Relative and Incremental Value Relevance of Accounting Information under the Integrated Reporting Approach: Evidence from South Africa

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***Abstract*—The current system of corporate reporting expects to convey effectively company information to the stakeholders regarding value creation for the short, medium, and long term. This study aims to investigate the effect of implementation of the integrated reporting (IR) approach on the value relevance of accounting information by observing the relative and incremental value relevance before and after implementation of IR. This empirical study was conducted using unbalanced panel data to ensure a wide range of the sample. The regression analysis was performed on 3.138 observations from 338 companies listed on the Johannesburg Stock Exchange (JSE) in 12 periods (six pre- and six post-IR periods). The financial data was collected from Datastreams Thomson Reuters. The results of regression show that accounting information has value relevance, thus supporting the view that the IR approach has a significant impact on the value relevance of accounting information in South African companies. This finding could help with the implementation of IR in many countries, both developed and developing, to ensure they use advanced corporate reporting models to support sustainability by implementing integrated thinking and action.**

Keywords*— *integrated reporting, value relevance, corporate reporting

I. INTRODUCTION

The development of corporate reporting has attracted much attention from practitioners, policy makers, investors, and researchers. Corporate reporting has now reached a new stage where value creation issues have become important with the emergence of the sustainability trend [1]. On December 9, 2013, the International Integrated Reporting Council (IIRC) released a framework called the Integrated Reporting Framework consisting of the fundamental concepts, guiding principles, and content as a business model to communicate how organizational strategy, governance, performance, and prospects lead to value creation in the short, medium, and long term [2]. Mervyn King, chairman of IIRC and chairman of the King Corporate Governance Committee [3] has said that integrated reporting provides an opportunity for companies to present their business clearly and concisely in an integrated manner. This allows stakeholders to obtain information from one corporate report instead of from silo corporate reports.

The evolution of integrated reporting, which benefits companies in each phase, has led many companies in different countries such as Brazil, Japan, Australia, Germany, South Africa, the Netherlands, Canada, America, United Kingdom and others to adjust their regulations and policies and follow the IIRC, despite not all countries performing the same action. Many companies in developing countries, especially in Asia, have become members of the IIRC. They recognize the IR approach and advocate for its implementation. In Asia, 106 companies have become members of the IIRC since 2013 [2]. South Africa took a significant step toward adopting this new approach of corporate reporting, by stating in King Code III (previously Global Reporting Initiative (GRI) in King Code II) that all companies listed on the on Johannesburg Stock Exchange (JSE) must adopt integrated reporting approach in their reports. This made all practitioners and researchers sit up and take note of the benefits of implementing IR by companies. However, the adoption of this approach raised the question of the enhancement of the value relevance of financial information. It became an empirical question of whether it has a value relevance when the application of accounting standards is the same before and after the adoption of IR [4][5][6].

Previous research has focused on the results and benefits of IR implementation when compared with the current approach to reporting such as sustainability reporting [7][8]. There is little research on the value relevance of IR. De Villiers et al. [5] have said that one of the most interesting agendas for research is the value relevance of IR adoption as the latest evolution in corporate reporting and the market reaction to it. Baboukardos and Rimmel [9] conducted a study in South Africa and found that IR enhanced the value relevance of accounting information as reflected in the earnings per share (EPS). On the other hand, research from Buys et al. [10] did not show a causal relationship, but suggested the possibility of a positive relationship between company reporting and stock prices. This gap encourages us to examine the effect of the adoption of IR on the value relevance of accounting information, particularly in Asian companies where this adoption is still voluntary.

This study aims to examine the effect of IR adoption on the value relevance of accounting information, and contributes to the theoretical and practical aspects of this issue. It also provides a new perspective and enriches the literature related to IR adoption. To our best knowledge, this is the first study to investigate the impact of mandatory adoption of IR on the value relevance of accounting information in mature companies especially in South Africa. Our work extends the work done by Baboukardos and Rimmel [9] and complements that of Barth et al. [11] and Davis-Friday et al. [12]. We hope it will provide insights for companies and regulators on the impact of IR through market reactions.

