

Article

Performance Sustainability and Integrated Reporting: Empirical Evidence from Mandatory and Voluntary Adoption Contexts

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Abstract: This paper looks at the topic of regulation of integrated reporting for listed companies, with the aim of contributing to the debate on the usefulness of introducing a mandatory regime, both from the perspective of integrated performance sustainability of companies and from that of relevance of information for providers of financial capital. The study is based on empirical research carried out on a sample composed of companies operating in territories where the adoption of integrated reporting is voluntary (Europe) and those operating in a country where adoption is mandatory (South Africa). The research shows that (a) in voluntary regimes, levels of integrated performance achieved by companies are higher; (b) mandatory regulation produces positive effects on integrated performance levels in the medium term; (c) integrated performance indicators are value-relevant, though having different levels of relevance under the two regimes examined.

Keywords: performance sustainability; integrated performance; integrated reporting

1. Introduction

The adoption of an integrated reporting approach, overcoming the boundaries and limitations of traditional information systems, is expected to enhance the effectiveness of internal control systems and to support the achievement of financial, environmental and social results; in other words, the sustainability of the overall performance, thus boosting the value creation of the organization [1]. Furthermore, such an approach is expected to improve the value relevance of traditional accounting information [2–4].

In some countries (South Africa), the publication of an integrated report has already become mandatory for listed companies. In Europe, while the EU and the member States’ legislators are working and interacting each other on the issue of non-financial information, the number of companies voluntarily adopting integrated reporting is growing steadily and the International <IR> Framework provided by International Integrated Reporting Council (IIRC) is extending its influence in this field.

For South Africa, with reference to effects on disclosure level, evidence was found that the mandatory introduction of integrated reporting “has resulted in an increase in the extent of disclosure of human, social and relational, natural and intellectual capital information of the listed companies” [5], with a more significant increase in disclosures on intellectual capital and human capital categories if compared with relational capital disclosures [6]. Numerous studies have also considered the relevance of information and the usefulness of Integrated Reporting (IR), by assessing the capital market effects of its mandatory [4,6–9] or voluntary adoption [3,10,11]. In general terms, the results of these studies

are of particular interest, because they seem to confirm that IR improves the relevance of information for providers of financial capital. With specific reference to the effects of regulation on usefulness for investors, studies have shown that the value relevance of summary accounting information (i.e., Book Value of Equity and Earnings) of listed companies improved after the mandatory adoption of an IR approach [4]. Along similar lines, Ioannou and Serafeim [12] verified that sustainability disclosure regulations positively affect company valuation.

It is useful to highlight that in our paper, as in the researches we mention, relevance is considered a qualitative characteristic of information. The information can be considered relevant if it is capable of making a difference to the decisions made by users. The studies on the value relevance of information, developed on the basis of the original Ohlson model [13], consider accounting information value relevant if it has a significant statistical relation with the market value of companies [14–16]. In this perspective, the existence of that significant statistical relation measures a qualitative characteristic of information which is considered relevant for the analysis, while other qualities of information (e.g., comparability, timeliness, verifiability, compliance, etc.) are deemed not important and therefore should not be considered.

With regard to the expediency of regulation, however, the debate on the effectiveness of mandatory integrated reporting is still an issue under discussion [12–14,17–20]. Indeed, compared to voluntary adoption, the mandatory publication of an integrated report deserves to be evaluated with some attention, since it may reduce the strategic role of integrated reporting, with the risk that this document is perceived as a further reporting obligation. For this reason, it was highlighted that laws and regulations on the integrated reporting approach “could result in a costly pooling rather than a separating equilibrium with respect to the value of sustainability disclosures and can thus eventually destroy shareholder value” [12] (p. 2).

Our paper fits into this research stream. In particular, by using certain integrated performance indicators provided by the main economic databases, this work aims to answer the following research questions:

- **RQ1**—Is it likely that companies that voluntarily adopt integrated reporting have a higher level of integrated performance (financial, environmental, social and governance) compared to companies forced to adopt it on the basis of a legal obligation?
- **RQ2**—In South Africa, has there been a generalized growth in integrated performance levels during the period following the mandatory introduction of integrated reporting?
- **RQ3**—Is there a statistically significant relationship between the integrated performance indicators and the market value of the companies? If that is the case, is this relationship more relevant for the companies that voluntarily adopt the integrated report?

The results of the research are deemed helpful to understand whether a voluntary integrated reporting approach

- is strategically more effective;
- is better decoded by external investors.

Thus, the research aims to provide a significant theoretical contribution to the current debate on the regulation of integrated reporting for listed companies. To the best of our knowledge, there have been no attempts to compare, with reference to certain countries with voluntary and/or mandatory adoption of an integrated reporting approach, the effects of regulation on sustainability of integrated performance and, at the same time, the value relevance of integrated performance (expressed by a valid summary indicator) in comparison with the value relevance (in comparison with that) of the summary accounting information (i.e., Book Value of Equity and Earnings).

Integrated reporting is currently recognized as an important tool for achieving sustainability, so that in recent years in the broad sustainability debate, many articles have been directed to this research stream [21–27].

2. Methods and Data

The study is based on empirical research conducted on a sample of European listed companies that voluntarily publish the integrated report in comparison with a sample of companies that publish it on a mandatory basis (South Africa).

2.1. Sample and Data

The two groups of companies were selected by process described in Table 1.

Table 1. Sample selection process.

	EU	SA	Total
Listed companies (Value recovered from Thomson Reuters Datastream database)	3727	335	4062
Descriptive statistics on A4R indicator (RQ1 and RQ2)			
Companies with A4R indicator available for all years in the period 2012/2016	841	127	968
Company/year observations for each variable	4205	635	4840
Regressions (RQ3)			
Companies with data (dependent variable and independent variables) available for all years in the period 2012/2016	363	113	476
Company/year observations for each variable	1815	565	2380

The results of the selection process are as follows:

- A sample of 841 companies for EU and a sample of 127 companies for SA chosen for the five years (from 2012 to 2016) under examination (i.e., 4840 company/year observations for the descriptive statistics used for RQ1 and RQ2);
- A sample of 363 companies for EU and a sample of 113 for SA chosen for the five years under examination (i.e., 2380 company/year observations for the regression models used for RQ3).

