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Improving Quality of Information: Does Integrated Reporting matter? Evidence from Sri Lankan Listed Companies

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Abstract

This study examines the information quality of integrated reporting (IR) adopted companies in comparison to non-adopted companies. Information quality was measured in terms of the decision usefulness approach based on fundamental qualitative characteristics (QCs) of financial information. Data were collected through annual reports of listed companies of 26 IR-adopters and 27 non-adopters for 2010 (pre-adoption year) and 2019 (post-adoption year). The results revealed IR-adopters have significantly improved information quality from 2010 to 2019 compared to non-adopters. Also, there is a significant positive relationship between the information quality of IR-adopters with the number of years of experience in IR.

Our novel QCs-based quality measurement index provides numerical measures for evaluating information quality. The study shows that IR has achieved its overall objective of improving information quality in the Sri Lankan context. Thus, it provides confidence for the firms expecting to adopt IR to improve their information quality in the future.

Keyword: integrated reporting, quality of information, relevance, faithful representation, qualitative characteristics, Sri Lanka.

I. INTRODUCTION

The concept of information quality in corporate reporting is often ventilated by accounting regulators and debated in the academic literature. For example, one of the aims of integrated reporting (IR) is "to improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital" (IIRC, 2021, p. 2). The conceptual framework for financial reporting of international accounting standards board (IASB) also states that the conceptual framework "contributes to transparency by enhancing the international comparability and quality of financial information, enabling investors and other market participants to make informed economic decisions" (IASB, 2018, p. 6). Further, the mission statement of the IASB states that the purpose of international financial reporting standards (IFRS) is to improve the quality of reporting because "high-quality financial information is the lifeblood of capital markets".[1] The latest IFRS Foundation's sustainability reporting project also attempts to develop "…high-quality and consistent measurement and disclosure requirements" (IFRS Foundation, 2020, p. 9) and associated qualitative characteristics (QC) for useful sustainability information (IFRS Foundation, 2020, p. 13).

Although improving the information quality is one of the main aims of both the IIRC and the IASB, what is meant by quality is wage within their references. Thus, the

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[1] See https://www.ifrs.org/about-us/who-we-are/.

concept of quality has been open to complex, confusing, and even contradictory debates on financial reporting, regulation, and accounting standard-setting globally (Agienohuwa & Ilaboya, 2018). In general, the notion of quality in financial reporting has become inherently subjective as a result of contradictory partialities across different users who make different decisions (McDaniel et al., 2002; Beattie et al., 2004; and Dechow et al., 2010) and users would judge about information quality for themselves based on their preferences Mai (2013).

Nevertheless, the quality of financial reporting is often emphasized in connection with financial crises, corporate collapses and disclosure problems. Accounting researchers (e.g., Cheung et al., 2010; Fung, 2014; and Babatunde et al., 2017) suggested that financial scandals are linked with poor quality of information disclosures and diluted investors' trust in the information provided within annual reports. Herath and Albarqi (2017) also noted accounting scandals in the 21st century (e.g., Enron, WorldCom, Sunbeam, Parmalat, Global Crossing, Halliburton, and Nicor Energy) are due to weaknesses in reporting quality of information.

As one of the latest developments in corporate reporting, international integrated reporting council (IIRC) introduced the integrated reporting (IR) framework in 2013 with a differentiation focus on an organisation's ability to create value in the short, medium, and long term (IIRC, 2021) and it was revised in 2021. Thus, its ultimate goal is to provide a holistic picture of an organisation to facilitate users' decision making by improving the decision-useful information (IIRC, 2021). Elaborating on 'decision usefulness', the IASB provides indirect indications for quality in financial reporting regarding decision usefulness to primary capital providers, i.e., lenders and investors. The IASB and literature (e.g., Jonas & Blanchet, 2000; Achim & Chiş, 2014; Dimi et al., 2014; McNally et al., 2017; and Slack & Tsalavoutas, 2018) support that information should be decision-useful to recognise as quality information. For example, IASB conceptual frameworks (IASB, 2010; 2018) state that the purpose of "financial reporting is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions" (IASB, 2010, p. 9; 2018, p. 8). Conceptual framework further states that "if financial information is to be useful, it must be relevant and faithfully represent what it purports to represent" (IASB, 2010, p. 16; 2018, p. 14). Relevance and faithful representation are the fundamental QCs[2] of financial information identified by IASB in its conceptual framework. Accordingly, the IASB indicates that complying with the QCs of financial information increases the quality of information (Beest et al., 2009; Braam & van Beest, 2013; Achim & Chiş, 2014; Mbobo & Ekpo, 2016; and Agienohuwa & Ilaboya, 2018).

Therefore, in this paper, we examine whether companies have improved the information quality of their annual reports along with the adoption of the IR framework. We merge IASB's conceptual framework approach to assess the information quality of IR and use the decision usefulness approach in terms of achieving QCs as prescribed by IASB.

The rest of the paper is organised as follows. First, section 2 provides a literature review and the hypothesis of the study. Then, the methodology is explained in section 3,

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[2] The qualitative characteristics of useful financial information identify the types of information that are likely to be most useful to the existing and potential investors, lenders and other creditors for making decisions about the reporting entity on the basis of information in its financial report (IASB, 2018, p. 14)

while section 4 provides the data analysis and the findings. Finally, section 5 provides the discussion and conclusion of the study.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The need for IR emerged mainly due to the drawbacks of traditional corporate reporting, such as incapability of identifying new ways of business conduct and value creation (Adams & Simnett, 2011), non-reporting of intangible assets information (Krzus, 2011), incapability to capture the interdependency among strategy, governance, operations, and financial and non-financial performance (Flower, 2015), dependency on historical information (IIRC, 2011) and provision of neither timely nor relevant information (Krzus, 2011; Adams, 2015). Therefore, the IR framework issued by IIRC's is expected to minimise the above weaknesses and provide quality information to users.

