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Early adopters of integrated reporting: The case of the mining industry in South Africa

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This study aims to investigate the structure and the content of Integrated Reporting, a new corporate reporting model that seeks to link financial and non-financial information disclosed by companies. This paper assesses the nature and extent of non-financial disclosures in corporate reports of the mining companies listed on the Johannesburg Stock Exchange. The methodological approach is Content Analysis with the aim of carrying out an automated lexical/textual analysis on the content of non-financial information using software for collecting a *Corpus* of data from the analysed corporate reports. The results do not highlight good practices of non-financial disclosure: the overall analysis does not detect homogeneous behaviour among companies. Nevertheless, the higher incidence of issues on Key Performance Indicators (KPI) targets and governance structures could be due to their relationship to certain listing requirements. The analysed period is restricted to one year, and it could be interesting to perform a longitudinal analysis. There is also a lack of a comparative analysis by means of the assessment of other industries in South Africa. Integrated Reporting is still in its early stages; consequently, findings from the first adopters may provide an insightful overview about its threats and weaknesses and practical suggestions for its preparers and users. The research may contribute to studies on the mining industry in the first country that has required the adoption of Integrated Reporting. The present study focuses on the first adoption of a new reporting tool that may be able to improve corporate communication to a wide range of stakeholders.

Key words: Integrated reporting, textual analysis, disclosure index, non-financial information, mining industry, South Africa.

INTRODUCTION

This study focuses on an analysis of the first adoption of Integrated Reporting (IIRC, 2013a), a new model of business reporting that combines financial and non-financial information, with a particular focus on the environmental, social and corporate governance items (Eccles and Krzus, 2010, 2014; Adams et al., 2011;

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Eccles and Armbrester, 2011; Tilley, 2011; Busco et al., 2013; King and Roberts, 2013). Consequently, Integrated Reporting (IR) aims to disclose information about the company's strategy, corporate governance and financial performance; to reflect the financial, social and environmental context within which companies operate; and to disclose a detailed description of companies' value creation in the medium-long term (IIRC, 2013b; Eccles and Krzus, 2010, 2014; Churet and Eccles, 2014; PWC 2010). Although a standardized structure has not yet been defined and there are no detailed guidelines (Rossouw, 2010: Busco et al., 2013; Abeysekera, 2013), IR has already been adopted (CorporateRegister.com, 2013) by an increasing number of companies[1].

The purpose of this paper is to contribute to the empirical understanding of early Integrated Reporting practices among the South African listed companies. This is achieved by analysing the IR disclosures within a wide range of corporate reports[2] in the first stage of IR adoption (fiscal year 2011). The research objectives are the following:

RO1: to identify the main items of non-financial information that should to be included in Integrated Reporting to highlight the major features of the IR content and structure;
RO2: to assess both the amount (how much) and themes (what) of non-financial information disclosed in corporate reports drawn up by 20 South African mining companies listed on the Johannesburg Stock Exchange (JSE).

The selection of South African companies is justified by several reasons; for example, there are interesting disclosure requirements issued by King Code of Governance Principles for South Africa (King III, 2009). In addition, the companies listed on the JSE are required to adopt Integrated Reporting for all financial years ending on or after March 1st 2010. There is also a strong propensity for developing countries to disclose items in the three categories of intellectual capital (Goh and Lim, 2004; Abeysekera, 2008) and social and environmental issues (de Villiers and van Staden, 2006).

The mining sector was chosen because of its significant role in the South African economy and its high risk with regard to ethical, social (Davis et al., 2012) and environmental issues (Firk, 2002; de Villiers and van Staden, 2006; Lodhia and Hess, 2014). The mining industry also includes companies with the highest environmental impacts, for example, high CO_2 emissions (National Treasury, 2010; Hindley and Buys, 2012); it needs its operations to be legitimized by means of environmental disclosures and practices (de Villiers and Barnard, 2000).

Reflecting the growing importance of non-financial disclosures in the success and reputation of many companies, there has been a dramatic increase in the academic attention paid to various aspects of these items, but IR adoption is still in its early stage and only few studies have made an in-depth investigation of the first reports drawn up by South African companies at the outset of IR implementation (Hindley and Buys, 2012; Carels et al., 2013; Setia et al., 2015).

KING CODE III (THE KING REPORT ON GOVERNANCE FOR SOUTH AFRICA 2009)

Companies listed on the JSE are required to implement integrated sustainability performance and integrated reporting[3] (all companies must issue an "integrated report" for financial years starting on or after March 1, 2010 m or explain why they are not doing so). The new requirements stem from the Institute of Directors, South Africa (IODSA)'s King Code of Governance Principles (King III). New JSE listing requirements put the Code into effect on 1 March 2010 for financial years ending 28 February 2011 and beyond. Although the King III enables companies to draw up separate reports for financial and non-financial information, the revolution brought about by the adoption of IR is represented by the deep cohesion among the different types of information: rather than being developed separately, financial, environmental, social and governance reports are produced in close connection with each other and made available simultaneously on the websites of listed companies.

King III recommends that entities adopt IR to enable stakeholders to make a more informed assessment of a company, based on a combination of its financial and social value, rather than its book value alone. In the words of Mervyn King, "Sustainability is the primary moral and economic imperative for the 21st century". The term "integrated report" is used throughout the Code and is explained in chapter 9: "The integrated report should … have sufficient information to record how the company has both positively and negatively impacted on the economic life of the community in which it operated during the year under review, often categorized as environmental, social and governance issues (ESG). Further, it should report how the board believes that in the coming year it can improve the positive aspects and eradicate and ameliorate the negative aspects" (King Code of Governance Principles for South Africa 2009: 9). King III's key principles are the following: Leadership, Sustainability and Corporate Citizenship. In particular King III identifies certain principles of IR and disclosure (King III, Chapter 9) that should inform the process of IR.

1 In addition, IIRC launched a *Pilot Programme* (2011) that provided a platform for companies to begin applying the principles of Integrated Reporting. This initiative ended in October 2014 (www.theiirc.org).

2 In the early stage of the IR mandatory adoption, the listed mining companies chose to prepare several report models, an integrated report and an annual report plus stand-alone reports. See Appendix 1.

3 Integrated reporting means "a holistic and integrated representation of the company's performance in terms of both its finance and its sustainability." IoDSA, King Code of Governance for South Africa 2009, p. 55.

Integrated reporting and disclosure requirements

The board should ensure that appropriate systems and processes are put in place to produce a report to stakeholders that provides a complete picture of a company's financial and non-financial profiles such that the report is holistic and reliable. To comply with the recommendations of the Code, "reporting should be integrated across all areas of performance, reflecting the choices made in the strategic decisions adopted by the board, and should include reporting in the triple context of economic, social and environmental issues. The board should be able to report forward-looking information that will enable stakeholders to make a more informed assessment of the economic value of the company as opposed to its book value." King III recommends companies adopt IR to show the following key elements of business:

1. Effective ethical leadership and corporate citizenship;
2. Governance of risk;
3. Governance of information technology;
4. Compliance with law, codes, rules and standards;
5. Their relationship with governing stakeholders.

More specifically: 1. Company decision-makers (the board of directors) should ensure the proper conduct of their firm in terms of their positive impact on the triple bottom line to qualify the company itself as a "good corporate citizen". 2. King III defines the roles and responsibilities for a risk management approach involving all types of business operations. 3. In addition, King III attaches great importance to the governance and management of information technology resources for the achievement of high specific skills. 4. Companies are required not only to comply with the rules established by law but also to follow those non-binding rules that can improve corporate governance. 5. A final aspect introduces an interesting new concept called "Alternative Dispute Resolution" (ADR), reported as Principle 8.10 in Chapter 8, "Managing stakeholder relationships", whereby King III places particular emphasis on stakeholders with the aim of providing adequate solutions to disputes that may arise in business relationships. To this end, it should be noted that the Code requires the Board to provide forecast information and ensure its quality and reliability, as this aspect represents a priority request by stakeholders.

The lack of a standard reporting framework may represent a serious obstacle to the current implementation of King III by all listed companies. For this reason, the role of the Integrated Reporting Committee South Africa (IRC SA) becomes essential, in that it does not reiterate the disclosure principles of King III, but "it sets out a framework within which such disclosures can be reported using the principles of "apply or explain" and of "substance over the form" (IRC SA, 2012: 18). The processing of a report should be carried out thoroughly from the very beginning by implementing the principles in the company's core business strategy to generate undoubted benefits, such as an increase in the legitimacy of the company's transactions and higher confidence among stakeholders.