Regarding sources of data, all variables were collected from the Thomson Reuters Datastream database. In this regard, we underline that the linear price-level model used (see Section 2.2) associates the company's market value of equity (MV) with its A4R and the classic accounting values such as book value (BV) and earnings (E). For the tests, some control variables were also used (see Table 2).

Table 2. Variables of the models and data source.

	Models' Variables	Identifier in Thomson Reuters Datastream
1	Overall equal weighted rate, that reflects a balanced view of a company's ESG (environmental, social and governance) performance (ASSET4)	A4R
2	"Market value of equity" ^(a) / "Number of common shares" ^(b)	^(a) MV; ^(b) NOSH
3	"Book value of equity" ^(c) / "Number of common shares" ^(b)	^(c) WC03995; ^(b) NOSH
4	"Earnings before interest and taxes" ^(d) / "Number of common shares" ^(b)	^(d) WC18191; ^(b) NOSH
5	"Total liabilities" ^(e) / "Number of common shares" ^(b)	^(e) WC03351; ^(b) NOSH

Variable A4R is used for the descriptive statistics that we carry out to examine the main differences in terms of integrated performance levels between the two contexts (see Section 2.2).

Furthermore, all the variables of the Table 2 are used for the regressions (linear price-level model). In more detail: market value per share (MVS) is the dependent variable; A4R, book value per share (BVS) and earning per share (EPS) are the independent variables; "Total liabilities" divided by "Total assets" represents the firm's leverage, which is used as the control variable in the regression model (see Sections 2.2 and 3.2).

In the regressions, the scale effect was mitigated by dividing each variable—excluding A4R—by the “Number of Common Shares”, which is the deflator most frequently used in literature concerning the value relevance of accounting information [16,28,29]. The accounting data refer to the financial years ending in 2012, 2013, 2014, 2015 and 2016, even when the end of the reporting period does not correspond to the calendar year. Market capitalization refers to six months after a company’s fiscal year-end, in line with studies on value relevance belonging to the category of association studies [15,16].

As regards ASSET4 equal weighted rate provided by Thomson Reuters Eikon, this is obtained by combining the ESG score with StarMine[®] Analytic Models (Economic Pillar). In particular, 282 measures are used, which are then combined into eighteen category scores (as subcomponents of the four pillars). The eighteen categories receive a score between 0 and 1. The overall company score (A4R) is derived from a roughly equal-weighted blend of the four pillar scores [30].

The process of creating the indicator is shown in Figure 1.

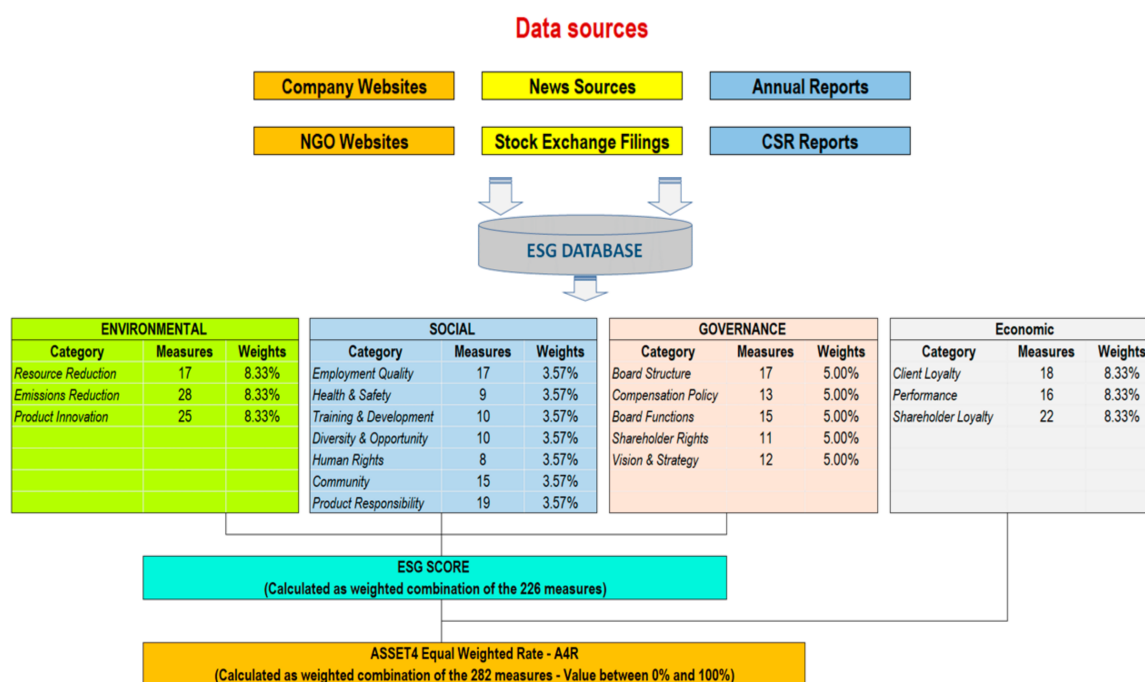


Figure 1. ASSET4 environmental, social and governance (ESG) data and framework. (Our elaboration from 30).

As described in Figure 1, the final ESG score results from the combination of 15 measures referred to the Environmental, Social and Governance performance indicators. The ESG score is built on these measures to reflect the commitment and effectiveness of the companies on the three pillars of qualitative performance. The ESG score is then combined with indicators referred to as the economic pillar to obtain the overall equal weighted rate A4R, which synthetizes the company’s ESG and economic performance. Both kinds of measures are weighted proportionately to the number of indicators pertaining to each category, selected on the basis of publicly reported information provided by each company [30].

2.2. Statistical Methods

For RQ1 and RQ2, descriptive statistics tools will be used to examine the main differences in terms of integrated performance levels expressed by A4R between our two sub-samples of companies.

