Integrated Reporting and Firm Value in the Nigerian and South African Oil and Gas Sector

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ABSTRACT: This paper evaluates the effect of integrated reporting on the firm value of oil and gas companies comparing the two biggest economies in Africa from 2015 to 2018. The study used Tobin's Q ratio as a proxy to firm value, while integrated reporting was broken down into five capitals of integrated reporting: intellectual capital, human capital, natural capital, social/responsibility capital, and financial capital. Preliminary analyses were conducted, such as descriptive statistics and correlation matrix. In analyzing the data, the study adopted the panel multiple regression method to identify the possible effect of integrated reporting on the firm value of oil and gas companies in Nigeria and South Africa using the Hausman test to choose between fixed and random effects. The result shows that integrated reporting has a significant positive effect on firm values in South Africa and Nigeria. We, therefore, recommend that integrated reporting in Nigeria should be used as a mandatory reporting system because this will encourage stakeholder understanding, instead of trying to source sustainability reports after examining financial statements.

JEL classification: G32, M40, M41.

Keywords: Tobin's Q, Intellectual Capital, Human Capital, Natural Capital, Social/Responsibility Capital, Financial Capital.

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1 Introduction

As a result of the impact of the activities of corporate organizations on society and its environment, which include disposal of hazardous waste, gas emissions, and the greenhouse effect from the pollution of oil and gas companies and other sectors, stakeholders have continued to demand more information about the non-financial activities of corporations after the global financial crisis of 2007-2009 (Velte and Stawinoga, 2017). This has led to the voluntary provision of a separate publication of social and environmental reports by some organizations. Nevertheless, most organizations tend to ignore these reports either as a result of the negative impact of their activities on society or because of the cost of publishing two separate reports. However, Wilburn and Wilburn (2016) condemned the publication of separate social and responsibility reports outside the financial reporting system, referring to the corporate scandals of Toshiba Corporation and Volkswagen AG. In 2015, Volkswagen AG demonstrated a weakness in its sustainability index reporting (social and environmental report), which was later removed because of a fraudulent accounting scandal (S&P Dow Jones Indices, 2015). Toshiba Corporation had also published corporate social responsibility reports from 2011-2014 that were not part of their strategic mission and included initiatives that were outside the financial reporting system (S&P Dow Jones Indices, 2015). As a result, stakeholders criticized the link between the traditional financial reports and the stand-alone sustainability (social and environmental) report.

Consequently, in 2013, the International Integrated Reporting Council, which is a global body of regulators, investors, companies, standard-setting bodies, accountants, and non-governmental organizations, launched a pilot program regarding the issuance of integrated reports. Eccles and Krzus (2010) see this form of reporting as a "one report", that is, a single report that covers finance, sustainability, risk management and strategy, human resources, corporate communication, stakeholder engagement, performance reporting, governance, and regulatory reporting, and information technology and operations management. Following the King Code of Governance Principles, wherein companies listed on the Johannesburg Stock Exchange (JSE) were mandated to adopt integrated reporting as of March 2010, it was recommended that corporations should also adopt integrated reporting on an "apply or explain" basis. According to Hoffman from KPMG in South Africa (Hoffman, 2012), one year into the adoption of integrated reporting in South Africa, over 80 companies experienced a positive impact on their strategic thinking.

On the other hand, Nigeria has yet to adopt a mandatory guideline on integrated reporting, irrespective of controversies among the host community because of disposal of hazardous waste in that state's oil and gas sector (Main and Hespenheide, 2012). This has become a major concern to stakeholders in Nigeria, giving rise to questions such as: Does integrated reporting positively drive the value of firms? Does integrated reporting have an insignificant effect on the firms' value? Would a mandatory disclosure of integrated

reporting increase the value of firms? What is the effect of integrated reporting on the value of firms in both Nigeria and South Africa?

Eccles and Krzus (2010) state that companies should adopt integrated reporting in their external reporting for two main reasons. First, they should do so to create value not only for their shareholders but also for society as a whole by means of creating a sustainable strategy. Second, it is a simplified report that sends a single message to all stakeholders as an element of improving information disclosure and financial transparency. The creation of value is the central point of integrated reporting because the value is shaped by factors additional to financial performance, such as reliance on the environment, social reputation, human capital skills, and others. Many studies have been done globally on integrated reporting such as Lee and Yeo (2016); Haji and Anifowose (2016); Higgins et al. (2014); Madan (2017) in Malaysia, Ayoola and Ilasanmi (2013) in Nigeria, and Orshi et al. (2019) in Nigeria. However, most of these researchers were focused on a single country or region, such as Nurkumalasari et al. (2019) in Asia. In contrast, there have not been many studies comparing mandatory and voluntary reporting such as in Nigeria and South Africa.