Prior studies on IR mainly focused on; opportunities and future potentials (Adams & Simnett, 2011; Adams, 2015), determinants of IR (Frías-Aceituno et al., 2013; García-Sánchez et al., 2019), the current context of IR (Atkins & Maroun, 2015; Ahmed Haji & Anifowose, 2016; and Bananuka et al., 2019), benefits, drawbacks and barriers to IR (Brown & Dillard, 2014; Flower, 2015; and Dumay et al., 2017), perception of stakeholder groups on IR (Atkins & Maroun, 2015; Abhayawansa et al., 2019; and Adhariani & de Villiers, 2019), and future research directions of IR (De Villiers et al., 2014; Dumay, 2016; De Villiers & Sharma, 2017; and De Villiers et al., 2017). Vitolla et al. (2019) state that although studies investigated IR, few studies focused on IR quality. It is observed that few studies focusing on the quality of IR resulted in inconclusive findings. This context stimulates us to conduct our study, particularly examining whether IR achieves its main objectives of improving the information quality in terms of the decision usefulness approach.

An integrated report benefits all stakeholders interested in an organization's ability to create value over time (IIRC, 2021). Studies conducted in different contexts (e.g., Cortesi & Vena, 2019; Cosmulese et al., 2019) discussed the importance and usefulness of IR. With the data of 636 companies from 57 countries, Cortesi and Vena (2019) found that the adoption of IR enhances corporate disclosure, reduces information asymmetries and increases the quality of reported earnings per share. Cosmulese et al. (2019) also find that the IR has played a key role in reducing the informational asymmetry due to how it manages to comprise various types of information useful in satisfying the stakeholders' expectations by using 180 companies listed in the New York stock exchange and national association of securities dealers automated quotations. Bernardi and Stark (2018) find that the adoption of IR increases analyst forecast accuracy in South Africa. In contrast to positive findings of IR, Flower (2015) argue that IR mainly focuses on capital providers and ignore other stakeholders. Mio and Fasan (2016) find an expectation gap between users and the integrated report. Few studies confirm the same view. For example, Slack and Tsalavoutas (2018) found the usefulness of IR to fund managers and equity analysts is low in the UK. McNally et al. (2017) also found that the usefulness of the integrated report is limited because the investor community is not taking the integrated report seriously in South Africa. These recent mixed findings evidence that the usefulness of IR is arguable in different country contexts.

Accounting researchers attempted to measure the quality of IR using various models. For example, studies (e.g., Barth et al., 2017; Iredele, 2019; Maroun, 2019; Mans-Kemp & van der Lugt, 2020; and Moloi & Iredele, 2020) have measured IR quality from the scores underlying the annual EY (Ernest and Young) excellence in integrated reporting Awards. Mans-Kemp and van der Lugt (2020) found that a high level of

integrated reporting quality is significantly associated with high levels of Economic, Social and Governance (ESG) performance and high earnings per share, and high leverage. Maroun (2019) finds that an increase in the number of elements of an integrated report being subject to external assurance is associated with higher-quality reporting. Moloi and Iredele (2020) supported that integrated reporting quality significantly impacts the firm value, whereas Barth et al. (2017) found a positive association between integrated reporting quality – liquidity and integrated reporting quality and expected future cash flows. Iredele (2019) found a significant relationship between the quality and length of integrated reports. They also revealed that firms vary in the quality of their integrated reports on account of differences in profitability, board size, gender and firm size.

As another model of measuring IR quality, Pistoni et al. (2018) used the integrated reporting scoreboard (IRS) model suggested by Hammond and Miles (2004). They measured the quality of IR based on four main criteria: background area, assurance and reliability area, content area, and form area. After analysing 116 integrated reports of the 58 sample companies included in the IIRC database for 2013 and 2014, they found that the IR quality level is low due to incomplete adoption of the IR framework. Vitolla et al. (2020) also measured the IR quality using the scoreboard developed by Pistoni et al. (2018) and found a positive relationship between the size, independence, diversity, and activity of a board with integrated reporting quality.

Other studies used diverse techniques and proxies for measuring the quality of IR. For example, Zúñiga et al. (2020) used Sustainability Disclosure Transparency Index (SDTI) as a proxy for IR disclosure quality. The SDTI was developed by integrated reporting and assurance services (IRAS). Zúñiga et al. (2020) find that the quality of IR is associated with lower earnings forecast error. Chouaibi and Hichri (2020) identify the quality of IR as the degree of consolidated, integrated reporting and found that auditor specialization and auditor ethics factors significantly positively affect the integrated reporting quality. Cosma et al. (2018) proxy high IR quality disclosure by the awards assigned to IR by a sample of South African listed companies from 2013 to 2016 and find that the stock market reacts positively to award announcements. Dilling and Caykoylu (2019) followed qualitative text analysis to assign scores on the quality of integrated reports of 110 global organizations to determine how companies report on specific topics related to the six capitals: social and relationship, human, intellectual, manufacturing, natural, and financial. According to their findings, larger size with a higher female board ratio and listing in the IIRC examples database are more likely to publish a higher quality integrated report. Malola and Maroun (2019) measured the quality of integrated reports by combining five indicators, namely, quantitative indicator, density indicator, measurement indicator, relevance indicator and ease of interpretation indicator. They define quantity indicators as the percentage of sentences in an integrated report over the average number of sentences for entities in the same or similar industry. They found that though IR has become well established in South Africa, there is considerable room for improvement. Most disclosures are qualitative and symbolic rather than quantified and substantive. Pavlopoulos et al. (2017) created an integrated disclosure score index based on a checklist with weighting assigned to the respective chapters of the King III Report and King III Code and found IR disclosure quality is positively associated with corporate governance variables. They concluded that higher quality IR information decreases agency costs. Pavlopoulos et al. (2019), using the same created score index, identified a positive relation between firm performance and the quality of IR disclosure.