The IRC and its framework working group will coordinate efforts with the Global Reporting Initiative's (GRI's) new International Integrated Committee (IIRC). The establishment of the IIRC is designed to support one of GRI's goals for 2020, to converge ESG and financial reporting, which was announced at the Amsterdam Global Conference on Sustainability and Transparency in late May 2010 (www.amsterdamgriconference.org/index.php?id=39&item=33). A fundamental support mechanism for the implementation of IR is the Global Reporting Initiative (GRI), a member of the International Integrated Reporting Council (IIRC), together with the International Accounting Standards Board (IASB), the Financial Accounting Standards Board (FASB), the Prince's Accounting for Sustainability Project and the World Business Council for Sustainable Development (WBCSD). The GRI is a globally recognized organization that has *de facto* established the standards for ESG reporting. As is well-known, in addition, the GRI sets the guidelines not only for "what to report" but also for "how to report", as well as laying down the rules for the implementation of reports in accordance with the so-called triple bottom line. The G3 guidelines (G3) were developed in 2006 and represent the third generation of GRI Guidelines for sustainability reporting. The guidelines indicate the general principles, guidelines and communication standards that should be included in sustainability reports. Recently, GRI updated these guidelines and issued a new version, the 2013 G4 Guidelines (GRI, 2013).

LITERATURE AND BACKGROUND OF THE STUDIES

The strong need to change corporate reporting (Beattie, 2000; Singleton-Green, 2010) towards a gradual "managerialization", that is, the adoption an internal perspective in the drawing up of external disclosure (Beattie and Pratt, 2003; Beattie et al., 2004; Zambon, 2011) has been boosted by the unanimous acknowledgement of the lack of information in traditional corporate reporting. The information gaps mainly concern the recognition and measurement of intangibles and intellectual capital (Striukova et al., 2008); more recently, environmental and sustainability items and ESG indicators (Environmental, Social and Governance) have become key information items (Gazdar, 2007; FEE, 2008; KPMG, 2011a, b; Hopwood et al., 2010; Eccles and Krzus, 2010, 2014; Porter and Kramer, 2011; IIRC, 2011, 2013a; ACCA and Eurosif, 2013; Iannou and Serafeim, 2014). Companies are being forced to re-evaluate how they can report financial and non-financial data as transparently as possible to all stakeholders (Rensburg

and Botha, 2014). Non-financial disclosure is especially remarkable because it provides different stakeholders with information that financial reporting alone fails to provide (White, 2005). Stakeholder theory emphasizes the need for an organization to identify powerful stakeholders (Stainbank, 2012) to which it is accountable and to maintain a good relationship with these stakeholders, which could include voluntarily disclosing information (Deegan et al., 2000; Newson and Deegan, 2002; Van Staden, 2003; Gray et al., 2014).

The mining sector shows an exceptional sensitivity to ESG issues (Frik, 2002) and corporate social responsibility (de Villiers and Alexander, 2014). Therefore, stakeholders would give due attention to the industry's environmental, social and governance performance. Jenkins and Yakovleva (2006: 272) state that there is an increased demand for the disclosure of social and environmental information by mining companies as a means of legitimizing their existence and documenting their performance (de Villiers and van Staden, 2006; Pellegrino and Lodhia, 2012; de Villiers and Alexander, 2014). Environmental legitimacy shows a strong relationship with environmental accountability, which involves the public evaluation of corporate environmental performance and reporting. This is also dependent on environmental proactivity, which requires companies to invest in environmental management and accounting systems, as well as stakeholder engagement (Alrazi et al., 2015).

Prior research: The case of South Africa and the mining industry

First, an overview of the existing literature evaluates the previous studies focused on corporate reporting referring to the integration of financial and non-financial information. As a preliminary result, a strong need for the disclosure of non-financial information can be emphasized in several studies (Robb et al., 2001; White, 2005; Bollen, 2004; Palenberg et al., 2006; Gazdar, 2007; Coram et al., 2009). According to Gray et al. (1995), non-financial reporting and especially social and environmental disclosure is country-dependent because independent studies in different countries provide different results. This type of disclosure in developing countries is crucial (Kumah, 2006; Islam and Deegan, 2008, de Klerk and de Villiers, 2012) and particularly necessary given the presence of multinational corporations in developed countries.

In depth-analyses mainly concentrate on the studies carried out in the mining industry, whereas, is well known, non-financial disclosure causes undoubted benefits in terms of transparency (KPMG, 2006). The increase and improvement of disclosure on intangibles, intellectual capital (Firer and Williams, 2003; Yongvanich and Guthrie, 2005), social (Coetzee and van Staden, 2011), sustainability (Borkowski et al., 2012) and environmental (Burritt, 1997; Antonites and de Villiers, 2003; Jenkins and Yakovleva, 2006) items is to be welcomed by mining industry stakeholders (Yakovleva and Vazquez-Brust, 2012). Moreover, it is possible to find several studies focused on Corporate Social Responsibility (CSR) (Warhurst, 1998; Tawiah and Dartey-Baah, 2005; Guenther et al., 2007; Hutchins et al., 2007) and on corporate governance within the mining industry (Abdo and Fisher, 2007; Mangena and Tauringana, 2007).

The previous content analysis studies based on companies' annual reports within the mining industry have mainly focused on environmental and social disclosures (de Villiers and Barnard, 2000; de Villiers and Lubbe, 2001; Jenkins and Yakovleva, 2006; Kemp et al., 2010; Fonseca et al., 2014; Maubane et al., 2014; Lodhia and Martin, 2014; de Villiers et al., 2014), sustainable management practices (Maffini et al., 2015), IC measurements and reporting (April et al., 2003), voluntary disclosures (Stainbank, 2012) and risk disclosures. If we shift from *content analysis studies* based on traditional corporate reporting to *content analysis studies* based on IR, we find that few studies have attempted to explore the disclosures and practices of the first adopters of IR (Wild and van Staden, 2015) in the mining sector (Hindley and Buys, 2012; Carels et al., 2013).

To verify the crucial role of IR in overcoming the information gaps in traditional corporate reporting (Eccles and Krzus, 2010, 2014; Leuner, 2012), we sought to evaluate the content of non-financial information (Chauvey et al., 2013) and the materiality of non-financial Key Performance Indicators (KPIs) by performing a content analysis on IR via a sample of listed mining companies.

METHODOLOGY

Content analysis and text mining

The methodological approach is the content analysis (Krippendorff, 1980; Weber, 1990; Krippendorff and Bock, 2009), which is often adopted in social sciences to measure external disclosures (Beattie et al., 2004; Beattie and Thomson, 2007), which are sometimes supported by a disclosure-scoring system (Robb et al., 2001; Vanstraelen et al., 2003). This analysis may generate data that can take the form of judgments of kind, magnitude and frequency (Hayes and Krippendorff, 2007). In addition, this methodological approach is useful because content analysis as a well-established method in social science and can classify text units into categories (Beattie et al., 2004; Dumay and Cai, 2015). Despite the important contribution of content analysis to analyse the "narrative" portion of companies' reports, many scholars have noted criticisms, for example: difficulties in delivering reliable content analysis (Boyatzis, 1998); difficulties regarding the choice of different units of analysis, such as words, sentences or pages (Gray et al., 1995; Beattie and Thomson, 2007); the need to test the reliability of the coding decision rules (Milne and Adler, 1999; Krippendorff, 2004; Krippendorff and Bock, 2009) and the disclosure rating (that is, by dummies or frequency counts).

The increasing and continuous production and spreading of

digital text data, as well as the evolution of information technology, have enabled the development of methods and algorithms for the acquisition, classification and automatic management of a large amount of unstructured textual databases. In the 1960s and '70s, statistical studies on data expressed in natural language or textual data had already undergone deep changes as a result of the evolution of information technology, later leading to the introduction of automatic text analysis and textual statistics (Lebart and Salem, 1994). Today, the latest solutions are no longer based solely on statistical instruments but are in fact the result of a strict multi-disciplinary approach whereby such instruments are combined with computer and language instruments, particularly in a research area known as text mining (Sullivan, 2001; Zanasi, 2005; Bolasco et al., 2005). In this context, text mining has become essential to draw out knowledge from data (Korczak et al., 2013). The use of automatic techniques for text analysis thus becomes necessary whenever the amount of information is such that it hinders the manual resolution of problems in terms of data classification and clustering.