This study compares the effect of integrated reporting on firm value in the Nigerian and South African oil and gas sector within the present voluntary and mandatory framework in the two countries. Although the main objective of the study is to determine the effect of integrated reporting on firm value in the South African and Nigerian oil and gas sector, our specific objectives include:

1. Determining the effect of financial capital disclosures on firm value in the Nigerian and South African oil and gas sector.
2. Examining the effect of intellectual capital on firm value in the Nigerian and South African oil and gas sector.
3. Ascertaining the effect of natural capital disclosures on firm value in the Nigerian and South African oil and gas sector.
4. Investigating the impact of human capital disclosure on firm value in the Nigerian and South African oil and gas sector.
5. Ascertaining the effect of social/relationship capital disclosure on firm value in the Nigerian and South African oil and gas sector.

2 Literature Review

2.1 Conceptual Review

2.1.1 Integrated Reporting

As a result of the global financial crisis between 2007 and 2009, the International Integrated Reporting Council (IIRC) was established, and in December 2013, the International Integrated Reporting Framework was published with the sole aim of explaining to

providers of financial capital how an organization creates value over time (IIRC, 2013). Integrated reporting is seen as the most debated issue in corporate reporting; it is without a universally accepted global framework and, therefore, largely a voluntary practice (Bhasin, 2017). According to the IIRC (2013), integrated reporting is defined as a kind of interconnected organized reporting that includes interrelated information about several internal and external aspects of an organization. Its main objective is to provide financial capital providers with enough information about the value creation (for the short, medium, and long-term) process of an organization. The IIRC also defined it as a concise communication about how an organization's strategy, governance, performance, and prospects (in the context of its external environment) lead to the creation of value in the short, medium, and long term. The IIRC states that integrated reporting prepared in line with the framework will improve the quality of information and its usefulness to providers of financial capital and other users to the extent that, in the long term, it will become the corporate reporting norm (IIRC, 2013).

While Eccles and Krzus (2010) defined it as "one report", Busco et al. (2013) see it as a report that enables organizations to present their environmental, social, or ethical information in a way that is clearly related to the financial, governance, and strategic information within an annual statement. Main and Hespenheide (2012) state that integrated reporting brings information about an organization's strategy, governance, performance, and prospects together in such a way that it reflects the commercial, social, and environmental context within which it operates. It also explains how they affect the ability of a business to create and sustain value in the short, medium, and long term according to Haller and Staden (2014).

The development of integrated reporting was motivated by two major ideas: first, the provision of additional information to investors to assist in their valuation of a firm's future performance, and second, the ability of management to respond to the changing needs of stakeholders regarding social responsibility. Bhasin (2017) sees it as a means of enhancing financial stability and rebuilding trust in capital markets while serving the real economy. The simplification of information in a single report to all stakeholders is expected to increase the transparency of a company (Eccles and Krzus, 2010).

Ernst and Young Global Ltd. (2014) defines integrated reporting as a concept created to better articulate the broader range of measures that contribute to long-term value and the role organizations play in society. Vakhrushina (2014) states that "an integrated report discloses the nature of the impact of management on six types of company capital, which include financial, manufactured, intellectual, human, natural, and social/responsibility capital." Finally, Solomon and Maroun (2012) define it as a report that incorporates in clear language, material information from financial statements, a sustainability report, and other sources to enable stakeholder evaluation of an organization's performance and to make an informed assessment about its ability to create and sustain value.

It is a concept developed to better align the range of measures that contribute to long-

term value and the role an organization plays in society. The IIRC (2013) states that the world has changed, and so should accounting reports in order to involve an integrated approach that better reflects the multidimensionality and connectivity of today's globalized world (Adams, 2013). Integrated reporting is necessary because of the shortcomings of financial statements. As a result, corporate reporting shifted from the mere presentation of financial statements to the integration of financial statements, management commentary, governance issues, environmental concerns, and remuneration reporting (IIRC, 2013). The concept of integrated reporting, in addition to clarifying financial capital and its ability to meet stakeholders' needs, examines five additional concepts of capital that should guide an organization's decision-making and its long-term success. These include natural capital, social/relationship capital, intellectual capital, human capital, and management capital. These additional definitions of capital should be factored into an organization's decision-making process and adapted into its business model. For example, Ernst and Young Global Ltd. (2014) states that for an organization to increase its dependence on natural capital, it might have to sacrifice its financial capital and invest in the human capital capable of achieving this goal. An organization may face a choice between protecting its financial capital in the near term and increasing its profit potential in the longer term.