In terms of the QCs based approach, Dimi et al. (2014) examined the usefulness of annual reports using the frameworks provided by the IASB and integrated reporting committee of South Africa based on the QCs approach to assess the usefulness. They used a structured questionnaire consisting of 18 questions developed by Beest et al. (2009), completed by 40 corporate governance experts. They identified that the usefulness of information had been improved in South African annual reports, but, most notably, the disclosure of non-financial information and the integration of this information with the financial performance and strategic vision of the organisation is required. Closer to our study's methodological approach, from the Sri Lankan context, Cooray et al. (2020) assessed the quality of IR of 132 listed entities using QCs and related it to corporate governance characteristics. They used their own measurement criteria to assess QCs and found limited support from the corporate governance system in Sri Lanka to provide quality information to stakeholders on the value creation process through IR.

Although the previous studies have used different approaches to measure the quality of reporting, as per our understanding, none of the studies examined integrated reports to provide direct evidence on how far IIRC achieved its' stated objective of improving the quality of the information in terms of decision usefulness viewpoint as per IASB's QCs, particularly comparing IR-adopters and non-adopters in one research context. Thus, the gap raises a requirement for further investigations about the information quality of IR-adopters and non-adopters providing evidence from Sri Lanka as one of the countries joined with the first pilot programme of IIRC in 2011. According to Gunarathne and Senaratne (2017), Sri Lanka is a country with an increasing IR adoption rate with high institutional support such as awareness programmes of professional accounting bodies, IR award competition, and initiatives of Colombo . Therefore, the objective of our study is to examine whether IR adopting firms have increased information quality compared to non-adopting firms in the Sri Lankan context as per the IASB's QCs-based elaboration of quality in terms of decision usefulness approach based on the above literature, we developed the following hypothesis in achieving the above research objective.

H_1: there is no statistically significant difference in information quality scores between IR-adopters and non-adopters in 2019.

H_2: there is no statistically significant difference in the information quality of adopters between the pre-IR adoption period and the post-IR adoption period.

H_3: there is no statistically significant difference in information quality of non-adopters between 2010 and 2019.

III. RESEARCH METHODOLOGY

We followed three steps in achieving our objective of the study, i.e., to examine whether the quality of the information in annual reports is increased in IR-adopters compared to non-adopters; 1) identifying IR-adopted companies and non-adopted companies, 2) developing an index for measuring the quality of information, and 3) measuring the quality of IR-adopters and non-adopters.

3.1. Sample: Identifying IR-Adopters and Non-Adopters

We considered listed companies on the Colombo (CSE) in Sri Lanka. Out of all listed companies, the top 100 companies based on market capitalisation[3] were selected on 31st March 2019. Those companies represent 91% of the total market capitalisation

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[3] Chakroun and Hussainey (2014) stated that listed companies are particularly more careful about their disclosure policies due to market pressure.

of CSE. Banking, finance, and insurance sector' companies (47 companies) were excluded from the sample due to double regulations and were significantly different from other sectors' reporting practices in Sri Lanka. A similar approach was used by Imam and Malik (2007), Manawaduge (2012) and Kalainathan and Kaliaperumal (2014). Finally, 53 companies were drawn to the final sample. Our sample represents 60.4% of the total market capitalisation of CSE and 17% of the total number of companies listed in CSE. Hence, our sample represents the economic substance of the listed entities in CSE.

All 53 companies' annual reports were examined to identify IR-adopters based on the following two criteria.

1). The annual report has discussed its value creation process through a business model, which is a system of transforming inputs, through its business activities, into outputs and outcomes that aims to fulfil the organisation's strategic purposes and create value over the short, medium and long term (IIRC, 2021), and

2). The name of the report states as 'integrated report,' or referring to the 'IIRC' or 'IR framework' (Gibassier et al., 2019).

If both the criteria are satisfied, we recognised them as IR-adopters. Accordingly, 26 companies were identified as IR-adopters, and 27 companies were identified as non-adopters. Data were collected for two years, 2010 and 2019. Sri Lanka adopted integrated reporting in 2011, and the first integrated report was produced in 2011. Therefore, we identify our base period as 2010 to represent the pre-IR period, which is none of the companies had produced an integrated report. The year 2019 was selected to represent the post-IR adoption period as the most recent year at the time of data collection, where all the sample companies prepared integrated reports.

3.2. Development of the Index for Measuring the Quality of Information

Defining and measuring 'quality' of information in reporting is challenging (Schipper & Vincent, 2003), and it is evidenced by the range of approaches used by different researchers (e.g., Ohlson, 1995; Dechow & Dichev, 2002; Barth et al., 2008; Beest et al., 2009; Cheung et al., 2010; Tasios & Bekiaris, 2012; Kythreotis, 2014; and Mbobo & Ekpo, 2016). However, as a useful approach guided by the IASB's conceptual framework, based on decision usefulness in terms of QCs, Beest et al. (2009) developed an index considering all the QCs of IASB's 2010 conceptual framework with 21 information dimensions to assess the quality of information. Those dimensions were based on prior literature which focused on individual QCs on reporting quality. Each of the QCs was measured using multiple items that refer to the sub notions of QCs. Finally, Beest et al. (2009) computed a standardised outcome for the QCs by adding the scores on the related items and dividing them by the total number of items. They tested this model using 231 annual reports in the UK and US stock exchanges for 2005 and 2007 and to find that US firms' annual report quality is better than for UK firms.

