar type of practices and structures to make them visible as an abiding company in the regulatory bodies' eyes and gain substantial legitimacy. Another critical assumption of this theory is that companies adopt new standards and frameworks to gain external approval in the form of the reduced cost of capital (Hardy and Clegg, 1999). Carpenter and Feroz (2001) identified the relationship of adopting a particular framework by a company concerning its competitors that stems from pressures from the parties external to the business environment, which they linked with institutional isomorphism (Powell and Colyvas, 2008). Regarding legitimacy theory, Higgins *et al.* (2014) observe that some organizations adopt the IR framework faster than other firms in their industry to become "the role model firm." According to them, it is vital to the adoption of IR at the national level. Vitolla *et al.* (2020) relate legitimacy theory to IR disclosure and note that firms having higher market value tend to legitimize their actions in society by incorporating a higher level of information on their performance in social, environmental and governance areas. Therefore, it is logical to conjecture both the institutional and legitimacy theory's relevance in this study.

2.1.2 Agency theory and internal pressure. Agency theory (Jensen and Meckling, 1976) identifies the factors that motivate managers in the current corporations having dispersed ownership structures. One of the critical issues in agency theory is corporate governance. The theory also observes how corporate governance affects the disclosure of forward-looking information in the corporate annual reports. Success or failure in the current firms is primarily affected by the decisions taken by the decision-makers. Therefore, managers in big companies have the incentive to disclose information related to different dimensions captured under the IR framework for the best interest of the firm's principals (shareholders). In Bangladesh, Islam and Anwar (2019) studied the post-IPO performance drifts from 2009 to 2014 and used agency theory as the underlying supporting framework. Rahman *et al.* (2019) studied intellectual capital reporting in Bangladesh and linked it with agency theory. Menicucci (2018) found the superiority of forward-looking information over historical information in making business decisions. Beretta and Bozzolan (2008) suggested that investors give more value to the quality of information than the quantity of information. Chowdhury (2012) shows agency theory's critical reflections and how corporate managers behave opportunistically in Bangladesh's context. Finally, information asymmetry can be appeased through better quality corporate reporting and disclosure (Ascioglu *et al.*, 2012; Boubaker *et al.*, 2014). Thus, following agency theory, it can be inferred that incorporating the corporate strategy, future outlook, vision and mission of the company, possible future risks and opportunities, strengths and weaknesses in the form of an integrated report will enhance the quality of disclosure. Hence, it will lead to more extraordinary firm performance and mitigate the agency problem hypothesized under the agency theory.

2.2 Hypothesis development

2.2.1 Primary hypothesis. As discussed earlier, IR is linked to creating value and communicating the value created to the financial capital providers to assess better the firm they have invested in or decide to invest in the future. IR fosters integrated thinking in the organization and further enhances the company's financial resources' better allocation. Given this critical focus on both value creation and financial capital, it is assumed that adopting IR leads to better financial performance. Earlier studies also found some similar results in different country settings. Barth *et al.* (2017) find a positive relationship between IR and stock liquidity, the firm's value and its expected cash flows. Lee and Yeo (2016) found that IR and firm value are positively correlated using a sample of 822 firms from 2010 to 2013. Zhou *et al.* (2017) identified that firms with integrated reports enjoy a lower cost of capital, and analyst forecast error is reduced. García-Sánchez and Noguera-Gámez (2017) observed a reduction in the cost of capital due to the adoption of IR using a sample of 995 companies from 27 different countries. Given all these earlier studies and their findings, it is reasonable to expect that IR is connected with a company's more superior financial performance. This leads to the central hypothesis to be tested in this study as follows:

> *H1.* There is a positive relationship between the type of report issued by a company and its firm performance; financial, operational and market growth performance indicators of the firm have a relationship with IR disclosure.

2.2.2 Financial and operational performance. The relationships between return on asset (ROA), return on equity (ROE) and corporate disclosures have been generally hypothesized as positive in most prior works of literature. The selection of one variable to another to measure firm performance is not clearly established under any prevailing theoretical notion. Some authors preferred ROA (Aljifri and Hussainey, 2007; Mahboub, 2019) while others preferred to use ROE (Menicucci, 2018; Uyar and Kilic, 2012). Rahman *et al.* (2020) found a positive relationship among ROA, ROE and intellectual capital disclosure (ICD) after analyzing the listed companies' annual reports under Bangladesh's pharmaceuticals and chemical industry. Salvi *et al.* (2020) analyzed the firms' performance and the presence of IR in the corporate annual reports and showed a positive connection between them. In the extant literature of corporate disclosure, profitable firms were early movers in adopting new paradigms in corporate reporting. Firms with greater ROA and ROE can bear the increased cost of compliance. In addition to that, to reflect their positive financial and operational performance to various stakeholders, better performing firms adopt new reporting tools such as IR voluntarily (Vitolla *et al.*, 2020). As a potential influencer, ROA and ROE are both widely established corporate profitability measures for voluntarily adopting IR disclosure. Therefore, in line with the majority of the literature cited earlier, this study tests the following hypotheses:

H2. Ceteris paribus, there is a positive relationship between ROA and IR disclosure.

H3. Ceteris paribus, there is a positive relationship between ROE and IR disclosure.

2.2.3 Market growth performance. The growth of the firm measures its future expansion possibilities. Financial markets assess a firm's actual market value in contrast to its book value, which is a good indicator of the corresponding firm's market growth. If a firm is listed in a stock exchange, the financing opportunities expand and give an international knowledge-sharing platform to its governing board (Biddle and Saudagaran, 1991). A superior form of reporting, such as IR, helps firms present their financial position in front of the investors that is positively reflected in the firm's market value. Thus, it is hypothesized that there is a positive relationship between the adoption of IR and the firm's growth. Dey (2020) found a positive and significant relationship of the market-to-book value ratio with the IR disclosure in Bangladesh's banking sector. On the contrary, Ntim *et al.* (2017) found that faster-growing UK higher educational institutions provided fewer voluntary disclosures in their annual reports. However, this study focuses on nonfinancial firms that are different in their operation and day-to-day activities than the higher educational institutions. Arguelles *et al.* (2015), using a worldwide sample, highlighted a positive relationship between the integrated report's quality and the market value of equity. Based on the aforementioned literature and their findings, the following hypothesis has been constructed:

H4. Ceteris paribus, there is a positive relationship between market growth of the firm and IR disclosure.