These decisions, if important, should be set out in an integrated report and defined in the organization's value-creation objectives. This approach goes beyond the value reflected in annual financial statements and includes the creation of an intangible value describing the impact of an organization's activity on society. It also includes a measurement (or at least a description) of how these impacts influence long-term shareholder value. The IIRC (2013) highlighted six ideas of capital that should guide an organization's decision-making and long-term success. Sinclair (2013) and Bhattacharyya (2013) also state that integrated reporting should be based on fundamental principles such as the concept of "capital": the business model concept, the value creation concept, and the materiality concept. These notions of capital include financial, manufactured, intellectual, human, social/relationship, and natural capital. According to Adams (2013), and Ernst and Young Global Ltd. (2014), these ideas of capital represent stores of value that can be built up, run-down, or transformed over time in the production of goods and services.

2.1.2 Firm Value

One of the fundamental concepts of integrated reporting is value creation. Sinclair (2013) and the IIRC (2013) are of the opinion that value for shareholders is created, changed, or destroyed by an organization over the short, medium, and long-term depending on the interaction between the business model, the various concepts of capital, and a range of internal and external factors which describes the assets that a firm owns; and also portrays the prosperity of the shareholder according to Oyedokun et al. (2019). Therefore, management has a responsibility to optimally maximize the values of a firm as a core objective of an organization. The performance of companies is shown through the firm

value. Firm value is the angle where investors also observe the company, and it is relevant to stock price. As well, Damodaran (2005) defines firm value as the opinion of the investor towards the growth of the company. This is mostly revealed in the share price of a company. An increase in share price shows the perception of investors to the company; i.e., they are willing to pay more for a company's share with the sole aim of a higher return. The value of a company is measured in the total assets owned. It consists of the market value of shares and liabilities. McKinsey and Company et al. (2010) define value as a method of measuring performance while considering the long-term interests of not just the shareholders, but of all stakeholders in an organization. According to Adegbie et al. (2019), value is created when investors generate future cash flows at rates of return that exceed their cost of capital. Therefore, the more capital invested at an attractive rate of return, the more value is created.

Ernst and Young Global Ltd. (2014) states that integrated reporting enables organizations to tell a comprehensive value-creation story that identifies the interdependency between all elements of the organization (both internally and externally) and that materially affects the organization's ability to create value over time. This connectivity requires integrated thinking. All the operating and functional units of an organization, as well as the various concepts of capital that it uses to create value, must be considered. This leads to integrated decision-making and actions. Therefore, integrated reporting is a product of the process of connectivity and integrated thinking in an organization. However, integrated reporting is not just about the report, but about an organization's unique approach to value creation. To translate integrated thinking into integrated reporting, an organization should convey a holistic view of strategy, governance, performance, and prospects. The integrated report should also bridge time horizons. It can, therefore, be used as a governance tool for performance-oriented management.

3 Theoretical Framework

The study was anchored on the stakeholder's theory of corporate governance developed by Freeman (1984), and the signaling theory developed by Spence (1973). The stakeholder theory argues that a company should be managed in the interest of its stakeholders. The interest of the stakeholders includes that of the shareholders and other direct and indirect stakeholders such as suppliers, creditors, government, and the host community (Freeman, 1984; Ahmalu et al., 2017). The signaling theory states that a corporate trustee has an obligation to report relevant information to the corporate capital owners, which helps in the operation of a business.

In the process of reporting, corresponding information must pass the corporate relevant signals to the capital market. The information can make the operator affect the flow of resources in the capital market to a certain extent to improve the enterprise's interests. According to Kirmani and Rao (2000), for information to have influence, it should reduce

information asymmetry among those involved in the contract, and it should be able to describe the information. However, Erdem and Swait (1998) are of the opinion that a signal should be transparent to both the provider and the user and must be credible to avoid adverse effects.