Given these premises, to limit certain criticisms (the first and third in the list indicated above) of content analysis and reach a great level of reliability avoiding subjectivity, this analysis should be performed by a specific software programme (Beattie and Thomson, 2007; Gumb and Noël, 2009). The use of software shows certain limitations due to the search and count of the unit of analysis; in our case, these limits are overcome due to the sophisticated treatment of the text by the software. It is important to emphasize that automatic content analysis is not able to indicate the location of the items as each company's reports are combined into a single TXT file.

Disclosure index

The main items of IR structure and content used in content analysis in the following tables contain a methodological reference in the following documents:

(i) 'King Report on Governance for South Africa' and 'King Code of Governance Principles' (King III). The Institute of Directors in Southern Africa, 2009;
(ii) Integrated Reporting Committee of South Africa (IRC SA), Discussion Paper, 25 January 2010;
(iii) International Integrated Reporting Council (IIRC), Towards Integrated Reporting - Communicating Value in the 21st Century, Discussion Paper, September 2011;
(iv) Survey conducted by Deloitte (2012) available in the paper "Integrated Reporting: Navigating your way to a truly Integrated Report", February 2012.

We decided to select nine semantic categories correlated to the key contents of IR (Table 1) on the basis of the framework issued by Deloitte (2011). For each category, we selected certain words or groups of words to understand how companies disclosed these issues within IR (Table 2).

Sample selection

The mining sector represents a significant portion of the South African economy (Davies et al., 2002; Maubane et al., 2014). All 20 South African mining companies listed on the JSE in 2012 were included in this study (Appendix 1). Mining companies were selected because the mining industry represents the largest market capitalization on the JSE (ADVFN, 2007). Consequently, the influence of the mining industry on the South African economy is substantial (PWC, 2013).

The 2011 corporate reports drawn up by the mining companies listed on the JSE were downloaded from the websites of these companies and analysed. The results of the content analysis were then tabulated in spreadsheet format using the Excel package. The extent of the quantity (how much) and themes (what) of disclosure and the benchmark assessment of the companies' non-financial disclosures were captured in tables for analysis.

Johannesburg stock exchange SRI index

The JSE SRI was launched in May 2004 as a system to identify those companies listed on the JSE that incorporate the principles of the triple bottom line and good corporate governance into their business operations (JSE and EIRIS, 2010). Some of the companies provided the GRI disclosure index for their non-financial reporting, which made it easy to follow the extent of their non-financial disclosures. Listed South African mining companies are encouraged to adopt GRI as the basis of their sustainability reporting in terms of King III. In other terms, King III recommends that companies produce an integrated report in place of an annual report and a separate sustainability report and that companies create CSR reports according to the GRI Guidelines. This fact provided the impetus for the improvement in these disclosures.

In the following tables, it is possible to notice the companies that have obtained the best results in terms of SRI index: in the first column labelled "high impact", there are eight mining companies that are included in our sample (Table 3). Table 4 shows the companies that obtained the best results in the last five years, 2007-2011 (the so-called "consistent best performers"). Four of the companies in our sample are on this list: Anglo American Plc, Anglogold Ashanti, Gold Fields Limited and Merafe Resources.

Research design and data collection

The empirical research sought to make a benchmarking analysis between the mining companies referring to both the amount and the themes of the information disclosed by the firms (Stainbank, 2012). An assessment of the degree of the companies' compliance with reference to the guidelines required by the above-listed documents will be formulated by means of a disclosure checklist (Table 5). The Research Questions are below:

RQ1: What are the amount (how much) and themes (what) of the items included in nine semantic categories (that is, disclosure checklist, (Table 5) disclosed by the mining companies listed on the JSE?
RQ2: Is it possible to identify homogeneous behaviour within the sample of the companies?
RQ3: What is the degree of compliance with items selected, in spite of the lack of a common framework for creating an integrated report in SA?

The analysed corporate reporting material mainly included the following documents[4]:

(1) Annual financial statements;
(2) Annual integrated reports;
(3) Sustainability reports;
(4) Mineral resource and ore reserve reports.

Annual report disclosures include a single component of an organization's public communication (Aerts and Cormier, 2009). Previous content analysis studies note that only examining the annual report could lead to underestimating the extent of social

[4] In this early stage of IR adoption, the mining companies decided to produce corporate reports in different manners, and it is possible to download various types of reports; only a few companies produced one report (see Table 5).

Table 1. The key issues of integrated reporting.

1)	**Group profile (Corporate context)**
	First few pages of the report to introduce the business
	In which sector does the business operate ?
	What type of business is this ?
	What are the products ?
	What is the structure of the Group and the company ?
	Where does the business operate ?
2)	**Scope and boundary**
	Indicate the reporting period to which the report pertains
	Focus on comparability between different reporting periods
	Focus on comparability between financial and non-financial information
3)	**Key features**
	Illustrate the company's main achievements and key features
	Ensure a balance between financial and non-financial information
	Utilise graphs, illustrations and pictures to deliver a clear message to the reader
4)	**Strategy Vision Values**
	Use this part of the report to inform the reader of the character and values of the business
	Clearly describe the strategic goals and objectives of the business
5)	**Governance structure**
	Set out the governance structure of the group and the company, including the committee structure
	Provide details on directors
	Describe the governance structures to manage risk and sustainability respectively
	Governance report should provide clear feedback on the performance of the Board and each committee
6)	**Stakeholders**
	The Integrated Report is directed at the business' key stakeholders
	Identify the key stakeholders of the business
	Identify the key interests and concerns of the key stakeholders
	Describe the strategy and methodology to ensure effective stakeholder communication
7)	**Material risks and opportunities**
	Identify the risks and opportunities facing the business
	Indicate the mitigation plans in place to mitigate the risks and capitalise on opportunities
	Ensure a balance between financial and other risks and opportunities
8)	**Key performance indicators and targets**
	Identify the key performance indicators as it pertains to the strategy, risks and stakeholder concerns
	Ensure a balance between financial and non-financial indicators
	Identify measurable targets linked to the key performance indicators
	Report back on the progress to achieve these targets
9)	**Remuneration**
	Explain the business' remuneration strategy
	How is remuneration used to ensure delivery on the business' strategy ?
	Information of long-term and short-term incentives, as well as financial and other incentives

Source: Adapted from the survey conducted by Deloitte "Integrated Reporting Navigating your way to a truly Integrated report" February 2012.

disclosures and that focusing exclusively on annual report disclosures may yield irrelevant or misleading results (Unerman, 2000). Therefore, this study analyses integrated reports, sustainability reports and other reports, such as mineral resource and ore reserve reports, which are useful for conveying non-financial information (Coetzee and van Staden, 2011).

An analysis of the reports made available on the websites of the sample of companies highlights significant differences in their

Table 2. Semantic categories and items for content analysis.

Group profile		Key performance indicators and targets		Key features	
Projects	1,843	Performance	3,660	Feedback	133
Structure	387	Targets	813	Materiality	116
Black economic empowerment	156	Mining operations	443	Maps	12
Market review	26	Summary	421	Graphs	12
Company overview	22	intangible assets	198	Symbols	7
Approach to reporting	22	Sustainability review	165	Connectivity	7
Managed mines	20	Forecast	156	Timelines	6
Operations review	20	Financial performance	152	Illustration	5
Story	14	Trend	124	Diagrams	1
Business overview	11	ISO 14001	124	Pictures	
Mining production	8	Environmental performance	104	Navigation tools	
Corporate objectives	8	Social performance	99	Quick reading	
Operational information	3	Global Reporting Initiative	87	Interactive tools	
Location of mines		Key performance indicators	86	Qualitative characteristics	
Product description		Achievements	85	Visual elements	
Extract operation		Sustainability performance	76	Request for further information	
Nature of the organization		Comparison	71	Ready accessible	
Overview of activities		Human capital	58	Conciseness	
Corporate context		Key features	32	Electronic information disclosure	
		ESG	19	XBRL	
		Intangibles	17		
		ISAE 3000	10		
		Improvement programmes	5		
		Ethics performance	4		
		Summary financial information	3		
		Measurable targets	2		
		Structural capital	2		
		Non financial			
		Non financial disclosure			
		Non financial targets			
		Non financial indicators			
		AA 1000 AS			
		ESG performance			
		ESG indicators			
		Relational capital			
		Intellectual capital			
Total	**2,540**	**Total**	**7,016**	**Total**	**299**

Strategy vision values		Governance structure		Stakeholders	
Strategy	1,782	Quality	652	Stakeholder engagement	280
Objectives	563	Audit committee	611	Expectations	208
Vision	207	Board of directors	515	Reputation	97
Innovation	78	Executive directors	445	Key stakeholders	45
Future outlook	61	Commitment	415	Stakeholder concerns	16
Mission	44	Ethics	394	Engagement process	14
Business Model	38	Internal audit	299	Credibility	10
Forward looking statements	23	Executive committee	262	Stakeholder inclusiveness	1
Management framework	22	Management systems	133	Target audience	1
Future targets	2	Independent assurance	81	Stakeholder needs	

Table 2. Contd.