The study of the stratified distribution of indicator A4 is carried out using normal summary statistical values and the differences among the distributions are observed using graphs and confirmed by applying the non-parametric ANOVA. In particular, we used Levene’s test—which is a reliable statistical measurement even for non-normal distributions, and allows the homogeneity of the

variances for a stratified variable to be evaluated [31]—and the Kolmogorov-Smirnov test—which is a non-parametric test used to verify the shape of sample distributions [32]—and, to detect that the assumptions of variance homogeneity and normality were not respected, a non-parametric ANOVA was carried out using the Kruskal–Wallis [33] and Median [34] tests, which are based on ranks and medians. Substantially, the former is based on the position of observations in ordered sequences of data and not on values, while the latter is based on the median, which is considered a “robust” summary measurement. Subsequently, the post-hoc test to verify which pairs of years are significantly different from each other was carried out using the Mann–Whitney test, based on ranks [23].

For RQ3, we study the relationship between market value (MV) and level of integrated performance by a linear price-level model used in studies on the value relevance of accounting information, which considers the information value-relevant if it has a significant statistical relation with the market value of companies [13–16].

In particular, with reference to the period 2012–2016 and to the two different regimes examined (Europe and South Africa), the aim is to study the value relevance of traditional accounting values of the financial statement with the addition of the A4R integrated performance indicator. In this context, considering that the data analyzed could be heterogeneous because of the effects of both time and individuals (companies) and aiming to get an efficient and effective model that allows heterogeneity of data to be checked while minimizing the error $\varepsilon_{i,t}$, data is formulated using “cross sectional time series”, better known as panel data. Panel data are obtained from original values through a “pooling” operation, so that the observations can be considered bi-dimensional varying both for individual and for time period. This choice is justified by the fact that analyzing only the time series does not allow individual heterogeneity to be unbundled from the error term $\varepsilon_{i,t}$, while a cross section analysis would only allow it if the data revealing this heterogeneity were available.

Thus, considering that the variability of the panel data is due to time and individuals, it is possible to break down the error term into three distinct parts:

- The first is constant over time and variable from one individual to another;
- The second, on the other hand, is constant among individuals but variable over time;
- The third represents the pure error component [35].

Substantially, by using the regression with *panel* data, the intention is to limit the distortion caused by individuals and/or time, controlling the effect of variables not measured, which inevitably influences the estimate of variables included in the model and correlated with those that are not included.

The regression models on panel data can be divided into dummy variable models or error components models.

In the dummy variable model, λ_i and ω_t are considered deterministic in nature; in the error component model, on the other hand, they are stochastic. The Hausman test allows verification of whether dummy variable model (H_1) or the error component model is more appropriate (H_0) [36].

The dummy variable model can be expressed using the equation

$$y_{it} = (\lambda_i + \omega_t) + X_{it}\beta + \varepsilon_{i,t}. \quad (1)$$

where λ_i is a fixed effect and errors are independent identically distributed, $\varepsilon_{it} \sim \text{IID}(0, \sigma^2)$.

In order to estimate the parameters, the least-squares dummy variables (LSDV) [37] method was used, since the ordinary least-squares (OLS) method, used for simple pooling, is inadequate for panel data regressions.

For the purpose of analysis, the use of panel data will allow more efficient estimation than cross section models, thanks to the increased degrees of liberty and to the reduction of multicollinearity among the regressors [38]. The advantage gained from the use of panel data is due to the increase in information content on which to base the estimates and the underlying logic of the panel regression,

according to which, considering a collection of heterogeneous individuals, it is possible to assume that, as well as the “factors” that vary over time, there are other different “factors” for each individual.

3. Results

3.1. Research Questions 1 and 2

Firstly, it is necessary to evaluate the distribution of the A4R indicator from a temporal viewpoint.

Distinguishing the two zones of reference (EU = Europe; SA = South Africa) we will have the summary statistics that are represented in Table 3 (Europe) and Table 4 (South Africa) (The original data are shown in Tables S1–S4):

Table 3. Europe: summary statistics.

Statistics	2012	2013	2014	2015	2016
N° of observations	841	841	841	841	841
Minimum	2.860	2.870	3.130	6.200	7.510
Maximum	96.760	96.930	97.030	96.240	96.050
1st Quartile	44.310	46.400	51.500	66.580	75.060
Median	84.230	83.480	83.610	87.110	88.750
3rd Quartile	92.410	92.280	92.020	92.520	93.110
Mean	68.413	68.735	70.822	76.431	80.004
Variance (n)	919.642	885.355	767.734	540.505	404.372
Variance (n – 1)	920.737	886.409	768.648	541.148	404.854
Standard deviation (n)	30.326	29.755	27.708	23.249	20.109
Standard deviation (n – 1)	30.344	29.773	27.724	23.263	20.121
Variation coefficient	0.443	0.433	0.391	0.304	0.251
Asymmetry (Fisher)	−0.916	−0.934	−1.073	−1.475	−1.828
Kurtosis (Fisher)	−0.707	−0.650	−0.233	1.097	2.588
Standard deviation standard of mean	1.046	1.027	0.956	0.802	0.694
Lower limit of mean (95%)	66.359	66.720	68.946	74.856	78.643
Upper limit of mean (95%)	70.466	70.750	72.699	78.005	81.366
Standard deviation of variance	44.927	43.252	37.506	26.405	19.755
Lower limit of variance (95%)	838.657	807.389	700.125	492.907	368.762
Upper limit of variance (95%)	1015.551	977.687	847.800	596.873	446.544

Normally, observation of the mean value of both distributions (EU; SA) would lead to the conclusion that the average trend of integrated performance measured by the A4R indicator over the five years studied highlights a better performance by European companies. It is important to specify, however, that, in order to carry out evaluations on the mean or on the variance of the data, it is necessary to consider that the companies chosen for this analysis are a sample. Therefore, it is better to refer to the confidence intervals. As could be expected, observing the differences characterising the standard deviations over the years examined, the confidence intervals of the mean (95%) have different widths, which narrow over the period observed in both geographical contexts.

If, however, the shape of the distributions of the A4R index in the various years in the two areas examined is evaluated using box-plots (Figure 2) of the summary statistics (median-quartiles-index of asymmetry) (Tables 3 and 4) a left asymmetry (greater concentration of higher A4R index values), which increases over the years. Thus, in these cases, the mean is not a “robust” summary measurement and it is better to refer to the median.

Table 4. South Africa: summary statistics.