4 Empirical Review

Ayoola and Ilasanmi (2013) in their article "Business Case for Integrated Reporting in the Nigerian Oil and Gas Sector" studied six oil and gas companies using content analysis, the GRI (Global Reporting Initiative), and the oil and gas industry guidance on voluntary sustainability report published by the International Petroleum Industry Environmental Conservation Association (IPIECA, 2005). They found that oil companies in Nigeria differ in their mode of reporting. This has resulted in a lack of comparison from one company to another. As well, there was no proper identification of the relevant stakeholders for engagement in the communities where operations were domiciled. Additionally, efforts to address environmental, social, and governance issues were short-term, *ad hoc*, and remained unrelated to the core activities of the corporations because long-term sustainability was not embedded as a core function of the businesses. They, therefore, concluded that integrated reporting should be made mandatory in Nigeria in order to ensure a uniform mode of reporting amongst quoted oil and gas companies in that country.

Also, Adegboyegun et al. (2020) studied integrated reporting and corporate performance in Nigeria's banking industry with a sample size of 10 quoted banks from 2009-2018, using ordinary least square regression and panel co-integration techniques for analyzing the impact of integrated reporting on corporate performance. They found that integrated reporting has no significant impact on corporate performance in the short run, but has a significant effect on firm performance in the long run. Hence, they concluded that integrated reporting should be made mandatory and adopted as a standard (like in South Africa) in order to strengthen long-term relationships.

Adegbie et al. (2019) evaluated integrated reporting and the value of listed manufacturing firms in Nigeria with a sample size of 38 manufacturing companies from 2012-2016, using Tobin's Q as a proxy for firm value and ordinary least square regression as a method of analysis. They concluded that integrated reporting is still at its early stage of adoption in Nigeria, and could be useful in determining a firm's value among the listed manufacturing companies in that state. They, therefore, recommended that regulators should increase awareness, training, and provide a framework for the mandatory adoption of integrated reporting in Nigeria. Finally, Iyoha et al. (2017) assessed the impact of integrated reporting on value creation from the bankers' perspective in Nigeria. The study used primary data by issuing 98 questionnaires to bankers. Their responses revealed that integrated reporting has a significant impact on the value of firms. As a result, they concluded that

awareness campaigns should be carried out to inform organizations about the need for integrated reporting.

In South Africa, Lee and Yeo (2016) examined the relationship between integrated reporting and firm valuation in listed firms in the JSE using cross-sectional data from 2010-2013. A self-constructed integrated reporting score was used, and Tobin's Q was used as the proxy for firm valuation. The study found that firm valuation has a positive relationship with integrated disclosures, and the benefits exceed its cost. Also, in terms of the stock market and accounting performance, firms with high integrated reporting performed better than firms with a low score for integrated reporting. Haji and Anifowose (2016) examined the trend in integrated reporting practice in South Africa as a result of the mandatory disclosure issued by the JSE. They concluded that there is an improvement in the quality of integrated reporting practices following the regulation, but that some firms are still not serious about the regulation.

Similarly, Setia et al. (2015) examined integrated reporting in South Africa. Based on a sample size of the top 25 JSE listed companies from 2009-2012 and using content analysis, they analyzed the changes in the extent of disclosure of the various capital types using t-tests. They found that the introduction of integrated reporting in South Africa has resulted in an increase in the disclosure of human, social/relationship, natural, and intellectual capital information of the quoted companies. They, therefore, concluded that an increase in the disclosure of social and relationship capital is statistically and significantly greater than the increase in the disclosure of other capital types. Their findings indicate that the JSE-quoted companies are adopting a legitimate strategy based on symbolic management when preparing integrated reports.

Additionally, Cosma et al. (2018) examined the effect of integrated reports on firm value in South Africa between 2013 and 2016. The study used stock return as a proxy for firm value, while the national market index return was used as a proxy for integrated reporting. The ordinary least square regression was used as a method of analysis. In this study, they found that integrated reporting had a positive effect on firm performance. As a result, they concluded that firm managers should increase their quality of integrated disclosure.