Strategies (strategy) planning	1	Governance structure	39		
Future objectives		Non executive directors	19		
		Civil society	17		
		Principles of Corporate governance	6		
		Key governance policies	1		
		Employee involvement	1		
		Governance of risks	1		
		Ethics disclosure			
Total	**2,821**	**Total**	**3,891**	**Total**	**672**

Material risks and opportunities		**Scope and boundary**		**Remuneration**	
Risk management	1,074	Reporting period	204	Remuneration committee	383
Opportunities	683	Time period	6	Compensation	330
Challenges	353	Scope of the report	2	Remuneration report	292
Goals	147	Time boundary		Executive remuneration	53
Uncertainties	98			Annual Bonus	51
Risk factors	86			Remuneration policies	44
Key risks	47			Remuneration strategy	19
Business risks	30			Share incentives	10
Risk mitigation	23			Long term incentives	8
Risk analysis	10				
Risk disclosure	2				
Risks indicators					
Total	**2,553**	**Total**	**212**	**Total**	**1,190**

Source: Our elaboration.

Table 3. 2011 SRI Index Best Performers* (in alphabetical order by environmental impact).

High impact	**Medium impact**	**Low impact**
Anglo American Plc	Barloworld Limited	Absa Group
AngloGold Ashanti	Massmart Holdings Limited	The Bidvest Group Limited
ArcelorMittal South Africa	Steinhoff International Holdings	Old Mutual
Exxaro Resources		Santam
Gold Fields Limited		Standard Bank Group
Impala Platinum Holdings		Vodacom Group Limited
Kumba Iron Ore		
Lonmin Plc		
Merafe Resources		
Mondi		
Pretoria Portland Cement Company Limited		
Sappi Limited		
Woolworths Holdings		

*Best performers are companies that meet the thresholds for best performance in relation to environment and climate change, as well as all relevant core indicators in relation to both Society and Governance and related sustainability concerns, including independent chairperson.

approaches. In some cases, companies only disclose one report, while in other cases, they either provide several reports or only summary reports. Alternately, sometimes an integrated report is provided as both a single document and separate segments focusing on specific subjects. This has forced us to make some choices, and there are cases where some data have not been

Table 4. SRI index best performers for five years running (2007 – 2011) (in alphabetical order).

Absa Group
Anglo American plc
AngloGold Ashanti
Gold Fields Limited
Merafe Resources
Standard Bank Group

The table refers to 6 December 2011.

included in the corpus because they were already inserted in the main document. In other cases, additional documents, such as tables with KPIs or the reports given to shareholders at Annual General Meetings, or other reports prepared on a voluntary basis, have been included.

The overall size of the *corpus* (that is, all reports analysed) totals 2,479,586 occurrences[5] of which 292,002 are occurrences of numerical elements, for a total of 2,187,584 text occurrences, excluding numerical occurrences. Textual analysis sought to identify the extent of the items belonging to nine semantic categories in the sample of corporate reports and highlight the correlation between mining companies and semantic categories. The analysis is carried out in three steps: 1. Identification of the semantic categories in the *vocabulary* and *corpus* through semantic tagging; 2. Extraction of the information by using software called Regular Expression (RE) and 3. Assessment of the correlation between companies and documents through an analysis of simple correspondences.

The lexical/textual analysis of the corpus has been carried out using TaLTaC2 software[6] (Bolasco, 2010a), whereas SPAD 5.0 software was used for the analysis of correspondences. Semantic tagging recognizes the simple and complex forms of the nine semantic categories listed in Table 6 and records them in the vocabulary. The application of the RE allows for the identification of semantic categories in the corpus that were previously recorded in the vocabulary. Because this operation, a text variable can be generated in which the occurrences of the different semantic categories are calculated for each document.

To better compare the use of items among the different companies, it is necessary to normalize the frequencies to delete the effect of the different sizes of the documents (Table 7 normalized frequencies) (Graph 1).

The results are also presented as percentages, which are used to measure to what extent each company discloses information in reference to each category of non-financial information within the analysed reports. Empirical findings are also shown using descriptive statistics (Yongvanich and Guthrie, 2005) to identify the companies with the highest and lowest disclosure levels for each category. In addition, the most commonly reported disclosure items were identified (Tables 8 and 9, Graphs 2 and 3).

Through an analysis of simple correspondences applied to the Documents x Variables matrix (items) it is possible to represent on the factorial plan the correlations between companies and thematic categories. In order to have a better representation of the factorial plan, it has been necessary to exclude the "scope and boundary" variable from the analysis, because it is of small size and strongly correlated to Coal of Africa. In order to properly explain the picture of the factorial plan it must be emphasized that the more distant the documents and the variables are from the origin, the greater their contribution to the determination of the axes, whereas the proximity of the documents refers to a correlation between the two characters (Bolasco, 2010b) (Graph 4).

RESULTS AND DISCUSSION

The results shown in Tables 6 and 7, including the total occurrences and the normalized frequencies relating to each category[7] enable us to evaluate the amount (how much) and the themes (what) of non-financial information disclosed by the mining companies listed on the JSE.

The first semantic category *Group Profile (Corporate context)* concerns the extent to which the information provided effectively communicates the "story" of the company to the stakeholders. Here, the main products and services of the organizations, its major markets and locations, key financial data and organization structure are described. Companies are generally doing well at setting out the corporate context in an easily readable and understandable format, sometimes using graphs, symbols, illustrations and diagrams, and the flow of information is generally logical. The disclosure checklist shown in Table 2 includes 19 items, 13 of which are detected with different absolute and normalized values (approximately 68% incidence). The following items have not been detected by the textual analysis:

(1) Location of mines
(2) Product description
(3) Nature of the organization
(4) Overview of activities
(5) Corporate context

The first and the second items concern technical aspects of the company's production, but the other items are generic and concern the company profile. We expected more information about the characteristics of production to clarify the environmental and social practices adopted by companies. If we analyse the normalized frequencies,

[5] The term "Occurrences" indicates the frequency words counts. For major details, see Beattie and Thompson, 2007.

[6] Tal. TaC2 is an acronym for "Trattamento automatico Lessicale e Testuale per l'analisi del Contenuto di un Corpus". It was developed following a study carried out at the University of Rome "La Sapienza" (Bolasco et al., 2002; www.taltac.it).

[7] For a detailed description of every category described in this section, see the survey conducted by Deloitte "*Integrated Reporting Navigating your way to a truly Integrated report",* February 2012.

Table 5. Summary of corporate reports.

#	Company	Financial statements	Integrated report	Sustainability report	Resources and reserves report	Other reports	Notes
1	African Rainbow Minerals		X	X	X	Sustainability case studies; Sustainable Development Report	One report
2	Anglo American Platinum		X	X		7 segments of the integrated report	The seven segments have not been analyzed because they are already included in the integrated report
3	Anglo American PLC	X	X		X	UK corporate governance checklist	The financial statement is separate from the integrated report
4	Anglogold Ashanti	X	X	X	X	Notice of Annual General Meeting 2011	The financial statement is separate from the integrated report
5	Assore Ltd		X			Notice of Annual General Meeting 2011	One report
6	Bhp Billiton PLC		X			Summary review	One report
7	Coal of Africa		X				One report without details about the integrated report (the name of the report is "annual report" without other details)
8	DRD gold		X	X		Sustainable Development Report	One report
9	Exxaro resources		X			Annual review	Both the integrated report and the annual review have been analyzed though the annual review is a synthesis of the full report
10	Gold fields	X	X		X	Memorandum of incorporation; Notice of Annual General Meeting 2011	The resources and reserve report has been included as an additional report and it includes 10 separate reports that have been analyzed too
11	Harmony		X	X		Abridged Report; Notice of Annual General Meeting 2011	Both reports have been analyzed, though the abridged report is a sinthesis of the integrated report
12	Implats Platinum		X	X	X	Sustainable Development Report	One report
13	Lonmin PLC	X		X		Notice of Annual General Meeting 2011	Two reports of which the first is called "annual report" without details on the integrated report
14	Merafe resources		X			Abridged report for the auditors	One report with a summary report which has been analyzed
15	Northam Platinum		X	X		Sustainable Development Report	One report
16	Pan African Resource		X			Report for the audited results	One report
17	Petmin Ltd	X	X			Some parts of the integrated report have been explained in separate reports; Notice of annual general meeting	The reserve and resources report is already included in the integrated report and it has been presented also separately
18	Royal Bafokeng Platinum		X				One report, but different reports are separately presented as the different parts of the one report
19	Sentula mining		X			KPIs tables; Memorandum of incorporation; Replacement Deed	One report but two KPIs tables are presented separately from the integrated report
20	Wesizwe platinum		X			GRI response table	One report

Source: our elaboration.