Statistics	2012	2013	2014	2015	2016
N° of observations	127	127	127	127	127
Minimum	3.200	3.140	3.830	6.100	8.230
Maximum	94.800	95.740	95.130	94.890	95.480
1st Quartile	39.790	38.955	45.875	61.100	73.140
Median	63.100	60.750	64.820	75.960	83.540
3rd Quartile	83.275	80.785	83.930	86.325	90.380
Mean	58.457	58.555	60.942	69.659	76.114
Variance (n)	750.205	759.919	645.280	466.200	407.055
Variance (n − 1)	756.159	765.950	650.402	469.900	410.286
Standard deviation (n)	27.390	27.567	25.402	21.592	20.176
Standard deviation (n − 1)	27.498	27.676	25.503	21.677	20.256
Variation coefficient	0.469	0.479	0.417	0.310	0.265
Asymmetry (Fisher)	−0.503	−0.489	−0.603	−1.133	−1.621
Kurtosis (Fisher)	−0.862	−0.875	−0.684	0.364	1.861
Standard deviation of mean	2.440	2.456	2.263	1.924	1.797
Lower limit of mean (95%)	53.628	52.695	56.464	65.853	72.557
Upper limit of mean (95%)	63.286	62.415	65.421	73.466	79.671
Standard variation of variance	95.267	96.501	81.943	59.202	51.691
Lower limit of variance (95%)	599.362	607.123	515.534	372.462	325.209
Upper limit of variance (95%)	984.035	996.776	846.406	611.509	533.929

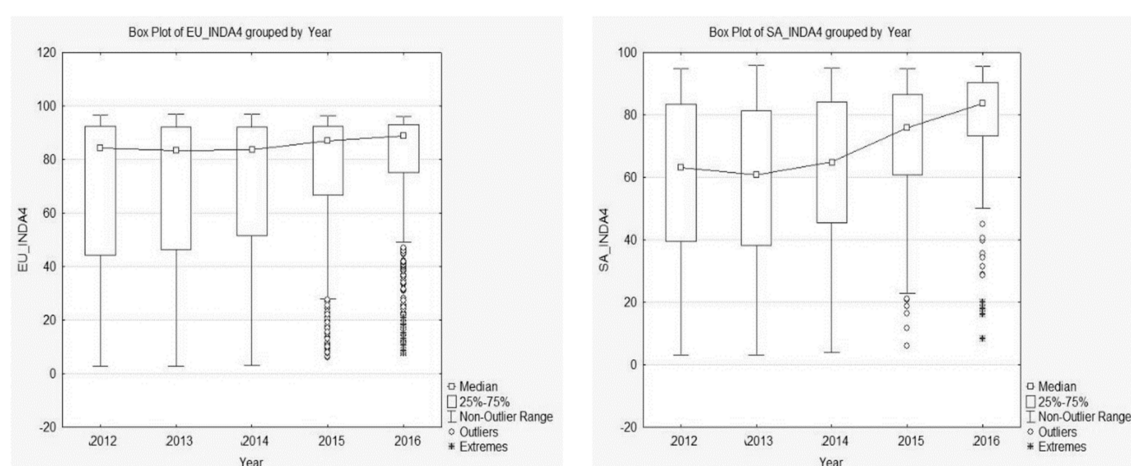


Figure 2. Box-plots (values with a positive or negative deviation from the third or first quartile greater than 1.5 times or 3 times the range interquartile range are considered outliers and extremes, respectively).

Observing the values of the median (Table 5), it can be seen that, unlike the mean, in the case of Europe the value decreases in 2013 and 2014 (for South Africa, only in 2013) compared with 2012. Moreover, analyzing the values of the medians and quartiles together, it is interesting to note that, without prejudice to the general improvement of the A4R performance indicator over time in both geographical zones, in 2012 50% of companies in Europe and South Africa showed an A4R value greater than 84.23 for the former and only 63.1 for the latter. In 2016, while the median value of A4R in South Africa remained lower, the situation seems to be normalizing. Indeed, the value of the median that divides the distribution in half is 87.1 for Europe and 83.5 for South Africa. Moreover, the integrated performance of companies that had an A4R index in 2012 grows considerably; indeed, 25% of companies that had an A4R value lower than 44.31 in 2012 in Europe have values below 75.0 in 2016, and in South Africa the change is from 39.7 to 73.1.

Table 5. Summary statistics.

Year	EU				SA			
	1st Quartile	Median	3rd Quartile	Mean	1st Quartile	Median	3rd Quartile	Mean
2012	44.310	84.230	92.410	68.413	39.790	63.100	83.275	58.457
2013	46.400	83.480	92.280	68.735	38.955	60.750	80.785	57.555
2014	51.500	83.610	92.020	70.822	45.875	64.820	83.930	60.942
2015	66.580	87.110	92.520	76.431	61.100	75.960	86.325	69.659
2016	75.060	88.750	93.110	80.004	73.140	83.540	90.380	76.114

The above observations regarding the shape of the distributions of the A4R indicator in the years in question for each geographical zone can easily be seen in the histograms shown in Figure 3. The frequencies relating to the distributions of the A4R indicator (min = 0; max = 100) were subdivided into 10 classes of width 10 for South Africa (Figure 3a) and Europe (Figure 3b).