This study employs a mixed method approach by using a sample of 338 companies listed in JSE over a 12-year period, which yields 3.138 firm years of observation. Financial variables were obtained from Datastream Thomson Reuters. We use fixed-effect regression to investigate our hypothesis.

This paper is organized as follows: Section 2 discusses the theoretical background; the concept of integrated reporting, and develops the hypotheses to be tested. Section 3 discusses the research methodology and follows this up with the results and discussion in Section 4. The conclusion and suggestions for further research are detailed in Section 5.

II. Literature Review

A. *Signaling Theory*

Stakeholder theory is a theory which reflects the company's accountability to stakeholders [13]. Integrated reporting is closely related to the stakeholders, especially with regard to the concept of value creation that plays a significant in the sustainability of the company [14]. The IR concept helps integrate all information related to social, economic, and environmental issues, as well as the socio-political and global economic subsystems. This approach makes investors more informed and able to assess the economic value of the company [15]. The concept of IR has shifted the corporate responsibility that was initially measured by the economic indicators in financial reporting, to social factors or social dimensions and the environment factor, both internally and externally. All of these aspects can be communicated through the integrated report, which integrates company communication and action, regardless of the cost incurred in the reporting process.

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C. *What is Integrated Reporting?*

Integrated reporting is a way to present how the company's strategy aligns with its financial aspects, so that it can help market participants understand how this strategy will impact company performance and firm value [16] by providing holistic, strategic, material, relevant, and responsive reporting across its parts [17]. Integrated reporting promotes a more cohesive and efficient approach to corporate reporting and aims to improve the quality of information available to financial capital providers to make more efficient and pro-ductive capital allocation [2]. IR is not merely a publication of a single report consisting of financial and nonfinancial information [18] but it also presents briefly and clearly how the company creates and maintains value by taking account of the economic, social, and environmental aspects [2].

The IR approach aims to explain how the organization creates value over time to the financial capital provider and the ways in which the information required by investors can be prioritized, so that it can improve the usefulness of financial reporting to investors through the enhancement of the value relevance of accounting information [2]. One aspect that distinguishes the IR approach from other approaches is its purpose in presenting concise information reflecting material aspects of the organization that include social, environmental, and economic outcomes; opportunities; and risks in an integrated manner through organizational reporting [2]. The potential impact of this value relevance generated by IR can improve the quality of reporting [19] [20][21]. Thus, the IR approach is expected to enhance the usefulness of corporate reporting for the stakeholders through its value relevance. A summary of the IR reporting framework is presented in Table I.

In several studies, researchers have often used content to determine the level of adoption of IR by the company. These are explained further below:

(1) Organization Overview and External Environment: This contains what the company does/did and shows what is the context in which the company operates.
(2) Governance: This section covers the way in which organizational governance structures support the company to create value in the short, medium, and long term.
(3) Business model: This refers to the aspects that reflect how the business model is run and what the company looks like in its daily operations.
(4) Risks and opportunities: This include all risks and opportunities which affect the ability of the organization/firm to create value in the short, medium, and/or long term, and also how the company's strategy helps deal with them.

TABEL I. Overview of the IR Framework's Principles-Based Requirements

Fundamental Concepts	Guiding Principles	Content Elements
1. Capital **Financial** **Manufactured** **Intellectual** **Human** **Social and Relationship** **Natural** **2. Value Creation**	1. Strategic Focus and Future Orientation 2. Connectivity of Information 3. Stakeholder Relationships 4. Materiality 5. Conciseness 6. Reliability and Completness 7. Consistency and Comparability	1. Organizational Overview and External Exvironment 2. Governance 3. Business Model 4. Risks and Opportunities 5. Strategy and Resources Allocation 6. Performance 7. Outlook 8. Basis of Presentation

Source: The IIRC [2]

(5) Strategy and resources allocation: This include the company's long-term goals and how it achieves this using existing strategies and resources.
(6) Performance: This aspect covers the extent to which the company has achieved its strategic objectives during that period and how its results impact its capital.

(7) Prospects: This includes the challenges and uncertainties that the organization faces in implementing its strategy and what its are implications for future business models and performance.
(8) Basic presentation: This includes how the organization determines what goes into the integrated report and how it is calculated or evaluated consistently.

