Towards a better understanding of factors influencing social, environmental and economic disclosures

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Abstract

Corporate social and environmental disclosure, later redefined as sustainability disclosure in order to include the third pillar of sustainability (economic), has been the subject or significant research over the past four decades. A major branch of empirical research has specifically focussed on the determinants of disclosure; those factors which correspond with greater breadth and depth of disclosure. Research has traditionally been focussed on the developed world, specifically North America and Western Europe and either addressed social or environmental disclosure in isolation or various hybrids of the two.

This research has two aims. Firstly it is an attempt to provide a view of disclosure in Africa, and specifically South Africa, where only minor empirical research has been undertaken. Secondly and crucially, this research attempts to address shortcomings in the existing body of research in that factors have traditionally been analysed for significance with regards to individual sustainability pillars alone, or at the aggregate level. A content analysis technique was employed to score sustainability reports for social, environmental and economic disclosures. An analytical model was then developed and a number of internal and external factors analysed to establish which were significant determinants of the level or extend of disclosure at both the individual pillar level and then compared to the aggregate or overall disclosure.

Keywords: *Sustainability; Indicators; Reporting; Determinants*

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Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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1 Introduction to research problem

1.1 Sustainable development and corporate social responsibility

Sustainable development can and has been defined in numerous ways by a multitude of sources, however, since its inception, the seminal report by the World Commission on Environment and Development (WCED) defined it as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environmental Development [WCED], 1987, p. 41). This has been the guiding definition quoted by academics in research and business in various communications.

The WCED was initiated by the United Nations General Assembly in 1982 and published the report entitled “Our Common Future” in 1987. The emerging field of sustainable development was considered by many at the time to be largely about the environment. In the foreword to the report, however, the Chairman Gro Harlem Brundtland clearly articulated a vision that was to remain:

> The environment does not exist as a sphere separate from human actions, ambitions, and needs and attempts to defend it in isolation from human concerns have given the very word "environment" a connotation of naivety in some political circles. The word "development" has also been narrowed by some into a very limited focus, along the lines of "what poor nations should do to become richer", and thus again is automatically dismissed by many in the international arena as being a concern of specialists, of those involved in questions of "development assistance". But the "environment" is where we all live; and "development" is what we all do in attempting to improve our lot within that abode. The two are inseparable ... Many of the development paths of the industrialized nations are clearly unsustainable. And the development decisions of these countries, because of their great economic and political power, will have a profound effect upon the ability of all peoples to sustain human progress for generations to come (WCED, 1987, p.7).

In the process of the discussion and dissection of this report, it became known as the Brundtland Report.

This standard definition, while seminal in its dissemination, was left intentionally vague (Becker, 2007), and as such resulted in a fair amount of ambiguity by allowing disparate groups to align themselves to it, creating a "veritable industry of deciphering and advocating what sustainable development really is" (Kates, Parris, & Leiserowitz, 2003, p. 11). The United States' National Resource Council, in its report "Our Common Journey: A Transition toward Sustainability" (Board on Sustainable Development, National Research Council, 1999), further synthesized the field in the definition of three categories – nature, life support systems and community. The 2002 World Summit on Sustainable Development expanded on this work in defining the now accepted pillars of sustainable development; economic, social and environmental (United Nations, 2002). Held in Johannesburg, this summit committed to "assume a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development — economic development, social development and environmental protection — at the local, national, regional and global levels" (United Nations, 2002, p. 5).

Sustainable development has been described as a social movement undertaken by a group of people with a common agenda or goal and realised through collaboration and engagement (Kates et al., 2003, p. 18). Such engagement encompasses international events such as the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 (Cleveland, Kubiszewski, & Miller, 2007), the WCED, as well as local initiatives such as Sustainable Seattle, Durban's Local Agenda 21 Programme and the Minnesota Sustainable Development Initiative (Kates et al., 2003, p. 18).

Although initially a societal concept, sustainability has increasingly been applied to corporate activities and situations under the banner of corporate sustainability (Steurer, Langer, Konrad, & Martinuzzi, 2005). As with sustainable development, there is no standard definition of corporate sustainability (Roca & Searcy, 2012). One definition offered, aligned to the WCED definition, is that of "meeting the needs of the firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities, etc.), without compromising its ability to meet future stakeholder needs as well" (Dyllick & Hockerts, 2002, p. 131). Branco and Rodrigues state that "sustainability reporting is related to complex issues such as environmental protection, human resources management, health and safety at work, relations with local communities, and relations with suppliers and consumers" (Branco & Rodrigues, 2006, p. 111); while Van Marrewijk holds

that corporate sustainability refers to "demonstrating the inclusion of social and environmental concerns in business operations and in interactions with stakeholders" (Van Marrewijk, 2003, p. 102). Roca and Searcy (2012) discuss how some views on corporate sustainability and corporate social responsibility diverge, with some authors considering the terms synonyms; and still others regarding them as distinct activities. Roca and Searcy conclude however, that most authors agree about the close association of the two terms; highlighting that both have come to address the environmental, social and economic aspects of corporate activity (Roca & Searcy, 2012, p. 104).

The corporate responsibility movement is described as a related part of sustainable development and comprising three elements: campaigns by Non-Government Organisations (NGOs) to alter corporate behaviour; efforts by corporations to contribute to sustainable development goals and reduce their harmful environmental and social impacts; and international initiatives aimed at harnessing and exploiting corporate knowledge and activities to better serve their environments and various communities (Kates et al., 2003, p. 18). Examples of these are the United Nations Global Compact (The United Nations Global Compact, 2011) and the World Business Council for Sustainable Development (World Business Council for Sustainable Development [WBCSD], 2012). As such, the terms sustainable development, sustainability and corporate social responsibility, while defined differently, are largely used to denote the same broad concept.

1.2 Sustainability reporting

Pre-empting the formalisation of the concept of sustainable development however, corporations began reporting information such as "product quality, equal opportunities and social benefits for their employees, and their contributions to the communities where they operated" (Fifka, 2011, p. 2). This was the result of increases in government regulation of corporations and criticisms of corporate behaviour (Abbott & Monsen, 1979, p. 506). Further to this, Fifka highlights that the 1970's are defined as the period where standalone reports were first used to transmit corporate performance information. The author explains how the 1980's were characterised by a focus on social issues in non-financial reporting, while the in 1990's non-financial reporting shifted towards environmental concerns as business warmed to the idea that environmentally friendly products and processes could yield cost-benefits. The author completes his review of historic reporting by noting that around the turn of the century, and as such in line with the accepted definition of sustainable development, the separation of social and environmental reporting was reversed and lead to more integrated reporting under such titles as Sustainability Report, Corporate Social

Responsibility Report, Corporate Citizenship Report, and finally paving the way for the Triple Bottom Line or Integrated Report (Fifka, 2011, p. 2).

1.3 Research on the topic

A large body of research has been conducted in the areas of sustainability and corporate social responsibility. In a seminal article, oft-quoted in literature on the field, Gray, Kouhy and Lavers (1995) discuss and interpret 20 years of empirical investigation into social and environmental reporting in the United Kingdom. The authors highlight attempts to place these empirical investigations into three broad groups of organisation-society theories, namely:

- Decision usefulness – studies premised on the idea that reporting is an attempt to remove information asymmetries between the organisation and external agents;
- Economic theory – which posits that disclosure can create economic value or at best mitigate the negative economic consequences of legislation and regulation; and
- Socio-political theory seeks disclosure as a means influencing the perceptions of society at large and specific organisational stakeholders.

(Gray, Kouhy, & Lavers, 1995, pp. 50 - 53)

Gray et al. state that decision-usefulness studies have not lead to any satisfactory outcome, while the economic theory studies are prefaced on highly contestable perspectives (Gray et al., 1995, p. 51). Social and political theory studies have been more widely used and have lead to more interesting and insightful perspectives drawn from the theoretical elements (Gray et al., 1995, p. 52). This analysis of social and environmental reporting drew several conclusions but specifically listed a number of factors which correlated to the predisposition for social and environmental reporting. Factors mentioned were capital intensity[1], age of the corporation, strategic posture[2], senior executive attitudes and the existence of a social responsibility committee; while organisation size[3], reporting location and country of ownership were also noted to have varied levels of effect on social and environmental disclosure (Gray et al., 1995, p. 50).

[1] Capital intensity refers to business process or industry / sector which require large amounts of money or other resources in order to produce a good or a service (Investopedia, 2011).
[2] Strategic posture refers to, for instance, the extent to which the top managers are inclined to take risks, to innovate and favour change in order to develop a competitive advance (Covin & Slevin, 1990).
[3] Several definitions of organisation size have been used, including but not limited to: asset value, revenue value, number of facilities, staff compliment and geographical spread. And further, direct values and natural logarithms of variables have been used.

A more recent and detailed review of corporate responsibility reporting was undertaken by Fifka (2011) who performed a meta-analysis of the 186 separate empirical studies into determinants of reporting. The study covered over 40 countries across six continents, in addition to transcontinental studies, and the findings with regards to the most prominent and pertinent factors can be summarised on the following page.

	Internal factors					External factors		
Factor studied	Size	Industry	Financial performance	Social and environmental performance	Managerial attitudes	Country / region	Stakeholder Interests	Media pressure
Percentage of total studies to include factor	40%	44%	25%	10%	8%	23%	11%	4%
Percentage of above total to find a statistically significant influence	87%	90%	64%	56%	93%	100%	70%	71%

Table 1: Summary of Fifka analysis in 'Table 3' (Fifka, 2011, p. 24)

What is clear is that determinants such as size, industry, country of origin and manager attitudes are significant influences in firms reporting corporate responsibility information, in line with Gray et al. (1995). What is further evident in the original table in Fifka (2011) from which *Table 1* is derived, however, is that between different regions both the interest in specific factors and the number of studies finding the factor a statistically significant indicator on reporting varies. For instance country / regional effects were evaluated in only 13% of African and 25% of Asian studies, but were studied in all Eastern European studies. In terms of significance, Southern European studies unanimously found financial performance a positively correlated factor; however that number drops to roughly 67% for North-West Europe and North America and down further to 25% for South-East Asian analyses. As such, both the academic interest and the outcomes of their studies vary according to region and breadth or precise scope of study. Furthermore, internal factors have been investigated far more widely than external factors. Gray et al. (1995) put this down to two factors: the data for internal factors is much more readily available and are generally reported by the organisation in question; and that internal factors (such as financials, headcount, etc.) are far easier to quantify than external factors (Gray et al., 1995).

With regards to the African studies, Fifka (2011) found only eight; six of which were conducted in South Africa. He notes that the majority of African studies have focussed on perceptions of and attitudes toward social and environmental reporting, which has consequently "led to the rather unique fact that structural determinants of reporting, like size and industry, have hardly received any attention at the Southern tip of Africa" (Fifka, 2011, p. 22). The lack of research in structural determinants of sustainability reporting in an African context thus presents a gap in the existing literature and an interesting area for further research.

A growing demand from organisations' stakeholders for responsibility reporting has been noted by many authors, most notably O'Dwyer, Underman and Hession (O'Dwyer, Unerman, & Hession, 2005), Kaptein and Tulder (Kaptein & Tulder, 2003) and Waddock, Bodwell and Graves (Waddock, Bodwell, & Graves, 2002). As such, there are a number of drivers for additional research into the area of corporate sustainability reporting for instance:

- Testing, with the use of a different data set, some of the contradictory observations in the literature noted in order to perhaps understand the contradictions specifically where previous studies focussed on environmental or social elements alone, or a combination of both;
- Provide one of the first studies on the determinants of sustainability reporting in Africa, while a South Africa study will provide a country perspective to complement other country specific studies (both of which filling a gap in the current body of knowledge);

As discussed, previous reporting of environmental or social concerns separately fell away to lead to more holistic reporting such as Triple Bottom Line reporting, a sentiment aligned to the concept of the "interdependent and mutually reinforcing pillars of sustainable development", highlighted by the United Nations (United Nations, 2002, p. 5). Through a detailed analysis of sustainability reporting, Lozano and Huisingh (2011) concluded that despite this "Sustainability is largely being addressed through compartmentalisation, mainly due to the sustainability reporting guidelines being based on single dimensions of the triple-bottom line" (Lozano & Huisingh, 2011, p. 106). The guidelines that the authors discuss are the Global Reporting Initiative's (GRI) sustainability guidelines (Global Reporting Initiative [GRI], 2011). The GRI guidelines have been the best known, most widely used and as such de facto reporting guidelines used worldwide (Brown, Jong, & Levy, 2009). A paper critical of GRI argues that it is precisely because of the compartmentalisation of the GRI that organisations reporting and business practices are reported in isolation per sustainability pillar (Moneva, Archel, & Correa, 2006). The merits of their argument

aside, the authors do make a clear point despite the use of the expression "integrated reporting", this integration is missing from reporting as well as business practices which are still largely segmented and compartmentalised (Moneva et al., 2006, p. 127).

In reading the research on sustainability reporting, this compartmentalisation is apparent too. For instance, study types are often themselves categorised:

- A number of empirical studies such as Liu and Anbumozhi (2009) and Monteiro and Aibar-Guzman (2010) have focused purely on environmental reporting and ignored the other pillars, thus limiting their scope in understanding sustainability;
- Some studies analyse disclosures in areas such as environmental, human resources, products and consumers and community involvement and other such elements (with many excluding the economic pillar), however hypotheses are only tested at an aggregate level. Studies of this type include Branco and Rodriques (Branco & Rodrigues, 2008) and Haider (Haider, 2010); and
- Other studies employ a measure of sustainability in line with three pillars of GRI; however independent variables are only correlated to the aggregated sustainability indexes, not the individual scores of the three pillars. Studies conducted as such include Reverte (Reverte, 2009) and Skouloudis, Evangelinos, and Kourmousis (Skouloudis, Evangelinos, & Kourmousis, 2010).

Only one study noted during the literature review conducted separate analysis on each of the pillars of sustainable development. Sotorrío and Sánchez (2010) conducted an empirical study of determinants of sustainability reporting in Spain over a period of four years from 2004 to 2007. They broke down disclosures into groupings related to employees, community and environment, and found variations in determinants of disclosure between each of those categories. For instance, proposing organisation size (measured by total assets) as a determinant factor produced statistical significance in all categories, but the range of p-value's[4] ranged from $p < 0.001$ for environment, through $p < 0.01$ for community and $p < 0.05$ for employees. For size as a factor (measured by number of employees) p-values of $p < 0.05$ for environment and community stood in contrast to a non-statistically significant relationship between size (by employees) and social disclosure (Sotorrío & Sánchez, 2010, p. 281). As such, this provides some tentative support for the proposition that organisational determinants may significantly influence certain types of

[4] a measure of the level of statistical significance, the smaller the value the larger the statistical significance of the results and the less likely the fluctuations are likely to be random

disclosure, while not influencing other types. The major drawback of this piece of research however, despite spanning many years, is the small sample size of 26 corporations. As such, statistical inferences made from such a small sample must be treated with a level of caution.

1.4 Need for further research

As such, it is believed that the main thrust of this study, in light of the apparent compartmentalising of sustainability pillars, is to study determinants of sustainability reporting at a disaggregated level, on each of the three pillars: environmental, social and economic. With the compartmentalisation of pillars, and the different subject matter reported therein, it is possible that different factors may be determinants at different significance levels within each pillar. Thus this study will both test the determinants of sustainability reporting in South Africa, and attempt to ascertain, and if possible understand, how the various factors influence the extent of disclosure within each of the three pillars.

2 Literature review

2.1 Corporate sustainability reporting

> An ever-increasing number of companies have recognised the sign of the times and are beginning to devote more attention to environmental and social issues in their reporting. As a designation for this new integrated form of reporting economic, environmental and social performance, the term 'sustainability reporting', a linguistic borrowing from the term 'sustainability', has become established (Daub, 2005, p. 76).

The WBCSD defines sustainable development reports as "public reports by companies to provide internal and external stakeholders with a picture of the corporate position and activities on economic, environmental and social dimensions'' (WBCSD, 2002, p. 7). Daub (2005) asserts that as such the sustainability reporting must contain qualitative and quantitative information as to how the organisation has improved the economic, social and environmental aspects of its operations within the context of its sustainability management system (Daub, 2005, p. 76).

Looking at reporting practices amongst the largest (Top 100) organisations in 22 countries in 2008, KPMG found that 45% of companies were reporting on sustainability, whilst amongst Fortune 500 companies this rose to 79% (KPMG Advisory N.V., United Nations Environment Programme, Global Reporting Initiative, Unit for Corporate Governance in Africa, 2010, pp. 13 - 14). In South Africa, KPMG found that 86% of the Top 100 Johannesburg Stock Exchange (JSE) listed companies produce some sort of sustainability report (KPMG Advisory N.V., United Nations Environment Programme, Global Reporting Initiative, Unit for Corporate Governance in Africa, 2010, p. 83).

Dalal-Clayton and Bass (2002) as cited in Lozano (2012) asserted that sustainability reporting, as a voluntary activity, has two main purposes: (1) to assess the state of an organisation's operations and activities in terms of the three pillars; and (2) to communicate said state to the organisation's stakeholders (Lozano, 2012, p. 22). Morhardt, Baird, and Freeman (2002) provided a comprehensive discussion of the motivations to report:

- Compliance with regulatory requirements and reduce the cost of future, possibly stricter regulations;

- Compliance with industry environmental codes, especially in cases where sanctions for non-compliance can be imposed;
- The reduction of operating costs;
- The promotion of improved stakeholder relations;
- The perceived environmental visibility of the firm;
- The notion that reporting on such issues can yield competitive advantages;
- The sense that without active environmental management the organizational legitimacy of may be impaired or withheld; and
- The sense of the social responsibility and desire to adhere to societal norms.

(Morhardt, Baird, & Freeman, 2002, pp. 215 - 216).

Branco and Rodrigues (2008), as with Gray et al. (1995), discussed reporting motivations at a higher level of abstraction and distil the rationale into two reasons. The first is that reporting will lead to better relations with stakeholders which will ultimately result in increased financial returns due to the development of valuable assets (resources and capabilities), differentiating themselves from their competitors. The second is to conform to stakeholder norms and societal expectations of how the organisation should conduct itself (i.e. as an instrument of legitimacy) (Branco & Rodrigues, 2008, p. 685).

With such a vague definition of sustainable development, a lack of standardised and regulated approach and leeway given to organisations in terms of reporting, a tremendous amount of variation in the scope, intent and method in voluntary sustainability information disclosure is to be expected. Roca and Searcy (2012) highlight the variety of names given to sustainability reports, including: Accountability Report, Citizenship Report, Corporate Social Responsibility Report, Responsibility Report and Sustainability Report; additionally calling attention to the varied lengths and the different stated scopes (Roca & Searcy, 2012, p. 115).

2.1.1 Reporting frameworks

Notwithstanding the various definitions of sustainable development, there is a great amount of divergence with regards to how to achieve sustainable development, multitudes of models to elucidate the process and classify sustainable development, and increased awareness of the indicators by which to do so (Becker, 2007).

Since reporting in most instances is voluntary, organisations must decide whether to develop in-house measures or chose one of various applicable frameworks or standards. In addition to numerous methods developed by authors in the field, frameworks have been suggested by entities such the WBCSD and the GRI (Krajnc & Glavic, 2005).

Lozano and Huisingh (2011) present and discuss four major frameworks for sustainability reporting, namely:

- ISO14000 series – 14031 and EMAS (Eco-Management and Audit Scheme) are the specific standards and are comprehensive, however the focus here is on the environment and as such the social and economic elements are not covered (International Organisation for Standards, 2011);
- Social Accountability standard SA 8000 – an auditable standard that is focussed solely on social dimensions, and especially human and labour rights (Social Accountability International, 2008);
- AccountAbility's AA 1000 framework – covering social and ethical considerations of sustainable development, and while not explicitly covering the environmental and economic pillars, is nonetheless complex in implementation (AccountAbility, 2012); and
- Global Reporting Initiative – guidelines and indicators for reporting on all three pillars of sustainable development (GRI, 2011).

Courtesy of a *Table 1* in Lozano and Huisingh (2010, p. 101).

The GRI guidelines were first promulgated in 2000 and have become the most prominent and widely used set of guidelines, largely due to the comprehensiveness in terms of the three pillars of sustainable development (Morhardt et al., 2002). The guidelines have gone through two major revisions and one minor update, meaning the current version of the guidelines is GRI 3.1 (GRI, 2011). Soon after publishing the first guidelines, the GRI created the Revision Working Groups as a forum for revising the guidelines. This revision process had three basic aims: to broaden the guidelines' stakeholder base; to improve the sustainability reporting; and to advance the guidelines' usefulness and credibility (Moneva et al., 2006, p. 127).

A second version of the guidelines was published in August 2002 at the United Nations World Summit on Sustainable Development. The main objective pursued by this new version of the guidelines is "to assist reporting organizations and their stakeholders in articulating and understanding contributions of the reporting organizations to sustainable development" (GRI, 2002, p. 1). The third revision (G3) of the guideline was published in 2006 and outlines several

principles, parameters and standard disclosures, including a list of 79 sustainability indicators. At around this time the United Nations Global Compact announced the GRI as its reporting standard, cementing its position as the global de facto standard (The Triple Pundit, 2011). This in turn was updated in 2011 (G3.1) to include numerous sector supplements and country specific annexures (Roca & Searcy, 2012, p. 105).

Several authors have analysed country-specific reporting practices. In his study, Daub (2005) notes that most Swiss companies use the GRI guidelines as the basis for their sustainability reporting, noting however, since the GRI is but a guideline and there is no requirement to address all areas of the guidelines, implementations differ (Daub, 2005). Roca and Searcy's (2012) study of corporate sustainability reporting in Canada highlighted that 45 out of 94 corporations reported using the GRI guidelines while only 31 of them explicitly identified the specific GRI indicators in the report (Roca & Searcy, 2012, p. 103).

In an investigation into the JSE Socially Responsible Investment (sustainability reporting) Index and the state of sustainability reporting in South Africa, Sonnenberg and Hamann (2006) noted that at the time of their study 28 South African companies used the GRI guidelines as a framework for their reporting, however only seven reported "in accordance" (which requires registration) with GRI (Sonnenberg & Hamann, 2006, p. 312).

In an international survey, Deloitte (2012) indicated that 51% of companies publishing integrated and/or non-financial reports use GRI as a framework, however only 27% disclosed their application level in contradiction of the framework's stipulations (Deloitte, 2012, p. 15).

According to a report from GRI, 79 South African organisations used GRI as a basis for their reporting in 2011 (Global Reporting Initiative Reports, 2012). As such, the GRI appears a suitable framework for analysis in its completeness, relevance and the fact that it is prevalent both with literature and in practice.

2.1.2 Variations in the selection and use of Indicators

Within each of the possible frameworks organisations might employ, various indicators are suggested or employed within each of the pillars / areas. Indicators are the specific measures which are reported on, and which give substance to, the framework. As with the variance with regards to the use of frameworks, indicators too appear to vary greatly within the area of

sustainability reporting. Innumerable indicators can be used, their selection largely being a function of grouping mechanisms, scope of use and the scale employed (Becker, 2010, p. 189). Moneva et al. (2006) criticise the GRI for the leeway given to organisations in the selection and scope of indicators employed. Organisational approaches to sustainability were previously categorised as reactive through remedial measures in response to environmental laws and regulations. The use of indicators grew out of a realisation by corporations that a proactive approach could reduce such punitive outcomes, with indicators providing an early warning sign in an approach to prevent economic, social and environmental consequences (Herva, Franco, Carrasco, & Roca, 2011, p. 1687).

Mineva (as cited in Roca and Searcy, 2012) commented that the latitude provided by the GRI guidelines has been considered by many authors as possibly leading to the proliferation of indicators in use (Roca & Searcy, 2012, p. 116). Becker (2010) concludes her work on how the definition of indicators can have an impact on, amongst other things, the achievement of sustainable development, by stating that the wording of an indicator is “important to operationalize sustainability” (Becker, 2010, p. 195).

In their study of Greek non-financial reports prepared against the GRI guidelines, Skouloudis et al., (2010) highlighted how even within an organisation, report content and the use of indicators can vary. The author’s results show how Athens International Airport was ranked first with regard to economic performance indicators, fourth in environmental performance indicators and sixth within the social indicator category (Skouloudis et al., 2010, pp. 432 – 433).

Roca and Searcy (2012) illustrate in their analysis just how varied the use of indicators is. In their analysis of 94 Canadian companies 585 different indicators were used in total, 324 of which were used only once, it became apparent that only 10 indicators were common across the Top 20 organisation’s reports (Roca & Searcy, 2012, p. 107). The authors conclude their analysis by noting that “Although voluntary sustainability reporting guidelines and best practices by industry leaders provide a starting point, there is still considerable discretion in determining what information to share publicly. These two factors have undoubtedly contributed to the wide variety of indicators disclosed” (Roca & Searcy, 2012, p. 116).