Braam and van Beest (2013) further developed this index and added another 12 information dimensions covering more useful information to users. Other scholars also used QCs-based approaches developed by Beest et al. (2009) and Braam and van Beest (2013) (e.g., Tasios & Bekiaris, 2012; Agyei-Mensah, 2013; Chakroun & Hussainey, 2014; Dimi et al., 2014; Mbobo & Ekpo, 2016; Jerry & Saidu, 2018; and Masruki et al., 2018) in the context of assessing reporting quality of annual reports.

Following the measures of QCs used by Beest et al. (2009) and Braam and van Beest (2013), among others, we also used nine information dimensions that can be used to assess the quality of reporting in annual report information under the QCs of relevance

and faithful representation.[4] However, the main problem we noticed in the index developed by Beest et al. (2009) and Braam and van Beest (2013) is the subjectiveness of assessment that involves personal bias in assessing the disclosure level of those information dimensions. Therefore, in contrast to Beest et al. (2009) and Braam and van Beest (2013), based on literature, we identified a total of 39 measurable sub-information items for each nine information dimensions (see Annexure 1) to develop an index to assess information quality.

In selecting main information dimensions and sub-information items under relevance and faithful representation, in our literature search, we were concerned mainly: 1) whether the sub-information items assist in measuring the respective QCs (i.e., relevance or faithful representation) and 2) whether the selected items are decision usefulness in making investment and/or lending decisions.[5] In identifying measurable sub-information items, additionally, we considered previous literature relating to user need studies and surveys conducted by international professional bodies such as IASB, financial accounting standards board (FASB) etc., existing annual report practices of Sri Lankan entities, annual report publishing guidelines issued by chartered accountants of Sri Lanka (CASL), and necessary accounting standard practices and other statutory disclosure practices in Sri Lanka. Accordingly, relevance was assessed by 29 measures categorised into six major information dimensions, and faithful representation was assessed using ten measures recognised under three information dimensions. In total, 39 measures were identified under nine information dimensions for two QCs used to measure information quality in terms of decision usefulness[6] (see Annexure 1).

3.3. Measuring the Quality of Annual Reports

After developing the measurement index, the next step is to measure the quality. We used dichotomous procedures by coding a disclosure item as '1' if present and '0' if not in annual reports of IR-adopters and non-adopters for 2019 and 2010. Researchers supported and used the dichotomous procedure (e.g., Bujaki & McConomy, 2002; Garefalakis et al., 2016; and Dawd et al., 2018) in past studies. However, Cooke and Wallace (1989) reported that this procedure is not entirely free of subjectivity and recommends that the entire corporate annual report should be reviewed first to identify whether a particular item is applicable or not, to avoid penalising a company by assigning a score of a '0' that would be misleading. We read the whole annual report to identify the information in annual reports is meaningfully related to the items in the checklist. We recorded '1' when the information item is disclosed or complied with the checklist item and recorded '0' when the information item is not disclosed or complied with the checklist items.[7]

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[4] The Conceptual Framework identified QCs into two clusters as fundamental and enhancing (IASB, 2018). Also, it recognized that enhancing QCs are supportive and improve fundamental QCs (IASB, 2018). However, the IASB is silent on providing detail guidance on how the enhancing QCs affect to fundamental QCs. Therefore, avoiding ambiguity, the current study used only the fundamental QCs in assessing the quality of information.

[5] IASB in its conceptual framework recognised that Investors and lenders as main capital providers.

[6] In this paper, we have not included the discussion of literature on selecting information dimensions and the measurable sub-information items. Further information with respect to justification from literature on identifying information dimensions and sub-information items can be provided on request.

[7] There are no inapplicable items in the checklist.

IASB, in its' conceptual framework, is silent on how each of the QCs is individually contributing to the quality of information. Also, Beest et al. (2009) and Braam and van Beest (2013) argued that QCs could not measure independently. Therefore, following the previous studies (e.g., Beest et al., 2009; Braam & van Beest, 2013; Garefalakis et al., 2016; and Dawd et al., 2018), we used the unweighted (all sub information elements are treated equally) scoring approach for 39 information items with the dichotomous approach.

We examined 53 annual reports and scored the information contained in annual reports for all 39 sub-information items using the measurement rules shown in the disclosure checklist (see Annexure 1). We added the scores of those sub-information items, which corresponded to two QCs. After obtaining the total, we then calculated the relative quality score RQS_{jit} for each QC, i.e., the ratio between what the reporting company discloses (the awarded scores) and what the company is expected to disclose under QCs (the maximum possible scoring points for QCs). Thus, the mathematical formula is expressed as,

$$RQS_{jit}= (AQ_{jit}/TQ_{jit})*100\% \quad \text{...} \quad 1$$

Where:

RQS_{jit}: represents the two QCs,

AQ_{jit} : the awarded scores for a QC for company i in year t, and

TQ_{jit} : the maximum possible score (40)[8] for QCs for company i in a year.

The relative scoring approach has been used in prior studies (e.g., Leventis & Weetman, 2004; Ghazali & Weetman, 2006), and it is important because two QCs has an unequal number of sub-information items associated. A further reason is to avoid a situation where a sampled company would be penalised for not disclosing a certain item in the index when the respective sub-information item is not applicable.