2.2.4 Control variables. In this study, two control variables are considered while developing the research model. Following Dey (2020) and Rahman *et al.* (2020), natural logarithm of total asset of the firm is taken as a variable for controlling the effect of firm size on the IR disclosure index, and financial leverage is another variable that controls for the effect of debt-to-equity ratio on the IRDIN.

3. Research methodology

3.1 Study sample

Sample firms are selected for this study using purposive sampling techniques. Purposive sampling, also known as judgmental sampling, is used to logically construct the sample representing the desired population for the study. In this research, sample firms are selected only from nonfinancial industries of Bangladesh as the purpose is to analyze the annual reports for the compliance in disclosure apart from the financial sectors. This approach helps to figure out the different patterns of disclosures from an industry-specific viewpoint. First, the study considers a sample period of three years, consisting of 2015–2016, 2016–2017 and 2017–2018. Financial years before 2015–2016 are excluded due to the change in the company's income year as per the directive issued by the Bangladesh Securities and Exchange Commission (BSEC) in 2016 [1]. Then randomly, two companies are selected from each of the ten different nonfinancial industries (see Tables A1–A3 for the full list of the sample companies used). Finally, the sample size is 20 individual firms, and overall, this gives 60 firm-year observations for the pooled-OLS regression. Although the sample is small in size, it is diverse enough to reduce the sample bias. The financial industry consisting of banks and nonbank financial institutions was excluded from this study as different Bangladesh Bank directives regulate them. Some of those directives also include how they will present their sustainability issues in the annual reports. However, there is no standard set for the manufacturing and other service industries referred to as the nonfinancial industry regarding corporate reporting. Hence, they provide a unique sample to test the theoretical assumptions under a voluntary disclosure regime. Combining the financial industry analysis would not allow this study to focus on the unique characteristics of nonfinancial industries in Bangladesh.

3.2 Study models

This study has developed three different research models used in the research analysis using multivariate regression to capture the relationship between firm performance and growth with the IRDIN. Following Vitolla *et al.* (2020) and Adegboyegun *et al.* (2020), the modified empirical models used in this study comprised three firm performance dimensions. The first research model is described as follows:

$$\mathrm{IRDIN}_{it} = \beta_0 + \beta_1\mathrm{ROA}_{it} + \beta_2\mathrm{FIRMSIZE}_{it} + \beta_3\mathrm{LEV}_{it} + \varepsilon_{it} \tag{1}$$

The second research model is as follows:

$$\mathrm{IRDIN}_{it} = \beta_0 + \beta_1\mathrm{ROE}_{it} + \beta_2\mathrm{FIRMSIZE}_{it} + \beta_3\mathrm{LEV}_{it} + \varepsilon_{it} \tag{2}$$

The third research model is as follows:

$$\mathrm{IRDIN}_{it} = \beta_0 + \beta_1\mathrm{GRWTH}_{it} + \beta_2\mathrm{FIRMSIZE}_{it} + \beta_3\mathrm{LEV}_{it} + \varepsilon_{it} \tag{3}$$

Where IRDIN is the dependent variable, β_0 is the constant and β_{1-3} are the slope coefficients of the independent and control variables. Independent variables are ROA (measures the operational performance), ROE (measures the financial performance) and GRWTH (measures the market growth performance). Control variables are FIRMSIZE (measured by the natural log of the total asset) and LEV (measured by debt to equity ratio). ε is the random error term; i stands for the firms and t stands for the period.

Dependent variable IRDIN is constructed using the unweighted method of content analysis. Where items listed in the checklist are matched against the sample annual reports in the first stage. If any relevant explanation was found, then that item was scored as 1; otherwise, for any nondisclosure as deemed appropriate, the item was scored 0. Mathematically the formula for constructing the dependent variable can be expressed as follows:

$$\mathrm{IRDIN} = \frac{\sum_{t=1}^{n} X_{ij}}{n_j}$$

Where n_j is the number of items for the jth firm. $X_{ij} = 1$ if the ith item is disclosed, 0 if ith item is not disclosed, so that $0 \leq \mathrm{ICDIN}_j \leq 1$

Table 1 provides the descriptions of all the variables. For a detailed description of the items included in the index for calculating IRDIN, please refer to the Tables A1–A3.

Acronym	Definition	Type	Operationalization	Source of data	Reference
IRDIN	Integrated reporting disclosure index	Dependent	Number of items in the checklist disclosed divided by the maximum possible score (36)	Annual reports	Vitolla *et al.* (2020) Adegboyegun *et al.* (2020) Dey (2020)
ROA	Return on asset	Independent	Net income to total asset	Annual reports	Dey (2020)
ROE	Return on equity	Independent	Net income to total equity	Annual reports	Vitolla *et al.* (2020) Menicucci (2018)
GRWTH	Growth of the firm	Independent	Market value to book value of equity	Annual reports	Dey (2020)
FIRMSIZE	Size of the firm	Control variable	Natural logarithm of total asset of the firm	Annual Reports	Vitolla *et al.* (2020) Adegboyegun *et al.* (2020) Dey (2020)
LEV	Financial leverage	Control variable	Debt-to-equity ratio	Annual Reports	Vitolla *et al.* (2020) Adegboyegun *et al.* (2020) Dey (2020)

Table 1.
Measurement of dependent and independent variables

4. Descriptive analysis

4.1 Descriptive statistics of integrated reporting disclosure index

This section summarizes the descriptive statistics of the overall disclosure index scores. Table 2 shows the detailed breakdown of each subindex developed along with their mean, median, standard deviation, minimum and maximum scores obtained.

For ease of comparison, a graphical representation of the mean index scores calculated is presented in Figure 1.