Ultimately, indicators contained within Corporate Sustainability reports should seek to provide useful information and insight into the impacts of an organisation’s operations and activities for the organisation’s stakeholders. The variety of frameworks and indicators available and the differing

scope and content of reports make meaningful comparisons difficult (Park & Brorson, 2005). With much latitude in the use of frameworks, and in the case of GRI the implementation of frameworks and indicator selection, the rationale behind the extent of reporting and indicator selection is of much interest.

2.2 Theoretical perspectives

Social and political theory studies have been more widely used and have lead to more interesting and insightful perspectives drawn from the theoretical elements (Gray et al., 1995, p. 52). Political economy theory holds that "the economic domain cannot be studied in isolation from the political, social and institutional framework within which the economic takes place" (Gray et al., 1995, p. 52). In line with this, Deegan (2002) explains that all life, and indeed all organisational efforts, occurs within a social, political and economic environment shaped by power conflicts between players groups (Deegan, 2002, p. 292). Thus, political economy theory is ideal for sustainability research as it covers the three pillars of social, environmental and economic elements. Political economy theory, as highlighted by Gray et al. (1995), is composed of a number of theoretical perspectives as described below.

2.2.1 Stakeholder theory

In his book defining the subject, Freeman (1984) defines a stakeholder as someone who can influence an organisation's performance or who is impacted by an organisation's actions. He contends that organisations have obligations to stakeholders (Freeman, 1984). Gray et al. (1995) note that an organisations' continued existence requires the support of stakeholders whose approval must be sought, stating that the more powerful the stakeholder, the more the company must adapt. This paper advocates the normative (or ethical) type of stakeholder theory which asserts that all stakeholders need to be treated fairly and as such the organisation must be accountable and report to all stakeholders equally. Deegan (2002), however, advocates managerial (or positive) stakeholder theory which suggest that some stakeholders hold more power for the organisation, which in turn suggests that organisations strategically alter their approach to disclosure based on the relationship and influence of the particular stakeholder.

Gray et al. (1995) further highlight that social disclosure is seen as part of the dialogue between the organisation and its stakeholders (Gray et al., 1995, p. 53). This is supported by Monteiro and Aibar-Guzmán (2010) who cite Moneva and Llena (2000) in stating that stakeholder theory recognises that besides traditional consumers of corporate reports, a wide range of agents are

seeking information around the impact of an organisation's activities (Monteiro & Aibar-Guzmán, 2010, p. 187). In addition, they assert that the stakeholder concerns amongst businesses have increased over time due to growing regulation allied to the heighted voice of environmentalists and general society around business' role as the major contributor to environmental degradation (Monteiro & Aibar-Guzmán, 2010, p. 186).

Roca and Searcy (2012) perform a thorough analysis of the existing literature around corporate sustainability, highlighting stakeholder theory as the most prominent theory employed (Roca & Searcy, 2012, p. 104). The authors discuss stakeholder theory's relevance as being evident in both the varied definitions of sustainable development as well as the names given to the various sustainability reporting indicators. In addition to stakeholder theory, they further highlight usage of institutional theory, resource based theory and legitimacy theory by various authors (Roca & Searcy, 2012, p. 104). Thus it appears that there varied approaches available when it comes to analysing sustainability disclosures.

In an analysis of the organisation-stakeholder relationship, so important to what they term environmental accounting research, Chen and Roberts (2010) conclude that there are two theoretical approaches which are important for future research. They detail these approaches by noting that "some business entities initiate social activities based on direct interactions with stakeholders, whereas others may also undertake similar activities to manage their societal level of legitimacy" (Chen & Roberts, 2010, p. 661). Thus, legitimacy theory appears to be a viable lens with which to analyse such disclosures.

2.2.2 Legitimacy theory

Gray et al. (1995) state that legitimacy theory is "a systems-oriented view of the organisation and society ... that [sic] permits us to focus on the role of information and disclosure in the relationship(s) between organisations, the State, individuals and groups" (Gray et al., 1995, p. 45). Thus a link to stakeholders and the resultant theory is clear. Deegan (2002) further highlights that legitimacy theory holds that organisations do not have an inherent right to existence and the use of resources; they exist only to the extent that society deems the organisation to be legitimate (Deegan, 2002, p. 292). Again, the link to the resource based perspectives mentioned earlier is alluded to. Deegan (2002) goes further - drawing the link to the concept of a social contract (Wraight, 2008), noting that an organisation's legitimacy, and ultimately its survival, will be threatened if it is deemed to have violated its social contract (Deegan, 2002, p. 293).

Defining and understanding legitimacy theory correctly are paramount to employing it and this has been a weakness in prior research which employs the theory, according to Chen and Roberts (2010). Further, the authors stress that despite an organisation's actions; legitimacy is conferred by society and the relevant stakeholders, and is inherently subjective in nature (Chen & Roberts, 2010, p. 654).

In a conference presented paper, Lindblom (1994) defined legitimacy as "a condition or status that exists when an entity's value system is congruent with the value system of the larger social system of which the entity is part" (Lindblom, 1994). The paper further highlighted that when disparity exists or is perceived between the two value systems, legitimacy is threatened. The author discussed four strategies for an organisation to close a legitimacy gap:

1. The organisation may seek to educate and inform the larger social system as to changes in its actual performance, used when the legitimacy gap is due to poor performance in the first place;
2. The organisation may seek to change the perceptions of the large social system but not its performance, employed when the organisation sees the legitimacy gap as being due to misconceptions or a lack of knowledge of its actual activities or performance;
3. The organisation may seek to manipulate perception by deflecting attention away from a concerning issue through, for example, emotive symbols or wording; and
4. The organisation may seek to change expectations of its performance when it believes those expectations are unrealistic or incorrect (much as an earnings notice would do with regards to financial disclosure).

The various strategies are supported by Branco and Rodriques (2007) in their definition and description of the use and tools of legitimacy (Branco & Rodrigues, 2007, pp. 80 - 81). Reverte (2009) specifically reinforces similar views on legitimacy and notes the many studies which have indeed showed that organisations do voluntarily disclose information in annual reports as a tool to manage their legitimacy (Reverte, 2009, p. 353). Thus, there a clear link between legitimacy theory and stakeholder theory, in that organisational legitimacy is in a large part dependent on stakeholders (especially key stakeholders as Deegan's (2002) managerial stakeholder theory refers) (Deegan, 2002). Beyond shareholders, employees are both central stakeholders and an important resource in the organisation's operations, thus the review turns to the resource based perspectives.

2.2.3 Resource based perspectives

The resource based perspective is a theoretical framework which examines the links between a firm's internal characteristics and its performance, and posits that explanations can be found in the combination of a firm's makeup and unique characteristics (Branco & Rodrigues, 2006). Indeed, Russo and Fouts (1997) state that the resource based view highlights the fit between what a firm is capable of doing and what its opportunities are (Russo & Fouts, 1997, p. 536).

As noted, resource based perspectives align with and compliment stakeholder theory and legitimacy theory in that organisational resources include employees, suppliers and partners, and as such the ways in which organisations treat these stakeholders can have a bearing on their legitimacy (Deegan, 2002, p. 293). Toms (2002) contends that the resource based view can be "extended to consider the role of accounting disclosure as a signal of improved social and environmental conduct and hence reputation" and highlights its usefulness in research (Toms, 2002, p. 258).

Russo and Fouts (1997) note that there are three types of resources:

- Tangible resources such as plant, property & equipment, financial reserves, stocks, raw materials and other such physical resources;
- Intangible resources such as technology, reputation and humour resources; and
- Personnel based resources which include culture, training & expertise of staff as well as their commitment and loyalty.

(Russo & Fouts, 1997, p. 537)

In another paper, Branco and Rodrigues (2008) contend that organisations with good socially responsibly reputations help build better relationships and interactions with external stakeholders such as customers, investors and suppliers. They further suggest that such reputations also attract better calibre employees which, when combined with better stakeholder relationships, may improve financial performance (Branco & Rodrigues, 2008, p. 687). However in their earlier work the same authors assert that despite this suggestion there is a lack of clarity and understanding of how better relationships truly assist in superior performance (Branco & Rodrigues, 2006). They state that this is a key drawback of the resources based perspectives and why many authors couple this theory with other social and political theories, particularly stakeholder and legitimacy theories (Branco & Rodrigues, 2008, p. 687).

2.2.4 Signalling theory

Signalling theory, sometimes referred to as quality signalling theory, is based on the idea that organisations and managers investing in activities for social or environmental reputational purposes are unlikely to realise reputational gain unless they make relevant disclosures to 'signal' such activities (Hasseldine, Salama, & Toms, 2005, pp. 233 - 234). Branco and Rodrigues (2006) stated that due the asymmetry of information between what is known inside and outside of the organisation, signalling is used by firms to inform stakeholders as well as compete for social status and reputation (Branco & Rodrigues, 2006, pp. 122 - 125).

Toms (2002) suggests signalling theory is important as it brings together empirical work; those studies focussing on disclosure as well as efforts based on resources-based or governance perspectives. He states in the theory hypothesises that certain signals are more believable than others; such as those that are difficult to imitate. The link is drawn to resource based perspectives where resources that are inimitable are of the greatest value. Thus the author concludes that quantifiable and verified information is of more value than vague, generic information to reputation building; and firms not pursuing environmentally friendly policies will find such disclosures difficult to imitate (Toms, 2002, p. 261).

2.2.5 Interlinking of theoretical perspectives

Gray et al. (1995) made the case that corporate social and environmental reporting is a complex activity which cannot be adequately explained by a single theoretical perspective. They opined that legitimacy and stakeholder theory specifically are complementary and not competing theories for understanding such disclosure (Gray et al., 1995, p. 67). This view was endorsed by Deegan (2002) who noted that "both theories conceptualise the organisation as part of a broader social system wherein the organisation impacts, and is impacted by, other groups within society" (Deegan, 2002, p. 295). Further support for the combination of these theories is given by Reverte (2009).

Branco and Rodrigues (2007) advised that due to the varied factors influencing organisations to disclose (stakeholder concerns, regulator pressure, environmental and social concern etc.); no single theory is comprehensive enough to explain these factors. As such the authors advocate a multi-theoretical approach (Branco & Rodrigues, 2007, p. 83). In a later article, the same authors raised one issue in combining different bodies of theory being that they may not be commensurate or compatible. In their study they combine legitimacy theory and resources based perspectives. They cite Campbell, Craven and Shrives (2003) in highlighting that these two theories are

interrelated concepts and form part of the "stakeholder metanarrative" (Branco & Rodrigues, 2008, p. 687).

Finally, Chen and Roberts (2010) found that it is possible to reach compatible interpretations of business social phenomena through the use of legitimacy theory, institutional theory, stakeholder theory and resource based perspectives. They state that while these theories have often been taught and applied separately, they are in fact alike since they "share a similar ontological view" and are considered systems-oriented theories (Chen & Roberts, 2010, p. 652).

Thus, the theories discussed appear to have significant scope for use in interpreting corporate social and environmental reporting. As shown, several authors have demonstrated that it is when combining multiple theories and interpreting results through the various lenses available, that meaningful analysis of such complex subject matter can be undertaken. Corporate signalling, through the means of corporate social and environmental reporting, to varied stakeholders, would appear to be a useful tool in legitimising operations.

2.3 Trends in Sustainability reporting

Two widely published authors in the field, Branco and Rodrigues, published an overview of issues in the field of corporate social and environmental research. This work highlighted two issues in the body of research: sample selection and data capture (Branco & Rodrigues, 2007, p. 73).

The authors note various methods for the selection of sample size including: company size; location of listing; and "interesting or best practice" companies. They quote Gray et al. (1995) when stating that there are compelling reasons to select large organisations as samples, the primary reason being that it allows comparability with most of the existing studies on the topic (Branco & Rodrigues, 2007, p. 74). With regards to data capture, the authors provide many reasons for the use of the company's annual report for this purpose. These reasons given again include comparability with existent literature, as well as the fact that the annual report is the main vehicle for company reporting and is considered the most credible of the various sources (Branco & Rodrigues, 2007, p. 74).

In their seminal paper analysing corporate social and environmental reporting, Gray et al. (1995) drew the following conclusions:

- In line with the fact that social and environmental reporting is not regulated or mandated in most countries, sustainability reporting would not appear to be a systematic activity;

- Corporate social and environmental disclosure does not appear to be related to profitability in the same period;
- Sustainability reporting does appear to be related to company size. However this is not the most reliable result when no allowance is made for other factors such as industry, the skills and attitudes of management and the regulatory environment;
- There is evidence of industry effects, though precise details of what these may be are not entirely clear;
- The country where reporting is undertaken, and the country of ultimate ownership of the organisation, seem to have a significant effect on reporting; and
- There appear to be a number of characteristics that correlate to a predisposition to make social disclosures; factors such as capital intensity, age of the corporation, strategic posture, senior executive and the existence of a social responsibility committee.

(Gray et al., 1995, p. 49 - 50)

As noted previously in brief, Fifka (2011) provided a detailed overview of sustainability research and noted a number of general themes at a global level:

- Content analysis has been the most frequently used data collection method;
- Annual reports have been the most prominent target of analysis, though use of stand-alone reports and company websites are increasing;
- Internal factors have been the most widely researched; with 57% of all studies focussing purely on internal factors, 12% on solely external factors and 31% probing both factors as determinants of reporting;
- Western studies form the bulk of current investigations into sustainability disclosure;
- Suggestions that sustainability research coherently correlates with stages of country development have been difficult to prove;
- Certain factors, such as organisation size and industry type, appear to be strong indicators of reporting in all regions, whereas other factors, such as financial performance, are generally strong indicators but not in all regions (such as Australia & South East Asia); and
- While noting that the general political environment has a strong impact on reporting practices, the author notes that stakeholder impact, for example, varies across the globe and not in line with expectations (for instance, stakeholder impact in the United States is stronger where stakeholder orientation is weaker, compared to North West Europe where stakeholder orientations are accepted as stronger).

(Fifka, 2011, pp. 24 - 26)

Fifka (2011) highlights the following internal factors: size, industry, financial performance, and social and environmental performance; and external factors: country / region, stakeholder interests, and media pressure as being the most prevalent factors in social and environmental disclosure (Fifka, 2011). Research on various topics has found various levels of support for each of the factors.

2.4 Factors and determinants of reporting extent and quality

2.4.1 External factors

2.4.1.1 Consumer proximity

Branco and Rodrigues (2008) found a significant positive correlation between organisations in industries designated as close to the customer (C2C) with regards to levels of internet disclosure (adjusted R^2 value of 0.376 at a 10% significance level in a two tailed test). The authors had hypothesised a similar correlation with annual report disclosure, however could find none (Branco & Rodrigues, 2008, p. 699). They had hypothesised this correlation due to their combination of legitimacy theory and resource based theory, positing that organisations in these industries provide more social responsibility disclosures in order to maintain or improve their reputation and ensure continued social contract and legitimacy (Branco & Rodrigues, 2008). While similar in nature, industry affiliation refers more to internal activities and required resources, while consumer proximity refers more to how close to the customer the industry is. By means of illustration, the authors noted consider pharmaceutical drug retailers to be a C2C industry, although not regarded as environmentally or sustainably sensitive.

Haddock-Fraser and Tourelle (2010) noted, in an analysis of the role consumers play in motivating stakeholder engagement, that prior research by Haddock-Fraser (2010) had demonstrated that companies supplying (in part or in whole) to end consumers were more likely to be proactive in reporting in general (Haddock-Fraser & Tourelle, 2010, p. 528).

2.4.1.2 Stakeholder pressure

De Villiers noted, through the use of a questionnaire, that the reason for increased disclosure in South Africa can be related back to stakeholder pressure, observing the organisations view of stakeholders as very broad (De Villiers, 1999). Indeed Fifka (2011) notes this factor as being one

of the most studied (although only occurring in around 4% of studies), with around 70% of all studies noting a positive correlation (Fifka, 2011, p. 25). Stakeholder pressure is considered critical to the political economy theories so prevalent in social and environmental research. Indeed Chen and Roberts (2010) noted pressure from stakeholders (stakeholder theory) and attempts to legitimise actions (legitimacy theory) as the two key drives of disclosure (Chen & Roberts, 2010, p. 651). As such it is of interest as to whether stakeholders important to organisations (i.e. stakeholders organisations referred to in corporate reports) have an influence on the amount of corporate social and environmental reporting.

2.4.2 Internal Factors

2.4.2.1 Organisational context

Becker (2010) makes the point that the selection of indicators will vary depending on those conducting the evaluation (or undertaking to report as it were) and the interest of stakeholders (Becker, 2010, p. 195). While Roca and Searcy (2012), in their evaluation of Canadian reporting, delve into stakeholder theory indicating different corporations have differing priorities for varied stakeholders. As such they claim it stands to reason that (particularly in the context of the lack of rigid reporting regulations) reports targeted to diverse stakeholder sets would disclose different indicators. Their study highlights several differences amongst sectors, such as oil & gas and mining, employing the largest amount of indicators, while the retail and steel industries employing the least amount (Roca & Searcy, 2012, p. 116).

In an investigation into the JSE Socially Responsible Investment Index (SRI) and the state of sustainability reporting in South Africa, Sonnenberg and Hamann (2006) illustrated similar variations amongst sectors; and specifically highlighted the fact that sectors other than the resources sector display a significantly lower capacity to explain and detail their environment policies, systems and impacts (Sonnenberg & Hamann, 2006, p. 314). Further, through their analysis that there are two overlapping categories of companies that tend to lead the way in terms of sustainability reporting, namely, companies with significant environmental impacts with regards to their operations; and companies with high levels of international exposure. They state that these companies too, are more likely to employ reporting in terms of the GRI guidelines (Sonnenberg & Hamann, 2006, p. 311).

In their Canadian study, Roca and Searcy (2012) highlighted the fact that the prevalence of the use of GRI varied per sector from 9% in food and retail, through to 31% in mining and 50% in transport, communications and services as well as construction and chemicals (Roca & Searcy, 2012, p. 112). Gao, Heravi and Xiao (2005), in a study of reporting in Hong Kong, found evidence that industry membership impacted on the amount of Corporate Social and Environmental Disclosure (CSED) (Gao, Heravi, & Xiao, 2005).

However, Monteiro and Aibar-Guzmán (2010) found, contrary to some of the authors discussed, no evidence of an influence of industry membership, and to a lesser extent international exposure (local subsidiaries of multinational firms and firms with international operations) on the decision to provide environmental disclosures (Monteiro & Aibar-Guzmán, 2010, p. 199). Furthermore, Branco and Rodrigues (2008) also found no correlation between international exposure and environmental disclosure.

2.4.2.2 Organisational size

Liu and Anbumozhi (2009) found a correlation between firm size and the amount of environmental information disclosure in a study limited to environmental disclosure. Additionally, in a significantly wider study, Gao et al. (2005) found further evidence of a positive correlation between firm size and the amount of CSED. In a study of environmental disclosure among 450 United Kingdom (UK) companies across multiple industries, Brammer and Pavelin (2008) found the quality (which incorporated an element of inclusiveness and as such, the extent of information) of disclosures were determined by both the size of the firm and, as previously discussed, by the nature of the organisation's business activities (Brammer & Pavelin, 2008, p. 134).

In contrast to these studies, Lynn (1992) found no evidence in Hong Kong of firm size having any impact on corporate social disclosure (Lynn, 1992, p. 108). However, in his meta-analysis, Fifka (2011) found that 87% of studies that analysed size found this factor to be significantly correlated with disclosure (Fifka, 2011, p. 25).

2.4.2.3 Labour Content

While none of the authors analysed this particular aspect, Brammer and Pavelin (2008) found the quality of disclosures to be determined by a firm's size and the nature of its business activities. Business activities are primarily undertaken by the organisations resources, specifically including the labour force. In the South African environment, more than 40% of the workforce is unionised

and organised labour unions are closely aligned to social and political issues, as a consequence, organised labour exerts a significant influence on all business activities (Dawkins & Ngunjiri, 2008). Organised labour has reference to all three theoretical perspectives which form the analysis in this paper. People are key elements of any organisations resource base, while organised labour constitutes a key stakeholder and a significant influence on the ongoing legitimacy of the organisation, particularly in the eyes of government.

Deegan (2002) provides insight here noting that both legitimacy theory and stakeholder theory are derived from political economy theory. The author notes the relevance of this theory stresses that organisational efforts occur within socio-political environment shaped by power conflicts between players groups (Deegan, 2002, p. 292). Branco and Rodrigues (2007) suggest that the more influential or powerful the stakeholder the more effort organisations make in managing this relationship (Branco & Rodrigues, 2007, p. 79).

2.5 The South African Environment

Dawkins and Ngunjiri (2008) found, in line with prior research, that region or country-specific institutional pressures play a role in shaping corporate social responsibility and the related reporting thereof. They quote institutional theory (with regards to reporting requirements on the JSE) and the need to legitimise firm activities with regional stakeholders as the driving force behind firms reporting of Broad-Based Black Economic Empowerment (BBBEE) [5] and HIV/AIDS (Dawkins & Ngunjiri, 2008, pp. 298 - 299).

Sonnenberg and Hamann (2006) highlight that some issues such as BBEEE and Health & Safety (H&S) receive significant attention in corporate reports due to being mandated as part of Black Economic Empowerment charters and the Occupational Health and Safety Act respectively. However the authors also note the exception here in HIV/AIDS, which receives significant attention despite not being legislated (Sonnenberg & Hamann, 2006, p. 311).

Indeed, these important specifics of South Africa reporting have been noted by researchers outside of the social and sustainability disclosure space as evidenced by the inclusion of BBBEE and HIV/AIDS elements in a recent study of corporate strategy disclosures (Padia & Yasseen, 2011, p. 29).

[5] BBBEE is an economic policy, a form of positive-discrimination enacted by the Government of South Africa, in order to redress the inequality and exclusionary practices of the Apartheid Government

2.6 Conceptual theoretic model

In terms of understanding the factors at play, the following conceptual model is proposed as a representation of how the influences play out in sustainability reporting. This conceptual model will be used to derive the analytical model use in the empirical study.

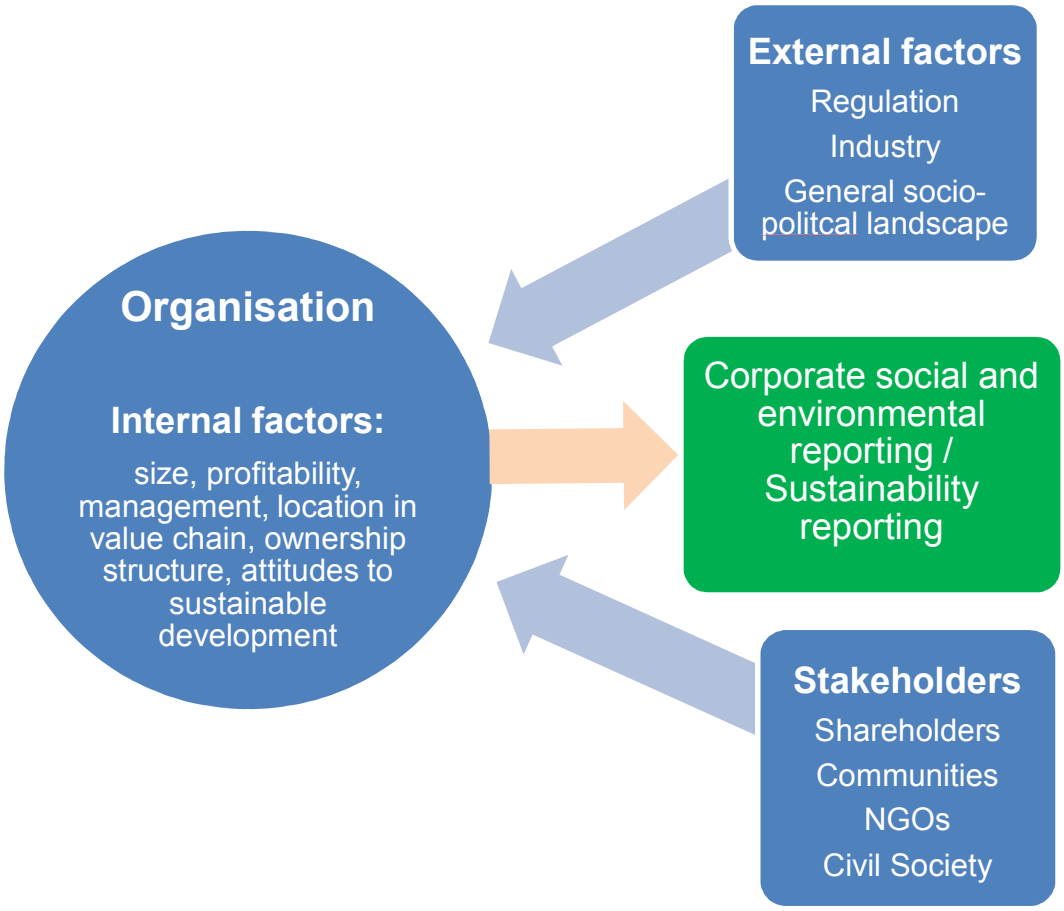

Figure 1 – Conceptual theoretical model

2.7 Analysis of corporate sustainability reports

In order to derive some measure of the amount of sustainable development disclosure, a method is required to be developed to review and score sustainable development reports. In a cross-sectional study of corporate social and environmental reporting, Gray et al. (1995) highlight content analysis as being widely deployed and appropriate, a view supported by Fifka (Fifka, 2011, p. 20). Abbott and Monsen (1979) similarly employ content analysis and define it as "a technique for gathering data that consists of codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity" (Abbott & Monsen, 1979, p. 504).