The reliability of collecting data through the quality measurement index was maintained with the following steps. The stability[9] of the measurement index was maintained with the test-retest method. Accordingly, four annual reports (two each from IR-adopters or non-adopters) were re-rated after two weeks from the initial examination, and there were no scoring discrepancies. Consistency and reproducibility of the index were certified by the test-test conditions (Krippendorff, 2004) with statistical comparisons of the interrater consistency. A randomly selected annual report was given for two other scorers (academic colleges professionally qualified in Accounting). Krippendorff's alpha test was used to estimate interrater reliability. The test results show that the interrater reliability is high (α= .7618), i.e., two scorers did agree.

Additionally, before scoring all the sample firms, a pilot study was conducted using a randomly selected sample of six annual reports representing six companies for 2010 and 2019 to identify the administration of the scoring procedures. Each scorer independently scores the annual reports of the pilot study sample, and the minor concerns were discussed to ensure consistency in applying the rules of scoring.

IV. RESULTS AND DISCUSSIONS

In achieving the study's objective, we first examined the information quality score for IR-adopters and non-adopters in 2019. Table 1 shows descriptive statistics for individual QCs as well as the overall quality scores for IR-adopters (N= 26) and non-adopters (N= 27) for the year 2019.

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[8] For 39 sub-information items, 40 points are calculated due to one sub-information item earn 2 points. This is explained in Annexure 1.

[9] Stability entails checking whether or not a measure is stable over time (Bryman & Bell, 2015, p. 157).

Table 1
Descriptive Statistics IR-Adopters vs Non-Adopters in 2019

QCs		N	Mean	Std. Deviation	Median	Std. Error Mean
Relevance	IR-Adopters	26	.60	.129	.63	.025
	Non-Adopters	27	.50	.128	.53	.025
Faithful-Representation	IR-Adopters	26	.82	.161	.81	.032
	Non-Adopters	27	.74	.162	.78	.031
Total Information Quality Score	IR-Adopters	26	.66	.126	.66	.025
	Non-Adopters	27	.56	.128	.58	.025

When the QCs are considered individually to measure the information quality regarding decision usefulness, both QCs depict higher quality scores (mean and median) by IR-adopters than non-adopters. Adopters have achieved more relevance (20% above mean difference), and faithful representation (11% above mean difference) of information of IR-adopters compared to non-adopters. The total quality score, which combines both QCs, shows a higher total quality score for IR-adopters (M= 0.66) than non-adopters (M= 0.56). Accordingly, an average of 66% of information quality is recorded by IR-adopters and 56% by non-adopters. IR-adopters have recorded their total quality score by 18% above compared to the non-adopted firms. Overall, descriptive statistics show that IR-adopters show high information quality in individual QCs and total quality than non-adopters.

Secondly, to statistically examine whether IR-adopters record higher quality than non-adopters, hypothesis 1 was tested using a significance test on sample averages between IR-adopters and non-adopters in 2019.

The results of the independent sample t-test are significant with t (51)= 2.777, p= .008. Therefore, we rejected the null hypothesis. It indicates that there is a statistically significant difference in mean quality score between IR-adopters (M= .66, SD= .126 N= 26) and non-adopters (M= .56, SD= .128, N= 27). The 95% confidence interval of the difference between the mean was .0269 to .167.

Further, we calculated the effect size to show the magnitude of the information quality difference between the two groups. Since the sample size and standard deviation are nearly equal, Cohen's effect size measures[10] were used. Cohen suggested that d= .2 is 'small' effect size, d= .5 represents a 'medium' effect size and d= .8 a 'large' effect size (Cohen, 1988). Accordingly, the calculated effect size of .78 is above .5 and closer to .8, which evidence a large effect size. This explains that the score of the average company in the IR adopted group is .78 standard deviations above the average company in the IR non-adopted group.

Third, we examined whether the IR-adopters improved their information quality in 2019 than their pre-adoption period, i.e., 2010. All IR-adopters in our sample adopted IR after 2011. Therefore, we examined 2010 annual reports of IR-adopters using the quality measurement index (Annexure 1) to identify the pre-adoption period information quality. Table 2 depicts that the mean quality value of the pre-adoption period is .4508 (N= 26), where an average of 45% of the information quality score was maintained in the year 2010. However, the mean quality score for the year 2019 for adopters is .6577 (N= 27), which records a significant improvement of 46% compared to the year 2010.

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[10] Cohen's d= (M2 - M1) ∕ SD$_{pooled}$, Cohen's d= (0.56-0.66) ∕0.127004= 0.787377. Alternatively, Hedges'g (where the sample size is not equal)= 0.727856 and Glass's delta (where each group has different standard deviation)= .793651, also shows the similar value.

Table 2
Mean Quality Scores of IR-Adopters in 2010 and 2019

Year	N	Mean	Std. Deviation	Std. Error Mean
2019 (Post-IR Adoption Period)	26	.6577	.1267	.02485
2010 (Pre-IR Adoption Period)	26	.4508	.1278	.02507

Hypothesis 2 was tested to identify whether there is a statistically significant difference in the pre and post-adoption period's information quality of IR-adopters.

The results of the paired sample t-test are significant with t (25) = 11.899, p= 0.000. Therefore, we rejected the null hypothesis and concluded that there is a statistically significant difference in mean information quality score between pre and post-IR-adopted periods. The effect size[11] recorded as 1.65, which is higher than one. It indicates that the difference between the two means is larger than one standard deviation providing a strong effect.

Further, in support of the high information quality of adopters, we examined whether there is a statistically significant association between the information quality score (i.e. 2019) and the number of years elapsed after adopting IR of each IR-adopted company. The average period of experience in IR adoption in Sri Lankan non-financial companies by 2019 is three years, while 15 companies are below the average and nine companies are above the average. We examined the correlation between information quality score and the number of years in IR using Pearson Correlation statistics (r= 0.421, p= .032, N= 26), showing a positive statistically significant relationship between information quality score and the number of years in IR.