Variable name	Symbol	Obs	Mean	Sd	Min	Max	Med	Mean 2016	Mean 2017	Mean 2018
Integrated reporting disclosure index	IRDIN	60	0.68	0.22	0	1	0.67	0.6597	0.6583	0.7069
Organizational overview and external environment index	OEEI	60	0.75	0.23	0	1	0.75	0.75	0.74	0.80
Governance-related disclosure index	GI	60	0.57	0.27	0	1	0.58	0.57	0.55	0.60
Value creation model index	VCMI	60	0.75	0.28	0	1	0.80	0.72	0.75	0.83
Risk and opportunity disclosure index	ROI	60	0.72	0.33	0	1	0.67	0.70	0.75	0.8
Strategy and resource allocation index	SRAI	60	0.69	0.24	0	1	0.80	0.67	0.71	0.75
Performance disclosure index	PMI	60	0.83	0.27	0	1	1	0.82	0.825	0.88
Outlook of the industry index	OLKI	60	0.77	0.24	0	1	0.75	0.73	0.75	0.8
Basis of preparation and presentation index	BPPI	60	0.11	0.23	0	0.66	0	0.08	0.13	0.13

Table 2.
Descriptive statistics of integrated reporting disclosure index (2018, 2017 and 2016)

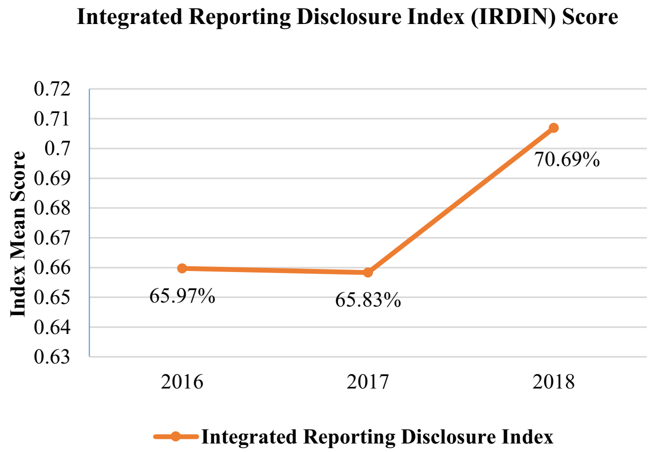

Figure 1. Integrated reporting disclosure index mean score (year-to-year basis)

If the trend is closely observed year to year, it shows that the overall disclosure pattern has been continuously increasing. For example, the IRDIN mean score in 2016 was 65.97%, which remained almost stable at 65.83% in 2017 and sparked in 2018 by reaching above the 70% mark. The reason for such a significant improvement within one year is attributable to the BSEC Corporate Governance Code of 2018, which is mandatorily followed by all the listed companies from December 31, 2019, and it has been observed that most of the companies started to fully disclose their information as per the requirements of the code [2]. Another reason might be the hunt for ICAB best presented annual report crown that legitimizes the corporate sustainability image among the investors. The minimum score in the IRDIN was 0% compliance due to a company that did not publish a standard annual report in a particular year. On the other hand, the maximum score obtained was 1, which implies 100% compliance by some of the sample firms, which is very promising for a voluntary disclosure regime like Bangladesh. The mean disclosure score in the overall integrated reporting is approximately 68%, which implies that still 32% of IIRC standards are not reflected in the annual reports analyzed among the sample firms.

Regarding previous studies, Islam and Islam (2018) analyzed 11 big multinational company's annual reports listed in the DSE from the sample period of 2013–2015 and found that the overall IR disclosure percentage was 69, 77 and 79% in the year 2013, 2014 and 2015, respectively. Nakib and Dey (2018) studied DSE30 companies from 2014 to 2016 and showed that the sample firms disclosed 45.11, 53.04 and 61.48% of the content elements present in the IIRC framework. However, this study covered the most recent annual reports from sample nonfinancial industries and captured fresh insights into the IR disclosure research in Bangladesh. Figure 2 summarizes the findings of Table 2 in an understandable bar chart.

There are still several rooms for improvement in the disclosure pattern of the annual reports analyzed. For example, in the governance index (GI), the mean score obtained is approximately 57%, which is not a good score in terms of the other indices' overall score. This is attributable to repeated disclosure of the same information over the years without proper discussion and analysis by the management of their actions to improve the firm's governance. Although in the year 2018, due to the compliance with the BSEC Corporate Governance Code of 2018, this score has increased to 60%. Another area of concern is the inadequate disclosure on the Basis of Preparation and Presentation Index (BPPI), which focuses on the firm's materiality determination process. Material issues need to be

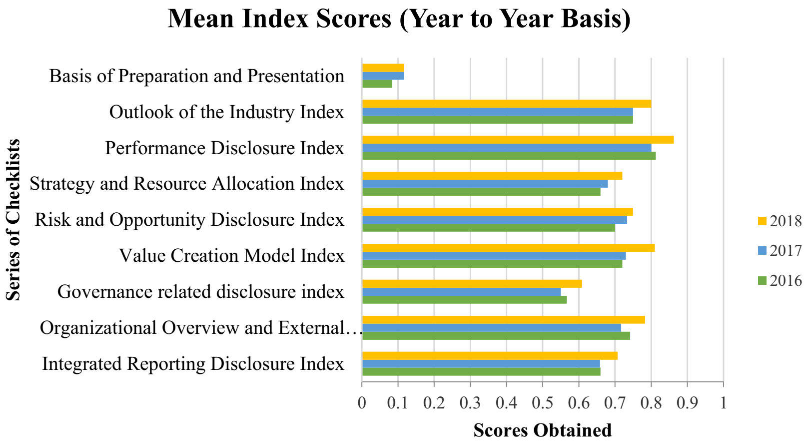

Figure 2.
Graphical representation of the mean scores obtained by each index

appropriately addressed by the firm to give the investors a good understanding of what the firm is doing to understand its material matters and quantify them for the investors. However, the mean score obtained is only 11%, indicating that there is almost no disclosure or discussion in this area of disclosure among the sample annual reports. This could be attributable to the fact that organizations do not want to fully disclose their material matters in the annual reports lest it should result in a competitive disadvantage. However, the positive and promising things to notice from here are the Organizational Overview and External Environment Index (OEEI), Value Creation Model Index (VCMI), Risk and Opportunity Disclosure Index (ROI), Strategy and Resource Allocation Index (SRAI), Performance Disclosure Index (PMI) and Outlook of the Industry Index (OLKI) showing a mean score of approximately 75, 75, 72, 69, 83 and 77%, respectively. These indices have shown an increasing trend over the sample years, and this implies that the sample companies have started to adopt the guidelines provided by the IIRC voluntarily, and in the near future, there will be a further increase in the adoption of IR practices in Bangladesh.