Beattie and Thompson (2007), in an extensively cited paper on content analysis, stress that the precise details of the content analysis method are to be transparent in order to allow for useful comparisons between studies and because the method and selection criteria reflected the researchers views on the subject matter (Beattie & Thomson, 2007). The former view was echoed by Hooks and Van Staden (2011) who noted that processes should be clear and repeatable by other researchers, as well as highlighting that methods vary, however, often based on extent and / or quality of information reported. The authors explain that extent-based studies seek to quantify the degree of reporting by utilising counts of words, pages or number of references to concepts (Hooks & Van Staden, 2011, p. 200). Gray et al. (1995) note that the extent-based techniques rely on the assumption that the extent of disclosure provides some signal of the importance of the issue disclosed to the reporting organisation (Gray et al., 1995, p. 89). Alternately, quality-based studies are premised on the suggestion that certain disclosures are of more relevance and value than others, and seek to qualify the quality of disclosure. This is noted as inherently more subjective, and assessment may vary between researchers (Hooks & Van Staden, 2011, p. 200).

Sonnenberg and Hamann (2006), in their analysis of JSE companies, stated that most organisations still report in an anecdotal and aspirational manner; highlighting positive content and lacking quantitative and verifiable content (Sonnenberg & Hamann, 2006, p. 311). Roca and Searcy (2012) raise a similar concern in suggesting that the high degree of qualitative information in sustainability reports is key in observer's doubts as to the extent disclosure accurately portrays the relevant organisational impacts (Roca & Searcy, 2012, p. 103).

In a detailed examination of the use of content analysis in studies of Intellectual Capital (IC) disclosures, Beattie and Thompson (2007) highlight six specific issues in the deployment of content analysis for this purpose:

- *Concept boundary problems and coding reliability* – this specific issue relates to a lack of clarity as to which category the item under evaluation falls;
- *Manual vs. electronic searching* – the authors noted that, with the exception of one study, manual searching was employed; while highlighting that, for instance, synonyms and differential use of language create problems for electronic searching;
- *Annual report analysis* – a lack of clarity exists as to which parts of the annual report are valid and should be analysed;

- *Volume of disclosure* – some studies employ presence / absence of information while others rely on counts of occurrences (some with, others without repetition); noting that it is unclear as to what the impact of this is on comparability of information;
- *Location and type of disclosure* – there is no reason why disclosures are made in certain locations of the report, however this in itself may be informative. Further, it was noted that while most disclosure is discursive rather than numerical, assessing only the volume of disclosure and not its credibility or quality may not provide the full picture; and
- *Units of analysis and units of measurement* – the basis for coding (what it is you measure) and the basis for measurement (how you judge quantity / quality) is a key element in impacting the accuracy and usefulness of the study. Notwithstanding units discussed (such as word count, sentence count, etc.), decisions must be made with regards to non-narrative disclosure such as pictures, graphs and other visuals.

(Beattie & Thomson, 2007, pp. 135 - 143)

In sustainable development disclosure, boundary problems are less of an issue due to the compartmentalisation of pillars as previously discussed. In respect of sections of the report too, sustainability disclosure is fairly clear and, especially in the case of stand-alone reports, the entire report is relevant.

With regards to units of analysis, a prominent method in the literature is that of a disclosure index which has been defined as a "qualitative-based instrument designed to measure a series of items which, when the scores for the items are aggregated, gives a surrogate score indicative of the level of disclosure in the specific context for which the index was devised" (Coy, 1995, p. 121). Hooks and Van Staden (2011) stated that it is a tool to analyse, compare and explain differences in extent and quality of reporting and is considered a valuable research tool. The authors further explain that units of analyses are selected using other indices, relevant literature or selected based on industry benchmarks such as the GRI (Hooks & Van Staden, 2011, p. 202).

With regards to units of measurement, Toms (2002) noted in an analysis of empirical studies that it is the quality and reliability of environmental information, and not the quantity thereof, that is important in the development of a positive reputation (Toms, 2002). Hooks and Van Staden (2011) highlighted authors echoing this as well as empirical research which support the assertion (Hooks & Van Staden, 2011, p. 202). Hooks and Van Staden (2011), however, performed an analysis of various types of content analyses in literature and found quality and extent of the studies' results

to be highly correlated, suggesting the differences as a result of the specific technique used are minimal (Hooks & Van Staden, 2011, p. 210).

Quality and reliability, however, cannot be determined purely though units of measurement that include for instance: word count, sentence count or page count. Beattie and Thomson (2007) highlighted this and cited previous concerns in literature with regards to such counts missing relevant contextual elements of the item in question, further exacerbated by different font sizing and page formats (Beattie & Thomson, 2007). This is supported by Unerman (2000) who noted similar concerns in his literature review, while stating that any study which ignores important information such as graphs, charts and photographs fails to capture the social or environmental disclosure in its entirety (Unerman, 2000, p. 675).

Indeed, authors such as Branco and Rodrigues (2007) state that "it is always preferable to use a method which allows the measurement of the extent of information disclosure, thus reflecting the emphasis that companies attach to the information disclosed" (Branco & Rodrigues, 2007, p. 82). Hasseldine et al. (2005) too recognised this, and designed a quality-adjusted method of content analysis where sentences are not only counted but also weighted (Hasseldine et al., 2005, p. 231).

Indeed, Hasseldine et al. (2005) are not alone. Various types of disclosure indices employing a multitude of scoring mechanisms are noted in literature. Some examples of indices used:

- An un-weighted (ignoring the literature on quality / extent, this codes a 0 for no information, and a 1 for information) index of 15 items based on an exploratory analysis of literature (Galani, Gravas, & Stavropoulos, 2011, p. 240);
- A weighted index based on combination of the GRI and information specified by 'Environmental Information Disclosure Measurement' issued by China State Environmental Protection Administration (SEPA). The weighting employed consisted of: 1 for no information disclosed; 3 for descriptive or incomplete quantitative disclosure; and 5 for descriptive and qualitative disclosures in detail (Liu & Anbumozhi, 2009, pp. 596 - 597); and
- An index based on all 141 topics in the GRI and deployed a five point scoring system. A score of 0 was assigned for no disclosure, 1 for brief or generic statements, 2 for more detailed coverage, 3 for extensive coverage and the maximum of 4 for full and systematic disclosure which allowed for comparability of information (Skouloudis et al., 2010, p. 429).

- Robertson and Nicholson (1996) provide a rating method for corporate reports which has been widely used and referenced in literature (including Hasseldine et al., 2005). This method employs the following coding:
    - 1. General rhetoric
    - 2. Specific endeavour; policy only
    - 3. Specific endeavour; policy specified
    - 4. Implementation and monitoring; use of targets, results not published
    - 5. Implementation and monitoring; use of targets, results published

    (Robertson & Nicholson, 1996)

Both Hooks and Van Staden (2011) and Toms (2002) stated that existing theory proposes that quality of disclosure, more than quantity of disclosure, provides better indication of disclosure and would thus be a better tool for legitimacy. The former noted that employing a weighted index may provide a better measure of disclosure than the un-weighted index or word counts, however points to critics highlighting the increased subjectivity introduced by the weighting method (Hooks & Van Staden, 2011, p. 202). Others highlight the subjectivity concerns, though concluded that this is acceptable in instances where the study sought to detect variation between organisations' disclosure (Branco & Rodrigues, 2007, p. 82). Whatever the details of the methods, they all seek to determine the extent or level[6] of reporting, to measure the emphasis on certain elements of reporting, either through quantity or quality of information reported.

[6] The expression 'level of disclosure' will be used in this study to denote the extent to which organisations have reported various elements within their disclosures.

3 Research Hypotheses

With regards to organisation characteristics, many studies, as noted, found a positive association between both membership to certain industries and international firms, and the level of social and environmental disclosure. Liu and Anbumozhi (2009) in particular found a strong association, with a p-value of under 0.01, while Reverte (2009) found a less significant association with p-value measuring 0.08 (Reverte, 2009, p. 361). However, the work by Monteiro and Aibar-Guzmán, (2010) and Branco and Rodrigues (2008) in particular, did not find any. This, in combination with the lack of South African literature, makes these factors of interest, leading to the first hypotheses:

> *H_1 : Organisations in environmentally sensitive industries are more likely to exhibit higher levels of disclosure than organisations in non-environmentally sensitive industries; and*
>
> *H_2 : Organisations with international exposure are more likely to exhibit higher levels of disclosure* than those with less.

Consumer proximity has been noted as a factor in some research, but has not been tested in most of the research covered; as such this factor requires further examination and leads to the third hypothesis:

> *H_3 : The amount of disclosure is positively associated with proximity to customers.*

With organised labour forming part of the South African Government's ruling party and consequently being a power influence within the political economy, this leads to a fourth hypothesis:

> *H_4 : The amount of disclosure is positively associated with the higher levels of unionised labour and the resultant power of organised labour in the organisation.*

In line with stakeholder theory, with regards to organisation's concerns with managing their legitimacy and attempts to manage their legitimacy, this leads to the fifth hypothesis:

> *H_5 : The amount of disclosure is positively associated with the number of stakeholder groups who influence the organisation (i.e. those that the organisation explicitly mentions in their reporting).*

In line with resource based perspectives, legitimacy theory and stakeholder theory, large organisations have both the resources to undertake sustainable development reporting and the most to lose by not engaging stakeholders and reporting information to maintain legitimacy. Thus the sixth hypothesis is:

> *H_6 : The amount of disclosure is positively associated with organisation size.*

In order to test hypothesis however, one must state them in a neutral sense. This is due to the fact that in analytical research, one does not prove a hypothesis, but rather disproves the null hypothesis in which no significant effects are noted. As such, the set of null hypothesis this study will seek to analyse, and possibly disprove are:

Hypothesis	Relevant literature
H_1 : The level of disclosure is not significantly associated with the environmental sensitivity of the organisation's operations	Roca and Searcy (2012) Monteiro and Aibar-Guzmán (2010) Gao et al. (2005) Brammer and Pavelin (2008) Sonnenberg and Hamann (2006) Branco and Rodrigues (2008)
H_2 : The level of disclosure is not significantly associated with higher levels of international exposure with regards to an organisation's operations	Monteiro and Aibar-Guzman (2010) Sonnenberg and Hamann (2006)
H_3 : The level of disclosure is not significantly associated with proximity to customers.	Branco and Rodrigues (2008) Haddock-Fraser and Tourelle (2010)
H_4 : The level of disclosure is not significantly positively associated with the higher levels of a unionised workforce and the resultant power of organised labour in the organisation.	Brammer and Pavelin (2008) Deegan (2002) Branco and Rodriques (2007) Dawkins and Ngunjiri (2008)
H_5 : The level of disclosure is significantly associated the number of stakeholders identified in the annual report	Chen and Roberts (2010) Fifka (2011) De Villiers (1999)
H6 : The level of disclosure is not significantly associated with the organisation's size	Gao et al. (2005) Liu and Anbumozhi (2009) Brammer and Pavelin (2008) Lynn (1992)

Table 2 - Hypotheses

4 Research Method

The research design was deductive by nature, with the study of literature leading to the development of six hypotheses which were tested through an analysis of data from corporate reports. An empirical model was developed and quantitative methods were applied in rejecting, or not rejecting the null hypotheses and determining whether a causal relationship existed between various independent variables and the dependent variables within the data set in question. Further to this, some element of descriptive analysis was undertaken to give both context to the data and was used in an attempt to explore the results of the hypothesis testing.

4.1 Scope

The scope of the study as defined within the literature review is that of sustainability and related corporate reports of listed companies reporting during the 2011 calendar year. Reports for organisations were found via their corporate websites and other web based integrator sites. Companies not reporting within the calendar year were not considered. Furthermore, due to time pressures and this study's focus on indicators, only sustainable development indicators and not the full suite of GRI disclosures were analysed. Thus the sections on the organisation profile, strategy and analysis, governance and the report scope were excluded. This was in line with findings by Morhardt et al. (2002) and Daub (2007) that the majority of points scored through content analysis of sustainability reports are through the general disclosures sections, and not the specific performance indicators. As such, true efforts at sustainability should be more evident through attempts at comprehensive and qualitative performance indicators, and not vague descriptions of corporate policies and behaviour.

Additionally, the scope was that of cross-sectional data in one year, with no analysis of temporal aspects considered; this was to avoid any shifts in the socio-political environment which may have skewed the findings.

4.2 Analytical framework

As described in the literature survey, an organisation's prosperity is in a large part due to the legitimacy it maintains through stakeholder engagement and in the way it uses resources to attain its aims. Where stakeholders are particularly concerned with elements of the social, economic and environmental affairs of the organisation and its deployment of resources, it stands to reason that firms will be more inclined to report on such information through mediums such as corporate

sustainability reporting and related disclosures. The literature survey culminated in the formulation of six hypotheses which required the definitions of an empirical model and relevant variables.

4.2.1 Empirical Model

In line with the proposed analytical framework, a number of elements which possibly influence the level of sustainable development disclosure had been defined and form the basis of the following empirical model:

$$SDRDL = \alpha_0 + \alpha_1 IND + \alpha_2 IE + \alpha_3 CP + \alpha 4 LAB + \alpha_5 SP + \alpha_6 SIZE + \alpha_7 CDP + \beta$$

Where:

- *SDRDL: the sustainable development reporting disclosure level*;
- α_0 : is the y-axis intercept of the model, necessary for any empirical method. It is the amount of disclosure likely (ignoring the error term) should organisation size be extremely small (it cannot be zero as this would suggest there is no organisation) and all variables be zero;
- *IND: industry classification* - a designation of whether the organisation operates in environmentally / sustainably sensitive industries;
- *IE: international exposure* - a measure of a firms international exposure, either its reach internationally, or in the case of a local subsidiary of an international firm, the extent of international reach of the parent company;
- *CP: consumer proximity* - a designation of whether the organisations operations are in close proximity, and as such, visible and well known to the consumer, who often deals directly with such a company;
- *LAB: labour content* - a measure of the composition of labour of the organisation, the proportion of its workforce that is unionised, and as such the likely influence that organised labour has on its operations;
- *SP: stakeholder pressure* - a count of the number of stakeholder groups influencing the organisation's reporting practices;
- *SIZE: organisation size* - a measure of the size of the firm, indicative of its level of resources;
- *CDP:* The score achieved in the year's Carbon Disclosure Project; and
- *β:* the error term – any model developed will contain some level of error in its levels.

4.2.2 Definition and operationalisation of variables

4.2.2.1 Dependent variable

The dependent variable in this study, SDRDL, is the level of disclosure of sustainable development reporting information, a measure of the amount and depth of sustainable development indicators disclosed in corporate sustainable development reports.

For this study, a content analysis spreadsheet was developed for the purpose of calculating the *SDRDL* (See *Appendix A – Data Collection Instrument*). The spreadsheet was developed through a combination of the GRI checklist (Global Reporting Initiative Resource Library, 2012) and the scoring sheets used in the Ernst & Young Excellence in Corporate Reporting Awards 2011 (Ernst & Young, 2011). The Ernst & Young scoring sheets were secured due to the author's position at the firm, and modified to select a combination of indicators from the environmental, social and economic pillars of sustainable development. Scoring from Ernst & Young was retained where possible as the mark plan was developed by adjudicators from the Department of Accounting at the University of Cape Town, and confirmed by Ernst & Young's Sustainability Practice, giving credence to the selection and weighting. Specific scoring elements were cross-referenced (see the "Link to GRI" column, found on the collection instrument in *Appendix A*). In addition, some elements of the social pillar scoring plan were not directly aligned to GRI 3.1; however such elements (related to HIV, Employment Equity and H&S) were retained (see the reference "ADDxx" in the "Link to GRI" column where xx refers to a unique number). This was due to their relevance to the social contract within the study environment and importance placed on them in prior research within South Africa as noted in the literature review. The scoring of the different pillars, to a combined score of 50, is broken down as follows:

- A score of 15 points was assigned to indicators of the economic pillar;
- A score of 15 points was assigned to indicators of the environmental pillar; and
- A score of 20 points was assigned to the indicators in the social pillar.

This document was completed for each organisation under review and measured two key elements:

- Whether disclosures under both the core and recommended indicator sets under each of the three pillars of sustainable development were undertaken; and
- Within each indicator the content analysis differentiated between the extent disclosure per indicator using a coding of:

- 0 for no disclosure of any kind;
- 1 for some level of disclosure, be it somewhat vague, with certain elements missing or a lack of quantifiable or qualifiable statements; and
- 2 for full levels of disclosure (the GRI Guidelines referred to earlier will provide guidance in this regard).

As expected with some indicators, the "1" coding was not relevant, as either a disclosure is made or it is not. Thus a weighted score, to the maximum value of 100, determined the *SDRDL* for each organisation studied.

4.2.2.1.1 Environmentally sensitive industries

In most literature, this was measured via the use of a dummy variable which was set to 0 for non-environmentally / sustainably sensitive industries and 1 for industries where the level of impact on the environment and society is high. In line with Branco and Rodrigues (2008), the following industries are designated as potentially having a high environmental impact: mining, oil and gas, chemicals, construction and building materials, forestry and paper, steel and other metals, electricity, gas distribution and water (Branco & Rodrigues, 2008, p. 691). Gao et al. (2009) included roughly the same industries but added petroleum, textiles, pulp and paper products (Gao, Heravi, & Xiao, 2005, p. 597). In terms of scoring the JSE SRI Index, the JSE makes use of European consulting firm EIRIS as their data provider and analysis organisation. For the purposes of the SRI, EIRIS developed an environmental sensitivity index for different sectors (JSE & EIRIS, 2011, p. 8). As, and in line with the JSE SRI, in this study low impact organisations will be coded as 1, medium impact organisations as 2 and high impact organisations as 3.

4.2.2.1.2 International exposure

This item was measured by a factor denoting the:

- Percentage of net sales which South African organisations had received from overseas operations; or
- Percentage of net sales of the international elements of the organisation in instances where the South African organisation was the local subsidiary of an international firm.

This is in line with Bansal's (as cited in Branco & Rodrigues, 2008) definition of international experience. Sonnenberg and Hamann (2006) also cite international exposure; however unfortunately do not define it in their paper. Both pieces of information were sourced from either

the sustainability reporting or from the financial statements in the event this is not covered in the economic portion of the sustainability reporting.

4.2.2.1.3 Customer proximity

This measure, too, was made via a dummy variable, set to 1 or 0; 0 for industries not regarded as close to the customer and 1 to those regarded as close to the customer. Based on a study of relevant literature, Branco and Rodrigues (2008) concluded that industries rated as close to the customer included household goods and textiles, beverages, food and drug retailers, telecommunication services, electricity, gas distribution, water and banks (Branco & Rodrigues, 2008, p. 690). All other industries were coded as 0. For diversified industries, the assessment was made on the extent of the business activities which speak for the greatest part of the organisations reported activities.

4.2.2.1.4 Composition of labour

As noted, no theoretical elements underpin this measure. As the percentage of workforce that is covered by collective bargaining agreements is a GRI indicator (*LA4*) recommended by the GRI, this could be recorded directly from the annual report.

4.2.2.1.5 Stakeholder pressure

De Villiers (1999) did not undertake an empirical study; however he noted the number of stakeholders identified during interviews with company executives. Based on the work of Fifka (2011), this item has not been analysed in empirical studies to any extent to date. As such a decision was made to measure stakeholder by the number (as a continuous range from the lowest number to the highest number reported) of stakeholder groups (a logical arrangement of stakeholders such as: suppliers, government departments, financial institutions etc) explicitly noted as such in the organisation's sustainability report.

4.2.2.1.6 Organisation size

Branco and Rodrigues (2008) used the total asset value as reported on the balance sheet as a proxy for organisation size. The authors stated that this was due to a lack of theoretical reasoning on the subject (Branco & Rodrigues, 2008). However both Liu and Anbumozhi (2009) and Monteiro and Aibar-Guzman (2010) used the natural logarithm of total assets. These two studies being the more recent; and Monteiro and Aibar-Guzman (2010) using organisation size as an

independent variable and not a control variable. This study, too, used the natural logarithm of total asset reported on the balance sheet.

4.2.3 Analytical model

With the various variables defined, the following is a graphical representation of the analytical model developed:

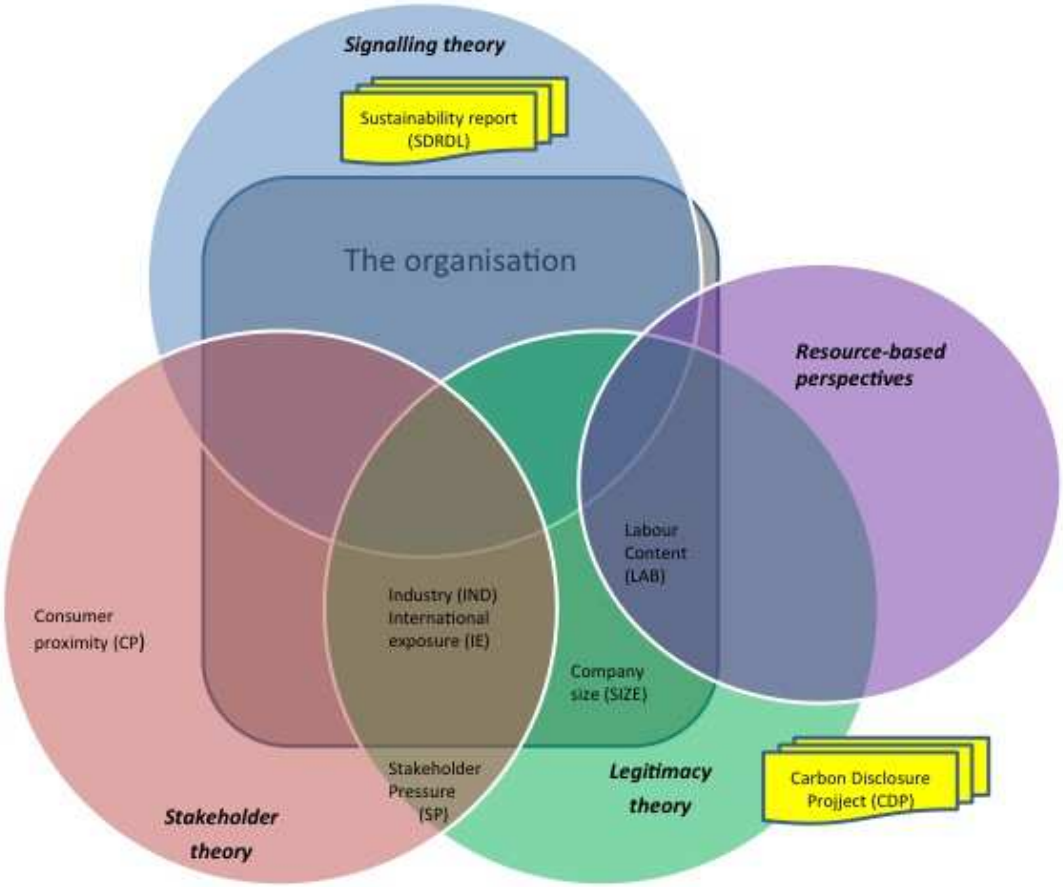

Figure 2 – Analytical model

The theoretical model indicates the theories employed and how they relate to the variables under analysis.

4.2.4 Data analysis

Data collection occurred using the collection instrument in *Appendix A;* employing content analysis of organisations annual reports (be they annual reports and sustainability reports independently or combined as in the Triple-Bottom-Line report).

The empirical model developed formed the basis of a multiple regression model which was used to analyse the data in question. Prior to this, descriptive statistics were performed on the data set to gain a better understanding of the data and to root out any outliers or perceived errors in the data collection method. Descriptive statistics along the areas of variable definition such as differences in data between organisations in environmentally sensitive industries, those denoted as close to the customer as well as by industry data, could have provided valuable insights into the types of reporting. Beyond this, differences within industries with regards to preference for indicators from one or more pillar of sustainable development were of interest. Finally, with regards to descriptive statistics, the data collection tool allowed an analysis of which indicators were more regularly used within the sample frame, and which indicators were either not reported on at all, or only anecdotally or vaguely so.