D. *Hypotheses Development*

The Financial Accounting Standards Board (FASB) (2000) states that the most important characteristics of financial statements are reliability and relevance [22]. The value relevance theory argues that the importance of accounting information lies in the valuation of equity, especially how a firm's value can be explained by or attributed to accounting information [23]. Barth et al. [11] also agree that financial information is relevant if it is associated with the market value. Several studies related to IR have been examined, but according to de Viliers et al. these studies are still in their infancy [5]. Previous studies have focused more on the results, benefits, and critics of IR implementation [7][8] [17] [24] [25] [26] [27] [28].

De Villiers et al. [5] state that one of the most interesting research topics related to IR is the value relevance of IR adoption and whether there is a market reaction because of this adoption. The potential impact of IR on the relevance of financial reporting has been acknowledged by researchers such as Eccless and Saltzman [29]. Studies related to the value relevance of disclosure provide indirect evidence supporting high quality integrated reports developed by IIRCSA and IIRC [2] [30]. Buys et al. [10] found the contrary result that there is no causal relationship but suggest the possibility of a positive relationship between corporate reporting and stock prices.

According to some researchers, the adoption of IR will also improve the quality of financial reporting [19] [21] [20]. Research on the enhancement of value relevance of accounting information in IR is supported by empirical evidence gathered by Baboukardos and Rimmel for the JSE where IR has become mandatory [9]. The results of this study indicate that there is a significant increase in the value relevance of accounting information after adoption of IR as reflected in the EPS. Thus, this study concludes that IR has an effect on the enhancement of the value relevance.

Based on the above literature, we develop the following hypothesis:

H1a: The book value per share (BVS) is value relevant to the market
H1b: The earnings per share (EPS) is value relevant to the market
H2a: The value relevance of BVS has increased under the IR approach
H2b: The value relevance of EPS has increased under the IR Approach
H3: The IR approach has enhanced the value relevance of accounting information

III. Research Methodology

In this section, we will describe the methods used to test the research questions and the hypothesis about the value relevance of accounting information under IR.

A. *Research Method*

This research uses the mixed method approach that combines the quantitative and qualitative methods. Financial variables are taken from Datastream Thomson Reuters. These variables were then tested using fixed-effect regression by STATA software with balanced panel data from year 1 to year 4.

B. *Data Analysis*

We obtained the sample from registered companies on the JSE to avoid bias in sample selection. The sample criteria used were as Table II.
We used several criteria to choose the final sample. These were as follows: (1) The company has financial statements and integrated reports that have been published through their company website or are accessible to the market; (2) The company had implemented IR by the time the JSE required it; (3) The company was not delisting during the research year; and (4) The company had complete data for the variables used in this research. The final sample Consisted of 338 companies with 3.138 firm-year observations based on unbalanced panel data from six periods before the implementation of IR and six post-IR.

We used the Linear Price Level model adopted from Baboukardos and Rimmel [9] and combined that with Barth et al. [11] and Davis-Friday et al. [12] to measure the relative and incremental value relevance under IR adoption based on the changes in the market value of equity [12]. This model has also been used by other researchers such as Barth et al. [11] and Davis-Friday et al. [12].

To test H1a and H1b

Model 1: $PR_{it} = \beta + \beta_1 BVS_{it} + \beta_2 EPS_{it} + \ldots + \varepsilon_{it}$
Model 2: $PR_{it} = \beta + \beta_1 BVS_{it} + \cdots \ldots\ldots\ldots\ldots + \varepsilon_{it}$
Model 3: $PR_{it} = \beta + \beta_2 EPS_{it} + \cdots \ldots\ldots\ldots\ldots + \varepsilon_{it}$

To test H2a and H2b

Incremental Value Relevance of BVS = adjusted R-Square of Model 1–adjusted R-Square Model 3
Incremental Value Relevance of EPS = adjusted R-Square of Model 1–adjusted R-Square Model 2

TABLE II. Sample Criteria

Sample Criteria	Number
Number of companies	488
12-year observations	5.856
Uncompleted data	(2.718)
Final Observations	3.138

Value Relevance Common to BVS and EPS = adjusted R-Square of Model 1–incremental value relevance of BVS–incremental value relevance of EPS.