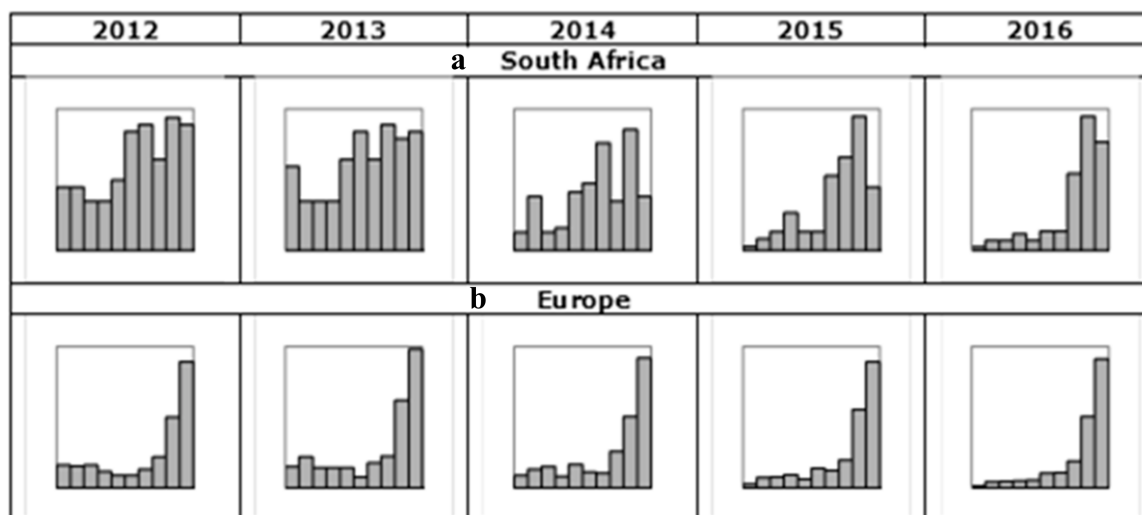


Figure 3. (a) A4R histograms for South Africa; (b) A4R histograms for Europe.

From the above graphs, it can be clearly seen that, from 2012 onwards, the distributions of the A4R indicator in Europe are heavily left-asymmetric. This means that in Europe from 2012 onwards there has been a large group of companies that have a high integrated performance index. The situation in South Africa is different, however; in 2012 and 2013 the situation is fairly flat and an increased concentration of companies in the upper area of the A4R indicator range can be noted only from 2015 onwards.

Further confirmation of these observations can be found in the concentration curves (Figure 4) relating to the years 2012 (Figure 4a) and 2016 (Figure 4b), which clearly show that in 2012 the percentage of companies with A4R below 80 is 44.5% in Europe compared with 70.9% in South Africa. As mentioned above, in 2016 the situation was still better in Europe but South Africa (40.1%) narrowed the gap compared with Europe (29.4%), which continued to improve.

The statistical tools used so far clearly indicate that there are differences between the annual mean values of the A4R indicator, both for Europe and for South Africa. In order to analyze more deeply, however, it is necessary to verify whether any differences observed are significant or not. To this end, it would be necessary to carry out a variance analysis, so as to clarify whether the mean improvement in integrated performance linked to the A4R indicator is due to time, or whether the differences found are the effect of random oscillations caused by the fact that we are considering samples. It should be remembered, however, that analysis of the ANOVA variance allows non-distorted results to be

obtained if, and only if, the basic assumptions are respected (the distribution must be normal and the variances must be homogenous). In order to verify these assumptions, two statistical tests are suitable: Levene's test and the Kolmogorov–Smirnov test. In this case, Levene's test showed that the variances are not homogenous (Table 6), and the Kolmogorov–Smirnov test (Table 7) demonstrated a violation of the normality hypothesis:

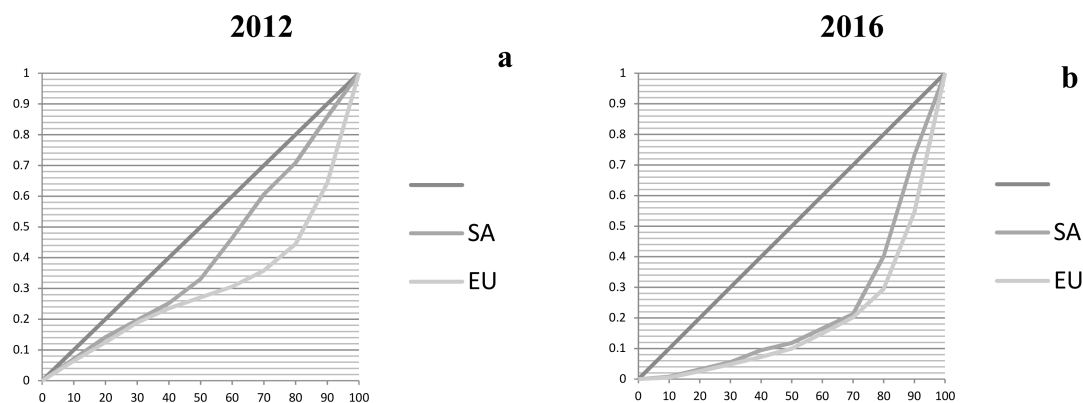


Figure 4. (a) Concentration curve in 2012; (b) Concentration curve in 2016.

Table 6. Levene's test for homogeneity of variance.

Effect: Year Degrees of Freedom for all F's: 4, 4200				
	MS	MS	F	P
EU	19862.76	216.7823	91.62538	0.00
SA	1665.374	203.8461	8.169762	0.000002

Table 7. Kolmogorov–Smirnov test.

	D	p-Value
EU	0.214	<0.0001
SA	0.117	<0.0001

It is, therefore, appropriate to use the non-parametric ANOVA, as its results do not depend on the hypothesis of normality, using the Kruskal–Wallis test (Table 8) and the median test (Table 9), which is a nonparametric (distribution free) test that is used when the assumptions of one-way ANOVA are not met.

Table 8. Kruskal–Wallis test.

	K (Observed Value)	K (Critical Value)	GDL	p-Value
EU	64.643	9.488	4	<0.0001
SA	51.332	9.488	4	<0.0001

Table 9. Median test.

Europe						
Chi-Square = 48.00958 df = 4 $p = 0.0000$						
	2012	2013	2014	2015	2016	Total
<=Median: observed	442	470	451	397	345	2105
expected	421	421	421	421	421	
obs.-exp.	21	49	30	−24	−76	
>Median: observed	399	371	390	444	496	2100
expected	420	420	420	420	420	
obs.-exp.	−21	−49	−30	24	76	
Total: observed	841	841	841	841	841	4205
South Africa						
Chi-Square = 62.90409 df = 4 $P = 0.0000$						
	2012	2013	2014	2015	2016	Total
<=Median: observed	80.0000	78.0000	77.0000	55.0000	28.0000	318.0000
expected	63.6000	63.6000	63.6000	63.6000	63.6000	
obs.-exp.	16.4000	14.4000	13.4000	−8.6000	−35.6000	
>Median: observed	47.0000	49.0000	50.0000	72.0000	99.0000	317.0000
expected	63.4000	63.4000	63.4000	63.4000	63.4000	
obs.-exp.	−16.4000	−14.4000	−13.4000	8.6000	35.6000	
Total: observed	127.0000	127.0000	127.0000	127.0000	127.0000	635.0000

In order to discover which years are significantly different from one another the non-parametric Mann–Whitney test was used, under the hypothesis of non-homogeneity of variances, obtaining the results set out in Table 10:

Table 10. Mann–Whitney test.