Robust to the above results, fourthly, we examined whether the IR non-adopters also had improved their information quality between 2010 and 2019. Table 3 shows that non-adopters (N= 27) recorded a mean quality score of 0.39 in 2010 and 0.56 in 2019, improving information quality by 44%.

Table 3
Mean Information Quality of IR Non-Adopters in 2010 and 2019

Year	N	Mean	Std. Deviation	Std. Error Mean
2019 (Post-IR Adoption Period)	27	.5607	.1283	.02571
2010 (Pre-IR Adoption Period)	27	.3904	.1312	.02525

Hypothesis 3 was tested to examine whether there is a statistically significant difference in information quality of IR non-adopted firms between 2010 and 2019.

The result of the paired sample t-test is significant with t (26)= 8.737, p= .000. Therefore, we rejected the null hypothesis, concluding a statistically significant difference in mean information quality score of non-adopters between 2010 (M= .39, SD= .131, N= 27) and 2019 (M= .65, SD= .128, N= 27). The effect size[12] recorded as 1.31, which is bigger than 1, explain that the difference between the two means is larger than one standard deviation providing a strong effect. Thus, statistics evidenced that non-adopters also have improved their information quality in 2019 compared to 2010 as IR-adopters. However, IR-adopters' level of quality is below the IR-adopters in both the years, and adopters have recorded a slight increase in quality by 2% compared to non-adopters from 2010 to 2019.

Additionally, we examined whether there was a significant difference in quality scores between these two groups, i.e., adopters and non-adopters, in 2010. Paired sample t-test is not significant with t (51)= 1.154, p= .136 that accept the null hypothesis

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[11] Cohen's d= (M2-M1)/SD_{pooled} = (0.45-0.66)/0.127004= 1.65349.

[12] Cohen's d= (M2-M1)/SD_{pooled}= (0.39-0.56)/0.129758= 1.31013.

concluding there is no statistically significant difference in mean information quality score of 2010 between IR-non-adopters and (M= .39, SD= .131, N= 27) and IR-adopters (M= .45, SD= .128, N= 26).

Finally, to understand the relationship between information quality and IR-adoption, we ran a simple linear regression using data of 2019 using the following model:

$$RQS_{jit}= \beta_0+\beta_1 IR+\beta_2 SIZE+\varepsilon \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 2$$

Where:

RQS_{jit} : the relative quality score of firm i in year t.

IR   : represents the IR-adopter or Not [If IR adopting firm '1' (N= 26) otherwise '0' (N= 27)].

SIZE   : represents the firm size which is measured by TA as a control variable.

B_0 : is the RQS-intercept or constant term at time zero.

β_1 and β_2: are the estimated parameters (the slope coefficient) for each independent variable.

ε : is the residual term of the model.

The regressions model reports an explanatory power of 36% (R^2= .357, F= 13.88, p= .000) and the fact of IR adoption or non-adoption (β= .059, t (53)= 2.465, p= .017) and TA as a control variable (β= .00, t (53)= 4.117, p= .000) has a positively significantly impact of integrated reports' quality scores in Sri Lankan listed entities. Supporting the same results, as provided in Table 4, correlation statistics also show a statistically significant positive correlation between information quality scores and the status (adopted or non-adopted) of adoption.

Table 4
Correlation statistics

		Information Quality Score	IR-Adopters vs Non-Adopters
IR-adopters vs Non-adopters	Pearson Correlation	.514**	
	Sig. (2-tailed)	.000	
Total Assets (TA)	Pearson Correlation	.520**	.311**
	Sig. (2-tailed)	.000	.001

Notes: ** significant at 5% and * significant at 1%.

V. CONCLUSION

One of the main objectives of adopting IR is to improve information quality, which presumes that IR-adopters can achieve high information quality compared to non-adopters. According to the data analysis and findings, when considering the quality score of 2019, both the QCs of relevance and faithful representation individually showed higher scores (mean and median) in adopters than non-adopters. Total information quality measured by combining both QCs is also higher in adopters than non-adopters. We noted a statistically significant difference in quality scores between IR-adopters and non-adopters in 2019, whereas no statistically significant difference between IR-adopters and non-adopters in 2010, i.e. before adopting IR. This provides evidence that the adoption of IR has made a significant difference in information quality. However, when comparing information quality between 2010 and 2019, surprisingly, we noted that both the groups, i.e. adopters and non-adopters, have increased their information quality from 2010 to 2019; though, adopters have achieved more improvement in information quality than non-adopters. As suggested by Adams and Simnett (2011), non-adopters also tend to provide quality information due to the increased information requirements, including the disclosure of additional non-financial information to complement financial indicators by users to facilitate their decision making. Nonetheless, the increase is less than the adopters; therefore, adopters' achieving more information quality evidenced that IR-adopters are more concerned about information quality than non-adopters.

These results provide evidence that IR-adopters have more potential to improve information quality than non-adopters. Our findings are supported by scholars (Cortesi & Vena, 2019; Cosmulese et al., 2019) who used different approaches and proxies to measure information quality, stating that IR improves the quality of information. However, those findings are limited here since they have not compared quality improvement against non-adopting firms.