Table 6. Total occurrences in absolute values.

Company	Content size	Group profile	Scope boundary	Key features	Strategy vision values	Governance structure	Stakeholders	Material risks opportunities	KPI targets	Remuneration	Total
Anglogold Ashanti	243,318	350	2	13	645	257	92	395	771	162	2,687
Exxaro resources	189,747	202	21	21	216	380	67	251	645	54	1,857
Bhp Billiton PLC	175,517	230	2	28	133	259	37	174	607	234	1,704
Gold Fields	161,705	166	6	6	180	346	45	193	354	65	1,361
Anglo American Platinum	146,449	238	16	76	254	243	53	159	624	73	1,736
African Rainbow Minerals	136,657	158	12	17	128	343	40	186	575	86	1,545
Implats Platinum	121,477	145	8	22	160	151	26	138	499	68	1,217
Lonmin PLC	117,731	95	6	16	195	228	43	141	479	109	1,312
Harmony	112,080	144	9	10	146	227	25	100	477	42	1,180
DRD Gold	99,471	70	3	14	58	203	19	93	224	64	748
Anglo American PLC	95,202	123	7	16	146	288	29	94	389	43	1,135
Merafe resources	79,909	79	12	20	95	194	47	114	262	19	842
Sentula mining	77,292	29	15	0	45	74	13	51	124	26	377
Royal Bafokeng Platinum	75,747	91	13	9	132	142	36	138	239	22	822
Petmin Ltd	74,604	99	8	1	70	101	18	76	110	41	524
Northam Platinum	74,096	50	9	16	48	94	25	47	226	22	537
Pan African resource	55,764	82	11	2	57	104	5	43	156	6	466
Wesizwe Platinum	52,967	72	17	4	50	90	29	61	84	11	418
Assore Ltd	52,485	59	6	4	29	108	13	65	97	19	400
Coal of Africa	45,366	58	29	4	34	59	10	34	74	24	326
Total	2,187,584	2,540	212	299	2,821	3,891	672	2,553	7,016	1,190	21,194

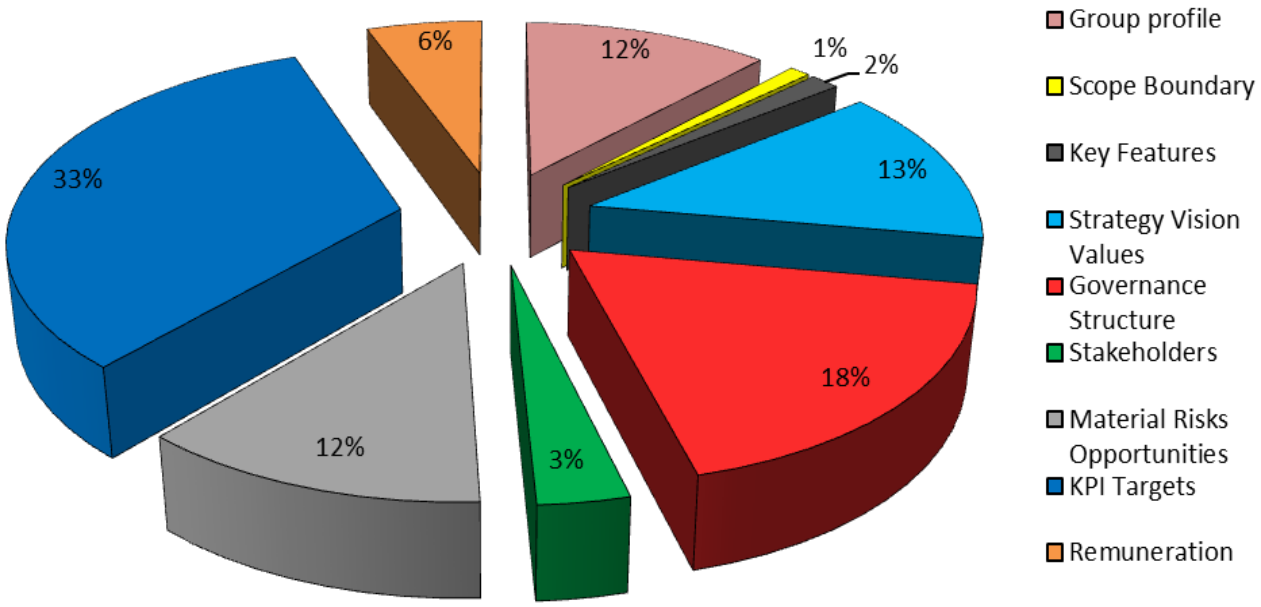
that is, those taking into account the size of the reports under analysis, the maximum value is attributed to Anglo American, whereas the minimum value remains associated with Sentula Mining. It is also interesting to estimate the percentage incidence of each item within the category: the item showing the highest incidence (72.6%) is "projects", whereas that with the lowest incidence is “operational information” (0.1%). Thus, there is clear evidence of a strong discrepancy among the disclosures of the different items. In particular, we may notice that some items showing a specific relevance to the mining sector actually have rather low values; for example, items such as “mining production” and "managed mines” have a very low incidence, below 1, and Black Economic Empowerment (BEE), in particular, has a value of approximately 6%. The BEE is indicated by the JSE as a required social indicator for the Socially Responsible Investment Index, and providing this information is one item of compliance with the rules established by the Broad-Based Black Economic Empowerment Act 53 2003 (the Act includes black Africans, Coloureds and Indians).

The part *Scope and Boundary* describes the comparability of financial and non-financial indicators, but it is necessary to note that the disclosure of non-financial data is relatively superficial and lacks information about non-financial targets, relational capital and intellectual capital. In this semantic category, only 4 items have been identified, making it the category with the smallest number of items and influencing the total number of occurrences that were identified in the analysis. The latter has detected only 3 items