		Z	p-Level	Significant
EU	Y2016 vs. Y2012	6.032353	0.000000	Yes
	Y2016 vs. Y2013	6.298073	0.000000	Yes
	Y2016 vs. Y2014	6.098119	0.000000	Yes
	Y2016 vs. Y2015	2.680851	0.007344	Yes
	Y2015 vs. Y2012	3.660797	0.000251	Yes
	Y2015 vs. Y2013	3.865622	0.000111	Yes
	Y2015 vs. Y2014	3.516014	0.000438	Yes
	Y2014 vs. Y2012	0.463869	0.642742	No
	Y2014 vs. Y2013	0.599515	0.548830	No
	Y2012 vs. Y2013	0.073647	0.941292	No
SA	Y2016 vs. Y2012	5.377173	0.000000	Yes
	Y2016 vs. Y2013	5.653027	0.000000	Yes
	Y2016 vs. Y2014	5.149135	0.000000	Yes
	Y2016 vs. Y2015	3.211271	0.001322	Yes
	Y2015 vs. Y2012	3.160881	0.001573	Yes
	Y2015 vs. Y2013	3.426492	0.000612	Yes
	Y2015 vs. Y2014	2.826090	0.004712	Yes
	Y2014 vs. Y2012	0.594426	0.552228	No
	Y2014 vs. Y2013	0.904451	0.365757	No
	Y2012 vs. Y2013	0.287818	0.773486	No

The test clearly shows that in both regimes the mean distribution of the A4R integrated performance indicator follows two different trends: one in reference to the period 2012–2014 and the other to the period 2015–2016.

The analyses carried out have highlighted significant differences in the A4R indicator over the period under consideration, thus in the mean levels of integrated performance in the two contexts examined.

South Africa is characterised by a lower initial mean value of the A4R indicator, which increases—as happens in Europe—over the period examined. In both contexts, moreover, variability around the mean value constantly declines over the years (see Table 4).

In general, the higher levels of integrated performance recorded by European companies can be explained by considering that these companies are part of a European population characterised by greater awareness of the process of value creation and a better capacity to manage it: in other words, they are companies with high level profiles compared with others operating in the territorial context. It was, therefore, to some extent logical to expect this result.

The study we carried out, however, brought to light that levels of integrated performance significantly improved in the years following the adoption of a mandatory integrated reporting approach, with effects that grow stronger over the medium term (see Figure 3). South African companies, therefore, after an initial phase, seem to have effectively taken on board and exploited the advantages deriving from integrated thinking. In fact, South African companies considerably reduced the gap that separated them from high level European companies that voluntarily adopted integrated reporting practices.

Research questions 1 and 2 are, thus, both verified.

3.2. Research Question 3

For data processing purposes, we used the following model:

$$MVS_{it} = \beta_1 A4R_{it} + \beta_2 BVS_{it} + \beta_3 EPS_{it} + \lambda_i + \varepsilon_{i,t} \quad (2)$$

where:

- β_i are the standardized regression coefficients;
- λ_i represents the mean corporate effect
- $\varepsilon_{i,t}$ represents the error, that is the mean quota of market value per share not explained by the model because of missing variables.

The other models tested with the further control variables SIZE and LEV were rejected because these variables proved to be statistically non-significant.

As concerns what was mentioned above in Section 2.2, verification of Research Question 3 was carried out using a linear price-level model with a “cross sectional time series” data formulation, better known as panel data. Considering, however, that the aim is to study the difference, in the two geographical areas studied (Europe and South Africa), of value relevance of traditional accounting values on the balance sheet, to which the A4R integrated performance indicator is added, we used a fixed effects regression model, which hypothesizes the existence of individual effects of each company constant over time.

In advance, the fixed effect panel regressions [38,39] were compared with the simple pooling models [40]. From test F it can be seen that use of fixed effects models is justified by rejection of the null hypothesis (H_0 = the groups have a common intercept) of test F (Table 11):

Table 11. Test F for the group intercept difference.

	SA	EU
Test F $H_0: \omega_t = 0$	19.05	23.46
Degrees of freedom	112.449	362.1449
p-value	7.17×10^{-117}	0.000

Moreover, the Hausman test confirms that the fixed effects model is preferable to the random effects model.

In the fixed effects model, λ_i and ω_t are considered determinant; in the random effects model, on the other hand, they are stochastic. The Hausman test allows verification of whether the fixed effects model (H_1) or random effects model (H_0) is more appropriate [36].

The results obtained by panel regressions are the following.

Examination of the parameters of the two fixed effect equations shows that for both geographical contexts in question the A4R integrated performance indicator is value relevant in statistically significant terms (see Table 12), and with a greater impact on investors' choices in the European context, in which the companies in the sample studied are also characterized by a lower value relevance of the BVS and of the EPS compared with South Africa.

Table 12. Panel Regression.

Fixed Effect Panel Regression (Dependent Variable Market Value per Share: MVS)	SA	EU
A4R	57.8386	194.689
<i>p-value</i>	0.00562	0.00273
BVPS	2.06578	0.00259092
<i>p-value</i>	<0.00001	0.08953
EPS	0.492042	0.00173262
<i>p-value</i>	0.027423	0.08016
<i>const</i>	−3217.1	21763.3
<i>p-value</i>	0.03698	0.00001
R^2	0.8849	0.8562

4. Discussion and Conclusions

In this paper, we have examined the topic of the regulation of integrated reporting for listed companies, from an economic-corporate viewpoint, with the intention of contributing to the debate on the usefulness of introducing a mandatory regime, both from the viewpoint of integrated corporate performance sustainability and that of relevance of information for providers of financial capital.

The three research hypotheses tested in our paper have been confirmed.