As an ancillary finding, we noted a statistically significant positive correlation between information quality score and the number of years in IR Sri Lanka. It indicates that the more experience in IR, the more information quality. Atkins and Maroun (2015) and Setia et al. (2015) found that initial integrated reports are detracted from their usefulness due to lengthy reports and repetitive contents in South Africa. After three years of IR adoption (2012 to 2014), Du Toit et al. (2017) finds an apparent decrease in the amount of information provided in integrated reports with less repetition and Mans-Kemp and van der Lugt (2020) find high quality in the integrated reports from 2013 to 2018 with the latest integrated reports in South Africa. Therefore, though the initial integrated reports do not significantly differ from non-adopters, gradually adopters have improved information quality. Similar to these findings, we also noted that in 2010 at the initial stage of adopting IR in Sri Lanka, there was no significant difference in information quality between adopters and non-adopters. However, there is a gradual improvement of quality in 2019, highlighting a significant difference between IR adopters and non-adopters. Stubbs and Higgins (2014) also stated that IR is deemed an incremental change rather than a revolutionary transformation of the financial and sustainability reporting approaches while IR is in its early adoption stage, and it may take more time before innovative disclosure mechanisms emerge. Hence, we conclude that Sri Lankan IR adopters have improved the information quality as promised in the IR framework, and the findings shed a green light for further improvement of the information quality in the future.

Overall, our study concludes that the adoption of IR is a matter of improving the quality of information. While contributing to the limited literature on the information quality of IR, our findings provide moral confidence for the firms expecting to adopt IR to improve their information quality in the future. As a cross-disciplinary study that merges IIRC's IR with IASB's conceptual framework approach in assessing the quality of information, our study contributes to academia providing numerical measures for evaluating quality in terms of decision usefulness viewpoint. We provide an index to measure QCs as an extended version of Beest et al. (2009) model of measuring quality. Also, we proposed a mechanism that future researchers can use to identify IR adopting firms and non-adopting firms.

Recent IASBs' approach of shifting their reporting orientation to focus with integrated reporting[13] and the merge of IIRC and sustainability accounting standards board (SASB) shed light on the discussion of quality reporting in terms of decision usefulness. At such an outset, merging IASB's conceptual framework guidelines in assessing quality based on QCs to IR, our findings highlight and provide evidence on the use of QCs as the feature of useful information in assessing the quality of integrated reports.

A study of IR-adopters achieving the quality of information based on the experience and how companies achieve information quality (internal mechanisms) in IR

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[13] See https://www.ifrs.org/news-and-events/2017/04/iasb-and-integrated-reporting/.

can be suggested as future research. Limiting the study for two fundamental QCs and the small sample size can be identified as limitations of our study.

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Annexure 1

QCs	Main Information Dimensions[14]	Sub-Category of Information Measures	Operationalisation
Relevance	Forward-looking information which helps to form expectations about the future of the company	1. Factors which influence the revenue or earnings targets (Robb & Zarzeski, 2001; CICA, 2002; Naser et al., 2003; Celik et al., 2006; and De Zoysa & Bhati, 2011)	No (0)/Yes (1)
		2. Forecasted growth in revenue (Chenhall & Juchau, 1977; Stanga, 1980; Stanga & Tiller, 1983; Joshi & Abdulla, 1994; Naser et al., 2003; Mirshekary & Saudagaran, 2005; Celik et al., 2006; and Laswad et al., 2016)	No (0)/Yes (1)
		3. Forecasted growth in dividends per share (Chenhall & Juchau, 1977; Joshi & Abdulla, 1994; Naser et al., 2003; and De Zoysa & Bhati, 2011)	No (0)/Yes (1)
		4. Forecasted growth in earnings per share (Benjamin & Stanga, 1977; Chenhall & Juchau, 1977; Stanga & Tiller, 1983; Mirshekary & Saudagaran, 2005; Celik et al., 2006; Alattar & Al-Khater, 2008; and Laswad et al., 2016)	No (0)/Yes (1)
		5. Forecasted growth in market price per share (Chenhall & Juchau, 1977; Gniewosz, 1990; Joshi & Abdulla, 1994; and Mirshekary & Saudagaran, 2005)	No (0)/Yes (1)
		6. Forecasted growth in profit (Stanga, 1980; Stanga & Tiller, 1983; Robb & Zarzeski, 2001; CICA, 2002; Hooks et al., 2002; Celik et al., 2006; Alattar & Al-Khater, 2008; and CASL, 2017)	No (0)/Yes (1)

To be continued Annexure 1.

QCs	Main Information Dimensions	Sub-Category of Information Measures	Operationalisation
		7. Future business opportunities (Joshi & Abdulla, 1994; CICA, 2002; Celik et al., 2006; and PWC, 2017)	No (0)/Yes (1)
		8. Future strategies that are to be used to achieve either revenue or earnings targets (Robb & Zarzeski, 2001; CICA, 2002; Hooks et al., 2002; Mirshekary & Saudagaran, 2005; De Zoysa & Bhati, 2011; CASL, 2017; and McGuinness et al., 2018)	No (0)/Yes (1)
		9. Information on future non-financial key-performance indicators (CASL, 2017; PWC, 2017)	No (0)/Yes (1)
	Information about past and future cash flows	10. Forecasted cash flows (Son et al., 2006; De Zoysa & Bhati, 2011; Cascino et al., 2014; and Hjelstrom et al., 2014)	No (0)/Yes (1)
		11. Past cash flow comparatives for more than one year (Mirshekary & Saudagaran, 2005)	No (0)/Yes (1)
		12. Past information on cash and cash equivalents (Mirshekary & Saudagaran, 2005)	No (0)/Yes (1)
		13. Justifications/reasons for the changes of past cash flows (operating, investing, or financing cash flows) (Cascino et al., 2014; CASL, 2017)	No (0)/Yes (1)
		14. Information on segmental cash flows (product, sector or geographical wise classification) (CASL, 2017)	No (0)/Yes (1)
	Segmental financial information	15. Segmental information on revenue (Benjamin & Stanga, 1977; Stanga, 1980; Hooks et al., 2002; Naser et al., 2003; Mirshekary & Saudagaran, 2005; PWC, 2010; De Zoysa & Bhati, 2011; IASB, 2013; and CASL, 2017)	No (0)/Yes (1)
		16. Comparative information on segmental revenue (Benjamin & Stanga, 1977; Stanga, 1980; IASB, 2013; and CASL, 2017)	No (0)/Yes (1)
		17. Segmental information on past profit (IASB, 2013; CASL, 2017)	No (0)/Yes (1)
		18. Segmental profit forecasts (Stanga, 1980; IASB, 2013; Aleksanyan & Danbolt, 2015; Laswad et al., 2016; and CASL, 2017)	No (0)/Yes (1)
		19. Segmental non-financial key-performance indicators (PWC, 2017)	No (0)/Yes (1)

To be continued Annexure 1.