To Test H3

Model 4: $PR_{it} = \beta + \beta_1 BVS_{it} + \beta_2 EPS_{it} + \beta_3 DIR_{it} + \beta_4 (DIR * BVS)_{it} + \beta_5 (DIR * EPS$
$+ \beta_{6} SIZE_{it} + \varepsilon_{it}$

The dependent variable in this study is the market value of equity (PR) measured by dividing the market value of equity in the third month after the fiscal year (t + 3) by the number of shares outstanding. The third period (t + 3) after the fiscal year is used because the purpose of this study is to know the investor reaction. This is not possible if the market value of equity is seen at the end of the year. This measurement has also been used in previous research [9]. In this study, we used four control variables because they are often used in research related to market valuation [9]. The corporate loss (LOSS) is measured using binary variables, which is 1 if the EPS is negative and 0 otherwise. The companies-debt ratio is measured by dividing the total debt by total assets. The company's profitability ratio is measured by dividing EBIT with the book value of equity, and firm size by the log of total assets.

IV. Results

The descriptive statistics are presented in Table III. The average market value of equity (PR) per share for 12 years is ZAR 0.0389 with the standard deviation of 0.0715. This means that the PR that is not very different among the sample companies. The mean of BVS of all samples is ZAR 17.925 for 12 years. The growth of these companies varies which is shown by a higher deviation standard than the average (ZAR 29.162). The EPS of all sample companies over 12 years has an average of ZAR 4.590. Most of the sample companies showed better performance compared to others.

This study performs fixed-effect regression with STATA as the best model to avoid heteroscedasticity and autocorrelation problems (Stata 12). Table IV presents the correlation matrix, which shows there is no correlation among the variables. The results of relative and incremental value relevance are shown in Table V. We see that there is significant relative value relevance every year indicated by BVS and EPS for all-years and partial years.

TABLE III. Descriptive Statistics

Var	Obs	Mean	Std. Dev.	Min	Max
year	3,138	2010.831	3.351	2005	2016
id	3,138	205.939	139.695	1	464
pr	3,138	0.039	0.072	.00e-05	0.378
bvs	3,138	17.925	29.16	-24.183	137.256
eps	3,138	4.592	9.402	-50.859	51.723
dir	3,138	.541	.498	0	1
dirbvs	3,138	10.981	24.378	-24.183	118.787
direps	3,138	2.234	5.961	-24.896	30.999
dloss	3,138	.134	.341	0	1
dlossbvs	3,138	.051	.165	-.451	0.621
dlosseps	3,138	-.010	.029	-.110	0
lev	3,138	.501	.254	-.028	1.675
roe	3,138	.262	.476	-1.613	2.814
size	3,138	14.559	2.366	4.727	21.405

TABLE IV. Correlation Matrix

Year	Intercept	BVS	EPS	Total Value Relevance (adjusted R^2) %	BVS	Relative BVS	EPS	Relative EPS	Incremental adjusted R^2			Relative BVS & EPS
	α	β_1	β_2		β_1	(Adjusted R^2) %	β_2	(Adjusted R^2) %	BVS %	EPS %	Common %	
Panel A All years (2005-2016)												
Pooled	.009***	.0012***	.0014***	34.14%	.0016***	28.8%	.0024***	16.49%	17.65%	5.34%	11.15%	BVS>EPS
Panel B Only negative earnings												
Pooled	.0119***	.0002	.0006***	5.5%	.0002	0.39%	.0006***	4.8%	0.7%	5.11%	-0.31%	BVS>EPS
Panel C Only positives earnings												
Pooled	.0073***	.0012***	.0022***	38.4%	.0016***	31.14%	.0035***	24.06%	14.34%	7.26%	16.8%	BVS<EPS
Panel D Partial years												
'05-'06	.0199***	.0015***	-.0004**	49.82%	.00135***	48.93%	.0013***	15.23%	34.59%	0.9%	14.33%	BVS>EPS
'07-'08	.0449***	-.00038**	-.0002***	16.78%	-.0010***	5.67%	-.0021***	16.15%	0.72%	11.11%	4.95%	BVS<EPS
'09-'10	.0092***	.00144***	.0004***	44.66%	.0016***	42.93%	.0011***	14.35%	30.31%	1.73%	12.62%	BVS>EPS
'11-'12	.0185***	.0010***	.0007***	10.38%	.0011***	6.57%	.0008***	4.70%	5.68%	3.81%	0.89%	BVS>EPS
'13-'14	.0010	.0021***	-.0001	10%	.0021***	9.98%	.0003	0.33%	9.67%	0.02%	0.31%	BVS>EPS
'15-'16	0.217***	.0010***	.0001**	15.05%	.0011***	14.97%	.00048***	1.57%	13.48%	0.08%	1.49%	BVS>EPS