With regards to the main analytical testing, the correlation between each of the test variables, the dependent variable *SDRDL* was tested. Further to this any co linearity between the variables was analysed in order to test independence of hypotheses. Hypothesis testing and multivariate analysis for the dependant variable and the independent variables were analysed, and this was used to test the hypothesis noted.

Finally, while most of the research to date has focussed on only environmental aspects, or an aggregated view of sustainability, this research attempts to go beyond this established norm. There is support for this in literature where Morhardt et al. (2002) stated that there is a general problem any time scores are applied to categorical variables. The authors highlighted the fact that quite different component scores were recorded for some organisations with very similar overall scores (Morhardt et al., 2002, p.228).

As such, in addition to the aggregated view of disclosure presented by *SDRDL,* a disaggregated multivariate analysis was further analysed with the following variables:

- $SDRDL_{eni}$: the environmental pillar indicators of *SDRDL*;
- $SDRDL_{soi}$: the social pillar indicators of *SDRDL*; and
- $SDRDL_{eci}$: the economic pillar indicators of *SDRDL*.

The intent of this analysis was to describe any differences between factors influencing disclosure of indicators of the individual pillars of sustainable development reporting over that of an aggregated view. Any observations noted in the descriptive elements of the data analysis were examined against this disaggregated regression analysis.

4.3 Sampling

4.3.1 Universe/Population

The *universe* is listed companies anywhere in the world who produce stand-alone sustainability reports or integrated reports such as the increasingly popular triple-bottom-line reports. The *population* for this research is that of JSE listed corporations fulfilling the research approach of analysing South African operating firms. It was anticipated that this would be helpful in a number of ways; it was relevant to the extent that the research is conducted in South Africa. Further, with regards to the literature review, it was anticipated that the research would be able to:

- Provide an additional data set and a further country perspective to that of existing works in countries such as China, Portugal and Norway; and
- Would provide some insight into whether local factors, such as the makeup of the labour component of the organisational resource system, exert any influence on sustainability reporting.

4.3.2 Sampling frame

The sample frame was the Top 100 companies on the JSE as defined by the Market Capitalisation, which is: the product of the number of publically traded shares and the value of the shares on the day of sampling. The frame was further reduced by the fact that only companies who had submitted responses to the Carbon Disclosure Project (CDP) would be considered as this was one of the independent variables under study. Thus the full sample frame consisted of 72 organisations.

4.3.3 Sampling technique

The sample technique employed was a random sample. A software tool at the researcher's organisation, called EY-Random, was used to generate a set of random numbers which would be used to draw the sample. The data was placed in order of market capitalisation, and the samples were drawn with regards to their order in the list.

4.3.4 Sample size

Sample size was driven by the amount of time allowed for by the content analysis. A sample size of 60 organisations was proposed in order to provide a significant sample of environmentally sensitive industry organisations, C2C organisations and organisations with significant international interests such that correlations and hypotheses testing were possible. During data analysis an additional telecommunications company was added to the data set in order to allow a more detailed analysis of the sector, yielding a final sample of 61 companies.

4.4 Research limitations

Any conclusions to this research must be taken in light of the following research limitations, namely:

- Due to the data set employed, the research has only been able make inferences with regards to South African sustainability reporting, though some observations may be found to be universally applicable;
- The study was cross-sectional in nature as such no temporal aspects of analysis associated with a longitudinal study have be provided;
- The analysis was performed against GRI reporting indicators by and large, with some exceptions, and as such the findings provide reference to reporting taken within this context;
- The scoring of the sustainable development disclosure levels were undertaken within the context of a modified version of the Ernst & Young scoring in their reporting awards (Ernst & Young, 2011). Notwithstanding, some element of subjectivity is unavoidable regardless of the chosen method of scoring;
- The findings and observations can only be valid and applicable to the extent that information contained in sustainability reporting reports is valid and accurate; and
- The study has focussed only on indicator disclosure, not on the profile of the organisation, report parameters, strategy, governance and other such elements.

5 Results

For the sake of clarity, a certain amount of discussion of the results is performed within the results chapter, particular the descriptive statistics. This reduces the amount of cross referencing which the reader needs to undertake in order to read the discussion of the results in tandem with the respective figures and tables.

5.1 Data collection and results

Data collection was undertaken over a period of two months, from July to August 2012 and using the collection instrument noted in *Appendix A* in combination with the following reports:

- The integrated / triple-bottom-line report; or
- The corporate social / responsibility / sustainability / environmental report;
- The annual report where necessary; and
- The website where explicitly referenced for particular information in the above reports (vague recommendations to find information on the website without clear reference in the report were not followed through however).

Sixty one companies were sampled in total. Two companies selected in the sample were removed and replaced before data collection was completed. In the first instance, the company was a holding company and noted in its annual report that the holding company only reports aggregated financial data and all other reporting information was undertaken individually by the held companies. In the second instance the firm was listed locally but had, in terms of what is reported, absolutely no presence here and reported no sustainability information and as such was deemed unacceptable as part of the sample.

In the majority of cases, information for each of the independent variables was available and scored from the data in the annual report or website. In some isolated cases however, industry averages or organisational proxies were employed, for example:

- In a few cases, breakdowns or revenues per region or country were not available for the *international exposure* variable; as such a proxy was used in the form of the number of workers locally and abroad. This variable was used five times from the sample of 61 companies and was found (through comparison in companies where both sets of data was available) to be a reasonable proxy;

- In the similar way, in three instances the breakdown of tax paid both locally and internationally was similarly used as a proxy, again after confirmation through testing that the results would be a reasonable proxy; and
- In two instances, the industry average was applied for an organisation's *labour content,* in the absence of any data reported in this regard. In one further instance, the previous year's number was used as no data was reported in the current year.

It is not believed that any of the changes and proxies employed constitutes a significant or material deviation which would affect the efficacy of the data. This is largely due to two reasons. Firstly the proxies used were found to be reasonable proxies through testing of their accuracy in other organisations in the sample which reported both data sets. Secondly, and importantly, the level of analysis, through a sample size of 60 companies, is that aggregated analysis, thus small levels of inaccuracy of individual data points are not significant at the aggregate level.

Data collection was carried out by a single person in order to avoid any bias associated with different interpretations of the results. The results, as scored and used as input to the data analysis, can be found in *Appendix 2 – Results of data collection,* for background information. However the analysis contained herein, does not require an understanding of the physical results. Where interpretation of specific results are required, they will be provided in the main body of this report.

5.2 Indicator results

The results of scoring per indicator are given in *Appendix 3 – Indicator results* and are tabled from highest to lowest scoring indicators. A total of 48 indicators were analysed with regards to each report. The breakdown was as follows: 14 economic indicators; 15 environmental indicators and 19 social indicators.

Of the total 48 indicators, only 21 of those indicators resulted in above average responses (i.e. the sample scoring 50% of the available points or more in total). Of those indicators scoring above average, nine were economic indicators, eight were social and only four were environmental. A more detailed discussion of specific indicators which were well disclosed, and those poorly disclosed, will be undertaken in section 6.1.

5.3 Analysis of variables – dependent variables

Analysis of dependent variables is as follows:

5.3.1 Sustainable development reporting disclosure level – SDRDL

	SDRDL
One Variable Summary	Maindata
Maximum possible score	**100**
Mean as % of max	**50%**
Mean	49.61
Variance	112.27
Std. Dev.	10.60
Skewness	0.2062
Kurtosis	2.3961
Median	49.50
Mean Abs. Dev.	8.53
Mode	44.50
Minimum	31.00
Maximum	73.00
Range	42.00
Count	61
Sum	3026.50
1st Quartile	42.50
3rd Quartile	56.00
Interquartile Range	13.50

Table 3 – Descriptive data of SDRDL

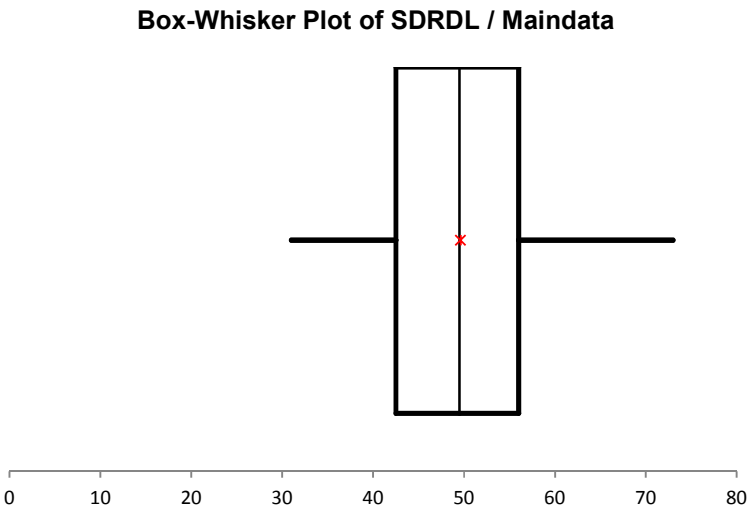

Figure 3 – Box-whisker plot of SDRDL

The box-whisker plot of *SDRDL* (*Figure 3*) shows fairly normally distributed data. This would be expected as the sample included a range of industries, organisations of different size and with different scope of operations and as such, there is no reason to expect anything but normalised data. This is largely supported by the histogram in *Figure 4* and the practically equal median and mean in Table 1. Despite the fairly normal data, a large number (10) of *SDRDL* scores 37 or lower were noted. A mean score of 49.61, roughly half of the maximum possible score of 100, and the reasonably high standard deviation point to relatively high levels of variability in disclosure levels of firms within the sample.

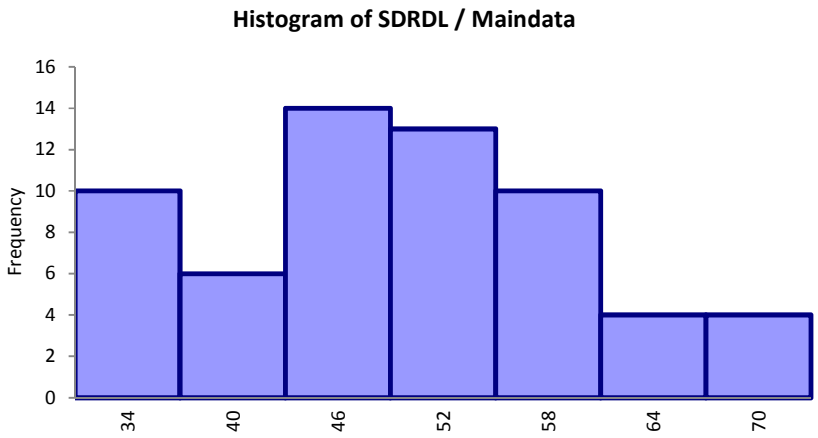

Figure 4 – Histogram of disclosure score

5.3.2 Individual pillar disclosure level – $SDRDL_{eni}$ / $SDRDL_{eci}$ / $SDRDL_{soi}$

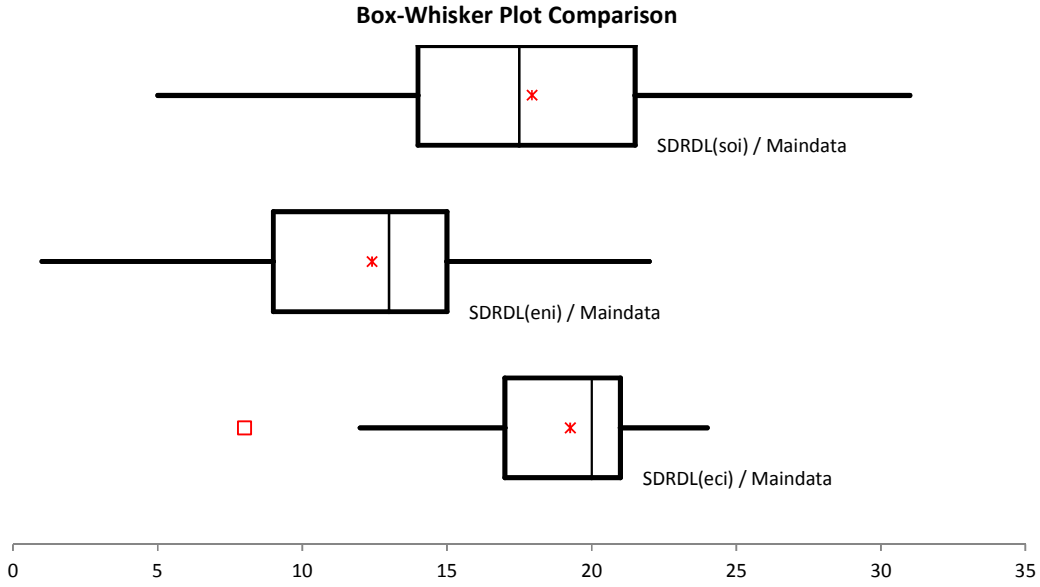

Figure 5 – Box-whisker plot in individual pillars

Figure 5 shows that of the three variables, the social pillar ($SDRDL_{soi}$) is the most normally distributed with the median falling just below the mean. However, it is also the most highly spread out in terms of recorded values. This is borne out in the numeric analysis in *Table 4* which shows the higher variance and standard deviation (as a proportion of the mean) for this variable. With a maximum score of 40 available, the average organisation only scored 17.9 or 45% of the available points.

The environmental pillar ($SDRDL_{eni}$) also exhibited a normal distribution, with a large range of 21 (a value of 169% of the mean value) due to several low scores including a score of 1 out of the possible 30. The mean of 12.4 represented only 41% of available points, meaning this is where most organisations recorded the lowest score.

The economic pillar ($SDRDL_{eci}$) represents both the highest average score (the mean of 19.2 representing 64% of the max of 30) as well as the area of least variation in response as noted in terms of both the variance and standard deviation (as a percentage of the mean). One significant outlier in the data was noted, but the corporate report was rechecked and rescored resulting in the same outcome. As such, this point represents a valid data-point in the sample.

	SDRDL(eci)		SDRDL(eni)		SDRDL(soi)	
One Variable Summary	Maindata	% if mean	Maindata	% if mean	Maindata	% if mean
Maximum possible score	**30**		**30**		**40**	
Mean as % of max	**64%**		**41%**		**45%**	
Mean	19.262		12.410		17.943	
Variance	9.563	50%	21.613	174%	36.217	202%
Std. Dev.	3.092	16%	4.649	37%	6.018	34%
Skewness	-0.9990		-0.0301		0.1850	
Kurtosis	4.9370		2.5616		2.7453	
Median	20.000	104%	13.000	105%	17.500	98%
Mean Abs. Dev.	2.355	12%	3.786	31%	4.794	27%
Mode	20.000	104%	13.000	105%	14.000	78%
Minimum	8.000	42%	1.000	8%	5.000	28%
Maximum	24.000	125%	22.000	177%	31.000	173%
Range	16.000	83%	21.000	169%	26.000	145%
Count	61		61		61	
Sum	1175.000		757.000		1094.500	
1st Quartile	17.000	88%	9.000	73%	14.000	78%
3rd Quartile	21.000	109%	15.000	121%	21.500	120%
Interquartile Range	4.000	21%	6.000	48%	7.500	42%

Table 4 – Descriptive data for individual pillar disclosures

The negative skewness of the economic pillar data, as visible in *Figure 6,* did not impact the validity of the hypothesis testing as the residuals (errors in the model produced) were normally distributed.

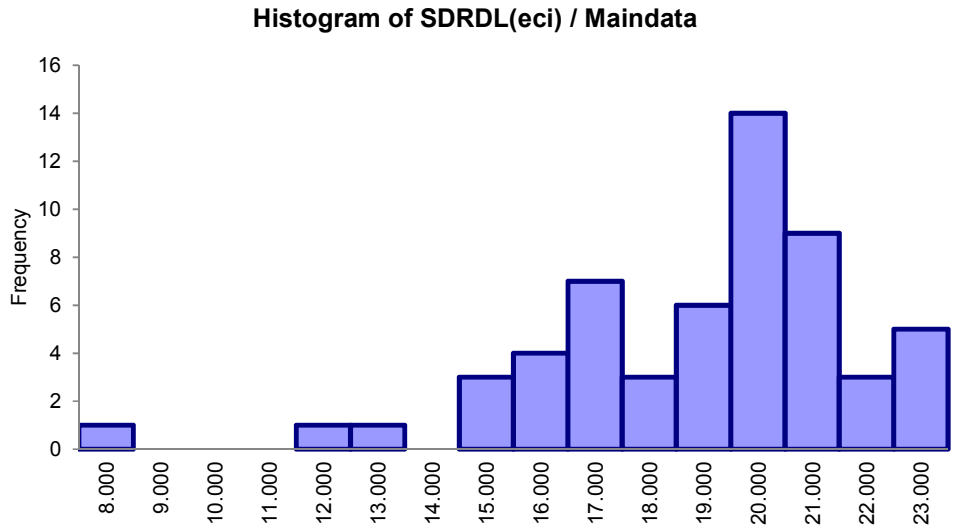

Figure 6 – Histogram of economic disclosure

5.4 Analysis of independent variables

5.4.1 Correlation between variables

Linear Correlation Table	CDP Score Dataset	SDRDL (eci) Dataset	SDRDL (eni) Dataset	SDRDL (soi) Dataset	SDRDL Dataset	IE Dataset	LAB Dataset	SP Dataset	SIZE Dataset
CDP Score	1.000								
SDRDL(eci)	0.217	1.000							
SDRDL(eni)	0.261	0.416	1.000						
SDRDL(soi)	0.237	0.347	0.358	1.000					
SDRDL	0.312	0.671	0.763	0.826	1.000				
IE	0.173	0.296	0.420	0.178	0.372	1.000			
CP	0.038	0.122	-0.120	-0.222	-0.143	-0.058			
LAB	0.234	0.255	0.259	0.447	0.442	0.022	1.000		
SP	-0.046	0.036	0.213	0.354	0.305	0.242	0.064	1.000	
SIZE	0.257	0.249	0.343	0.183	0.327	0.377	0.124	0.174	1.000

Table 5 – Variable correlations

Table 5 shows the correlation[7] between variables with the darker green shades highlighting the higher correlations. As expected, the correlation of the individual pillars is quite high, with the social indicator being the best indicator of overall disclosure level. The variables *IND* and *CP* are

[7] Correlation is an indicator of the strength of a linear relationship between two variables such that a unit increase in the value of one variable result in a corresponding unit increase in the second variable, the higher the correlation is the stronger and more predictable the relationship is.

not included in the correlation table since correlations between variables containing categorical data are meaningless (i.e. there is no linear relationship with categorical data). However SP was included as there are enough data points to produce a continuous variable where a linear relationship can be estimated.

5.4.1.1 Industry

The breakdown of results per industry classification is as follows:

Industry (environmental sensitivity) - IND	Count	SDRDL(eci) mean	SDRDL(eni) mean	SDRDL(soi) mean	SDRDL mean
1	10	17.6	11.7	16.6	45.9
2	18	19.3	10.4	14.9	44.7
3	33	19.7	13.7	20.0	53.5
	61				

Table 6 – Dependent variables per industry classification

It is clear that there is an increase in each of the dependant variables between industry classification 1 (least sensitive industry) and classification 3 (most sensitive industry). However, of interest is the modest decrease noted in both environmental and social pillars between classification 1 and classification 2.

With regards to relationship with the other independent variables (*Table 7*), some patterns arise. With regards to interpretation for instance, classification 1 companies averaged only 14% of their workforce as unionised, 21.6% of their operations internationalised and had 9.3 stakeholders. Classification 2 companies had 41.6% of their workforce unionised, 22.2% internationalised operations and 7.7 stakeholders. Certainly, the more environmentally sensitive industries are smaller in size and are increasingly less close to the customer, and these industries tend to have higher proportions of unionised labour in their workforce. There does not appear to be any trend with regards to the number of stakeholders identified in annual reports of organisations within the different industry classifications.

Industry (environmental sensitivity) - *IND*	IE	CP	LAB	SP	SIZE
1	21.6%	90.0%	14.1%	9.3	25.124
2	22.2%	72.2%	41.6%	7.7	24.648
3	38.3%	21.2%	53.2%	8.8	24.133

Table 7 – Independent variables per industry classification

The fact that more than half of the organisations assessed were rated as 3 points to the fact that the majority of the sample are organisations operating in highly environmentally sensitive industries, as defined by the EIRIS classification system.

5.4.1.2 International exposure

The international exposure data is interesting, although a mean of 30.8% is perhaps misleading due to the fact that the data is not normally distributed as evidenced by the high counts in the first two ranges listed in *Table 7* and clearly shown in the histogram below in *Figure 7*. As such there are a high proportion of companies with highly localised operations in the study.

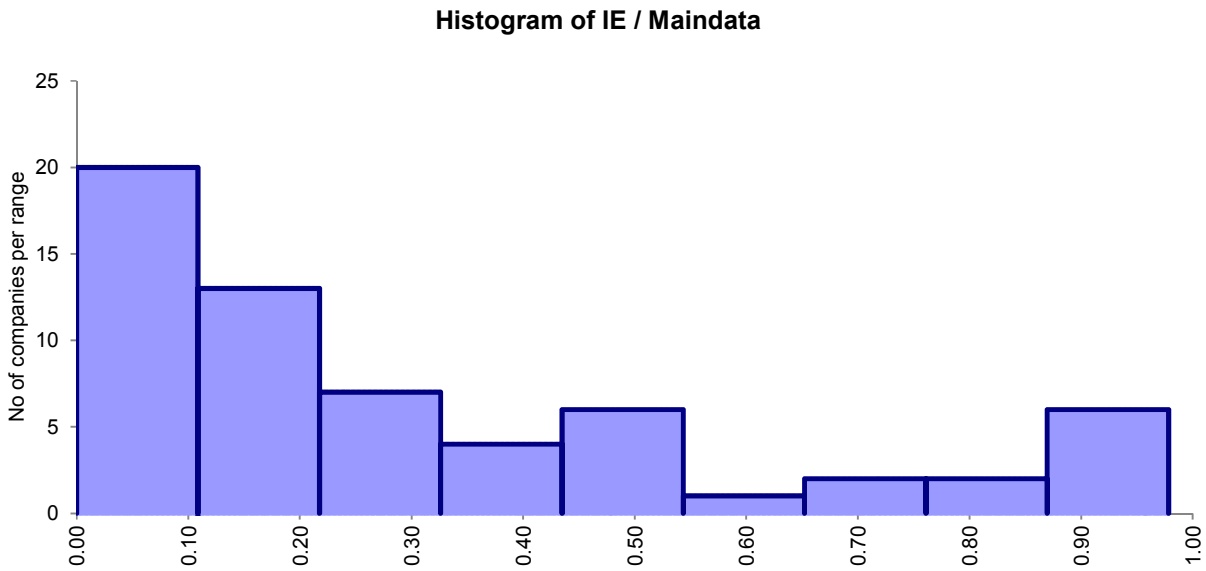

Figure 7 – Histogram of industry exposure

The correlations listed in *Table 5* indicate that there is a moderate correlation of 0.372 between *IE* and *SDRDL*. The correlations vary between the individual pillars, the weakest being for the social pillar at 0.178 and strongest for the environmental pillar at 0.420. *Figure 8* shows the relationship in a scatterplot.