Firstly (RQ1): it was demonstrated that companies that adopt the integrated reporting approach voluntarily have higher levels of integrated performance. As we clarified in the paper, this result was to be expected, even though we decided to provide empirical evidence, because the companies selected in the voluntary regime area (EU) represent a “select” part of the whole population; that is, a group of companies that probably use integrated reporting practices because they have “something extra” to show compared with other companies in the same area that do not adopt these practices.

The descriptive statistics used for RQ2 showed that there has been a significant growth in the integrated performance of companies after the regulation of integrated reporting in South Africa. It is clear that this does not necessarily mean that the mandatory integrated reporting requirement is the only reason explaining that increase. Nonetheless, that empirical evidence reasonably allows us to say that the introduction of the mandatory regime has played a positive role, especially considering that the regulation of integrated reporting was one of the most important innovations of the period in South Africa. In the opposite direction, it is reasonable to exclude that the new regulation of integrated reporting has had negative effects, because the sample of South African companies significantly reduced the gap with the sample of European companies during the post-adoption period considered in the analysis.

Thus, we believe that all the above considerations allow us to say that in South Africa the introduction of a mandatory integrated reporting regime revealed to be an effective measure for

improving the companies' integrated performance. The results obtained show that the effects were mainly felt in the medium term, thus confirming the uncertainty expressed in literature on the short-term effects tied to the introduction of a mandatory regime of integrated reporting [20]. On the other hand, the study demonstrates that mandatory adoption—which in the short term could be perceived by companies as an obligation which causes difficulties due to the need to adapt the corporate culture and reporting systems, costs and new compliances—nonetheless played positive effects in the medium term.

The analyses carried out to respond to RQ3, finally, demonstrated that the A4R indicator is value relevant in statistically significant terms. The European context shows greater valorisation by the market of the A4R integrated performance indicator, in the presence of di very low regression coefficients for EPS and BVS. The A4R regression coefficient is also very high and statistically significant for South Africa, but in this context, there is a greater valorisation by the market of EPS, and above all BVS, compared with Europe. With reference to the samples and the geographical zones examined, therefore, there is a significant relationship between the integrated performance indicators and the market value of the companies, which is more relevant for companies that voluntarily adopt the integrated report. Thus, for our sample and the period under investigation, the empirical evidence proves that the level of integrated performance positively influenced investors' choices, producing consistent benefits on the market capitalization of companies, with a low relevance of traditional accounting information (book value and earnings).

These findings have important practical implications, particularly for managers of the companies and policymakers. As regard the managers, the value relevance of the A4R indicator shows that the ESG practices are considered by investors in their investment decisions, thus they are important drivers for the enterprises' value. Because the investors are critical stakeholders which wield considerable influence on the strategy of the companies [17], the managers should be aware of the importance of keeping a balanced view of company's ESG performance for the shareholders' value creation. In a wider perspective, therefore, this confirms the role of integrated reporting as a tool for achieving sustainability [13]. For the policymakers, the main issue concerns the usefulness of the mandatory adoption of integrated reporting. This aspect was addressed with various perspectives in the literature [4,8,12,17–20]. The findings of our paper provide a contribution to this debate by giving an empirical evidence of the general increase in the integrated performance level of the companies after the mandatory adoption of the integrated practices.

As regards future research directions, other statistical analyses could be addressed to explore to which extent a cause–effect relation could exist between the mandatory adoption of integrated reporting and the increase in the integrated performance (financial, environmental, social and governance) and to investigate if in the context of voluntary adoption integrated reporting shows the same positive effects on integrated thinking, as demonstrated by similar studies conducted with reference to South Africa [4–6,20,41,42].

Supplementary Materials: The following are available online at <http://www.mdpi.com/2071-1050/10/5/1351/s1>, Table S1: South Africa dataset regressions, Table S2: Europe dataset regressions, Table S3: South Africa data (2012–2016), Table S4: Europe data (2012–2016).