TABLE V. Relative and Incremental Value Relevance of Accounting Information

	year	id	pr03	pr06	bvs	eps	dir	dirbvs	direps	dloss	dlossbvs	dlosseps	lev	roe	size
year	1.0000														
id	0.0150	1.0000													
pr03	0.0716	-0.1207	1.0000												
pr06	0.0608	-0.1213	0.9910	1.0000											
bvs	0.1237	-0.1542	0.7593	0.7500	1.0000										
eps	-0.0080	-0.1766	0.6771	0.6795	0.6966	1.0000									
dir	0.8638	0.0159	0.0735	0.0653	0.1061	-0.0102	1.0000								
dirbvs	0.3882	-0.1128	0.5610	0.5439	0.7732	0.4463	0.4146	1.0000							
direps	0.3069	-0.1226	0.5239	0.5160	0.5556	0.6682	0.3449	0.7336	1.0000						
dloss	0.0659	0.0058	-0.1445	-0.1494	-0.1194	-0.2541	0.0687	-0.0675	-0.2123	1.0000					
dlossbvs	0.0965	-0.0173	-0.0792	-0.0846	-0.0344	-0.2289	0.0914	0.0004	-0.1976	0.7889	1.0000				
dlosseps	-0.0881	0.0072	0.0964	0.1020	0.0553	0.2410	-0.0849	0.0170	0.2068	-0.8457	-0.8350	1.0000			
lev	-0.0131	-0.1400	0.0788	0.0795	-0.0129	0.1258	0.0072	-0.0048	0.1177	0.0644	-0.1216	-0.0444	1.0000		
roe	-0.1345	-0.0079	0.1213	0.1261	-0.0005	0.2459	-0.1200	-0.0461	0.1039	-0.4275	-0.3582	0.4150	0.2232	1.0000	
size	0.2030	-0.1759	0.5443	0.5398	0.5641	0.4865	0.1650	0.4470	0.4082	-0.2781	-0.0624	0.1351	0.1845	0.1508	1.0000

The main coefficients are $\beta 1$ and $\beta 2$ (Tabel IV) They show that the value relevance of accounting information reflected in BVS (book value of stock equity) and EPS has positive and significant coefficients. The coefficient of BVS is.001383 and it is statistically significant at the 1% level, while the coefficient of EPS is 0.000925. This finding indicates that the value of BVS and EPS have a positive effect on the value relevance of accounting information which is reflected in the stock price. This result shows the company's value measurement model through BVS and EPS from Ohlson [32] as the basic model for calculating the market value of the firm's market equity. For the effect of integrated reporting on the relevance of firm value, we look at the coefficients $\beta 3$, $\beta 4$, and $\beta 5$. The coefficient $\beta 3$, that is, DIR, has a positive value (.0009253) and is significant at 1%. On the same hand, the interaction coefficient on the DIR*BVS variable has a negative value with a value of -.0051861 and is statistically significant (p value = 0.000). This finding shows that the adoption of integrated reporting affects the value relevance of the company reflected in the BVS price. On the other hand, the value relevance of BVS decreased after the adoption of integrated reporting, which is consistent with the findings of previous research.

The coefficient of DIR*EPS is positive (.0014104) with a p value of 0.000. Thus, this study shows that the adoption of mandatory integrated reporting in South African companies has a significant effect on the value relevance of accounting information, so hypothesis 1 (H4) is supported. Moreover, based on the relative and incremental value relevance as well as the regression analysis result, accounting information remains having value relevance for market. This is reflected by BVS and EPS at the 1% significance level.