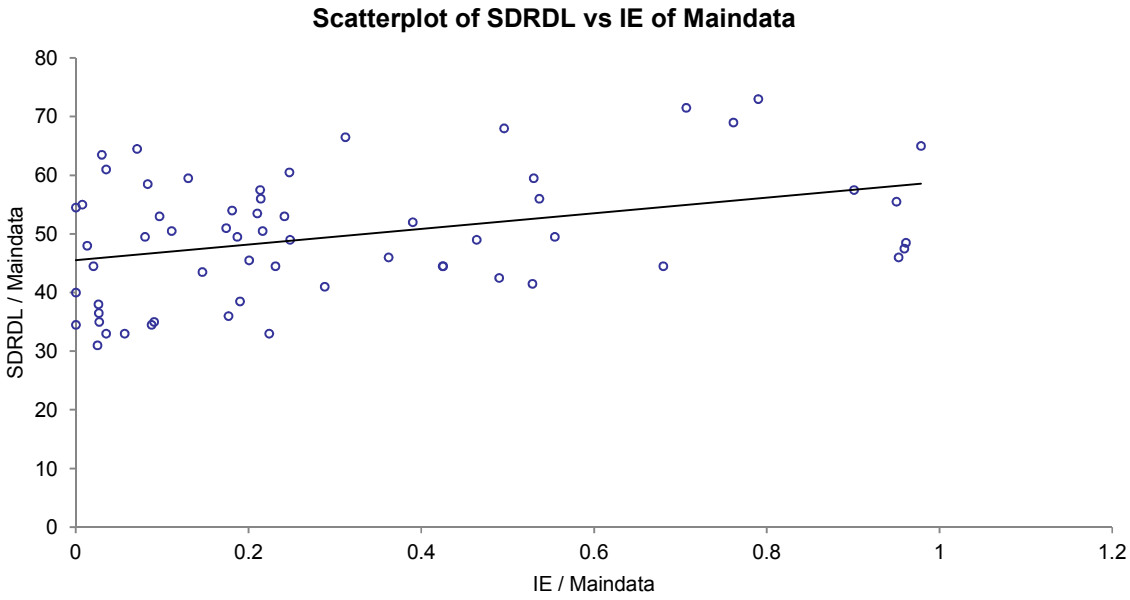

Figure 8 – Scatterplot of disclosure level vs. industry exposure

In terms of correlation between independent variables, *Figure 9* shows the strongest relationship:

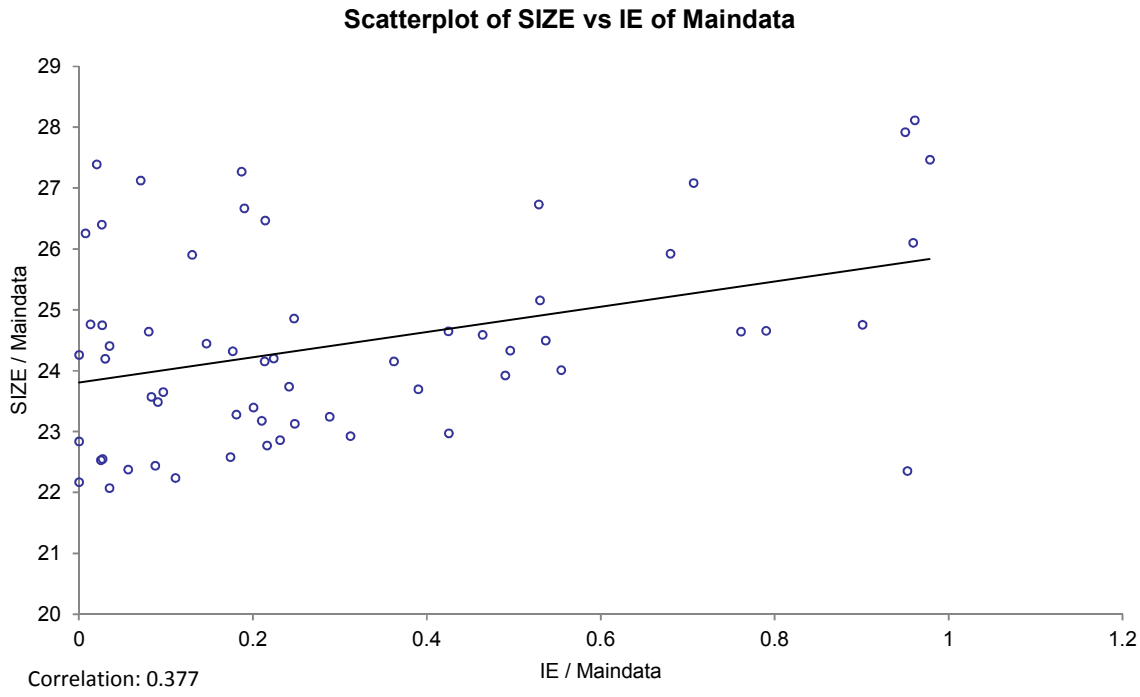

Figure 9 – Scatterplot or organisation size vs. industry exposure

5.4.1.3 Customer proximity

The summary information for *customer proximity* (*CP*) is as follows

Consumer Proximity	Count	SDRDL(eci) mean	SDRDL(eni) mean	SDRDL(soi) mean	SDRDL mean	IE	IND	LAB	SP	SIZE
0	32	18.9	12.9	19.2	51.0	32%	2.78	52%	8.97	24.13
1	29	19.7	11.8	16.6	48.0	29%	1.93	34%	8.14	24.79
	61									

Table 8 – Study data sorted by consumer proximity

The effects of this variable are mixed, the economic disclosure level increases marginally for *C2C* companies and the environmental pillar disclosure decreases marginally. Interestingly however, the social pillar disclosure declines significantly resulting in a three point decline in *SDRDL*. In terms of the other independent variables, *C2C* companies tend to be those which are in less environmentally sensitive industries and ones which have significantly less labour union employment.

5.4.1.4 Composition of labour

The mean value for labour composition was 43.4% and the histogram in *Figure 10* shows fairly evenly distributed data:

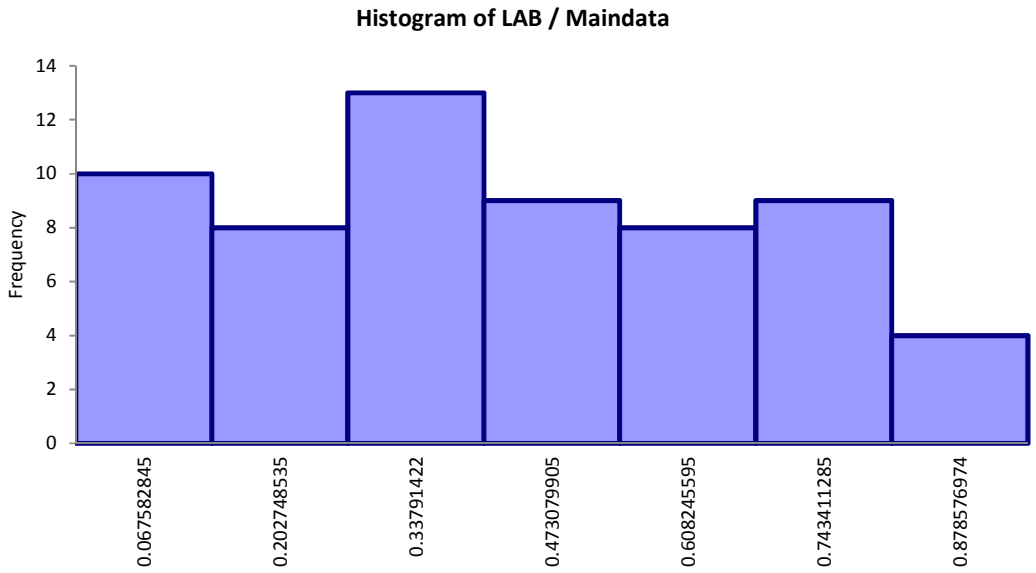

Figure 10 – Histogram of labour content data

Table 5 showed that LAB correlates fairly strongly with all dependent variables, the strongest being the social pillar at 0.447 closely followed by the overall disclosure level *SDRDL* with 0.442. The relationship is shown in the scatterplot in *Figure 11*.

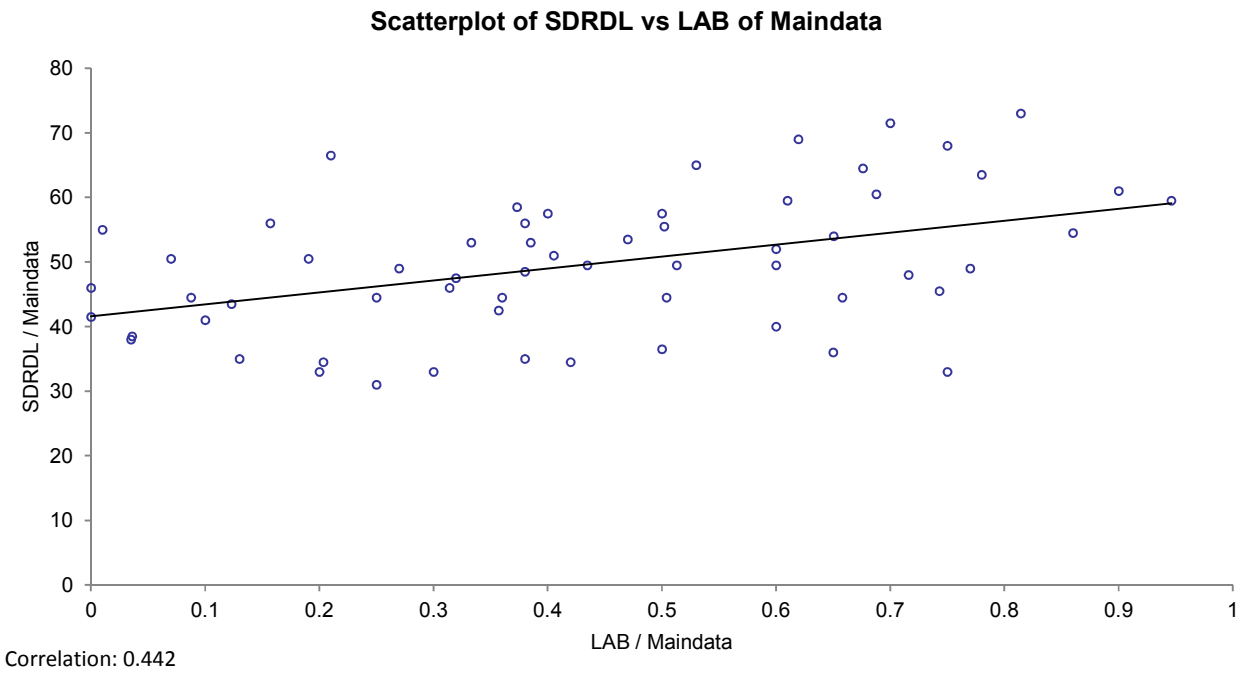

Figure 11 – Scatterplot of disclosure level vs. labour content

In terms of correlations between independent variables, the most significant relationship is *LAB* and *CP*, the relationship is negative and the correlation is 0.352. This is indicative of the fact, as noted in Table 8, that *C2C* companies has a mean 34% of their workforce unionised, while the mean for non-*C2C* companies was 52%.

5.4.1.5 Stakeholder pressure

The data per number of stakeholders is as such:

S/Holders	Count	SDRDL(eci) mean	SDRDL(eni) mean	SDRDL(soi) mean	SDRDL mean	IE	CP	LAB	IND	SIZE
2 - 4	2	19.5	10.5	12.3	42.3	9%	50%	45%	2.00	24.07
5	3	17.7	8.0	13.5	39.2	7%	100%	37%	1.67	25.41
6	6	19.0	11.7	17.0	47.7	40%	50%	47%	2.83	23.80
7	7	18.3	11.7	16.5	46.5	23%	57%	34%	2.29	24.05
8	15	20.3	13.0	18.8	52.0	36%	40%	49%	2.60	24.29
9	7	18.0	11.3	12.5	41.8	16%	29%	37%	2.43	23.27
10	7	21.3	13.3	21.3	55.9	23%	100%	34%	1.86	25.46
11	8	18.5	13.5	21.5	53.5	39%	13%	50%	2.63	25.05
12	3	19.7	16.0	18.5	54.2	59%	67%	32%	1.67	25.68
13 - 14	3	18.3	12.3	22.2	52.8	51%	0%	63%	2.7	24.3
	61									

Table 9 – Study data split by stakeholders

There does indeed appear an upward trend in *SDRDL* with increases in *SP* as measured by the number of stakeholders. In each of the pillars there is an increase in disclosure level; however it

does appear to level out at a point and then possibly even decrease as the number goes beyond 10 identified stakeholders.

Figure 12 shows the frequency distribution of responses, with the median / mode of 8 being by far the most common response:

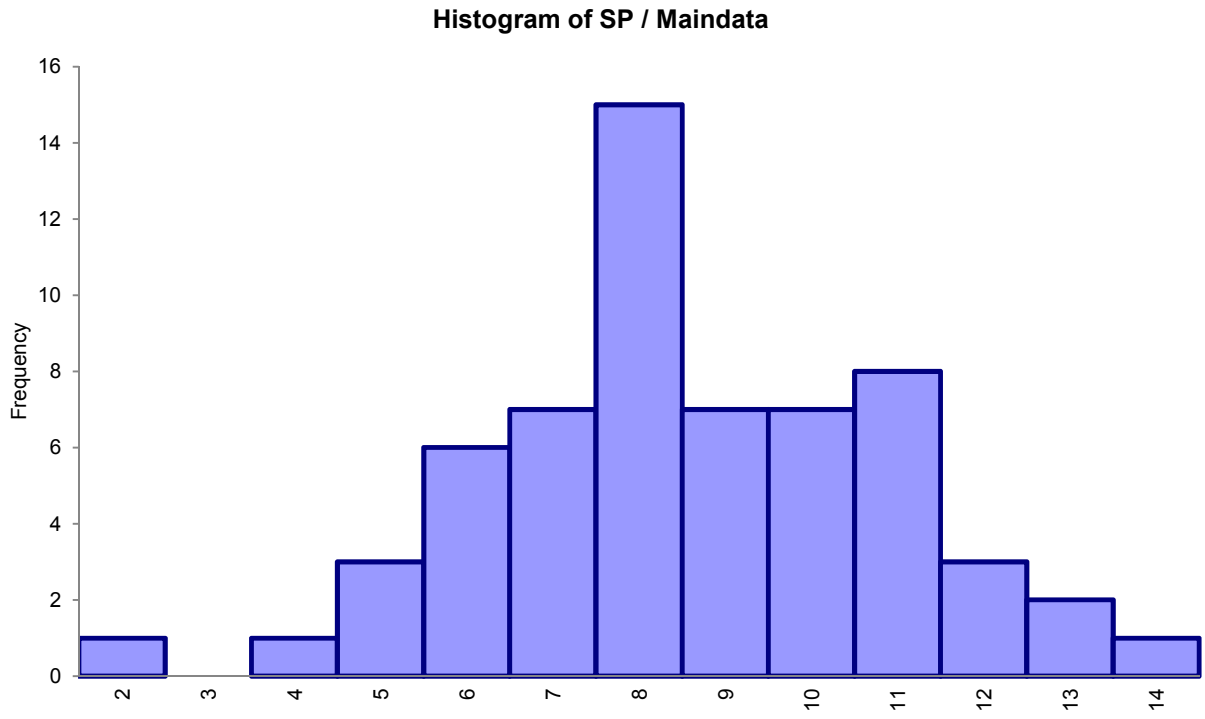

Figure 12 – Histogram of number of identified stakeholders

5.4.1.6 Organisation Size

The summary data for the *organisation size* variable is listed in *Table 10* below. The analysis variable SIZE is measured as the natural log of the total asset value, however for ease of interpretation the actual total asset value is used here for analyses.

	SIZE	Total Assets
Mean	24.45	R 41,446,683,683
Median	24.26	R 34,412,999,965
Minimum	22.07	R 3,861,137,000
Maximum	28.12	R 1,623,850,000,000

Table 10 – Descriptive data of organisation size

The box-whisper plot in *Figure 13* and the histogram in *Figure 14* show the non-normal nature of the distribution of organisation size. As a result of 35 of the companies having total assets lower than the mean, the median is a fair amount smaller than the median size of R41.5 million.

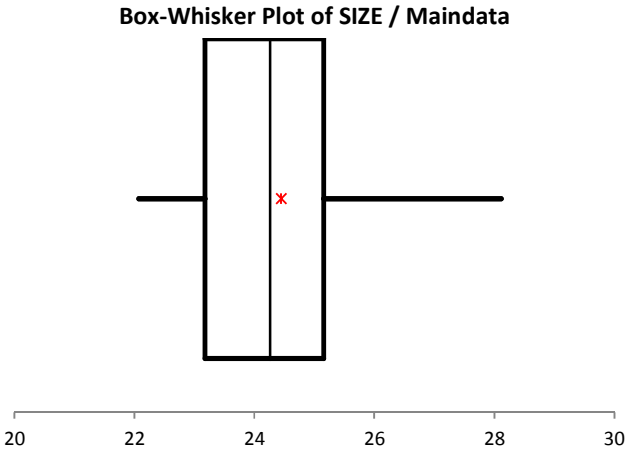

Figure 13 – Box-whisker plot of organisation size

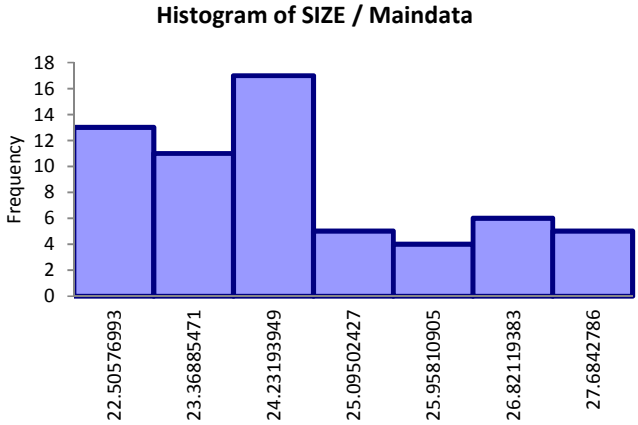

Figure 14- Histogram or organisation size

The relationship between *SIZE* and *disclosure level SDRDL* is shown in *Figure 15* below:

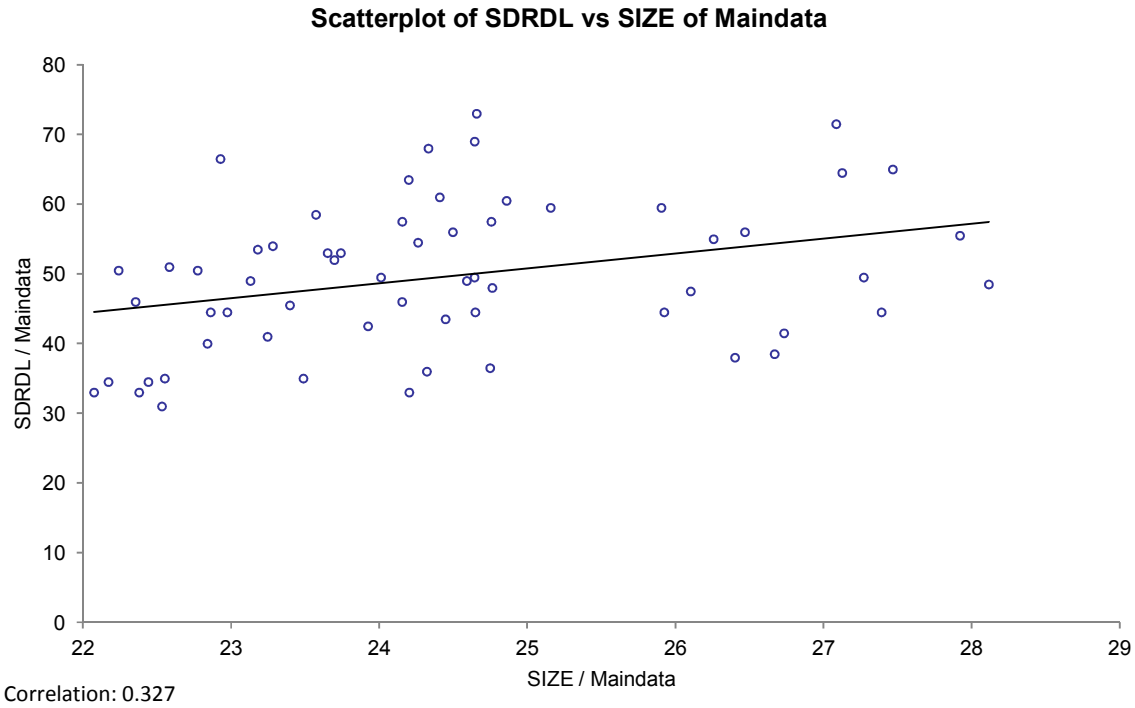

Figure 15- Scatterplot of disclosure level vs. organisation size

5.5 Sectoral analyses

The overall analysis of the sectoral results is as follows (number of organisations per sector in the sample given in parenthesis):

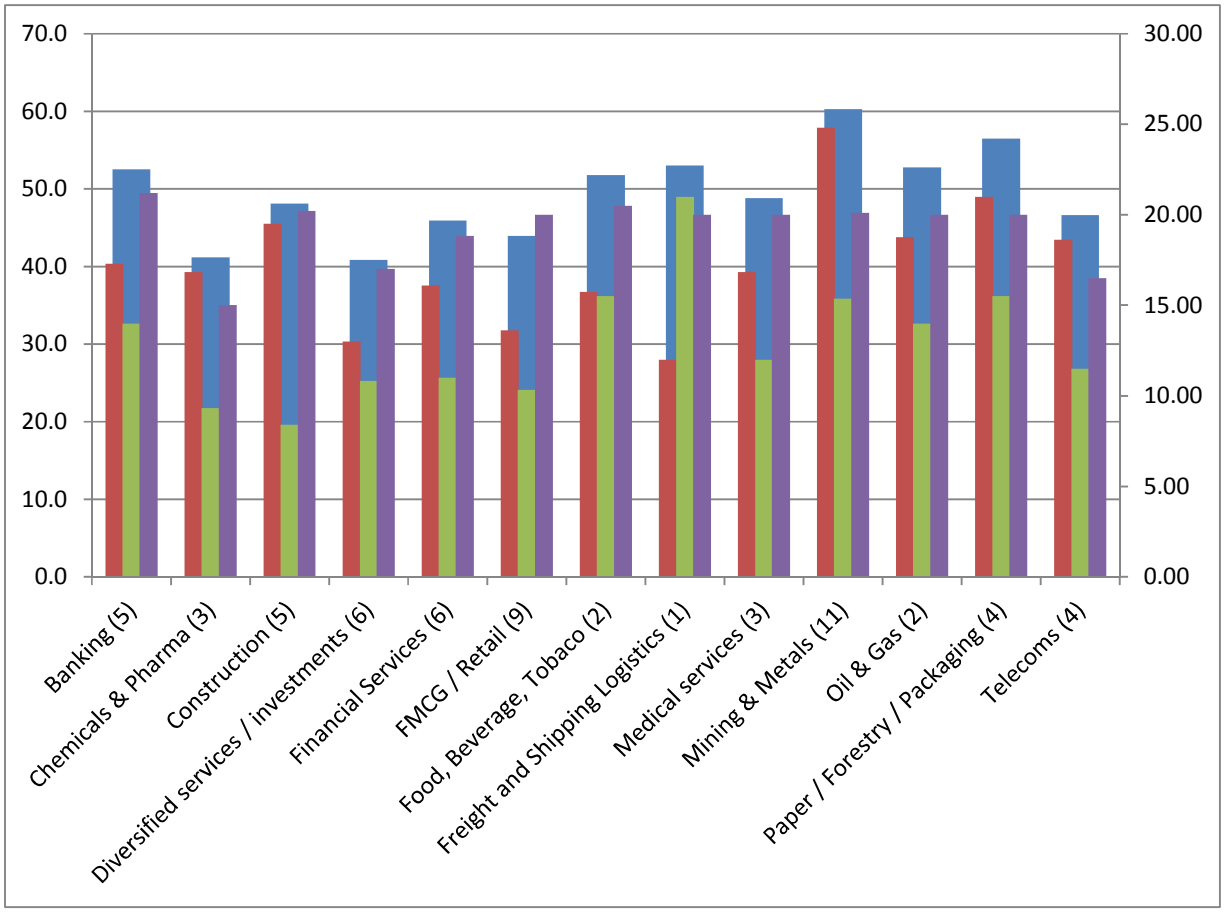

Figure 16 – Breakdown of industry results by disclosure pillar

The left hand axis is relevant for the overall disclosure level *SDRDL*, and the right hand axis has reference for the individual pillars. What the figure shows is the variation in reporting, but further also the overall score is attained with respect to how the individual pillar scores contribute to the overall disclosure level. This will be explored further in the analysis of specific industries.

Table 10 shows, via the use of conditional formatting, the levels of variation per sector for each of the dependent variables. Cell shading represents the magnitude of variability in the data as measured by the ratio of the mean standard variation of each sector variable to the sector variable mean. This was done to normalise the data for comparison purposes.

	StdDev % of SDRDL	StdDev % of SDRDL(soi)	StdDev % of SDRDL(eni)	StdDev % of SDRDL(eci)
Banking (5)	0.15	0.30	0.11	0.08
Chemicals & Pharma (3)	0.20	0.24	0.12	0.42
Construction (5)	0.09	0.12	0.34	0.09
Diversified services / investments (6)	0.25	0.43	0.41	0.21
Financial Services (6)	0.16	0.18	0.26	0.15
FMCG / Retail (9)	0.27	0.38	0.67	0.13
Food, Beverage, Tobacco (2)	0.12	0.38	0.05	0.03
Medical services (3)	0.13	0.18	0.30	0.15
Mining & Metals (11)	0.18	0.27	0.28	0.17
Oil & Gas (2)	0.18	0.36	0.20	0.00
Paper / Forestry / Packaging (4)	0.17	0.16	0.31	0.13
Telecoms (4)	0.07	0.23	0.26	0.06

Table 10 – Industry results

What this highlights is that the fast moving consumer goods / retail sector shows the highest variability with regards to reporting, with the exception of within the economic pillar, which is roughly the average. Diversified organisations also showed variable response rates (unsurprisingly given the diverse nature of their operations and constituent organisations). Chemical and pharmaceutical companies varied in their approaches to economic reporting to a large extent but their environmental responses were consistently lower than average.

Specific industries are evaluated briefly next, however organisations with four or less representatives within the sample will not be analysed due to the large individual effect of a single organisation altering the aggregate results.