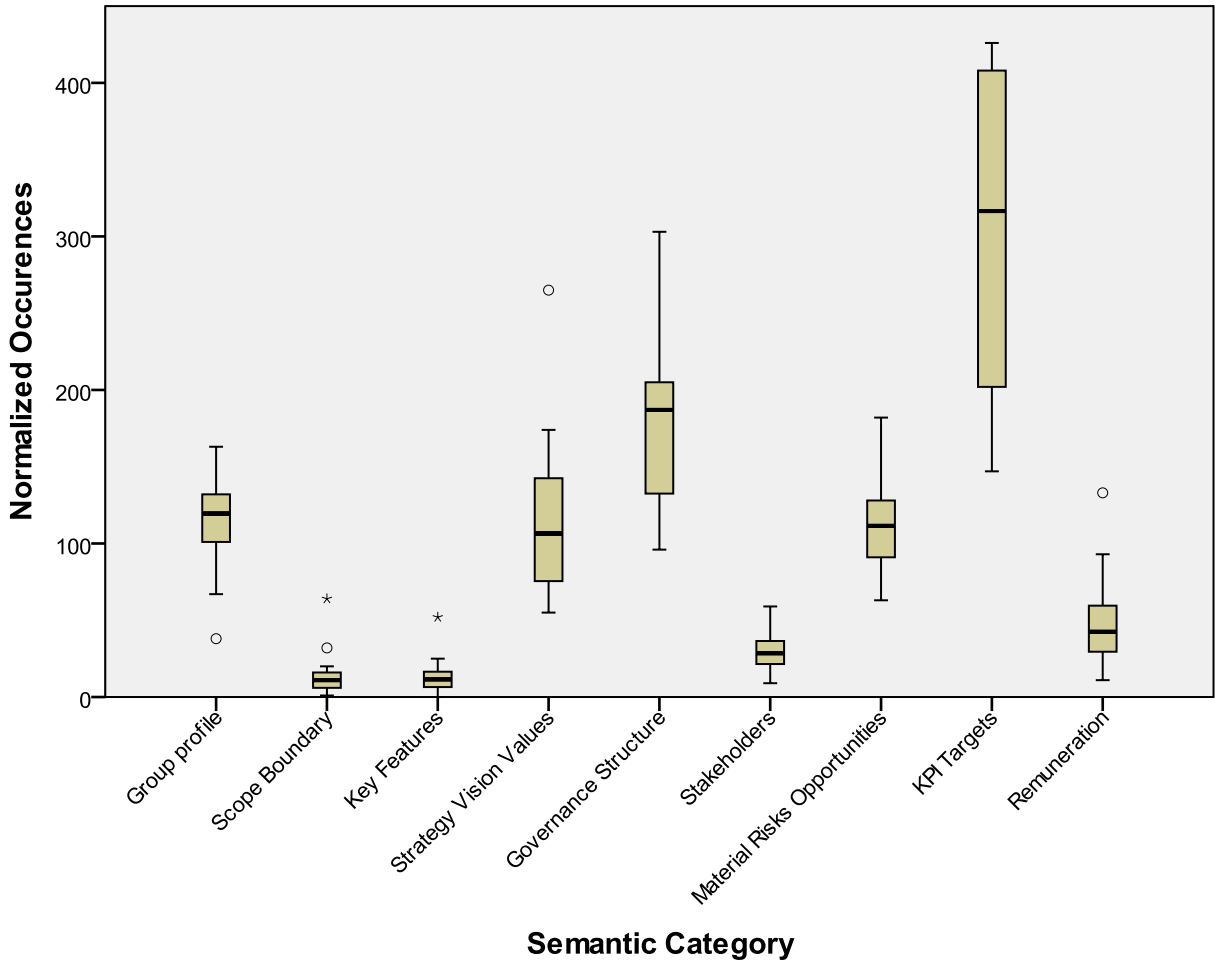
Table 7. Normalized frequencies.

Company	Group profile	Scope boundary	Key features	Strategy vision values	Governance structure	Stakeholders	Material risks opportunities	KPI targets	Remuneration	Total
African Rainbow Minerals	116	9	12	94	251	29	136	421	63	1,131
Anglo American Platinum	163	11	52	173	166	36	109	426	50	1,185
Anglo American PLC	129	7	17	153	303	30	99	409	45	1,192
Anglogold Ashanti	144	1	5	265	106	38	162	317	67	1,104
Assore Ltd	112	11	8	55	206	25	124	185	36	762
Bhp Billiton PLC	131	1	16	76	148	21	99	346	133	971
Coal of Africa	128	64	9	75	130	22	75	163	53	719
DRD Gold	70	3	14	58	204	19	93	225	64	752
Exxaro resources	106	11	11	114	200	35	132	340	28	979
Gold Fields	103	4	4	111	214	28	119	219	40	842
Harmony	128	8	9	130	203	22	89	426	37	1,053
Implats Platinum	119	7	18	132	124	21	114	411	56	1,002
Lonmin PLC	81	5	14	166	194	37	120	407	93	1,114
Merafe resources	99	15	25	119	243	59	143	328	24	1,054
Northam Platinum	67	12	22	65	127	34	63	305	30	725
Pan African resource	147	20	4	102	187	9	77	280	11	836
Petmin Ltd	133	11	1	94	135	24	102	147	55	702
Royal Bafokeng Platinum	120	17	12	174	187	48	182	316	29	1,085
Sentula mining	38	19	0	58	96	17	66	160	34	488
Wesizwe Platinum	136	32	8	94	170	55	115	159	21	789

out of 4 (with an incidence of 75%); one of them, "time boundary", was not detected in the occurrences. The calculation of normalized frequencies shows Coal of Africa having the maximum value of occurrences in relative value (64), whereas both Anglogold Ashanti and BHP Billinton show the minimum value. As for the percentage incidence of each item within a single category, we can see that the item with the highest incidence – 96.2% - is the "reporting period"; the other two items have a very low incidence. The "scope of the report", in particular, shows an incidence of approximately 0.01%. This may be seen as a sign of the companies' increased emphasis on correctly identifying the accounting period of the financial reports, rather than the purpose of the reports themselves. The part *Key Features* contains the general characteristics of the report to address the key requirements of IR, specifically focusing on the length of the report, to whom the report is addressed and the balance between financial and non-financial data. Many companies put out non-financial KPIs about environmental and social performance. The third category analysed is composed of 20 items, of which only 9 were detected: in this case the incidence is 45%. An analysis of the data deducted from the influence of the size of the documents confirms the results of the evaluation of the data expressed in absolute value. In fact, we have a maximum value of 52 occurrences in Anglo American Platinum and a minimum value of 0 occurrences in Sentula Mining. The next step allows us to consider the percentage of each item within the category, and the resulting data show that the item with the highest incidence is "feedback" (44.5%), whereas the lowest incidence is registered by "diagrams" (0.3%). This result suggests an assessment of the



Graph 1. Pie Chart of normalized frequencies.



Graph 2. Box plot - Semantic categories.

Table 8. Descriptive statistics.

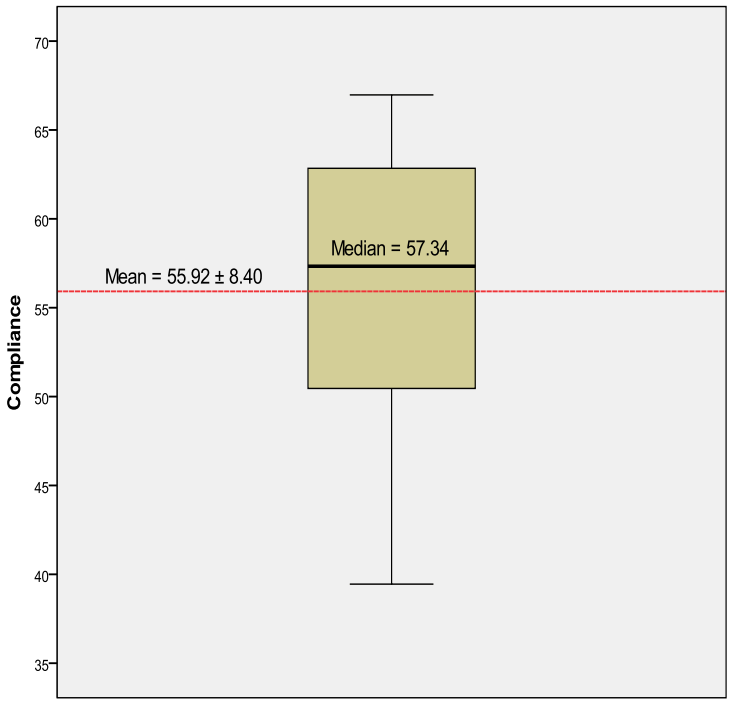
Statistics	Group profile	Scope boundary	Key features	Strategy vision values	Governance structure	Stakeholders	Material risks opportunities	KPI targets	Remuneration
Min	38	1	0	55	96	9	63	147	11
Max	163	64	52	265	303	59	182	426	133
Median	119.75	10.82	11.47	106.77	186.98	28.55	111.09	316.20	42.68
Mean	113.51	13.41	12.97	115.46	179.60	30.44	110.99	299.40	48.43
Std. Dev.	30.43	14.01	11.28	51.91	52.30	12.58	30.80	101.07	27.68

Table 9. Compliance.