Doni et al. (2016) investigated the early adoption of integrated reporting in South Africa's mining industry using content analysis, specifically, of the level of financial and non-financial disclosures by companies. The paper assessed the nature and extent of non-financial disclosures in corporate reports of mining companies listed on the JSE for one year. The results do not highlight good practices of non-financial disclosure: the overall analysis does not detect homogeneous behavior among companies. The higher incidence of issues on key performance indicator (KPI) targets and governance structures could be due to their relationship to certain listing requirements. They concluded that integrated reporting is still in its early stages, and findings from the first adopters provide an insightful overview about its threats and weaknesses and give practical suggestions for

its preparers and users.

Appiagyei et al. (2016) examined the relationship between integrated reporting and firm performance using a comparative study of the JSE, where integrated reporting is mandatory, and the Australian Stock Exchange (ASX), where integrated reporting is voluntary, from 2012-2015 using the disclosure index provided by Setia et al. (2015) for integrated reporting. They found that a significant difference exists between the quality of integrated reports in South Africa and that in Australia because of differences in their respective regulatory settings. They thus concluded that integrated reports should be encouraged in large firms in Australia, as it is expected to yield some desired benefits.

Finally, Suttipun (2017) examined the extent of integrated reporting in the annual reports of companies listed on the Stock Exchange of Thailand, and the effect of integrated reporting on corporate financial performance. A sample of 150 listed companies was picked, and content analysis was used on the annual reports for the years 2012 to 2015. The capital for sustainability reporting was used as a proxy for integrated reporting (IR). The most common IR related to intellectual capital was 30% of the total IR, followed by social capital reporting (21%), human capital reporting (13%), manufactured capital reporting (10%), and environmental reporting (7%). The manufactured capital reporting positively affected the level of IR, while environmental reporting had a negative effect on the level of IR.

In summary, studies in South Africa, such as Lee and Yeo (2016), Setia et al. (2015), and Cosma et al. (2018), concluded that integrated reporting had a significant effect on the values and performance of firms. However, studies such as Doni et al. (2016) concluded that integrated reporting does not highlight good practices of non-financial disclosure and does not detect homogeneous behavior among companies as a result of its early adoption. Haji and Anifowose (2016) concluded that integrated reporting is still viewed as a ceremonial report by some companies. In Nigeria, Adegbie et al. (2019), Iyoha et al. (2017), and Adegboyegun et al. (2020) concluded that integrated reporting had a positive effect on firm value, and encouraged its mandatory implementation. Finally, Ayoola and Ilasanmi (2013) found that oil companies in Nigeria differ in their mode of reporting; therefore, the results are inconclusive. They also found that integrated reporting is not being applied by oil companies in Nigeria.

Despite the established benefits of integrated reporting, it is not a mandatory report in Nigeria. As a result, material non-financial information is not included in corporate annual reports, making these documents inappropriate for stakeholder decision-making. Although entities such as banks voluntarily adopted integrated reporting, which is meant to enable them to include non-financial information in their annual report, their integrated reports are still skeletal. The non-inclusion of non-financial information in the general-purpose financial statement (GPFS) has made it inadequate, incomplete, and unreliable for decision-making by stakeholders of listed entities in Nigeria. Stakeholders now require both financial and non-financial information to make optimal resource allocation

decisions. Therefore, this research is aimed at filling the gap in Nigeria's stock exchange - Nigerian Exchange Group (NGX) - by determining and comparing the effect of integrated reporting on firm values of oil companies quoted on the NGX (where integrated reporting is voluntary), and the firm values of quoted oil companies on the JSE (where integrated reporting is mandatory), and where its impact is already being felt by over 80% of the companies that have adopted it.

5 Data and Models

The study uses six quoted oil and gas companies in South Africa whose integrated reports can be accessed online, and twelve quoted oil and gas companies in Nigeria from 2015-2018. This is because integrated reporting is mandatory in South Africa, while it is voluntary in Nigeria. The comparison will provide insight into both the mandatory and voluntary reporting environments.

5.1 The Indicators

In specifying our linear regression model for the effect of integrated reporting on firm value, our major variables include the five capitals of integrated reporting as stated by Global Reporting Initiative (2006) and used by Suttipun (2017), and Ayoola and Ilasanmi (2013): disclosure of intellectual capital, (DIC), disclosure of human capital (DHC), disclosure of natural capital (DNC), disclosure of social/responsibility capital ($DSRC$), and disclosure of financial capital (DFC). Also included in the model are the cross-section (selected oil and gas quoted companies) and years (2015-2018) in the panel regressions. In the light of the above, we used Tobin's Q as a measure of firm value for the study; this is also based on the methods used by Adegbie et al. (2019), and Oyedokun et al. (2019).