5.5.1 The mining and minerals sector

Eleven organisations were sampled within this industry and the sample market capitalisation[8] ranged (precise values are not given in order to preserve the anonymity of the sample) from roughly R500 billion maximum to in the low billions. The overall analysis of the mining and minerals sector is displayed below:

[8] The market capitalisation of a company is the product of the number of shares the company has issued, and the share value, expressed in Rands.

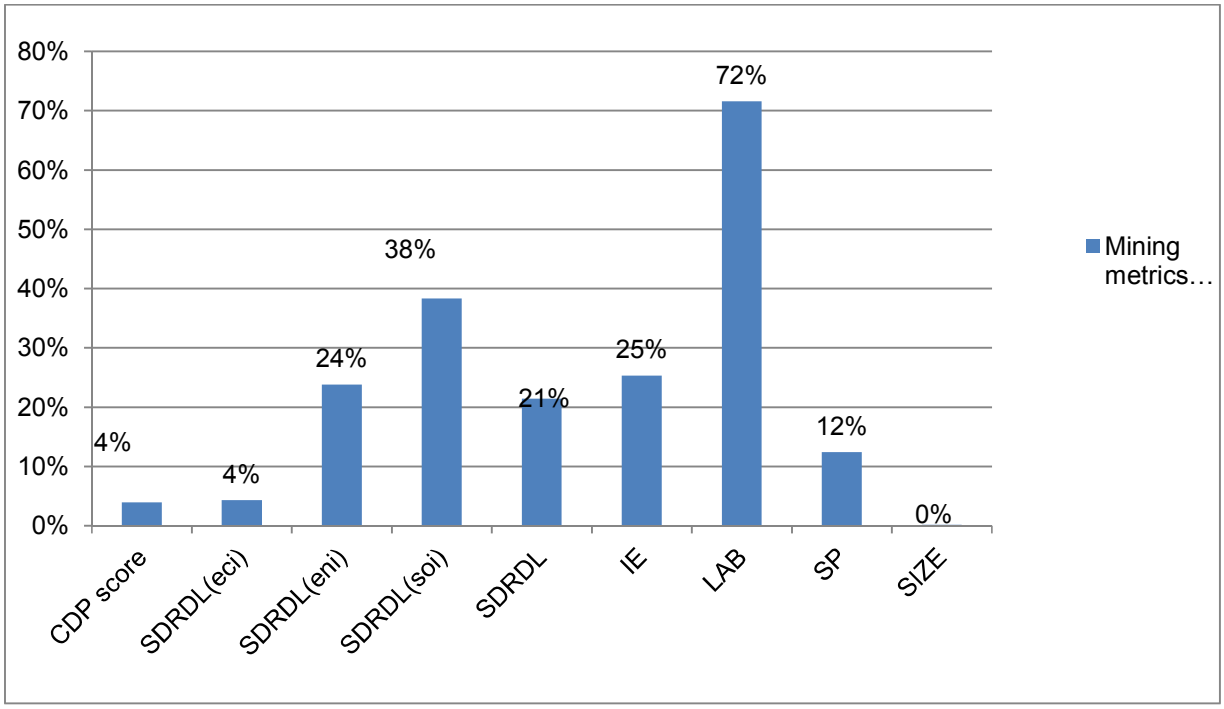

Figure 17 – Mining and metals industry data

Figure 17 shows that while only slightly above overall sample average with regards for CDP score and economic disclosures, the mining and minerals industry scored significantly better in the environmental (by 24%) and the social (by 38%) pillars than the sample average. As such the companies in this sector outscored the sample mean by 21% on average. In addition, on average, mining firms had 25% more international exposure as a result of their operations, noted 12% more stakeholders in their reports and labour unions constituted 72% more of their workforce than the sample mean.

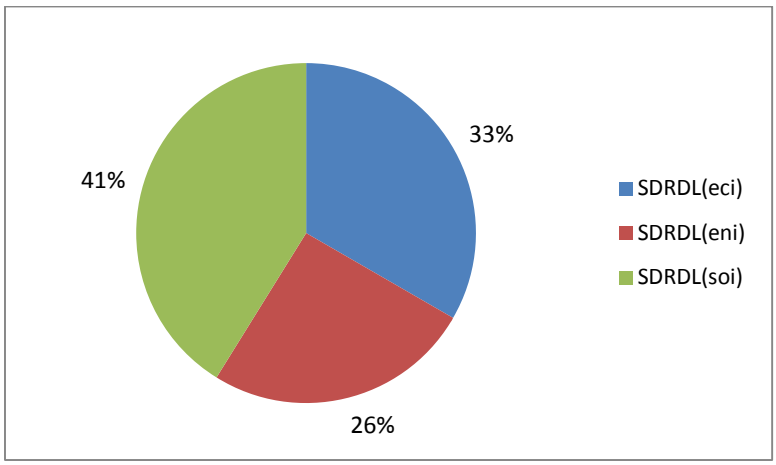

Figure 18 – Pillar contribution, mining and metals

Finally, *Figure 18* indicates that, with regards to their overall disclosure, and based on the collection instrument employed, on average mining companies' disclosures are made up of 41% social, 33% economic and only 26% environmental disclosures.

5.5.2 FMCG

Nine organisations formed part of the sample and the market cap in this industry ranged from almost R50 billion to single digit billions. The overall analysis of the FCMG / retail sector is displayed below:

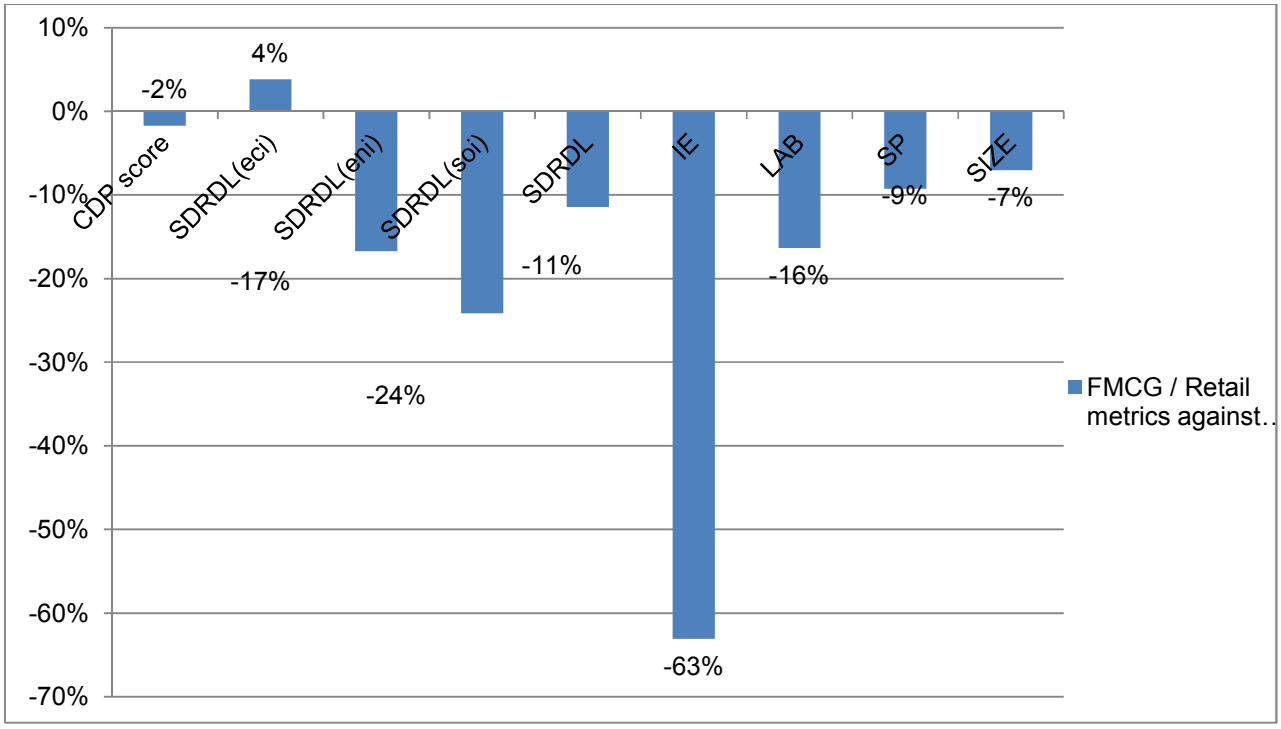

Figure 19 – FMCG industry data

Figure 19 shows that, while scoring higher than average in the economic pillar, retail / FMCG companies scored significantly lower in the environmental (-17%) and social (-24%) pillars. As such the companies in this sector were underperformed by the sample mean by 11% on average. In addition, on average, these companies were over 60% more localised in their operations than the sample group, and employed 16% less unionised labour.

Finally, *Figure 20* indicates that, with regards to their overall disclosure, on average retail / FMCG companies' disclosures are made up of 45% economic, 31% social only 24% environmental disclosures.

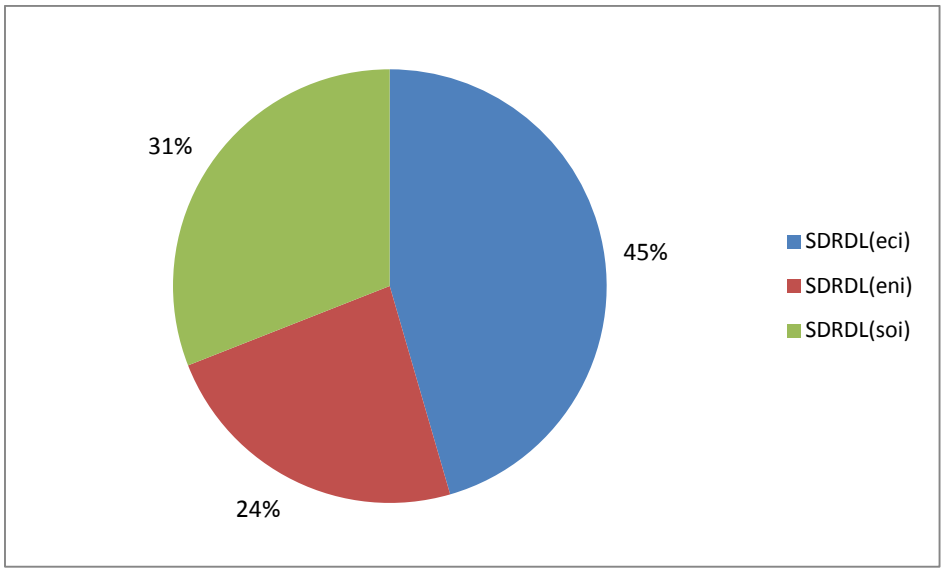

Figure 20 – Pillar contribution - FMCG

5.5.3 Financial services

Six financial service firms formed part of the sample with market capitalisations between R80 billion to the low tens of billions. The overall analysis of the sector is displayed below:

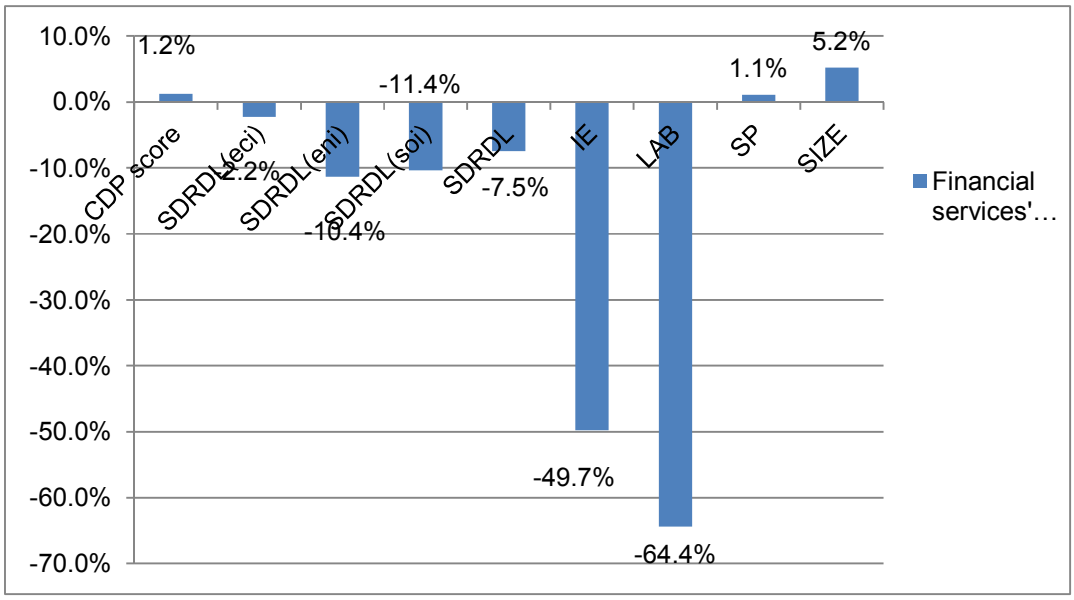

Figure 21 – Financial services results

Figure 21 shows that, while scoring fairly averagely with respect to economic disclosures, the financial services firms scored below average with regards to environmental and social disclosure resulting in a mean score of 7.5% below the average. In addition, on average, these companies

were roughly 50% more localised in their operations than the sample group and employed 64.4% less unionised labour within their workforce.

Finally, *Figure 22* indicates that, with regards to their overall disclosure, on average financial services firms reported fairly similarly to retail / FMCG companies with disclosures shifted by four percent from social disclosures in favour of economic disclosures.

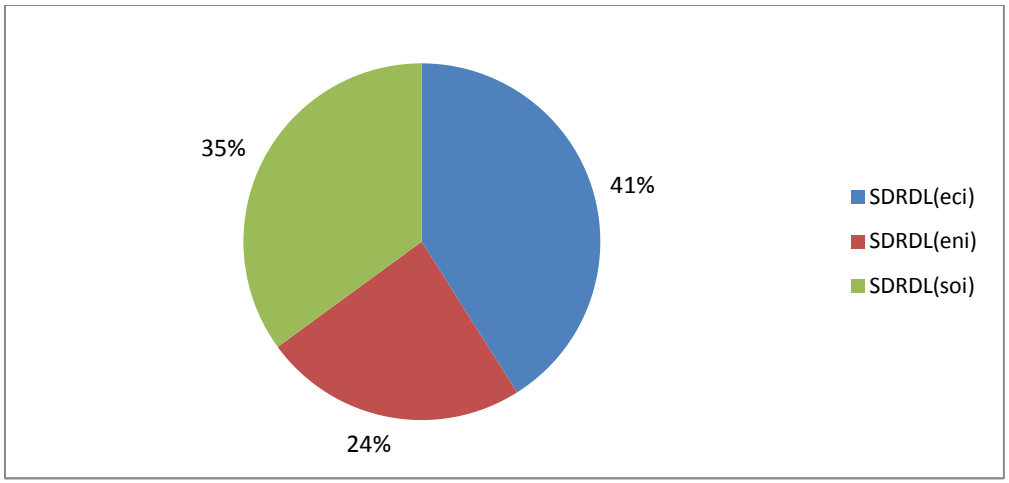

Figure 22 – Pillar contribution - FMCG

5.5.4 Diversified investments and services

This diverse sector, common only in terms of their range of the subsidiaries and activities, included six companies with market capitalisations very similar to the financial services sample. The overall analysis of the sector is displayed below:

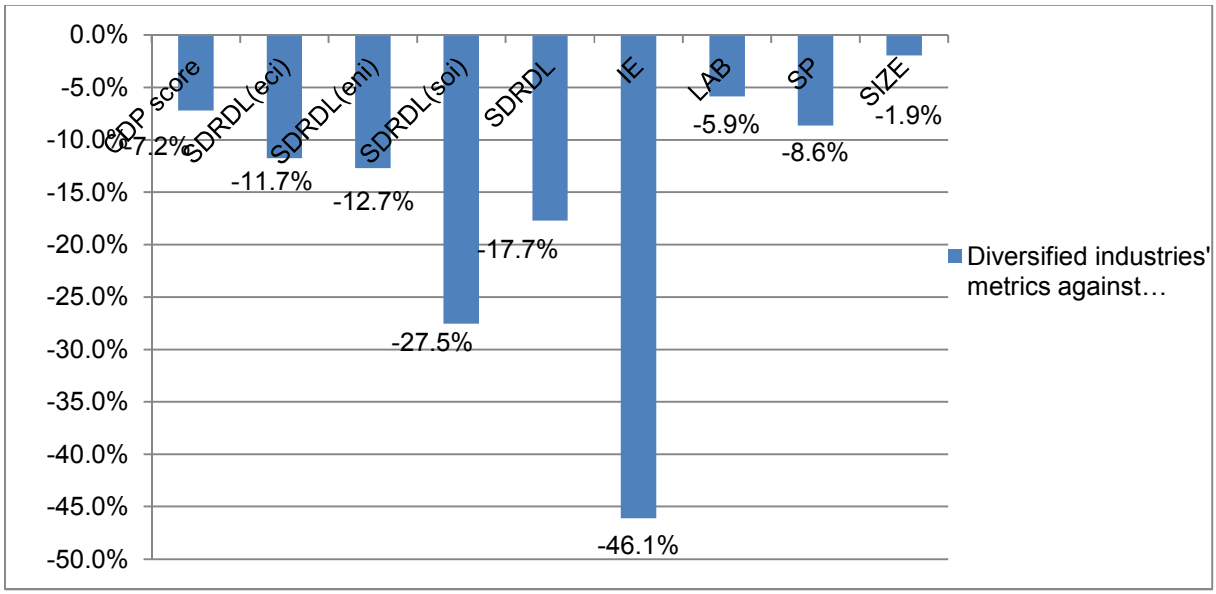

Figure 23 – Diversified industry results

Figure 23 shows that, while scoring below average in all areas studied, social disclosures were significantly (27.5%) below the sample average, resulting in the sector *SDRDL* being 17.7% below that of the sample average. In addition, on average, these companies were roughly 45% more localised in their operations than the sample group.

No figure is shown for the proportion of *SDRDL* associated with individual pillars as the proportions are very similar to the proceeding two sectors, with the economic pillar accounting for 42%, social accounting for 32% and environmental taking up the remaining 26% of disclosures.

5.5.5 Banking sector

The banking sector portion of the sample contained five companies with market capitalisations of between R80 billion and R180 billion. The overall analysis of the sector is displayed below:

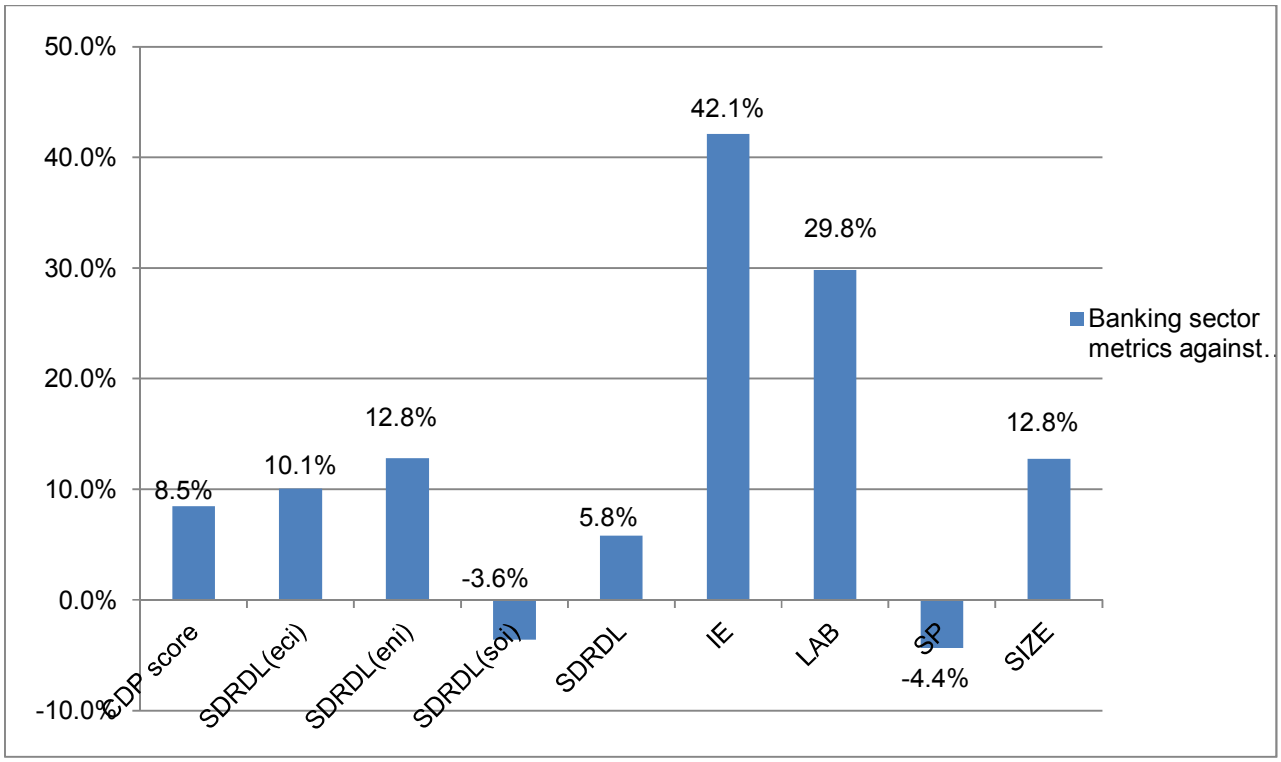

Figure 24 – Banking sector results

Figure 24 shows the sector scored above average in almost all areas, with only their social disclosures failing below the sample mean. The sector also was significantly above average in the extent to which its operations were international, and the unionised component of its workforce.

Finally, there is no figure showing proportion of *SDRDL* associated with individual pillars as the proportions are very similar to the proceeding three sectors with economic pillar accounting for 40%, social accounting for 33% and environmental taking up the remaining 27% of disclosures.

5.5.6 Construction sector

Five companies formed part of the sample with market capitalisations from R20 billion and below. The overall analysis of the sector is displayed below:

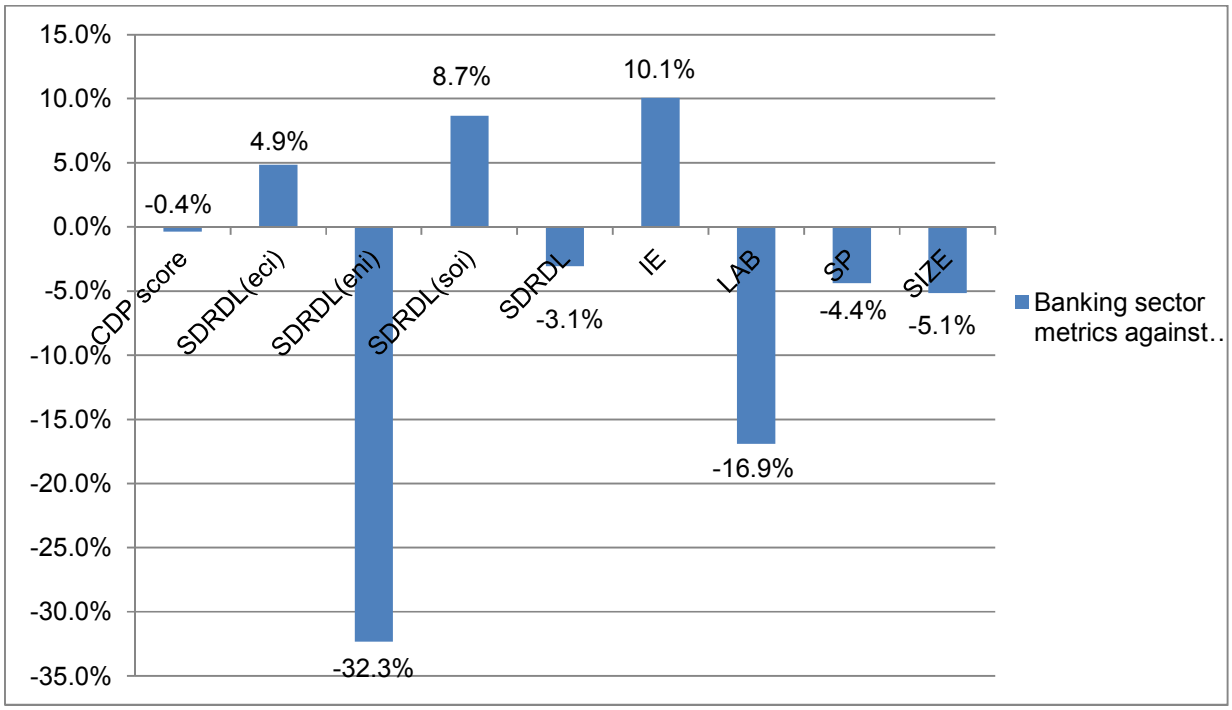

Figure 25 – Construction sector results

Figure 25 shows the variation in variables under investigation in this sector. Economic and social disclosures were found to be in excess of the sample average; however, the environmental disclosures were significantly lower than the sample. As a result the overall disclosure level was just under the average. The above analysis is borne out in *Figure 26;* just 17% of the overall disclosure score for this sector was attained through environmental disclosures.