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References

1. Dumay, J.C. A critical reflection on the future of intellectual capital: From reporting to disclosure. *J. Intell. Cap.* **2016**, *17*, 168–184. [CrossRef]
2. International Integrated Reporting Council. The International <IR> Framework. 2013. Available online: <http://integratedreporting.org/resource/international-ir-framework/> (accessed on 11 February 2018).
3. Lourenco, I.C.; Callen, J.L.; Branco, M.C.; Curto, J.D. The value relevance of reputation for sustainability leadership. *J. Bus. Ethics* **2014**, *119*, 17–28. [CrossRef]
4. Baboukardos, D.; Rimmel, G. Value relevance of accounting information under an integrated reporting approach: A research note. *J. Account. Public Policy* **2016**, *35*, 437–452. [CrossRef]
5. Setia, N.; Abhayawansa, S.; Joshi, M.; Huynh, A.V. Integrated reporting in South Africa: Some initial evidence. *Sustain. Account. Manag. Policy J.* **2015**, *6*, 397–424. [CrossRef]
6. Ahmed Haji, A.; Anifowose, M. Initial trends in corporate disclosures following the introduction of integrated reporting practice in South Africa. *J. Intell. Cap.* **2017**, *18*, 373–399. [CrossRef]
7. Eccles, R.G.; Serafeim, G. Accelerating the adoption of integrated reporting. In *CSR Index*; de Leo, F., Vollbracht, M., Eds.; InnoVatio Publishing Ltd.: Boston, MA, USA, 2011; pp. 70–92.
8. Solomon, J.; Maroun, W. *Integrated Reporting: The Influence of King III on Social, Ethical and Environmental Reporting*; The Association of Chartered Certified Accountants: London, UK, 2012.
9. Bernardi, C.; Stark, A.W. Environmental, social and governance disclosure, integrated reporting, and the accuracy of analyst forecasts. *Br. Account. Rev.* **2016**, *50*, 16–31. [CrossRef]
10. Middleton, A. Value relevance of firms' integral environmental performance: Evidence from Russia. *J. Account. Public Policy* **2015**, *34*, 204–211. [CrossRef]
11. Lee, K.W.; Yeo, G. The association between integrated reporting and firm valuation. *Rev. Quant. Finance Account.* **2016**, *4774*, 1221–1250. [CrossRef]
12. Ioannou, I.; Serafeim, G. *The Consequences of Mandatory Corporate Sustainability Reporting*; Harvard Business School Research; Working Paper No. 11-100; Harvard Business School: Boston, MA, USA, 2012.
13. Ohlson, J.A. Earnings, Book Values and Dividends in Equity Valuation. *Contemp. Account. Res.* **1995**, *11*, 661–687. [CrossRef]
14. Barth, M.E.; Beaver, W.H.; Landsman, W.R. The Relevance of the Value Relevance Literature for Financial Accounts Standard Setter: Another View. *J. Account. Econ.* **2001**, *31*, 77–104. [CrossRef]
15. Kothari, S.P. Capital markets research in accounting. *J. Account. Econ.* **2001**, *31*, 105–231. [CrossRef]
16. Mechelli, A. *La Value Relevance del Bilancio di Esercizio. Modelli, Metodologie di Ricerca ed Evidenze Empiriche*; Giappichelli Editore: Turin, Italy, 2013.
17. Eccles, R.G.; Saltzman, D. Achieving sustainability through integrated reporting. *Stanf. Soc. Innov. Rev.* **2011**, *9*, 56–61.
18. Doshi, A.R.; Dowell, G.W.; Toffel, M.W. How firms respond to mandatory information disclosure. *Strateg. Manag. J.* **2013**, *34*, 1209–1231. [CrossRef]
19. Hung, M.; Wang, Y. Mandatory CSR Disclosure and Shareholder Value: Evidence from China. HKUST Working Paper. Available online: http://www-bcf.usc.edu/~yongxiaw/CSR_HSW_final.pdf (accessed on 8 February 2018).
20. Steyn, M. Organizational benefits and implementation challenges of mandatory integrated reporting: Perspectives of senior executives at South African listed companies. *Sustain. Account. Manag. Policy J.* **2014**, *5*, 476–503. [CrossRef]
21. Miralles-Quirós, M.M.; Miralles-Quirós, J.L.; Gonçalves, M.V. The Value Relevance of Environmental, Social, and Governance Performance: The Brazilian Case. *Sustainability* **2018**, *10*, 574. [CrossRef]
22. Pavláková-Dočekalová, M.; Kocmanová, A. Comparison of Sustainable Environmental, Social, and Corporate Governance Value Added Models for Investors Decision Making. *Sustainability* **2018**, *10*, 649. [CrossRef]
23. Sutopo, B.; Kot, S.; Adiati, A.K.; Ardila, L.N. Sustainability Reporting and Value Relevance of Financial Statements. *Sustainability* **2018**, *10*, 678. [CrossRef]
24. Alshehhi, A.; Nobanee, H.; Khare, N. The Impact of Sustainability Practices on Corporate Financial Performance: Literature Trends and Future Research Potential. *Sustainability* **2018**, *10*, 494. [CrossRef]
25. Timbate, L.; Park, C.K. CSR Performance, Financial Reporting, and Investors' Perception on Financial Reporting. *Sustainability* **2018**, *10*, 522. [CrossRef]

26. Singh, P.J.; Sethuraman, K.; Lam, J.Y. Impact of Corporate Social Responsibility Dimensions on Firm Value: Some Evidence from Hong Kong and China. *Sustainability* **2017**, *9*, 1532. [CrossRef]
27. Gómez-Bezares, F.; Przychodzen, W.; Przychodzen, J. Corporate sustainability and shareholder wealth. Evidence from British companies and lessons from the crisis. *Sustainability* **2016**, *8*, 276. [CrossRef]
28. Easton, P.D.; Sommers, G.A. Scale and the Scale Effect in Market-Based Accounting Research. *J. Bus. Finance Account.* **2003**, *30*, 25–56. [CrossRef]
29. Barth, M.E.; Clinch, G. Scale Effects in Capital Markets-Based Accounting Research. *J. Bus. Financ. Account.* **2009**, *36*, 253–288. [CrossRef]
30. Thomson Reuters Eikon. Thomson Reuters ESG Scores. Available online: <https://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/financial/esg-scores-methodology.pdf> (accessed on 4 April 2018).
31. Levene, H. Robust tests for equality of variances. In *Contributions to Probability and Statistics: Essays in Honor of Harold Hotelling*; Olkin, I., Hotelling, H., Eds.; Stanford University Press: Palo Alto, CA, USA, 1960; pp. 278–292.
32. Corder, G.W.; Foreman, D.I. *Nonparametric Statistics: A Step-by-Step Approach*; Wiley: Hoboken, NJ, USA, 2014.
33. Kruskal, W.H.; Wallis, W.A. Use of ranks in one-criterion variance analysis. *J. Am. Stat. Assoc.* **1952**, *47*, 583–621. [CrossRef]
34. Giardina, B. *Statistica non parametrica*; Franco Angeli: Milan, Italy, 1972.
35. Coletta, G. Una Guida per la Stima dei Modelli Panel Dinamici: Le Specificità dei Modelli Macroeconomici. Available online: http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/37/050/37050078.pdf (accessed on 8 February 2018).
36. Hausman, J. Specification Tests in Econometrics. *Econometrica* **1978**, *46*, 1251–1271. [CrossRef]
37. Baltagi, B.H. *Econometric Analysis of Panel Data*; John Wiley & Sons: New York, NY, USA, 2001.
38. Hsiao, C. *Analysis of Panel Data*; Cambridge University Press: Cambridge, UK, 2003.
39. Maddala, G.S. *Introduction to Econometrics*, 3rd ed.; John Wiley & Sons: New York, NY, USA, 2001.
40. Manera, M.; Galeotti, M. *Microeconometria: Metodi e Applicazioni*; Carocci Editore: Rome, Italy, 2005.
41. Atkins, J.F.; Maroun, W. Integrated reporting in South Africa in 2012: Perspectives from South African institutional investors. *Meditari Account. Res.* **2015**, *23*, 197–221. [CrossRef]
42. De Villiers, C.; Rinaldi, L.; Unerman, J. Integrated reporting: Insights, gaps and an agenda for future research. *Account. Audit. Account. J.* **2014**, *27*, 1042–1067. [CrossRef]



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