4.2 Descriptive statistics of firm performance and control variables

Table 3 summarizes descriptive statistics related to the firm performance and growth variables as well as the control variables used. ROE has a mean score of 18.16% with a minimum of −2.2% and a maximum of 83%. Thus, this study captures a wide variation in the ROE among the sample firms. However, the median ROE is 13.90%, reflecting that most of the sample firms had a fair rate of ROE. ROA shows a mean score of 8.90%, and the minimum score obtained is – 1.4%, and the maximum is 43.10%. Median ROA is 5.75%, which also shows that most of the sample firms did generate a positive ROA over the years. Regarding

Table 3.
Descriptive statistics of firm performance and control variables (2018, 2017 and 2016)

Variable name	Symbol	Obs	Mean	SD	Min	Max	Med
Return on asset	ROA	60	0.0890	0.08566	−0.014	0.431	0.0575
Return on equity	ROE	60	0.18163	0.1767	−0.022	0.83	0.139
Growth of the firm (market to book value of equity)	GRWTH	60	3.6548	3.7813	0.1073	15.078	2.3142
Size of the firm (in millions)	FIRMSIZE	60	23500	31800	464	139000	11700
Financial leverage	LEV	60	2.4199	1.6468	1.008	8.198	1.846

the firms' growth, the minimum ratio was 0.1073, while the maximum growth ratio was 15.078. The median firm size proxied by the total asset is BDT. 11700 million, while the maximum amount of the total asset is BDT. 139000 million. This shows that there is wide variation in the amount of the total assets presented in the balance sheet, and hence the sample firms vary considerably in terms of size. Finally, the presence of financial leverage in the capital structure is found to be 2.4199 on average. This is calculated using the debt-to-equity ratio. The minimum ratio is 1.008 while the maximum ratio is 8.198, which implies that some firms in the sample are using more debt than equity (highly levered firm) as their capital source.

4.3 Bivariate analysis

This section shows the Pearson correlation matrix for dependent, independent and control variables along with their variance inflation factor (VIF). It is widely discussed in the empirical research that the real strength of an OLS regression depends on the assumption that independent variables are not correlated. The reason behind testing the problem of autocorrelation is that an extreme multicollinearity level often inflates the standard errors of the estimated coefficients. The Pearson correlation matrix presented in Table 4 shows that the ROA has a significant positive correlation with the IRDIN, meaning that firm performance leads to more voluntary IR disclosure in the sample firms' annual reports. Correlation between ROE and IRDIN is found to be positive and statistically significant as well. A higher ROE shows the firm's commitment toward shareholder value creation, which is reflected through a higher level of IR-related disclosures. This study uses the market-to-book value of the equity as a proxy for measuring the firm's growth, and a positive and significant correlation between the IRDIN and firm growth is observed. This result implies that firms that are growing over the years tend to adopt the framework of IR voluntarily. Moving to the control variables, firm size, measured in the natural logarithmic form of the total assets, shows a significant positive correlation with IRDIN. This also becomes logical as firms bigger in size want to show maximum disclosures in their annual reports to legitimize their worth in front of their shareholders. Financial leverage shows a negative and insignificant correlation with IRDIN, and this might happen that highly levered firms do not want to disclose more about their governance and managerial functions in the annual reports due to the restrictions provided by their debtors in the form of debt covenants.

To test the presence of any possible collinearity among the independent variables, Table 4 lists the calculated VIF. Gujarati (2015) suggests that a VIF less than 10 indicates no severe multicollinearity problem in the particular independent variable used in the regression model. The table shows that the VIF values for all independent variables are less than 10, meaning that independent variables used in this study do not suffer from any severe collinearity problems.

	IRDIN	ROA	ROE	GRWTH	FIRMSIZE	LEV	VIF
IRDIN	1.000						
ROA	0.4545*	1.000					3.67
ROE	0.3972*	0.7530*	1.000				5.22
GRWTH	0.3554*	0.6571	0.7315*	1.000			2.47
FIRMSIZE	0.5750*	0.2396	0.4780*	0.2381	1.000		1.51
LEV	−0.2046	−0.2489	0.1906	−0.0951	0.4132*	1.000	1.94

Note(s): *significant at 5%

Table 4. Correlation among dependent, independent and control variables with variance inflation factor (VIF)

5. Empirical results

This section goes for a robust pooled-OLS regression over the three different models. Table 5 shows the robust pooled-OLS regression after adjusting for the problems of heteroscedasticity. Starting with model 1, ROA, used as the proxy of operational performance, shows a positive and significant relationship with the dependent variable IRDIN. The coefficient is 0.4271, which implies that a 1-unit increase in the ROA variable for the sample firms leads to an average increase of 0.4271 units in the IR index score. Progressive companies want to portray their image to society and try to maintain their legitimacy, and thus they adopt better disclosure policies such as IR. In reference to this finding, Dey (2020) found similar evidence using two-stage least squares (2SLS) estimation in Bangladesh's banking sector, although the relationship of ROA with IR disclosure was positive but insignificant. However, the study sample used in this study encompasses only the nonfinancial industries, and as a result, this difference in findings is perceivable. Hence, hypothesis 2 is accepted according to the results of model 1. Firm size has a positive and statistically significant relationship with the IRDIN of the sample firms. The firm size has a coefficient of 0.1124, which means if firm size increase by 1 unit, then on average, there will be an increase of 0.1124 units in the overall IR index score. Financial leverage is having a negative relationship with the disclosure of IR. The possible reason behind this outcome might be that highly levered firms do not have the freedom from their management to disclose information in detail due to the debt providers' restrictions.