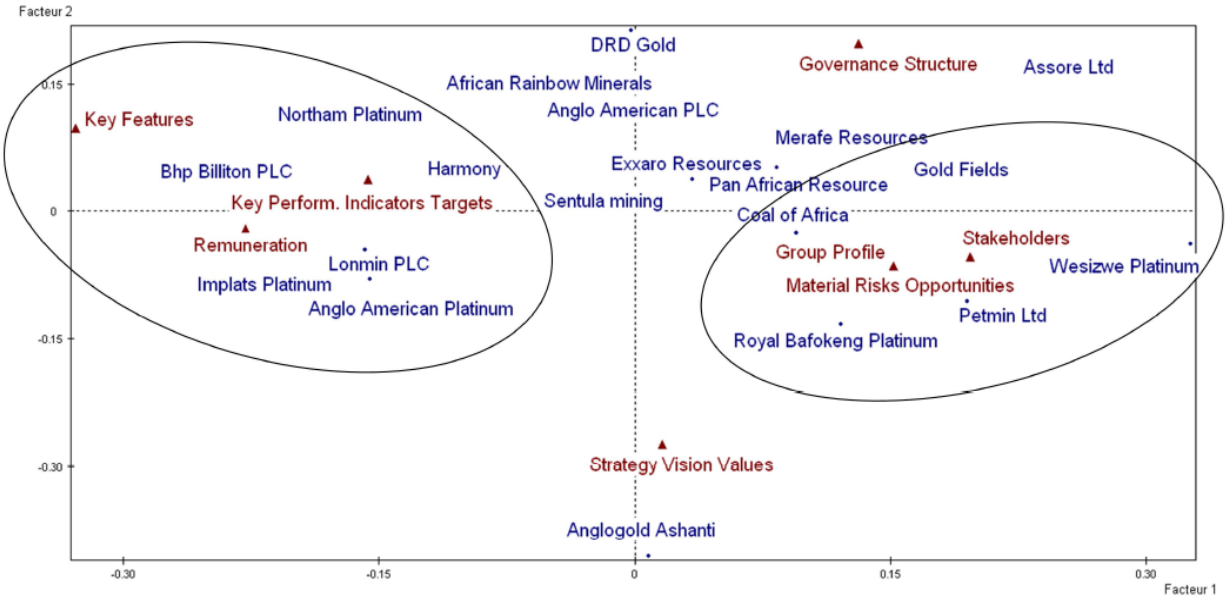
Company	Disclosed Items	Compliance
African Rainbow Minerals	71	65.14
Anglo American Platinum	73	66.97
Anglo American PLC	59	54.13
Anglogold Ashanti	72	66.06
Assore Ltd	52	47.71
Bhp Billiton PLC	66	60.55
Coal of Africa	43	39.45
DRD Gold	58	53.21
Exxaro resources	63	57.80
Gold Fields	62	56.88
Harmony	66	60.55
Implats Platinum	70	64.22
Lonmin PLC	72	66.06
Merafe resources	67	61.47
Northam Platinum	59	54.13
Pan African resource	47	43.12
Petmin Ltd	47	43.12
Royal Bafokeng Platinum	66	60.55
Sentula mining	48	44.04
Wesizwe Platinum	58	53.21

incidence of similar terms that indicate the presence of graphs, diagrams and representations. If, for example, we consider the value of items such as “symbols”, “illustration”, “graphs” and “maps”, the resulting values are quite low, from 4 to 2.3% and down to 1.7%. This would suggest that mining companies do not generally focus on the part of their integrated reports that are devoted to graphs and pictures.

The main characteristics that are described in the part *Strategy vision values* are useful for understanding the vision of the future through challenges and relevant opportunities for the organization. More specifically, it examines the level to which the strategy goals, values and objectives correlate with the sustainability vision and whether the company has adequately assessed its key risks and opportunities. As for the items relative to strategy reports, the results show that only one item ("future objectives') out of a total of 11 was not found in any analysed report. In this case, the percentage is therefore high (91.6%) and allows us to give the semantic category a prominent position in the mining sector. Clearly, the number of occurrences must be estimated as a normalized value, but the overall judgment is very positive. As for the normalized values, a maximum value of 265 was detected in Anglogold Ashanti’s reports, whereas a minimum value of 55 was associated with Assore Ltd. The next step is the assessment of the percentage of each item in the category. As expected, the item with the highest percentage is "strategy" (63%), and the one with the lowest percentage is "strategy planning" (0.03%). However, the above items could be considered synonyms; consequently, in light of the results, the input of a single item would have been correct. Another item with a very low percentage (0.07%) is



Graph 3. Box plot – Compliance.



Graph 4. Factorial plan. Source: our elaboration.

"future targets", where however, company disclosures have again preferred a more general term, such as "objectives", with an incidence of approximately 20%.

The part *Governance Structures* describes governance supports the strategic objectives of the organization related specifically to the approach to remuneration. The governance structure oversees the level to which strategy is linked to environmental, social and governance (ESG) risks and opportunities and the level of the integration with the business. The content of this part is formulated

directly from King III, which clearly sets out the requirements for governance and specifically requires boards to include a statement on the integrity of the integrated report. The corporate governance category includes 18 items, and only one of them was not found in the reports analysed (that is, “ethics disclosure”), but as mentioned above, this item may be associated with "ethics", which has an absolute value of 394 out of a total of 3,891. The significant presence of nearly all of the items (94%) is evidence of the top priority assigned to this semantic category, as one might have expected in light of the significance attached to this aspect by the King III code. The normalized frequency table shows different results with respect to the absolute values: the highest value is associated with Anglo-American Plc, the lowest one with Sentula Mining. Thus, in this case, the size of the reports has been fairly influential. If we consider the importance of each item, the one with the highest incidence is "quality" (16.7%), whereas three items show the lowest incidence, namely, "employee involvement", "governance of risks" and "key governance policies". Examining the results, we think the positive quantitative judgment can be undermined by the strong presence of rather general items such as “quality” and “board of directors” rather than items such as “employee involvement”, “governance of risks” or “ethics”. Compliance with the King III code may therefore result in inadequate corporate governance and little attention to ethical conduct.

Integrated reporting provides insight into companies’ relationships (Section Stakeholders) with their key stakeholders (internal and external) and how and to what level the organizations understand and takes into account and responds to their needs and expectations. It is also necessary to ensure that major stakeholders are not overlooked or incorrectly prioritized. The link to which credibility is also achieved through external assurance must be assessed. The materiality of issues to stake-holders, however, cannot be assessed. Considering the significance of these issues within the organization itself and the overlap between what is important to both stakeholders and the company will define the truly material interests that should be described in IR. As for the items in the category concerning stakeholders, we can further note a strong correspondence with the items shown in the checklist: only 1 item out of a total of 10, “stakeholder needs”, was not detected in the analysed documents. The resulting data of the normalized frequencies show that the minimum value is associated with Pan African Resource, whereas the maximum value is identified with Merafe Resources. As for the assessment of the incidence of each item, the highest percentage is associated with “stakeholder engagement” (41.7), the lowest one with "stakeholder inclusiveness" and "target audience" (0.15). The most significant aspect of the non-financial information provided to stakeholders Is therefore the need for the real involvement of all stakeholders in corporate life.

In the part *Material Risks and Opportunities*, there is a description of the circumstances under which the company works, including key resources and relationships on which it depends, the key risks and opportunities that will influence the organization, and how this will affect their business and the risk mitigation plan. It remains unclear, however, how organizations link these risks to their strategic objectives and how they translate to measurable KPI. The semantic category on risk and opportunity management totals 12 items, and only one (“risk indicators”) could not be detected by the TaL.TaC software. This category is therefore adequately represented in the reports of mining companies (91.67%). The results of the analysis of normalized frequencies shows that, with a value of 182, Royal Bafokeng scored the maximum value (182), whereas Pan Africa Resource scored the minimum value of 63. As for the percentage of each item within the category, it should be noted that the item showing the highest percentage (approximately 42%) is "risk management", with the lowest percentages belonging to "risk disclosure" (0.08%) and "risk mitigation" (0.4%).

The most important focus in the part *Key Performance Indicators and Targets* is obtaining an understanding of the level at which the chosen KPI meets the materiality criteria and whether the key targets linked to the sustainability strategy are described. The KPIs category has the greatest number of items; in fact, these indicators use both financial and non-financial information that can be located in different places within the companies’ reports. Thirty-six items are identified in the checklist, and if we observe the data expressed in absolute value, the total occurrences show the highest value. It is possible to note *in primis* that in the companies analysed, only 27 items (75%) were found in the reports. The results highlighted in the normalized frequency table are very different from the absolute values: the highest value is found for Anglo American Platinum and Harmony (426), whereas the lowest value (147) is that of Petmin Ltd. As for the incidence of single items, "performance" has the highest percentage (52.16%), whereas "intellectual capital", "measurable targets" (0.03%) and "improvement programmes" (0.07%) show the lowest percentage.

The part *Remuneration* covers the approach towards remuneration and how remuneration policies are aligned with the strategic objectives. The last category covers the disclosure of the board’s remuneration, and an analysis of the number of items in the checklist has shown that all of the 9 identified items appear on the table of total occurrences. The maximum normalized value is associated with BHP Billiton and the minimum with Pan African Resource. As for the incidence of each item within the category, "remuneration committee" is the item with the highest percentage (approximately 32%), whereas the lowest percentage is associated with "long term incentives". However, 100% compliance can be noted

because all companies have identified all of the items on the checklist.