QCs	Main Information Dimensions	Sub-Category of Information Measures	Operationalisation
	Information on risk relating to financial, market, economic, political concerns etc.	20. Information on company risk profiles for the current year (Amran et al., 2008; Cascino et al., 2014; CASL, 2017; FRC, 2017; McGuinness et al., 2018)	No (0)/Yes (1)
		21. Disclosures of risk mitigation plans (KPMG, 2014; Laswad et al., 2016; CASL, 2017; FRC, 2017; and PWC, 2017)	No (0)/Yes (1)
		22. Comparisons of risk profiles with past year/s (Cascino et al., 2014; Laswad et al., 2016; and CASL, 2017)	No (0)/Yes (1)
	Assets, liabilities, and equity line items in annual reports are measured using fair value	23. Assets, liabilities, and equity line items in annual reports are measured at historical cost or modified historical amounts (Gassen & Schwedler, 2010)	Line items presented at HC as a % of total line items. If more (above 50%) line items are recorded at cost, it gets (1), otherwise below 50% (0)
		24. Disclosures on the description of the valuation processes used for assets, liabilities, and equity items (Hooks et al., 2002; Mirshekary & Saudagaran, 2005; and IASB, 2011)	Line items presented at FV as a % of total line items. If $\geq$50% of line items are recorded at FV, record '2'. If <50%, score '0'.[15]
		25. Information on changes in fair values of assets, liabilities, and equity items (IASB, 2011; CASL, 2017)	No (0)/Yes (1)
		26. Disclosures on the description of the valuation processes used for assets, liabilities, and equity items (Hooks et al., 2002; Mirshekary & Saudagaran, 2005; and IASB, 2011)	No (0)/Yes (1)
	Information on the capital structure of the company	27. Explanations on gearing ratio (debt to equity) used by the company (Chenhall & Juchau, 1977; Joshi & Abdulla, 1994; and Laswad et al., 2016)	No (0)/Yes (1)

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[15] There are two reasons for this heuristic rule. Firstly, fair value makes information more relevant than the historical cost. This relationship is expressed through assignment of '2', rather than '1', when the respective condition for FV5.2 is satisfied. Secondly, information can only score above zero once in either FV5.2 or FV5.1, and when it does, a higher score is assigned to the presence of FV rather than historical cost measurements.

To be continued Annexure 1.

QCs	Main Information Dimensions	Sub-Category of Information Measures	Operationalisation
		28. Comparative information on the change of capital structure (Benjamin & Stanga, 1977; PAAinE, 2009; and Laswad et al., 2016)	No (0)/Yes (1)
		29. Information on the breakdown of long-term debt (Joshi & Abdulla, 1994; Hooks et al., 2002; Mirshekary & Saudagaran, 2005; and Laswad et al., 2016)	No (0)/Yes (1)
Faithful Representation	Providing valid arguments to support the decisions about accounting estimates and the selection of accounting policies	30. The explanation for accounting policies selected (Benjamin & Stanga, 1977; Naser et al., 2003; Mirshekary & Saudagaran, 2005; Al-Ajmi, 2009; and IASB, 2010;)	No (0)/Yes (1)
		31. The basis for making accounting estimates (Benjamin & Stanga, 1977; Mirshekary & Saudagaran, 2005; Naser et al., 2003; Al-Ajmi, 2009; IASB, 2010; and FRC, 2017)	No (0)/Yes (1)
		32. Explaining the limitations of making accounting estimates and selecting accounting policies (Hooks et al., 2002; FRC, 2017)	No (0)/Yes (1)
		33. The factors affecting the decisions on accounting estimates and the selection of accounting policies (Al-Ajmi, 2009; IASB, 2010)	No (0)/Yes (1)
		34. Explanations with respect to reasons for changes in accounting estimates and policies (Stanga, 1980; Joshi & Abdulla, 1994; Jonas & Blanchet, 2000; Cole et al., 2012; and FRC, 2017)	No (0)/Yes (1)
	Information on related party transaction disclosures	35. Providing an independent related party transactions review committee report – IAS-24. IASB (2009)	No (0)/Yes (1)
	Disclosures relating to both positive (good) and negative (bad) future events	36. Information on past negative events (Clatworthy & Jones, 2003; Chatterjee et al., 2008; and FRC, 2017)	No (0)/Yes (1)
		37. Information on past positive events (Clatworthy & Jones, 2003; Chatterjee et al., 2008; and FRC, 2017)	No (0)/Yes (1)
		38. Expected future negative information(Benjamin & Stanga, 1977; Clatworthy & Jones, 2003; Chatterjee et al., 2008; FRC, 2017; and PWC, 2017)	No (0)/Yes (1)

To be continued Annexure 1.

QCs	Main Information Dimensions	Sub-Category of Information Measures	Operationalisation
		39. Expected future positive information (Clatworthy & Jones, 2003; Chatterjee et al., 2008; and FRC, 2017)	No (0)/Yes (1)
		Total score:	**40**