Model 2 uses ROE as the proxy of financial performance to measure its relationship with the IR disclosure index. The coefficient is positive and significant, thus leading to the conclusion that firms having greater returns to their shareholder's equity tend to have more voluntary disclosure in line with the IR framework. Previous studies also had supporting results similar to the one derived here. Menicucci (2018) found that ROE is a significant positive influencer of forward-looking information disclosure in the integrated reports, specifically in the area of risk-related disclosures. According to that paper, profitable firms convey a positive message to their creditors about risk and opportunities and contribute to the capital market's efficient operation. Based on the previous supporting result in the area of IR and the empirical results derived from model 2, it is logical to accept the validity of hypothesis 3. Firm size and financial leverage, in this case, have almost identical results compared to model 1.

In model 3, the relationship between the firm's growth and the IR index is measured. The coefficient is 0.0075, and it is found to be positive and statistically significant. If the firm's

Dependent variable (IRDIN)	Model 1 (ROA)	Model 2 (ROE)	Model 3 (GRWTH)
Constant	−1.809514***	−1.762792***	−1.875836***
p-value	(0.000)	(0.000)	(0.000)
ROA	0.4271774***		
p-value	(0.007)		
ROE		0.1934404*	
p-value		(0.051)	
GRWTH			0.0075405**
p-value			(0.011)
FIRMSIZE	0.112455***	0.1115162***	0.1163321***
p-value	(0.000)	(0.000)	(0.000)
LEV	−0.0626216***	−0.0717706***	−0.0679037***
p-value	(0.000)	(0.000)	(0.000)
R^2	0.5880	0.5847	0.5812
Observations	60	60	60

Note(s): Level of significance: ***1%, **5%, *10%

Table 5.
Regression output of model 1, 2 and 3 using OLS robust estimation

growth increases by 1 unit, then the IR index score will increase by almost 0.0075 units. Several previous studies support this result. Dey (2020) found a significant relationship of the market-to-book value ratio with the IR disclosure in the Bangladeshi context. Arguelles *et al.* (2015) showed an increase in firm value in line with IR-related disclosures. Barth *et al.* (2017) analyzed the IR quality and firm value in the South African context covering the firms listed in the Johannesburg Stock Exchange (JSE). Their study finds a positive relationship running in between IR quality and firm value disaggregated by capital market effect and real effect. An interesting point to note here is that it is mandatory to provide an annual integrated report for the firms listed in JSE while it is entirely voluntary for the companies listed in the DSE. Hence, this study captures the supporting evidence of the relationship between firm growth and IR disclosure in a voluntary disclosure regime. All these previous findings are corroborated by the analysis addressed in this study from the perspective of Bangladesh. So, hypothesis 4 is accepted. Firm size and financial leverage under model 3 are also showing similar results in terms of coefficient in line with model 1 and model 2.

As all the hypotheses regarding firm performance are accepted, it is reasonable to accept the primary hypothesis. Therefore, hypothesis 1 is accepted, concluding that firm performance measured in operating, financial and growth perspectives is positively related to the IRDIN among the sample firms in this study. R squared as a measure of goodness of fit of the models 1, 2 and 3 was approximately 58%. This value is above 50%, and the fitness of the model is quite satisfactory. All three models performed better without violating any conditions of the classical linear regression model. These models are checked and adjusted for the heteroscedasticity problem, and hence the term robust is used.

Thus, it can be concluded that previous studies had mixed findings on the relationship of firm performance and disclosure with the IR in the corporate annual reports, while this study found a positive relationship among all the three variables with the IR in the context of nonfinancial industries of Bangladesh. Findings differed due to different dimensions under which the particular research was undertaken. Nevertheless, in summary, it is reasonable to believe that good performing firms have an inherent tendency to legitimately disclose their corporate values in the form of an integrated report in a voluntary context such as Bangladesh.

6. Conclusion

As Bangladesh is moving toward a free-market economy and more of its listed companies are exporting quality products outside the country's border, a growing interest has been observed by the stakeholders' home and abroad about the nonfinancial performance of these firms. With this view in mind, the author has decided to undertake this research to explore the underlying relationship between IR disclosure and firm performance.

For analysis, this study undertook three independent pooled cross-sectional regression models to capture the relationship of firm performance and firm growth with the IRDIN. The models have shown an exciting pattern regarding the relationship of firm performance (ROA and ROE) and growth (market-to-book value of the equity) with the overall pattern of disclosure in the sample firms' corporate annual reports. Significant findings of this study can be summarized in the following sentences. First, in the voluntary context of Bangladesh, the practice of IR has gained a considerable attention from the sample non-financial firms after the circulation of a disclosure checklist by the ICAB which is in line with the globally practiced IR framework. A manual content analysis of the annual reports based on the constructed IRDIN index reveals that the disclosure percentages have been 65.97, 65.83 and 70.69% in the years 2016, 2017 and 2018, respectively. Second, the disclosure pattern has been quite different from industry to industry, and only a few companies are following the framework as per the required format. Third, ROA and ROE both, as a proxy of firm performance, have a positive and statistically significant relationship with the adoption of the

IR framework measured using the first two regression models. Fourth, market-to-book value of the equity, which is used as the proxy of the firm's growth, has a positive and significant relationship with the adoption of IR disclosure practice of the sample firms. Thus, it is promising that firms operating under a voluntary regime are taking the proactive initiative of addressing IR in Bangladesh following international guidelines. Though the disclosure pattern was not uniform over different industries and years, a positive rate of change is observed. In the future, if the Bangladesh Securities Exchange Commission (BSEC) makes the adoption of the IR checklist produced in line with the IIRF by the ICAB mandatory for the listed companies in Bangladesh, a spike in disclosure quality is perceived by the author.

This research's limitation stems from the fact that the time span is three financial years, but it was due to the change in the date of end in the financial year from December 30, to June 30 after 2015. As the author explored only the nonfinancial industries, the overall picture of the publicly listed companies in Bangladesh regarding the IR framework's adoption cannot be generalized based on this research's findings. Having no formal database in Bangladesh also forced the author to analyze all the reports concerning the constructed index manually, and hence subjective judgment might have affected the construction of the index scores. Moreover, IR is still a new concept in developing economies such as Bangladesh characterized by a voluntary disclosure regime. Hence, uniform pattern in the disclosure or more advanced concept of IR, such as integrated thinking, was not visible in most of the cases. As a consequence, given index scores to the corresponding annual reports do not imply that the company has implemented the philosophy of IR completely. Using data mining and applying big data analytics may reduce this problem, but it requires the annual reports to be in eXtensible Business Reporting Language (XBRL) format, which is not still adopted by the BSEC, the prime capital market regulatory organ of the government. The author would like to urge the regulators to adopt this reporting format as XBRL facilitates the tagging of financial and nonfinancial data streamlining the annual report analysis. Nevertheless, this study will work as a timely intervention to decipher IR's concept in a voluntary disclosure regime like Bangladesh and motivate future research targeted on some other IR dimensions. Possible future research regarding IR in Bangladesh can address the limitations mentioned here, which will make the existing literature much more vivid with arguments and counterarguments.