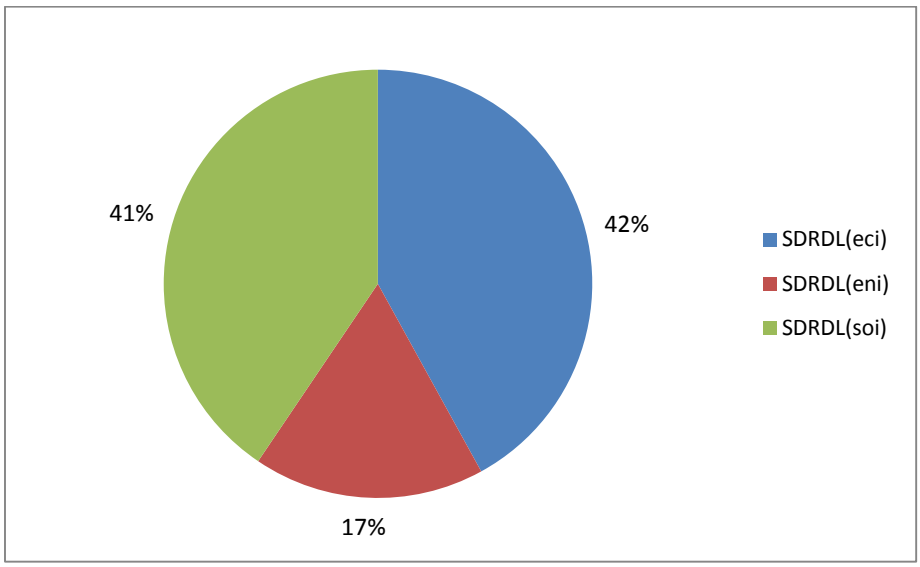

Figure 26 – Pillar contribution, construction

5.5.7 Other sectors

Four companies fell within the paper / forestry / packaging sample and disclosures were above those of the sample mean. With international exposure 65% and labour content 45% higher than the respective sample means, this industry achieved an *SDRDL* of 14% higher than the sample mean.

The above sector was also one of only three sectors, including telecommunications (sample of 4) and chemicals / pharmaceuticals (sample of 3) where economic disclosures did not contribute the most to the overall disclosure level. In telecommunications, social disclosure accounted for 40% of all disclosures, with economic and environmental constituting 35% and 25% respectively. In chemicals and pharmaceuticals, social disclosure leads with 41% over economic with 36% and environmental with 23%.

5.6 Models developed and tested

The results of the analytical models are presented below with only sparse commentary; please see the respective sections in Chapter 6 for a more detailed discussion of the results and conclusion on the relevant hypothesis testing.

5.6.1 Overall disclosure level – SDRDL

The results for the analytical model developed for the overall disclosure level dependent variable are shown in *Table 11* below. The source table provides the p-value, a measure of the significance of the individual variable in the model describing the dependant variable measured (a p-value of <0.05 indicates that a variable is statistically significant at a 95% confidence level of result accuracy). The parameter table indicates the coefficient of the linear model estimating the relationship between the variables and thus the size of the effect (in the Estimate column).

Source	DF	Type III SS	Mean Square	F Value	Pr > F
IND	2	340.01	170.00	2.42	0.099
IE	1	93.14	93.14	1.32	0.255
CP	1	67.41	67.41	0.96	0.332
LAB	1	361.33	361.33	5.14	0.028
SIZE	1	156.15	156.15	2.22	0.142
SP	1	206.32	206.32	2.93	0.093
CDP_Score	1	69.39	69.39	0.99	0.325

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-8.32	21.56	-0.39	0.701
IND 3	4.87	4.71	1.03	0.306
IND 2	-2.12	3.96	-0.54	0.595
IND 1	0.00	.	.	.
IE	5.36	4.66	1.15	0.255
CP 1	2.71	2.77	0.98	0.332
CP 0	0.00	.	.	.
LAB	13.35	5.89	2.27	0.028
SIZE	1.30	0.87	1.49	0.142
SP	0.88	0.51	1.71	0.093
CDP_Score	0.10	0.10	0.99	0.325

Table 11 – analytical results for overall disclosure

Since the coefficient for *LAB* was significant, we reject H_4 at a 95% confidence level. Further, we reject H_1 and H_5 at the 90% confidence level. We cannot however, based on the results noted, reject H2, H3 or H6 at any reasonable confidence level.

5.6.2 Environmental disclosure level – $SDRDL_{eni}$

The source table and parameter estimates for the environmental disclosure level are shown below:

Source	DF	Type III SS	Mean Square	F Value	Pr > F
IND	2	45.00	22.50	1.34	0.271
IE	1	47.25	47.25	2.81	0.099
CP	1	0.23	0.23	0.01	0.908
LAB	1	16.54	16.54	0.99	0.326
SIZE	1	40.30	40.30	2.40	0.127
SP	1	4.54	4.54	0.27	0.605
CDP_Score	1	7.53	7.53	0.45	0.506

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-10.06	10.53	-0.96	0.344
IND 3	1.00	2.30	0.44	0.665
IND 2	-1.42	1.93	-0.74	0.466
IND 1	0.00	.	.	.
IE	3.82	2.28	1.68	0.099
CP 1	0.16	1.35	0.12	0.908
CP 0	0.00	.	.	.
LAB	2.86	2.88	0.99	0.326
SIZE	0.66	0.43	1.55	0.127
SP	0.13	0.25	0.52	0.605
CDP_Score	0.03	0.05	0.67	0.506

Table 12 – Analytical results for environmental disclosure

As such, based on the results, we reject H_2 for this pillar at a 90% confidence level. We cannot however reject any further hypotheses with regards to environmental disclosure.

Of interest here is that within the economic pillar, the only significant factor is that of IE, and only at a 90% confidence level. However this factor was not significant at the aggregate analysis level. Further, none of the factors significant at the aggregate disclosure level were significant with regards to environmental disclosure.

5.6.3 Economic disclosure level – $SDRDL_{eci}$

The source table and parameter estimates for the environmental disclosure level are shown below:

Source	DF	Type III SS	Mean Square	F Value	Pr > F
IND	2	25.13	12.57	1.54	0.224
IE	1	8.89	8.89	1.09	0.302
CP	1	37.10	37.10	4.54	0.038
LAB	1	6.40	6.40	0.78	0.380
SIZE	1	7.76	7.76	0.95	0.334
SP	1	0.67	0.67	0.08	0.776
CDP_Score	1	2.97	2.97	0.36	0.549

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	5.81	7.35	0.79	0.433
IND 3	2.81	1.61	1.75	0.086
IND 2	1.87	1.35	1.38	0.172
IND 1	0.00	.	.	.
IE	1.66	1.59	1.04	0.302
CP 1	2.01	0.94	2.13	0.038
CP 0	0.00	.	.	.
LAB	1.78	2.01	0.89	0.380
SIZE	0.29	0.30	0.97	0.334
SP	0.05	0.17	0.29	0.776
CDP_Score	0.02	0.04	0.60	0.549

Table 13 – Analytical results for economic disclosure

As such, we reject H_3 for this pillar at a 95% confidence level. However we cannot reject any of the other hypotheses, for this disclosure pillar, at any reasonable confidence level.

As with environmental disclosure, none of the significant factors noted at the aggregate level are significant with regards to economic disclosure. We reject H_3 and as such suggest that consumer proximity is a significant factor with regards to economic disclosure, but again this is not significant at an aggregate level.

5.6.4 Social disclosure level – $SDRDL_{soi}$

The source table and parameter estimates for the economic disclosure level are shown below:

Source	DF	Type III SS	Mean Square	F Value	Pr > F
IND	2	107.18	53.59	2.09	0.134
IE	1	0.04	0.04	0.00	0.968
CP	1	2.70	2.70	0.11	0.747
LAB	1	154.05	154.05	6.00	0.018
SIZE	1	11.31	11.31	0.44	0.510
SP	1	130.33	130.33	5.08	0.028
CDP_Score	1	14.92	14.92	0.58	0.449

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-4.07	13.02	-0.31	0.756
IND 3	1.06	2.85	0.37	0.712
IND 2	-2.57	2.39	-1.07	0.288
IND 1	0.00	.	.	.
IE	-0.11	2.82	-0.04	0.968
CP 1	0.54	1.67	0.32	0.747
CP 0	0.00	.	.	.
LAB	8.72	3.56	2.45	0.018
SIZE	0.35	0.53	0.66	0.510
SP	0.70	0.31	2.25	0.028
CDP_Score	0.05	0.06	0.76	0.449

Table 14 – Analytical results for social disclosure

Thus, we reject H_4 and H_5 for this pillar at the 95% confidence level. We are unable to reject any further hypotheses for this disclosure pillar.

Again as with the other pillars, a factor is significant here (*SP*) without being significant at the aggregate level, further lending support to the research assertion that different factors would display varied levels of significant within the different disclosure pillars. However, the social disclosure (being the most closely correlated to the overall or aggregate disclosure level) analysis did result in one significant factor, that of LAB (corresponding to H_5) which mirrors the effect on overall disclosure level.

6 Discussion

The results show that the mean score for the *SDRDL* was 49.6, meaning that on average organisations only achieved half of the points available as per the scoring system implemented. The standard deviation was 10.6 and as such a significant portion of the study sample (37 of the 61 sampled) scored between 43 and 61 with 10 firms scoring 37 or lower, ultimately skewing the normality of the results somewhat.

In terms of the disclosure of the individual pillars, the results were not particularly surprising. The economic disclosures resulted in the least amount of variability, as would be expected as these disclosures are closely aligned (and in some cases duplications) of traditional financial metrics reported in annual reports and subjected to accepted reporting standards and formats. This can be seen by comparing the variances and the ratios of ranges to means given in *Table 4*.

The results are interesting and seem to support Morhardt et al. (2011) in that quite different component scores can be achieved for organisations with the same overall score as depicted in the two examples (in an excerpt from the results) in *Table 16* below:

Sector	SDRDL (eci)	SDRDL (eni)	SDRDL (soi)	SDRDL	IND	IE	CP	LAB	SP	SIZE
FMCG / Retail	17	7	9	**33**	2	3.5%	1	0.2	9	22.07
Chemicals & Pharma	8	10	15	**33**	3	5.6%	0	0.3	11	22.38
Construction	18	8	18.5	**44.5**	3	42.5%	0	0.25	6	22.97
FMCG / Retail	21	17	6.5	**44.5**	3	23.1%	0	0.36	9	22.86

Table 16 – Comparison of pillar versus overall results

6.1 Indicator results

The indicator results are presented in *Appendix C* and provide an insight into where companies in the sample excelled at providing detailed, complete and comparable information with respect to sustainability indicators.

Unsurprisingly, given this is where most (61%) companies received their highest score, economic pillar indicators represented seven of the top ten highest scoring indicators. Six of these included traditional indicators of financial performance and the value added statement (*EC1*). The other economic indicator (EC8) was the "*Description of infrastructure investment and services supported that provide public benefit*".

The non-economic pillar indicators present in the top ten highest scoring indicators were:

- *EN3/4 – Direct and indirect energy usage (*a CDP indicator);

- *ADD6/7/8/9 - BEE, social investment. Disclosure of programmes, policies and practices in place, including BEE* (as noted in the literature, an important aspect of South Africa Reporting) and
- *LA4 - Disclosure of percentage of employees represented by independent trade unions* (again providing support for the findings of the literature survey).

The three other indicators for which more than half of the sample scored the highest possible score of 2 included:

- *EN16/17/18/19/20 - Greenhouse gas emissions / Use and emissions of ozone-depleting substances* (another CDP indicator);
- *LA10 – Training investment* (a further component of BBBEE); and
- *E3 - Coverage of the organisation's defined benefit pension plan* (again a standard indicator in traditional financial reporting).

The five lowest scoring indicators, in order of increasing score, were:

- *EC5 - Entry level wage compared with local minimum wage for significant locations of operation;*
- *LA5 - Policy and procedures involving information, consultation and negotiation with employees over changes in operations;*
- *ADD11 – Environmental performance of suppliers;*
- *HR1 - Percentage of significant investment agreements that include human rights clauses or that underwent human right screening*; and
- *EC7 - Procedures for hiring locally, and proportion of senior management in locations of significant operations.*

Thus, even though the economic pillar indicators were prevalent at the top of the ranking, each pillar contained results at both the poor and the well responded ends of the spectrum. One particular insight is of interest however.

The presence of *ADD6/7/8/9* at the top of the ranking, combined with *EC7* in the bottom are instructive of a trend noted in South African reporting. Indicators predicated on placing emphasis on “local” elements of operations such as hiring policies, management representation and procurement were quite wide in definition. Most organisations interpreted or action this as “from South Africa” as opposed to local to the specific base of operation as the wording of GRI seems to

indicate. Indeed, only a small portion of the sample, mostly mining companies, provided a more granular view and detailed information with regards to local employees, service providers and communities at their specific locations of operation.

6.2 Analysis of the models and discussion of hypothesis testing

6.2.1 Overall disclosure level – SDRDL

The model developed for sustainable development disclosure level was significant ($F=5.47$; $p<0.0001$) and explained almost half (46%) of the variance in the dependent variable *SDRDL*. In the 200 different studies analysed, Fifka (2011) found over 70 different variables which were significantly correlated with the propensity to report various sustainable development information (Fifka, 2011). As such, explaining roughly 50% of reporting variation by means of seven independent variables is a reasonable result. The model is thus determined to have been successfully constructed and meaningful inferences can be made from its results with regards to the influence of the independent variables.

As noted, the p-value is indicative of the statistical significance of the variable as an indicator of variance in the independent variable. As such, and with regards to the variables, the effect of *LAB* was significant at the 95% confidence level, while the effects of *IND* and *SP* were significant at the 90% confidence level. The effects in terms of the model are interpreted as follows:

- *LAB*: A 10% increase in *LAB* resulted in a 1.3-point unit increase in *SDRDL*;
- SP: A 1 unit increase in *SP* resulted in a 0.9 unit increase in *SDRDL*; and
- *IND:* The mean *SDRDL* for Category 3 was significantly higher than that for Category 2 (but not significantly different to that of Category 1). This is illustrated in the LS means plot in *Figure 27*.

Figure 27 shows the significant difference between companies classified as 3 in terms of *IND* (the most environmentally sensitive classification) and those classified as 2. However, the same could not be said between 3 and 1 classifications; this is due to the high variability in the data for those classified as 1 (as indicated by the size of the 95% confidence intervals for the mean shown as error bars in the plot). Perhaps a reason for this can be seen by analysing the data. Half of the organisations in classification 1 belong to the financial services industry and may be subject to more rigorous reporting measures as a result of their lending practices and those they lend to, more so than their actual operations. This may potentially contribute to the higher scores in classification 1. This aside, the low number of organisations in this category (10 as opposed to 18

for classification 2 and 33 for classification 3) mean that the influence of one or two high scoring reporters may have skewed the results somewhat.

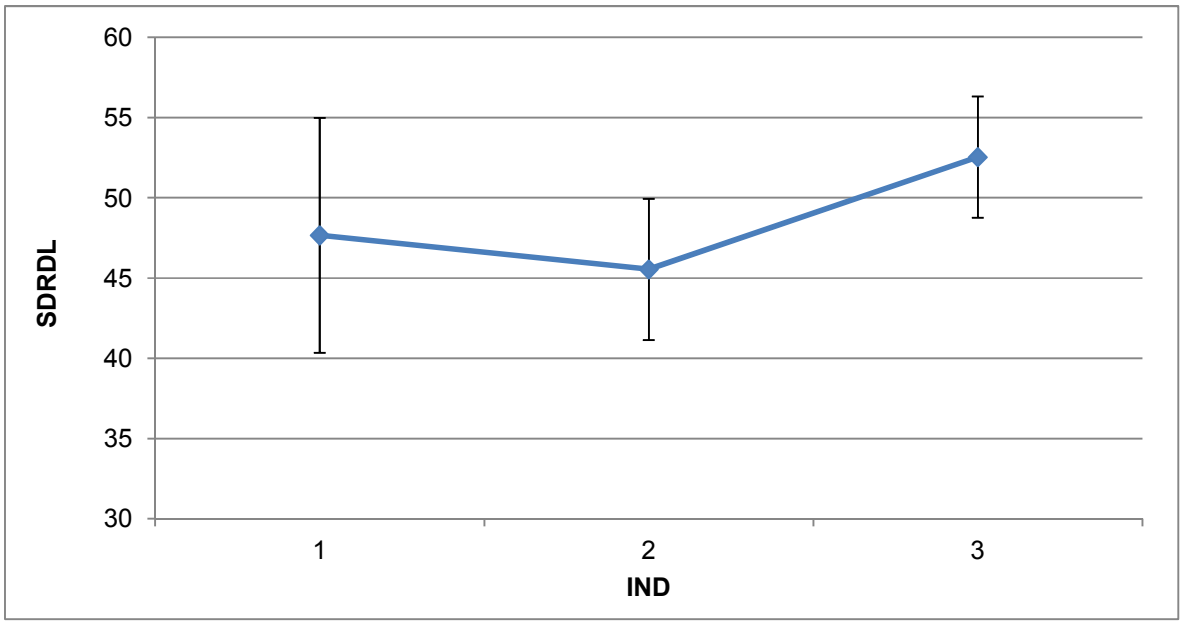

Figure 27 – Least squares mean graph

Since the coefficient for *LAB* was significant, we reject H_4 and conclude that the amount of disclosure is significantly associated with higher levels of union participation in the workforce. Since the coefficient was positive, higher levels of disclosure are associated with higher levels of unionised workforce.

Further, we reject H_1 and H_5 at the 90% confidence level and conclude that the amount of disclosure is significantly associated with the environmental sensitivity level of the target organisation as well as the number of stakeholder groups explicitly mentioned in the corporate report.

We cannot however, based on the results noted, reject H_2, H_3 or H_6 at any reasonable confidence level and as such no statistically significant relationship has been noted between overall disclosure level and international exposure, customer proximity or organisation size.

As such, with regards to the most comparable study reviewed in the literature, Sonnenberg and Hamann (2006), conflicting conclusions have been found. In line with their South African study, industry did indeed influence reporting, however contrasting to their work, organisation size was

not significant in the model developed. It should be noted however, that at a p-value of 0.142, this indicates the possibility of a weak relationship between variables. Sonnenberg and Hamann's (2006) sample was roughly the same size as this study, however, and while details of their sample methodology are not available, they only sampled responders to the JSE SRI index and as such their sample makeup would likely be similar to this study. It is unclear then, why the results are different; however the sample selection of only JSE Top 100 companies may have skewed the results. It is quite possible that selecting a larger sample would have resulted in organisation size being statistically significant. Further, there is the possibility that the significance of this variable has declined over time, as more organisations have realised the need for, and benefit of, sustainability reporting.

6.2.2 Environmental disclosure level – $SDRDL_{eni}$

The overall model for $SDRDL_{eni}$ was significant (F=3.16; p=0.0055). The model explained a third (33%) of the variance in the dependent variable.

The effect of *international exposure* was significant at the 90% confidence level. The effect is interpreted as follows:

- *IE*: A 10% unit increase in *IE* resulted in a 0.4 unit increase in $SDRDL_{eni.}$

As such, based on the results, we reject H_2 for this pillar and conclude that the amount of environmental disclosure is, at a 90% confidence level, significantly associated with the international exposure of the organisation's operations. This result is in line with the findings of Sonnenberg and Hamann (2006) and Monteiro and Aibar-Guzmán (2010), who also found an association with this variable. Environmental laws differ from country to country, and it is not unexpected that firms who operate in many locations develop systems that comply with the strictest territories they operate in. This would be expected since the organisations in questions are multinationals, and while they are responsive to local conditions, most multinationals strive for consistency in operating procedures and processes as this drives down costs, improves repeatability of outcomes and allows for sharing of best practices while facilitating movement of workers without the need for re-training.

The remaining hypotheses however cannot be rejected for this disclosure pillar. Again, the p-value for organisation size is 0.127, indicating that there is a relationship, but not statistically significant enough to reject the null hypothesis. Interestingly, p-values for industry (0.271) and labour content

(0.326) are significantly above what is seen at an aggregate level, while the p-value for CDP score is also very high at 0.506. This aligns to the correlation value 0.267 showing a very weak association. This may seem unexpected at first, but when one considers that carbon disclosures represent only 5 out of a possible 15 points for environmental disclosure pillar, this is put into perspective.

6.2.3 Economic disclosure level – $SDRDL_{eci}$

The overall model for $SDRDL_{eci}$ was significant (F=2.28; p=0.035). The model explained 26% of the variance in the dependent variable.

The effect of *CP* was significant at the 95% confidence level. The effect is interpreted as follows:

- *CP*: Companies with *CP*=1 (close proximity to customer) had on average a 2.0-unit increase in $SDRDL_{eni}$ compared to those with *CP*=0 (not in close proximity to customer).

Since the coefficient for *CP* was significant, we reject H_3 for this pillar and conclude that the amount of environmental disclosure is significantly associated with organisations in industries that are *C2C*. Since the coefficient was positive, higher levels of environmental disclosure are associated with *C2C* companies.

Interestingly, Haddock-Fraser and Tourelle (2010) found that companies supplying goods and services directly to the end customer are more likely to report more information in general. Thus these findings contrast their work somewhat, since consumer proximity was not found to be significantly influential at either an aggregate level (p-value of 0.332), or with regards to environmental (p-value of 0.908) and social (p-value of 0.747) disclosures. Thus at an aggregate level, these findings do not support Haddock-Fraser and Tourelle's work, but does suggest economic disclosures do indeed increase for companies which are close to the customer (Haddock-Fraser & Tourelle, 2010).

6.2.4 Social disclosure level – $SDRDL_{eci}$

The overall model for $SDRDL_{soi}$ was significant (F=4.09; p=0.0008). The model explained 39% of the variance in the dependant variable. This pillar thus provided the greatest explanation of variation in reporting level, supported further by the fact that the correlation between this pillar and overall reporting level was 0.826 as opposed to 0.671 and 0.763 for economic and environmental disclosures respectively.

The effects of *LAB* and *SP* were significant at the 95% confidence level. The effects are interpreted as follows:

- *LAB*: A 10% unit increase in *LAB* resulted in a 0.9 unit increase in $SDRDL_{soi.}$
- *SP:* A 1 unit increase in *SP* resulted in a 0.7 unit increase in $SDRDL_{soi.}$

Since the coefficient for *LAB* was significant at the 95% confidence level, we reject H_4 for this pillar and conclude that the amount of social disclosure is significantly associated with higher levels of union participation in the workforce. Since the coefficient for *SP* was significant at the 95% confidence level, we reject H_5 for this pillar and conclude that the amount of social disclosure is significantly associated with higher levels of stakeholder pressure. Since the coefficient was positive, higher levels of social disclosure are associated with high levels of union participation and greater number of identified stakeholders.

As expected, since social disclosure correlates most closely with overall disclosure, two of the three overall significant variables (at a 90% confidence level or greater) are significant in terms of social disclosure. The other variable, industry, has a p-value which is not too high at 0.134. Interestingly, international exposure, significant for environmental disclosures, is the least significant variable here with a p-value of practically 1 (0.968).

6.2.5 Hypothesis testing in summary

Table 15 below shows graphically the results of the hypothesis testing on the various models, indicating the significance of each of the independent variables in accounting for the variation in the dependent variables under study.

Variable	SDRDL	SDRDL_eni	SDRDL_eci	SDRDL_soi
IND	**0.099***	0.271	0.224	0.134
IE	0.255	**0.099***	0.302	0.968
CP	0.332	0.908	**0.038****	0.747
LAB	**0.028****	0.326	0.380	**0.018****
SIZE	0.142	0.127	0.334	0.510
SP	**0.093***	0.605	0.776	**0.028****
CDP_Score	0.325	0.506	0.549	0.449

Table 15 – Hypothesis testing summary

*** significant at a 95% confidence level* * *significant at a 90% confidence level*

Table 15 neatly illustrates that, as proposed, the various independent variables do indeed exert different levels of influence within the different pillars. In fact each of the variables examined, with the exception of *organisation size* and *CDP score*, appears to be a significant indicator of reporting extent in only one pillar*. International exposure* is significant for the environmental pillar alone, but is not at an aggregate level. *Customer proximity* is significant for the economic pillar alone (at the 95% level), but again not at an aggregate level. *Labour content* and *stakeholder pressure* are both significant at the 95% confidence level, and are both significant at an aggregate level; however the significant of *stakeholder pressure* diminishes for the aggregate results.