V. Discussion

This study is a response to the recent calls for investigation of the benefits of adopting integrated reporting from the capital market [4][5][6]. Previous research has shown that mandatory adoption of integrated reporting enhanced the value relevance of accounting information for companies listed on the JSE in South Africa [9] [29] but in a narrow window of six years. Moreover, in several developed countries using the case study showed benefits for sample companies resulted by implementing the Integrated Reporting [2]. However, the results of this study support recent papers that indicate that IR does affect the value relevance of accounting information, as the coefficient of DIR*EPS is positive and statistically significant. Our results are in line with those in Baboukardos & Rimmel [9] who found that IR adoption enhanced the quality of accounting information (Table VI).

These results are consistent with those of Baboukardos and Rimmel [9] who examined mandatory IR adoption in the JSE over a longer period between 2008 and 2013 using a dummy variable for IR. They found that the implementation of IR affects the value relevance of accounting information. The concept of IR with its value creation and distribution is important to carry out a firm's responsibilities for managing resources and improving the welfare of its stakeholders [33]. Based on this, one can say that the implementation of IR provides a good signal that is useful for providing a better quality of information for the investor community [34].

The implementation of IR not only accommodates the interests of the investors but also those of other stakeholders such as management. Management plays an important role in determining the use of the company's resources and in corporate performance reporting. The implementation of IR is an investment for the company for conveying information to stakeholders. This is in accordance with stakeholder theory which states that management is obliged to provide useful information to support decision-making by all parties. While the implementation of IR is faced with constraints such as costs, companies in the Asian region still commit to implementing IR by registering as IIRC members. Such actions are believed to have an impact on the stakeholders.

TABLE VI. Regression Model

PR	Sign	Coef	P>I t I
BVS	+	.001383***	0.000
EPS	+	.0009253***	0.000
DIR	+	.0009253***	0.009
DIR*BVS	-	.0003104***	0.000
DIR*EPS	+	.0014104***	0.000
DLOSS	+	.0004628	0.908
DLOSS*BVS	+	.0051861	0.442
DLOSS*EPS	-	.0417219	0.303
ROE	+	.0016598	0.233
SIZE	+	0002359	0.762
Cons		.0036235	0.742
PR = market value per share (t+3 months), BVS = book value per share, EPS = earnings before interest and tax per share, DIR = dummy IR 1 for IR implementation and 0 otherwise, DIR*BVS = interaction between DIR and BVS, DIR*EPS = interaction between DIR and EPS, DLOSS = dummy loss 1 for earnings negative and 0 otherwise, DLOSS*BVS = interaction between DLOSS and BVS, DLOSS*EPS= interaction between DLOSS and EPS, ROE = return on equity, Size = logarithm of total assets			*Adjusted R-Square 35.91%*

VI. Conclusion

This study aims to investigate the effect of IR on the value relevance of accounting information. This study is based on 3.138 firm-year observations for companies listed on the JSE. The results reveal that the IR approach has an effect on the value relevance of accounting information. We arrived at this conclusion by (1) detailing the relative value relevance of BVS and EPS, (2) detailing the incremental value relevance of BVS and EPS, (3) detailing all-years 2005 - 2016 observations, and (4) performing the regression for value relevance.

Our results add to the literature on the impact IR adoption, especially in South Africa. This study provides insights for companies in Asia, particularly Indonesia, looking to promote IR in the corporate world. In addition, some companies in Indonesia that follow IR but are not members of the IIRC can become leading examples of IR implementation and adopt strategies to enhance the value relevance of accounting information through IR.

This study has some limitations. First, the samples are limited to emerging companies which are registered as IIRC members, because of limited time and resources. Therefore, our results cannot be generalized for voluntary IR adoption in the JSE which has 488 listed companies. Second, the period used in this study is limited to 12 years, six before IR adoption and six after. Thus, it is possible that our results may not hold if we look at a longer period. For further research, one can use additional samples with wider coverage of IR adoption and with a more comprehensive measurement of IR. One can also use other measurement variables, particularly in IR disclosure measurements and IR adoption in emerging companies.

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