Notes

1. On April 27, 2016, the prime capital market regulator of Bangladesh, BSEC, circulated a directive on their website mentioning that all the taxpayer companies except banks, insurance and financial institutions will have to maintain a uniform income year from July to June.
2. On June 3, 2018, BSEC issued a new "Corporate Governance Code" on a comply basis that significantly improved the corporate governance mechanisms of the listed companies in DSE and CSE.

References

Adams, C.A., Potter, B., Singh, P.J. and York, J. (2016), "Exploring the implications of integrated reporting for social investment (disclosures)", *The British Accounting Review*, Vol. 48 No. 3, pp. 283-296, doi: 10.1016/j.bar.2016.05.002.

Adegboyegun, A.E., Alade, M.E., Ben-Caleb, E., Ademola, A.O., Eluyela, D.F. and Oladipo, O.A. (2020), "Integrated reporting and corporate performance in Nigeria: evidence from the banking industry", *Cogent Business and Management*, Vol. 7 No. 1, p. 1736866, doi: 10.1080/23311975.2020.1736866.

Ahmed Haji, A. and Anifowose, M. (2017), "Initial trends in corporate disclosures following the introduction of integrated reporting practice in South Africa", *Journal of Intellectual Capital*, Vol. 18 No. 2, pp. 373-399, doi: 10.1108/jic-01-2016-0020.

Ahmed Haji, A. and Hossain, D.M. (2016), "Exploring the implications of integrated reporting on organizational reporting practice: evidence from highly regarded integrated reporters", *Qualitative Research in Accounting and Management*, Vol. 13 No. 4, pp. 415-444, doi: 10.1108/QRAM-07-2015-0065.

Aljifri, K. and Hussainey, K. (2007), "The determinants of forward-looking information in annual reports of UAE companies", *Managerial Auditing Journal*, Vol. 22 No. 9, pp. 881-894.

Arguelles, M.P.M., Balatbat, M. and Green, W. (2015), *Is There an Early-Mover Market Value Effect for Signalling Adoption of Integrated Reporting*, Unpublished working Research, University of New South Wales.

Ascioglu, A., Hegde, S.P., Krishnan, G.V. and McDermott, J.B. (2012), "Earnings management and market liquidity", *Review of Quantitative Finance and Accounting*, Vol. 38 No. 2, pp. 257-274, doi: 10.1007/s11156-010-0225-9.

Barth, M.E., Cahan, S.F., Chen, L. and Venter, E.R. (2017), "The economic consequences associated with integrated report quality: capital market and real effects", *Accounting, Organizations and Society*, Vol. 62, pp. 43-64, doi: 10.1016/j.aos.2017.08.005.

Beretta, S. and Bozzolan, S. (2008), "Quality versus quantity: the case of forward-looking disclosure", *Journal of Accounting, Auditing and Finance*, Vol. 23 No. 3, pp. 333-376, doi: 10.1177/0148558x0802300304.

Biddle, G.C. and Saudagaran, S.M. (1991), "Foreign Stock Listings: benefits, costs and the accounting policy dilemma", *Accounting Horizons*, Vol. 5 No. 3, pp. 69-80.

Boubaker, S., Hamrouni, A. and Liang, Q.B. (2014), "Corporate governance, voluntary disclosure and firm information environment", *Journal of Applied Business Research (JABR)*, Vol. 31 No. 1, pp. 89-102, doi: 10.19030/jabr.v31i1.8993.

Brown, J. and Dillard, J. (2014), "Integrated reporting: on the need for broadening out and opening up", *Accounting, Auditing and Accountability Journal*, Vol. 27 No. 7, pp. 1120-1156, doi: 10.1108/AAAJ-04-2013-1313.

Carpenter, V.L. and Feroz, E.H. (2001), "Institutional theory and accounting rule choice: an analysis of four US state governments' decisions to adopt generally accepted accounting principles", *Accounting, Organizations and Society*, Vol. 26 Nos 7-8, pp. 565-596, doi: 10.1016/s0361-3682(00)00038-6.

Chowdhury, D. (2012), *Incentives, Control and Development: Governance in Private and Public Sector with Special Reference to Bangladesh*, Dhaka University Press: University of Dhaka, Dhaka.

De Villiers, C., Rinaldi, L. and Unerman, J. (2014), "Integrated Reporting: insights, gaps and an agenda for future research", *Accounting, Auditing and Accountability Journal*, Vol. 27 No. 7, pp. 1042-1067, doi: 10.1108/AAAJ-06-2014-1736.

Dey, P.K. (2020), "Value relevance of integrated reporting: a study of the Bangladesh banking sector", *International Journal of Disclosure and Governance*, Vol. 17 No. 4, pp. 1-13, doi: 10.1057/s41310-020-00084-z.

DiMaggio, P.J. and Powell, W.W. (1983), "The iron cage revisited: institutional isomorphism and collective rationality in organizational fields", *American Sociological Review*, Vol. 48 No. 2, pp. 147-160, doi: 10.2307/2095101.

Eccles, R. and Kiron, D. (2012), "Get ready: mandated integrated reporting is the future of corporate reporting", *MIT Sloan Management Review*, Vol. 53 No. 3, pp. 1-3, available at: https://www.proquest.com/docview/963965382?accountid=30552.

García-Sánchez, I.M. and Noguera-Gámez, L. (2017), "Integrated reporting and stakeholder engagement: the effect on information asymmetry", *Corporate Social Responsibility and Environmental Management*, Vol. 24 No. 5, pp. 395-413, doi: 10.1002/csr.1415.