Conclusions

South Africa is one of the most important mining countries in Africa and the world. It has the world's largest reserves of chrome, gold, vanadium, manganese and PGMs (platinum group metals) and accounts for nearly all of Africa's metals and mineral production (Burger, 2006). According to White (1995) and Stainbank (2012), the mineral extraction and processing industry is the most dominant industry in the South African economy in that it contributes a substantial amount to its export earnings and opens employment opportunities that are crucial to South Africa's economic and social concerns. In addition, due to their impact on the natural environment, mining companies are under close watch by environ-mental groups and society at large. There are many mining companies in emerging countries looking to Western stock exchanges to find markets for their stocks (Smith and Mokgoatlheng, 2003). Because the South African mining industry is in an emerging country, it may need to improve its non-financial disclosures to compete globally and meet the expectations of potential investors (Atkins and Maroun, 2015; Stainbank, 2012; PWC, 2013).

In South Africa, the elaboration of an integrated report has become compulsory after the recommendations included in the King Code of Governance Principles for South Africa 2009 (King III) and the definition of the listing requirements on the JSE (http://www.jse.co.za/Home.aspx). "South Africa is among the first countries in the world to require integrated reporting of listed companies. This puts way ahead of the game" Mervyng King told reporters (www.southafrica.info/news/business/143897.htm).

Companies listed on the JSE are obliged to comply with the JSE's listing requirements, which involve compliance with the King Report III and the SRI index. A previous study of the South African mining sector (Stainbank, 2012) noted that the number of companies reporting according to the GRI increased by 20% in 2006 compared to 2004 or 2005. In addition, some companies provided the GRI disclosure index for their non-financial reporting, which made it easy to follow the extent of their non-financial disclosures. As a consequence, non-financial information is affected by compliance with mandatory regulations, even if the pressure exerted by the stakeholders urges companies to further increase the amount of information, particularly with regard to the human capital. Therefore, issues such as human rights and health and safety have become a priority to enhance the contribution exerted by the sector with a view to sustainable development in the areas of emerging economies (ICMM, 2006; ICMM, 2012).

Given these premises, the empirical research conducted on the basis of the checklist displayed in Table 2 showed some interesting results in terms of disclosures relating to the items in the nine semantic categories listed above. In brief, the textual analysis showed the following results:

1) The semantic categories that display the greatest compliance by companies are n. 4 *Strategy Vision Values*, n. 5 *Governance Structures*, n. 6 *The Stakeholders*, n. 7 *Material Risks and Opportunities* and n. 9 *Remuneration*. Many items in category n. 8, *Key Performance Indicators and Targets*, were not detected.
2) For each category, it is not possible to find total homogeneity in absolute occurrences and normalized frequencies because the maximum and minimum values are quite different. Existing differences in the individual words are partially due to the type of item selected. In fact, in certain cases, the most general items had higher values than more specific words or expressions. The boxplots (Graph 2) show homogenous behaviours for certain groups of companies in relation to certain semantic categories: examining the width of the boxes and the length of the "flakes" - "Mustache", we could say that KIP Targets are isolated with a high variability, Strategy Vision and Values Governance Structure has an average variability, Group Profile, Material Risks and Opportunities Remuneration have a moderate variability and, finally, Scope Boundary, Key Features and Stakeholders have a low variability.
3) Checking the degree of compliance on the part of the sample companies leads to the analysis of the number of items found in the documents with respect to the item totals in relation to the individual companies. The assessment of each company makes it possible to perform a comparative evaluation in overall terms. The results show that on average, the degree of compliance with the disclosure checklist (Tables 2 and 9) is approximately 55.92%, and the best results are achieved by the company Anglo American Platinum (66.97%), while the company with the lowest value is Coal of Africa (39.45%) (Table 9).

Overall, the empirical findings do not indicate homogeneous behaviour among companies; nevertheless, it can be noted that the higher incidence of the issues set forth above may be due to the correspondence with some areas noted in the criteria themes of SRI index. For example, category n. 6 *Stakeholders* may be associated with the topic "Society", category n. 4 *Strategy vision values* with "policies and strategies", and category n. 5 *Governance Structures* with "governance and related sustainability concerns". Compliance with the essential requirements for ESG set by JSE for the SRI index may have exercised some influence (JSE and EIRIS, 2010).

The items related to environmental disclosures found in category n. 7 - such as sustainability review, environmental performance and sustainability performance - did not display significant values, and others, such as ESG indicators and ESG performance, were not detected. This

seems to contradict the strong pressure exerted by various stakeholders and society in general about the growth of disclosures concerning the environment. In particular, the SRI index requires special attention to the issue of climate change with the intention of leading companies to consider what risks they face due to the anticipated effects of climate change, and how they are managing and reporting on their efforts to reduce carbon emissions (JSE, 2010).

Further clarification about the items related to the disclosure CI is needed. In this case, the information is rather lacking: for example, the item *intellectual capital* (category n. 7) was not found in the documents analysed. This confirms the results of a previous survey of 75 companies carried out in South Africa (Firer and Williams, 2003), which indicated that the association between the efficiency of value added by a firm's major resource components (physical capital, human capital and relational capital) and the three traditional dimensions of corporate performance (profitability, productivity and market value) is limited and mixed. Consequently, the empirical findings of this study state that despite the efforts to improve its intellectual capital base, the business environment and market in South Africa still appear to place greater weight on corporate performance based on physical capital assets. This aspect also arises from another study (April et al., 2003) whose empirical results show that mining companies tend to report on fewer intellectual capital attributes than other companies. In addition, results show that mining companies rate intellectual capital highly, but appear to be lacking in its measurement and reporting.

This research does not provide an optimistic view of the implementation of IR in its early stage because the results exhibit a wide range of diversity in the type and quantity of information reported. This finding confirms that the lack of a precise framework and IR standards produce a high diversity of IR practices (Wild and van Staden, 2014) in spite of the mandatory listing requirements in South Africa. This suggests that the first adopters are unable to achieve the IIRC aims and cannot produce concise, consistent and comparable reports. The findings show a high heterogeneity among corporate reports produced by companies.

This appears to be worrying in view of the need of enhancing disclosures linked to human capital, in particular, given the high frequency of accidents at work, which have a strong impact on reputation and corporate image. This item can also be considered a part of the social disclosure as a peculiarity of the mining sector, as mining activities generate significant social concerns in terms of their environmental impact and employees' health and safety (Deegan and Rankin, 1996; Cho, 2009; Coetzee and van Staden, 2011). Davies et al. (2002) indicate that South Africa mining industry's employees are extremely vulnerable to HIV/AIDS because they generally come from remote areas and are far away from their families. Hence, the effects of this disease on the labour force may cause a considerable impact on the South African economy.

As is generally known, the use of content analysis to measure non-financial information disclosure as an end in itself (references) and as an input in statistical regression studies to investigate the determinants of non-financial disclosures is increasing in similar studies (Kang and Gray, 2011). Consequently, further research could help to identify the potential reasons behind companies' non-financial disclosures and practices. The determinants that influence disclosure and compliance are the firm's size and its trends in share price and performance. Finally, this study shows certain limits. The analysed period is restricted to one year; consequently, we did not evaluate the temporal trend of potential improvements of non-financial information disclosures, and it might be interesting to perform a longitudinal analysis. Another caveat of this paper is the lack of comparative analysis by means of the assessment of other industries in the South African economy.

Conflict of Interests

The authors have not declared any conflict of interests.

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Appendix 1. Sample of listed mining companies.

Name	Business activity
Coal of Africa Exxaro resources	Companies engaged in the exploration for or mining of coal
BHP Billiton Anglo American Assore Ltd African Rainbow Minerals Ltd Merafe Resources Petmin Ltd Sentula Mining	Companies engaged in the exploration, extraction and refining of minerals not defining elsewhere within the mining sector
Anglogold ashanti Gold fields Harmony Pan African resources DRD gold	Prospectors for and extractors or refiners of gold bearing ores
Anglo American platinum Impala Platinum Hds Lonmin PLC Northam Platinum Royal Bafokeng Platinum Wesizwe Platinum	Companies engaged in the exploration for and production of platinum, silver and other precious metals not defined elsewhere

Source: JSE.