Financial capital is the pool of funds that is available to an organization for use in the production of goods or the provision of services, or obtained through financings, such as debt, equity, or grants, or generated through operations or investments.

Human capital is the employee's skills and competence, and their ability to innovate and align their support to an organization's governance framework and ethical values, such as its recognition of human rights, and ability to understand and implement an organization's strategies.

Manufactured capital is human-created, production-oriented equipment and tools, and manufactured physical objects that are available to an organization for use in the production of goods or the provision of services, including buildings, equipment, and infrastructure (such as roads, ports, bridges, and waste and water treatment plants).

Social/relationship capital is seen as the institutions and the relationships that exist within and between communities, stakeholders, and other networks, and the ability to share information to enhance individual and collective well-being. Social and relationship

capital includes shared values and common behaviors.

Natural capital is all the renewable and non-renewable environmental resources and processes that provide goods or services that support the past, current, or future prosperity of an organization. It includes air, water, land, minerals, forests, biodiversity, and ecosystem health (Adegbie et al., 2019).

Intellectual capital is the knowledge-based intangible assets that provide a competitive advantage to the organization, including intellectual property, such as patents, copyrights, software, and organizational systems, procedures and protocols, and other intangibles that are associated with the brand and its reputation (Ayoola and Ilasanmi, 2013).

The following scale ratings were applied in assessing the degree of reporting in the sampled companies:

Table 1: Scale rating

	Rating
Issues not reported at all	0
Reported in general terms	1
Reported in specific terms	2

Source: Authors' calculations.

Tobin's Q is the ratio between physical assets and their replacement value as illustrated by Kaldor (1966) and modified by Chung and Pruitt (1994) in Wolfe and Sauaia (2003):

$$q = (MVS+D)/TA$$

where: MVS = market value of all outstanding shares, which is share price * outstanding shares, TA = total asset, which is the total value of property plants and equipment + cash + inventories + receivables, D = net debt.

5.2 Summary Statistics and Correlation Analysis

The relative statistics of these indicators are shown in Table 2 across the two countries. Nigeria has the lowest level of disclosure. This can be seen as the disclosure of natural capital with a mean value of 3% and a minimum disclosure level of 1%, which implies that oil companies in Nigeria only disclose an average of 3% on their use and impact on land resources, hydrocarbon spillage, and disposal of hazardous waste as required by ESG and GRI. South Africa's disclosures show an average of 5% with a minimum disclosure level of 3% and a maximum of 12%. Additionally, oil companies in South Africa give a more detailed disclosure on human capital with an average of 14% and a minimum disclosure of 5%, while Nigeria has an average disclosure level of 12% and a minimum disclosure of 5%.

South Africa shows a Tobin's Q average value of 4.43 with a standard deviation of 1.39, unlike Nigeria with Tobin's Q level of 1.53, a standard deviation of 1.27, and a negative minimum value of 1.20. This indicates that for an average of 4.43, South Africa has

a 1.3% risk of being affected by not giving a detailed disclosure because of the mandatory requirement in the Johannesburg Stock Exchange. The correlation matrix of the variables in Table 3 shows that disclosure of intellectual capital (DIC) is strongly and positively related to disclosure of human capital (DHC), which implies that the skills and competence of the employee determine how well the company's intangible assets grow. Therefore, investment in human capital increases the growth of intellectual capital. The figure of DIC/DNC -0.68 shows a strong negative relationship between disclosure on natural capital and intellectual capital and a weakly negative relationship between disclosure on human capital and disclosure on natural capital. The figures of $DSRC/DIC$ 0.19, $DSRC/DHC$ 0.33, and $DSRC/DNC$ 0.39 show a weakly positive relationship between disclosure on social and responsibility capital and disclosure on intellectual, human, and natural capital.

Table 2: Descriptive statistics

	South Africa				Nigeria			
Variables	Mean	Min	Max	Std Dev.	Mean	Min	Max	Std Dev.
DIC	0.122083	0.100000	0.140000	0.013181	0.124167	0.080000	0.140000	0.016990
DHC	0.147500	0.070000	0.160000	0.025918	0.126667	0.050000	0.160000	0.018944
DNC	0.051250	0.030000	0.120000	0.031251	0.035625	0.010000	0.100000	0.028502
$DSRC$	0.276667	0.180000	0.340000	0.035460	0.282500	0.200000	0.340000	0.039760
DFC	0.077500	0.070000	0.080000	0.004423	0.091458	0.060000	0.800000	0.104637
Tobin's Q	4.430417	1.420000	6.080000	1.394893	1.532708	-1.200000	3.140000	1.277450

Source: Authors' calculations.