Gujarati, D. (2015), "Regression diagnostic I: multicollinearity", *Econometrics*, pp. 80-95, doi: 10.1007/978-1-137-37502-5_4.

Guthrie, J. and Parker, L.D. (1989), "Corporate social reporting: a rebuttal of legitimacy theory", *Accounting and Business Research*, Vol. 19 No. 76, pp. 343-352, doi: 10.1080/00014788.1989.9728863.

Hardy, C. and Clegg, S. (Eds) (1999), *Studying Organization: Theory and Method*, Sage. doi: 10.4135/9781446218556.n19.

Higgins, C., Stubbs, W. and Love, T. (2014), "Walking the talk(s): organizational narratives of integrated reporting", *Accounting, Auditing and Accountability Journal*, Vol. 27 No. 7, pp. 1090-1119, doi: 10.1108/aaaj-04-2013-1303.

Hossain, D.M., Salat, A. and Amin, A. (2016), "Integrated report an emerging trend in corporate reporting", *The Accountant*, Vols April-June, pp. 105-110, available at: http://www.icab.org.bd/webNewsEventNoticeCir/view/13839 (accessed 13 June 2020).

IIRC (2013), "The international IR framework", available at: https://integratedreporting.org/wp-content/uploads/2015/03/13-12-08-THE INTERNATIONAL-IR-FRAMEWORK-2-1.pdf (accessed 28 October 2020).

Islam, M.S. and Anwar, S. (2019), "Post-initial public offering performance drift: evidence from Bangladesh", *The Bangladesh Development Studies*, Vol. 42 No. 1, pp. 107-126.

Islam, R. and Islam, M.R. (2018), "Insights the Practice of Integrated Reporting: a study on MNCs in Bangladesh on the degree of adherence to the reporting framework", *Open Journal of Business and Management*, Vol. 6 No. 3, pp. 733-748, doi: 10.4236/ojbm.2018.63056.

Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360, doi: 10.1016/0304-405x(76)90026-x.

Kamal, Y. and Islam, M.S. (2018), "The paradox of foreign loans and grants: an econometric analysis in the perspective of Bangladesh", *Dhaka University Journal of Business*, Vol. 39 No. 3, pp. 51-66.

Kassai, J.R. and Carvalho, N. (2016), "Integrated reporting: when, why and how did it happen?", in Mio, C. (Ed.), *Integrated Reporting*, Palgrave Macmillan, London, pp. 109-116, doi: 10.1057/978-1-137-55149-8_6.

Khan, I. and Islam, M.S. (2020), "Accounting and auditing through the lens of non-accountants: an emerging economy experience", *Asia-Pacific Management Accounting Journal*, Vol. 15 No. 2, pp. 65-91, doi: 10.24191/apmaj.v15i2.1203.

Lee, K.W. and Yeo, G.H.H. (2016), "The association between integrated reporting and firm valuation", *Review of Quantitative Finance and Accounting*, Vol. 47 No. 4, pp. 1221-1250, doi: 10.1007/s11156-015-0536-y.

Mahboub, R.M. (2019), "The determinants of forward-looking information disclosure in annual reports of Lebanese commercial banks", *Academy of Accounting and Financial Studies Journal*, Vol. 23 No. 4, pp. 1-18.

Menicucci, E. (2018), "Exploring forward-looking information in integrated reporting: a multi-dimensional analysis", *Journal of Applied Accounting Research*, Vol. 19 No. 1, pp. 102-121, doi: 10.1108/JAAR-01-2016-0007.

Nakib, M. and Dey, P.K. (2018), "The journey towards integrated reporting in Bangladesh", *Asian Economic and Financial Review*, Vol. 8 No. 7, pp. 894-913, doi: 10.18488/journal.aefr.2018.87.894.913.

Ntim, C.G., Soobaroyen, T. and Broad, M.J. (2017), "Governance structures, voluntary disclosures and public accountability: the case of UK higher education institutions", *Accounting, Auditing and Accountability Journal*, Vol. 30 No. 1, pp. 65-118, doi: 10.1108/AAAJ-10-2014-1842.

Powell, W. and Colyvas, J. (2008), "Microfoundations of institutional theory", *The Sage Handbook of Organizational Institutionalism*, SAGE Publications, London, pp. 276-298, doi: 10.4135/9781849200387.n11.

Rahman, M.M., Sobhan, R. and Islam, M.S. (2019), "Intellectual capital disclosure and its determinants: empirical evidence from listed pharmaceutical and chemical industry of Bangladesh", *The East*

Asian Journal of Business Management (EAJBM), Vol. 9 No. 2, pp. 35-46, doi: 10.13106/jbees.2019.vol9.no2.35.

Rahman, M.M., Sobhan, R. and Islam, M.S. (2020), "The Impact of intellectual capital disclosure on firm performance: empirical evidence from pharmaceutical and chemical industry of Bangladesh", *The Journal of Asian Finance, Economics and Business*, Vol. 7 No. 2, pp. 119-129, doi: 10.13106/jafeb.2020.vol7.no2.119.

Rinaldi, L., Unerman, J. and de Villiers, C. (2018), "Evaluating the integrated reporting journey: insights, gaps and agendas for future research", *Accounting, Auditing and Accountability Journal*, Vol. 31 No. 5, pp. 1294-1318, doi: 10.1108/AAAJ-04-2018-3446.

Salvi, A., Vitolla, F., Giakoumelou, A., Raimo, N. and Rubino, M. (2020), "Intellectual capital disclosure in integrated reports: the effect on firm value", *Technological Forecasting and Social Change*, Vol. 160, doi: 10.1016/j.techfore.2020.120228.

Uyar, A. and Kilic, M. (2012), "Influence of corporate attributes on forward-looking information disclosure in publicly traded Turkish corporations", *Procedia-Social and Behavioral Sciences*, Vol. 62, pp. 244-252.

Vitolla, F., Raimo, N. and Rubino, M. (2019), "Appreciations, criticisms, determinants and effects of integrated reporting: a systematic literature review", *Corporate Social Responsibility and Environmental Management*, Vol. 26 No. 2, pp. 518-528, doi: 10.1002/csr.1734.

Vitolla, F., Raimo, N., Rubino, M. and Garzoni, A. (2020), "The determinants of integrated reporting quality in financial institutions", *Corporate Governance*, Vol. 20 No. 3, pp. 429-444, doi: 10.1108/CG-07-2019-0202.

Zappettini, F. and Unerman, J. (2016), "'Mixing' and 'Bending': the recontextualization of discourses of sustainability in integrated reporting", *Discourse and Communication*, Vol. 10 No. 5, pp. 521-542, doi: 10.1177/1750481316659175.

Zhou, S., Simnett, R. and Green, W. (2017), "Does integrated reporting matter to the capital market", *Abacus*, Vol. 53 No. 1, pp. 94-132, doi: 10.1111/abac.12104.

Appendix

Serial no	Items	Reference
1	*Organizational overview and external environment*	
	Vision and mission	IR Framework 2013
	Operating structure, principle activities and market position	IR Framework 2013
	Competitive environment and institution's position	IR Framework 2013
	Key quantitative information	IR Framework 2013
	Commercial, social, technical, environment and political environment	IR Framework 2013
	External environment and its impact on value creation	IR Framework 2013
2	*Governance*	
	Leadership structure, diversity and regularity requirement	IR Framework 2013; Ntim *et al.* (2017)
	Executive and nonexecutives' role and responsibilities	IR Framework 2013; Ntim *et al.* (2017)
	Strategic decision-making process	IR Framework 2013; Ntim *et al.* (2017)
	Monitoring approach of strategic direction	IR Framework 2013; Ntim *et al.* (2017)
	Risk identification, monitoring and mitigation	IR Framework 2013; Ntim *et al.* (2017)
	How remuneration and incentives are linked to value creation	IR Framework 2013; Ntim *et al.* (2017)
3	*Value creation model – business model*	
	Main activities, strategic purpose achievement and value creation	IR Framework 2013
	Main source of income	IR Framework 2013
	Social and environmental impact of institution's activities	IR Framework 2013
	Organizational change adoption and staff training and development	IR Framework 2013
	Identification of key stakeholders and other dependencies	IR Framework 2013
4	*Risk and opportunity*	
	Specific sources of risks and opportunities	IR Framework 2013
	Assessment of risks and opportunities	IR Framework 2013
	Specific steps taken for risks and opportunities	IR Framework 2013
5	*Strategy and resource allocation*	
	Short-, medium- and long-term objectives	IR Framework 2013
	Resource allocation plans to implement strategy	IR Framework 2013
	Financial sustainability for short, medium and long term	IR Framework 2013
	Performance measurement for short, medium and long term	IR Framework 2013
	Developing and exploiting intellectual capital	IR Framework 2013
6	*Performance*	
	Quantitative indicators about targets and risks and opportunities	IR Framework 2013
	Institutional performance toward strategic, financial and environmental issue	IR Framework 2013
	Relationship between key stakeholders and respond toward their legitimate needs	IR Framework 2013
	Linkage with past, current and future outlook performance	IR Framework 2013
7	*Outlook*	
	Challenges and uncertainties regarding pursuing its objectives	IR Framework 2013
	Potential respond to the critical challenges and uncertainties	IR Framework 2013
	Potential implications for its business model and future performance	IR Framework 2013
	Institution's strengths, weakness and market position to tackle external environment	IR Framework 2013
8	*Basis of preparation and presentation*	
	Organization's materiality determination process	IR Framework 2013
	Disclose the individuals involved in preparation and review the report	IR Framework 2013
	Material matter identification process	IR Framework 2013

Table A1.
Disclosure checklist

Index name	Explanation	Measurement of the index	Sources
IRDIN	Integrated reporting disclosure index	Number of items in the checklist disclosed divided by the maximum possible score (36)	Annual reports
OEEI	Organizational overview and external environment index	Number of items in the checklist disclosed divided by the maximum possible score (6)	Annual reports
GI	Governance-related disclosure index	Number of items in the checklist disclosed divided by the maximum possible score (6)	Annual reports
VCMI	Value creation model index	Number of items in the checklist disclosed divided by the maximum possible score (5)	Annual reports
ROI	Risk and opportunity disclosure index	Number of items in the checklist disclosed divided by the maximum possible score (3)	Annual reports
SRAI	Strategy and resource allocation index	Number of items in the checklist disclosed divided by the maximum possible score (5)	Annual reports
PMI	Performance disclosure index	Number of items in the checklist disclosed divided by the maximum possible score (4)	Annual reports
OLKI	Outlook of the industry index	Number of items in the checklist disclosed divided by the maximum possible score (4)	Annual reports
BPPI	Basis of preparation and presentation index	Number of items in the checklist disclosed divided by the maximum possible score (3)	Annual reports

Table A2. Integrated reporting disclosure index and its subindexes

Industry	Serial no	Selected company
Cement	1	Heidelberg CementBangladesh Ltd
	2	LafargeHolcim Bangladesh Limited
Ceramics sector	3	RAK Ceramics (Bangladesh) Limited
	4	Shinepukur Ceramics Limited
Engineering	5	Rangpur Foundry Limited (RFL)
	6	GPH Ispat Ltd
Food and allied	7	British American Tobacco Bangladesh Ltd
	8	National Tea Company Ltd
Fuel and power	9	Meghna Petroleum Limited
	10	United Power Generation and Distribution Ltd
Pharmaceuticals and chemicals	11	Orion Pharma Limited
	12	The ACME Laboratories Limited
Services and real estate	13	SAIF Powertec Limited
	14	Samorita Hospital Limited
Tannery industries	15	Bata Shoe Company (Bangladesh) Limited
	16	Apex Footwear Limited
Telecommunication	17	Bangladesh Submarine Cable Company Limited
	18	Grameenphone Ltd
Textile	19	Square Textile Ltd
	20	Alhaj Textile Mills Ltd

Table A3. Selected sample companies classified under different industry

About the author

Md. Shafiqul Islam is a gold medalist from the Department of Accounting and Information Systems, University of Dhaka, Bangladesh, and he is National 1st Runners Up of the IDLC Finance Olympiad 2018. His research interest lies in but not limited to the integrated reporting, integrated thinking, corporate sustainability, the SDGs and intellectual capital. Md. Shafiqul Islam can be contacted at: fbsshuvo@gmail.com