Table 3: Correlation matrix

	DIC	DHC	DNC	$DSRC$	DFC
DIC	1.0000				
DHC	0.5830	1.0000			
DNC	-0.6844	-0.0003	1.0000		
$DSRC$	0.1900	0.3355	0.3954	1.0000	
DFC	0.0135	0.0132	-0.0399	0.0630	1.0000

Source: Authors' calculations.

5.3 The Model

There is extensive literature in economics and finance that has examined integrated reporting on firm value, e.g., Adegboyegun et al. (2020), Adegbie et al. (2019). Integrated reporting will be an increasing function of firm value. The underlying construct of firm value refers to Tobin's Q (Adegbie et al., 2019). Since the value of firms is influenced by integrated reporting, which often is determined by factors such as intellectual capital disclosure, human capital disclosure, natural capital disclosure, social and responsibility

capital disclosure, and financial capital disclosure, there are reasons to believe in a positive effect between integrated reporting and firm value. To evaluate the effect of integrated reporting using the full and sub-samples, we used this literature to estimate the expected firm value according to the following regression specification:

$$TQ_{it} = \alpha_0 + \alpha_1 DIC_{it} + \alpha_2 DHC_{it} + \alpha_3 DNC_{it} + \alpha_4 DSRC_{it} + \alpha_5 DFC_{it} + u_{it} \quad (1)$$

with *a priori* expectation: $\beta_1 < 0$, $\beta_2 < 0$, $\beta_3 < 0$, $\beta_4 > 0$, $\beta_5 < 0$, and TQ_{it} being the firm value, $\alpha_1 DIC_{it}$ - the intellectual capital disclosure, $\alpha_2 DHC_{it}$ - the human capital disclosure, $\alpha_3 DNC_{it}$ - the natural capital disclosures, $\alpha_4 DSRC_{it}$ - the social and responsibility capital disclosure, $\alpha_5 DFC_{it}$ - the financial capital disclosure, and u_{it} - the general error term.

Furthermore, the following estimation approaches were adopted. (1) The sample model delineations; Tobin's Q allowed for the comparison of findings across the value of firms. (2) The use of static models allowed to systematically draw the significance of integrated reporting on firm value. The study used panel data of 72 observations ($N = 18$ observations across $T = 4$ years). Similarly, the adoption of these techniques served as robustness check for one another in order to observe the consistency of the effect of integrated reporting on firm value. The static models were the pooled ordinary least squares (POLS) model, which did not allow for heterogeneities across the panels, and the fixed effects (FE) and random effects (RE) model, which recognized panel heterogeneities square result for South Africa and Nigeria, respectively.

6 Results and Discussion

In Table 4, we present an OLS pooled regression and two-panel data estimation techniques in 4 columns (ordinary least square, fixed effect, and random effect). Column 1 represents the ordinary least square result for South Africa; column 2 represents the OLS result for Nigeria; and columns 3 and 4 represent the fixed effect result and random effect result for South Africa and Nigeria, respectively. The three results revealed differences in their coefficients magnitude, signs, and number of significant variables. This clearly shows that pooled OLS regression does not reflect the heterogeneity in the sampled financial institutions. This effect is reflected in the two-panel data regression results. In selecting from the two-panel data models, the Hausman test was conducted, and the result of 0.0000 in column 3 shows that we should adopt a fixed-effect model and reject a random effect model.

This means that we will adopt, interpret, and draw conclusions as well as recommendations from the fixed effect panel data regression results for South Africa. On the other hand, the Hausman test result of 0.0672 in column 4 indicates that we should adopt and interpret the random effect as the result is above 5%. Based on the result below, the fixed

effect adjusted R-squared of South Africa indicates that 96% of the activities of Tobin's Q were jointly explained by our independent variables at an overall significant level of 1%. However, for Nigeria, 22% of the activities of Tobin's Q were jointly explained by our independent variables with an overall significant level of 1% as indicated by the p-value of our F-statistics.

Table 4: OLS pooled regression and data estimation techniques

	Main Regression (OLS)		Random and Fixed Effects	
	(1)	(2)	(3)	(4)
c	10.4***	-7.18***	7.09***	-5.83***
	(2.4)	(-4.99)	(3.27)	(-3.31)
DIC	10.2*	42.74***	32.44***	32.90***
	(0.40)	(3.51)	(3.50)	(2.48)
DHM	-16.9*	-3.69*	-16.21***	2.82
	(-1.61)	(-0.32)	(-3.85)	(0.26)
DNC	23.20***	8.30*	10.76***	11.75*
	(2.75)	(1.48)	(-2.66)	(1.66)
DSRC	6.67*	12.81***	-11.41***	8.77*
	(1.16)	(3.04)	(-2.72)	(1.65)
DFC	-105.04*	0.42*	-25.75	-0.31
	(1.57)	(0.31)	(-0.91)	(-0.26)
R-Squared	0.51	0.49	0.91	0.30
Adj-R-Squared	0.38	0.44	0.96	0.22
F-statistic	3.8 [0.01]***	8.3 [0.0]***	58.57***	3.7 [0.0]***
Hausman test			0.0000	0.0672
N(n)	24	48	24	48

Note: The t-statistics values are presented in parentheses below the coefficient estimations. The symbols *, **, and *** indicate that the coefficient estimates are statistically significant at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations.

Disclosure on intellectual capital with a coefficient of 32.44 in column 3 and 32.90 in column 4 has a significant positive effect of 1% on Tobin's Q. This implies that an increase in intellectual capital disclosure increases the value of the firms in South Africa and Nigeria. On human capital disclosures, the coefficient is negative and statistically significant at the 1% Tobin's Q in South Africa, while in Nigeria it is positive and insignificant. This shows that an upward increase in human capital disclosures reduces the value of firms in South Africa, while a proportionate increase in human capital disclosures increases the value of firms in Nigeria. Natural capital disclosures with a coefficient of 10.76 and 11.75 have a significant positive effect of 1% and 10%, respectively, showing that a proportionate increase in natural capital disclosures increases the value of firms in both countries.

However, social and responsibility capital disclosure with a coefficient of -11.41 and 8.77 has a significant effect of 1% and 10%, respectively. This implies that an increase in social and responsibility capital disclosures reduces the value of firms in South Africa, while a social and responsibility capital disclosure increases the value of firms in Nigeria. The results on financial capital disclosure indicate an insignificant negative effect on the firm value of both countries, as upward changes in financial capital disclosure reduce the value of firms.

7 Conclusion and Recommendation

This study evaluates the effect of integrated reporting on firm value in South Africa and Nigeria. A contribution is made on integrated reporting on firm value in both countries by comparing the voluntary and mandatory nature in the two states from 2015 to 2018. In this work, we only covered four years because integrated reporting in Nigeria became more pronounced among stakeholders within this period. However, there is no evidence of any such voluntary compliance in Nigeria. What compliance measures exist, especially in the oil and gas sector, are skeletal, *ad hoc*, and short-term disclosures that are unrelated to the core activities of the entities.

We reported some compelling findings, which substantiate that integrated reporting has a statistically significant effect on the value of firms in South Africa and in Nigeria (despite the skeletal publication of integrated reports in the latter country). We used the Hausman test to deal with the issue of endogeneity regressors in the regression model. The Hausman test helps to see if there is a correlation between the unique errors and the regressors in the model. It also tests the misspecification that helps us to choose between the fixed and random effect models of which the fixed effect was chosen and interpreted for South Africa, while the random effect was chosen and interpreted for Nigeria. The positive, statistically significant coefficients of integrated reporting variables-particularly, intellectual capital disclosure, natural capital disclosures, and social and responsibility capital disclosure-maintained a consistent positive significant relationship to the value of firms across all model specifications.

Other findings are that human capital disclosures reduce the value of firms in South Africa, while a proportionate increase in human capital disclosures increases the value of firms in Nigeria. Financial capital disclosure shows a negative effect on the value of firms. The reason for this is that an increase in capital expenditure and a low dividend payout reduce investors' confidence in both countries. We, therefore, recommend that regulatory bodies in Nigeria, such as its federal reporting council (which is the main standard-setting body in the country), should make integrated reporting a mandatory reporting system as in South Africa. As a result, this will encourage stakeholders and enable an overall understanding, instead of forcing them to look for sustainability reports after examining financial statements.

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