The result for the *industry classification* variable is the most interesting in that this variable is not a statistically significant indicator within the any of the individual pillars. However, the variable is significant at an overall level. This is an unexpected, though not specifically an uncommon result. The effect within each pillar is non-significant, though the individual effects, when added up, do produce a statistically (though barely so) effect at the aggregate level. Again this may be as a result, as previously discussed, of firms reporting practices in some industries being de-linked from their primary activities (i.e. financial services firms and diversified firms). The make-up of the industry variable results (roughly half of the organisations sampled fell within the most environmentally sensitive industry classification) further complicates the analysis of the results in this area.

International exposure produced an only barely statistically significant effect on environmental disclosure, while no noticeable effect on the other pillars. The results of this study were unable to suggest anything other than random fluctuations in the data. It is likely that this study's focus on local firms perhaps resulted in a dilution of the effect of this variable. The fact that the environmental pillar was the only pillar to show some indication of an influence with regards to international exposure makes sense. This is in light of the fact that, notwithstanding some elements of foreign labour and foreign shareholding, environmental issues are the most transferrable to other countries in that the environment does not contain barriers to transference of pollution or related environmental issues.

The results for *consumer proximity* are interesting too. Organisations recorded as being *C2C* were found to report (statistically speaking) significantly more *economic disclosure*. However the high p-values for both the *social* and *environmental disclosures* indicate that the effects here were not significant in the least (i.e. variations appear random relative to the independent variables studied).

The strongest statistical significance noted in the study was the relationship between the *labour content* of the organisation and its propensity to disclosure more social information, and indeed sustainability information in general. This relationship was significant at a 95% confidence level for both the social pillar as well as for the aggregate disclosure level. This was expected due to the relatively high correlation of 0.477 between the *labour content* variable *LAB* and the social disclosure level as well as the 0.442 correlation between *LAB* and the aggregate disclosure level *SDRLD*. This is further supported, as previously discussed, by the correlation between the social disclosure level $SDRDL_{soi}$ and the *SDRDL*. As discussed, the power of South African trade unions in the political arena, their status as a key stakeholder, and ultimately their impact on ongoing organisational legitimacy, make this result expected.

The results for *stakeholder pressure* are similar in nature to those of *customer proximity*. As noted, the effect of increases in identified stakeholder groups was a significant indicator for *social disclosure*. However, values obtained for the other pillars did not indicate any statistically significant relationship based on the content analysis. Brammer and Pavelin (2008) discuss the fact that disclosure reduces information asymmetry between been organisations and stakeholders (Brammer & Pavelin, 2008). However it is unclear why, despite the wide variety in of stakeholders identified in most reports, only social information would increase in response thereto. Perhaps the lack of identification of environmental interest groups in almost all reports points to the fact that organisations do not view these groups as powerful agents of legitimacy; while economic stakeholders tend to view the standalone annual report or financial data.

As previously highlighted, neither *organisation size* nor *CDP score* were statistically significant in the models developed and tested. *Size*, a variable evaluated in roughly 75 of Fifka's (2011) studies and found to be a significant indicator in 87% of those (Fifka, 2011, p. 25), was not found to be so in this case. It is unlikely that the use of proxies (as none were used for this variable) and the variable selection (this study used the most commonly used approach, asset base, and use of the nominal value as opposed to the natural logarithm were found not to influence the outcome) made any significant difference to the results. As noted in *Table 15*, the significance of the relationship between this variable and environmental reporting is much stronger than the other pillars. Fifka notes the separation of social and environmental reporting and the later introduction of economic elements into triple bottom line reporting (Fifka, 2011, p. 2), and it is unclear just how much of the author's work is predicated on environmental reporting (the paper is a study of corporate responsibility reporting). As such, this, combined with the noted fact that this study

focused on JSE Top 100 companies, may have diluted the effect of this variable within the sample in question.

6.3 Relationship between variables

The preceding analysis has dealt with the research hypothesis in a rigorous, analytical manner and provided resolution to the research hypothesis. Further to this, heat-maps were developed to provide a more graphical representation of relationships between the significant independent variables and the disclosure level *SDRDL*. *Appendix 4* provides a detailed heat-map indicating what values of *SDRDL* correspond to increasing levels of labour and identified stakeholders. A smaller version is provided below in Figure 24 for the purposes of the analysis below.

Average of SDRDL	SP												
LAB	2	4	5	6	7	8	9	10	11	12	13	14	Grand Total
0-0.04			38.50				46.00	48.25	38.00				43.80
0.04-0.08					50.50								50.50
0.08-0.12					41.00					44.50			42.75
0.12-0.16					43.50	35.00		56.00					44.83
0.16-0.2							50.50						50.50
0.2-0.24				34.50			33.00	66.50					44.67
0.24-0.28				44.50	49.00		31.00						41.50
0.28-0.32				46.00		47.50			33.00				42.17
0.32-0.36						42.50				53.00			47.75
0.36-0.4	35.00			56.00		53.33	44.50						49.25
0.4-0.44			34.50			57.50			51.00			49.50	48.13
0.44-0.48						53.50							53.50
0.48-0.52		49.50				40.50			56.50				48.70
0.52-0.56										65.00			65.00
0.6-0.64					47.17	69.00		59.50					54.00
0.64-0.68			44.50			54.00		64.50			36.00		49.75
0.68-0.72								48.00	66.00				60.00
0.72-0.76				45.50		68.00	33.00						48.83
0.76-0.8						56.25							56.25
0.8-0.84											73.00		73.00
0.84-0.88							54.50						54.50
0.88-0.92									61.00				61.00
0.92-0.96				59.50									59.50
Grand Total	35.00	49.50	39.17	47.67	46.50	52.03	41.79	55.86	53.50	54.17	54.50	49.50	49.61

Figure 24 – Heat-map of SP vs. SDRDL

The conditional formatting of the figure allows for a visual representation of the relationship. Higher values of *SDRDL* are shown in green and lower values in red. The right hand axis formatting shows how the disclosure level increases with higher levels of labour, illustrating why this study showed this to be the most significant factor influencing disclosure levels. On the bottom axis it is clear, as discussed, that for stakeholder pressure the relationship is not quite as strong or consistent. However the aggregate effect can be seen in that, with a few exceptions, values of *SDRDL* do indeed tend to increase as both of the independent variables increase. The exceptions noted, however, are indicative that the model was only able to explain 46% of the variation in disclosure level variations. As such, it is likely that many other internal, external and possible intangible factors are likely to impact the depth and level of corporate sustainability disclosure.

7 Conclusion

The review of literature has shown how trends in corporate social and environmental reporting have changed significantly over the last several decades. Fifka (2011) detailed these changes, highlighting the rise of non-financial reporting in the 1970s. He discussed how both research focus and reporting practices shifted from social to environmental reporting in the early 1990s as environmental concerns began to surface (Fifka, 2011). What followed was a period of consolidation as the concept of sustainability, and it's defined areas or pillars, gained prominence in both public discourse and corporate boardrooms and lead, ultimately, to the now ubiquitous triple-bottom-line report.

One of the challenges faced by both academics and corporate officers however, has been in defining precisely what sustainability is, and how it can be achieved. Becker (2007) believed this to be as a result of the definition being left intentionally vague in order to cater for different industries, activities and circumstances (Becker, 2007). Ultimately then, the vague definition and the fact that sustainability reporting is by and large not mandatory, has resulted in significant variation in reporting practices both from country to country, and within a particular country. The introduction, and later wide adoption, of the GRI's reporting standard has helped to standardise reporting to a greater extent. This, however, has been tempered by the reporting standard being a guideline only, allowing a great level of discretion in the selection of indicators, the collection of data and the depth and breadth of information reported.

The literature review undertaken pointed to the use of political economy theory as the dominant framework within sustainability studies. A broad and diverse field, political economy theory is principally constituted by legitimacy theory and stakeholder theory, with signalling theory and resource based perspectives as related frameworks. Several authors, including Gray et al. (1995), Deegan (2002), Branco and Rodrigues (2009), Chen and Roberts (2010) and Revert (2009), provided support for the interlinking of these theories for the purposes of such a complex activity as understanding sustainability reporting.

Consequently, an analytical framework was developed, based on those theories, as the primary lens with which to examine sustainability reporting. Variation in reporting, motivations for reporting and determinants of reporting quality / quantity have been amongst the most studied topics in the subject area. Fifka (2012) provided a detailed meta-analysis of the existing research into the determinants of corporate responsibility reporting. Through this review of 186 empirical studies of determinants of reporting over a period of almost 35 years, the author identified those factors, both

internal and external to an organisation, which correlated with a propensity to report responsibility information (Fifka, 2012).

Internal factors such as size, industry, financial performance, social and environmental performance and managerial attitude as well as external factors such as country / region, stakeholder interests and media pressure were found to be the most studied determinants. Within those, size, industry, managerial attitudes and country were found to be the most significant determinants. However, some significant shortcomings of the existing research and the interpretation thereof were noted, including:

- Unclear definition of which areas of sustainability or corporate responsibility were under review, possibly due to the lack of a definition of these concepts;
- Varied results for studies which were conducted on the different pillars but using the same determinants tested; and
- Importantly, the fact that the social, environmental and economic pillars are fundamentally different in nature and content, thus leading to the possibility that determinants found to be significant may exert differential influences on reporting practices within each pillar.

The latter point was indeed highlighted by a previous study by Sotorrío and Sánchez (2010). These authors found some tentative support for discrepancies in the influence of various determinants in reporting between the different pillars. However a very small sample size of 26 meant the results were far from conclusive. As such, it was decided to conduct a similar study to those previously undertaken with regards to the determinants of reporting, but to do so at a disaggregated level, analysing the significance of each determinant at an individual pillar level, and then comparing the relative impacts to the significance of its effect on the overall sustainability disclosure. Further, the dearth of studies in both emerging markets, and specifically in Africa, lead the researcher towards conducting a study in the South African context of the Johannesburg Stock Exchange.

In order to understand determinant significance on sustainability disclosure a method for measuring such disclosure had to be developed. Content analysis was chosen due to its widespread acceptance within academia, and its ability to provide a view on the level or extent of reporting. Level, or extent, of reporting was defined as a measure of the emphasis on certain elements of reporting, either through quantity or quality of information reported. The theory behind this was that the collection and reporting of information is a resource intensive process, requiring

effort and time from the reporter. Thus where better quality and more detailed information was found, not only does it prove to be of more value to the reader than anecdotal or vague information, the author has signalled its importance through the allocation of critical organisational resources.

A content analysis checklist was developed and used to score a total of 61 organisations which were randomly sampled from the Top 100 of JSE listed companies (measured by market capitalisation). The content analysis sheet contained a number of indicators spread across the three pillars of sustainability, namely: economic, social and environmental. Generally, organisational reporting information such as organisation profile, location and type of operations and reporting processes were eliminated. This was due to findings by authors such as Morhardt et al. (2002) and Daub (2007) who noted that, in related studies, most organisations scored the majority of the points for these general sections, which infer no relevant information about the organisation's sustainability practices or performance (Morhardt et al., 2002; Daub, 2007).

Thus, each organisation's sustainability disclosure was scored separately in each pillar, which then lead to an aggregate score, while information pertaining to each of the independent variables was also recorded. In certain instances proxies were required for missing information, but this was the exception and not the rule, and the researcher does not believe it resulted in any material impact on the results. Indeed, a set of dummy results conducted without all of the companies where proxies were employed was undertaken, with the aggregate results not being materially affected. In addition, the choice of using the natural logarithm of the asset base as the variable for organisation size was tested against the results of the asset base alone, and again the results did not vary in any material way.

The descriptive statistics resulted in a number of interesting observations. Of all of the pillars, the economic pillar disclosure exhibited the least amount of variation, most likely due to this section containing a large amount of indicators which closely match or exactly mirror standard financial disclosures. In addition, the economic disclosures were the best scored of the three, with organisations averaging 64% of the possible total compared to the 41% and 45% in the environmental and social disclosure pillars. Both these latter pillars too, contained a fair amount of variation in responses.

This variation came through in the sectoral analysis. The mining and metals industry received the highest scores followed by the paper / forestry / packaging sector, freight / logistics sector, oil and

gas, banking, and then food, beverage & tobacco. Each of these sectors scored above the sample average of 49.6 (out of a total of 100 available points). However, economic disclosures provided the highest proportion of points for the FMCG / retail, financial services, diversified, banking, and medical sectors. In mining / metals, paper / forestry / packaging, telecommunications, and chemical / pharmaceutical sectors social disclosures were the dominant contributor to the overall disclosure level. The construction sector, on average, received almost identical scores for social and economic disclosure. In no sector, and in only one organisation in the entire sample, did the environmental pillar represent the greatest contributor to their overall disclosure level.

The table of correlations provided support for the research premise that certain indicators would exhibit varied levels of influence within the different sustainability pillars. This can be seen in *Table 5* which indicates that for instance *international exposure* has a correlation of 0.420 with environmental disclosure, but only 0.178 with social disclosure; and *stakeholder pressure* which correlates 0.354 with social disclosure but only 0.036 with economic disclosure. The correlations also showed that *size, international exposure, stakeholder proximity* and *labour content* were the most highly correlated with the overall disclosure level. Within the dependent variables, the social pillar was the most closely correlated with the overall disclosure level at 0.826 indicating that high levels of social disclosure were generally evidenced in those organisations which scored highly in terms of to overall disclosure.

With regards to the specific indicators implemented by organisations, again economic pillar indicators represented the most consistently employed and well received in terms of the scoring index used in this study. Unsurprisingly, traditional indicators of financial performance and value added statements (economic restatements of financial information) resulted in full score allocations for most organisations. As the sample consisted of only organisations which participated in the Carbon Disclosure Project these indicators were also well scored for most organisations. Those indicators that dealt with localisation of supply chain and hiring practices were amongst the most poorly scored, most likely due to a focus of South African firms on BBBEE practices which focus on goods and services procured from previously disadvantaged[9] persons and not with regards to location of operations.

[9] By South Africa's previous Apartheid regime's policies of segregation and exclusion based on race.

Table 15 succinctly displayed the results of the hypothesis testing at both an individual disclosure pillar level as well as the aggregate results. For the sake of their interpretation it is useful to restate the null hypothesis of the research:

- H_1: The level of disclosure is not significantly associated with the environmental sensitivity of the organisation's operations;
- H_2: The level of disclosure is not significantly associated with higher levels of international exposure with regards to an organisation's operations;
- H_3: The level of disclosure is not significantly associated with proximity to customers;
- H_4: The level of disclosure is not significantly positively associated with the higher levels of unskilled labour and the resultant power of organised labour in the organisation;
- H_5: The level of disclosure is significantly associated the number of stakeholders identified in the annual report; and
- H_6: The level of disclosure is not significantly associated with the organisation's size.

In terms of H_1, we reject the null hypothesis at a 90% confidence level for the overall disclosure level, but only barely so. Further to this, the study was unable to reject the null hypothesis for any of the individual disclosure levels and, as such, there is only tentative support for *industry classification* as significant factor in disclosure level.

With regards to H_2, we reject the null hypothesis at a 90% confidence level for the environmental disclosure level only, and again we can only just do so. As with H_1, we are unable to reject the null hypotheses for the other pillars.

In terms of H_3, we reject the null hypothesis for economic disclosures at the 95% confidence level. While we cannot reject the null hypothesis for the other pillars, the p-value of 0.038 provides strong support, at a 95% confidence level, that companies which operate close to the customer disclose statistically significantly more economic information.

In terms of H_4, we reject the null hypothesis for both the social pillar, as well as the overall disclosure at the 95% level confidence level. Based on the results, organisations whose labour force is increasingly unionised tend to report statistically more social, and indeed sustainability, disclosures. This is likely as a result of both the power of labour unions due to the Congress of South African Trade Unions' (COSATU) relationship with the ruling party, as well as these organisations' reliance on labour as a critical resource in their value chain. Thus, organisations

can be seen to disclose more information in an attempt to maintain legitimacy within government, as regards to their workforce and within the communities in which they operate. As noted, there was some additional support for this as mining and metals companies (who had the highest average labour content of 74.4%) were also prominent as amongst the few organisations who reported detailed location specific indicators in attempt to maintain legitimacy with their local communities, a key stakeholder.

As regards to H_5, we reject the null hypothesis at a 95% confidence level for the social pillar, and at a 90% confidence level in terms of the overall disclosure level. We can conclude that there is strong support in that organisations that identify greater numbers of stakeholders in their sustainability reports are compelled to disclose statistically more social information. Further to this there is support, although less so, that they disclose more sustainability information in general. There is however, no support for them reporting more economic and environmental information.

Finally, with regards to H_6, despite high correlations, the study could not reject the null hypothesis and as such could not provide support for larger organisations reporting significantly (statistically speaking) more sustainability disclosures. This stands in contrast to the majority of the studies on the subject (Fifka, 2011, p. 25).

Thus, the results have been able to provide support for some hypotheses, while disproving others. Beyond this, the results support the principle research claim, namely, that the significance of factors (both internal and external) would vary for the different pillars that make up sustainability. This is clear in the results with each factor (independent variable) proving to be a statistically significant factor for at least one of the disclosure levels (dependent variable), with the exception of *organisation size* and CDP score (which was not hypothesized as being a significant factor). In each of the other variables, a statistical significance was noted in only one pillar. And of the four statistically significant factors at an individual pillar level, two of those produced a statistically significant influence at an aggregate level as well. Both of these factors were significant within the social pillar. This is not surprising, given the strong correlation between this pillar and that of the overall disclosure level.

While the research was successful in terms of its principle aims, some areas for additional research and deeper analysis were identified during the process. Further resolution with regards to types of stakeholders identified (financial / economic, social / community and public / NGO) and the influence of these on reporting would be of principle interest. While this element of the

research proved useful and significant, the broad range of stakeholders may necessitate analysing whether specific stakeholder groups prove to be significant indicators of disclosure of social, environmental or economic disclosures. This would be in line with, and support, Deegan's (2002) positive stakeholder theory which suggests that certain stakeholders yield more influence than others.

The use of a more diversified sample size, consisting of small and medium enterprises and organisations listed on Johannesburg's ALTEX index, would provide greater insight as to the precise impact of company size on the results. This factor has proved significant in the past, and the selection of only Top 100 JSE companies may have impacted the study's results. A diverse sample would provide the resolution needed to more effectively and conclusively comment on the impact of this variable.

In addition, temporal aspects of reporting are of interest; replicating this study every second year for a number of years would possible provide some insight into the trends in South African reporting and how practices are changing over time, especially as the socio-political environment shifts. Due to the large amount of effort in conducting an analysis on a sizeable sample using the current criteria, either a reduced content analysis approach, or a detailed analysis of a small sample of companies over a number of years, is recommended.

Finally, the content analysis approach undertaken can be improved in the mind of the author. The use of a three point scale was found, after several reports had been scored, to be non-optimal. The middle score of 1 (in place, but limited or vague and lacking in comparable information) was found to be too broad in that included responses which were merely anecdotal as well as those while detailed and rich, lacked the quantitative information to be comparable. Thus, a four point scale is recommended such that those responses that fall short of detailed, comprehensive and comparable are separated from those which while included, are not of significant value.

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Towards a better understanding of factors influencing social, environmental and economic disclosures

Appendix A – Data collection Instrument

MARKSHEET	Overall Score		Final score:	

COMPANY:……

			Not in place	In place but limited or vague	Conclusive, quantifiable, qualifiable	Final rating
	ECONOMIC INDICATORS	**MAX: 15**				
EC1	Traditional indicators of financial performance	1				
EC1	Intangible assets / Future value creation	1				
	Direct impacts					
EC1	Customers	1				
EC1	Suppliers	1				
EC1	Employees	1				
EC1	Providers of capital	1				
EC1	Public sector	1				
EC2	Financial implications of climate change	2				
EC3	Coverage of the organisation's defined benefit pension plan	1				
EC4	Financial assistance received from government	1				
	Market presence					
EC5	- Entry level wage compared with local minimum wage for significant locations of operation	1				
EC6	- Practices and proportion of spending on locally based suppliers at significant locations of operation	1				
EC7	- Procedures for hiring local, and proportion of senior management in locations of significant operations	1				
	Indirect economic impacts					
EC8	- Description of infrastructure investment and services supported that provide public benefit	1				

	ENVIRONMENTAL INDICATORS	**MAX: 15**				
EN1	Total material usage	1				
EN2	Information on paper consumption. Proof of, and information on recycling initiatives	1				
EN2	Information on significant environmental impacts of transportation used for logistical purposes	1				

EN3/EN4	Direct and indirect energy usage	1				
EN5/6	Initiatives to use renewable energy sources and increase energy efficiency	1				
EN7	Annualised lifetime energy requirements of major products	1				
EN8	Total water use, including reporting in relation to water available from various sources	1				
EN11/EN12	Biodiversity issues	1				
EN16/17/18/19/20	Greenhouse gas emissions / Use and emissions of ozone-depleting substances	1				
EN21	Total amount of waste by type and destination	1				
EN22	Significant discharges to water by type	1				
EN23	Significant spills of chemicals, oils and fuels	1				
ADD11	Environmental performance of suppliers	1				
EN26	Significant environmental impacts of principal products and services	1				
EN27	Percentage of the weight of products sold that is reclaimable and % actually reclaimed	1				

	SOCIAL INDICATORS	**MAX: 25**				

	Product responsibility	**MAX: 2**				
PR1	Policy for preserving customer health and safety during product use	1				
PR3	Description of policy, procedures and systems related to product info and labelling	1				

	Safety, Health and Environmental (SHE)	**MAX: 4**				
	Whether company and subsidiaries comply with applicable law regarding SHE	1				
	How legal compliance is tested and SHE performance monitored	1				
	Incidents of and fines for non-compliance, as well as notification procedures	1				
	Efforts made regarding continual improvements in SHE efforts, use of targets, benchmarks	1				

	Health	**MAX: 4**				
ADD1/2	HIV - identification of HIV issue and understanding social and economic impact on business activities	1				
ADD3	HIV - adoption of appropriate strategy, plan and policies	1				
ADD4	HIV - monitoring and measurement of performance using indicators	1				
ADD5	Primary health issues - community in which co-operate	1				

Towards a better understanding of factors influencing social, environmental and economic disclosures

	Society and transformation	**MAX: 3**				
LA13/14	Reporting using indicators against targets, bench markets and historical info: - Employment Equity - Diversity management	2				
ADD6/7/8	BEE, social investment. Disclosure of programmes, policies and practices in place, including BEE	1				

	Human capital	**MAX: 5**				
	Reporting against targets, benchmarks and historical information					
LA1	Number of staff (demographics, gender disabilities and age)	1				
LA2	Staff turnover	0.5				
LA10	Training investment	1				
LA4	Disclosure of percentage of employees represented by independent trade unions	0.5				
LA5	Policy and procedures involving information, consultation and negotiation with employees over changes in operations	1				

	HUMAN RIGHTS PERFORMANCE	**MAX: 2**				
HR1	Percentage of significant investment agreements that include human rights clauses or that underwent human right screening	1				
HR5	Incidents of violation of freedom of association and collective bargaining	1				

Appendix B – Results of data collection

Count	Sector	SDRDL (eci)	SDRDL (eni)	SDRDL (soi)	SDRDL	IND	IE	CP	LAB	SP	SIZE
1	Food, Beverage, Tobacco	21	15	11.5	47.5	3	0.96	1.00	0.32	8.00	26.10
2	Food, Beverage, Tobacco	20	16	20	56	3	0.21	1.00	0.38	6.00	26.47
3	Mining & Metals	22	20	23	65	3	0.98	0.00	0.53	12.00	27.47
4	Mining & Metals	24	20	27.5	71.5	3	0.71	0.00	0.70	11.00	27.09
5	Telecoms	16	13	15.5	44.5	1	0.68	1.00	0.09	12.00	25.92
6	Oil & Gas	20	16	23.5	59.5	3	0.13	1.00	0.61	10.00	25.90
7	Banking	21	16	18.5	55.5	2	0.95	1.00	0.50	11.00	27.92
8	Mining & Metals	19	14	21.5	54.5	3	0.00	0.00	0.86	9.00	24.26
9	Telecoms	16	13	14.5	43.5	1	0.15	1.00	0.12	7.00	24.45
10	Banking	21	14	14.5	49.5	2	0.19	1.00	0.60	7.00	27.27
11	Mining & Metals	20	22	31	73	3	0.79	0.00	0.81	13.00	24.66
12	Banking	20	13	11.5	44.5	2	0.02	1.00	0.66	5.00	27.39
14	Mining & Metals	21	13	26.5	60.5	3	0.25	0.00	0.69	11.00	24.86
15	Banking	20	12	16.5	48.5	2	0.96	1.00	0.38	8.00	28.12
16	Banking	24	15	25.5	64.5	2	0.07	1.00	0.68	10.00	27.13
17	Mining & Metals	24	14	30	68	3	0.50	0.00	0.75	8.00	24.33
18	Mining & Metals	21	18	20.5	59.5	3	0.53	0.00	0.95	6.00	25.16
19	Financial Services	16	8	14.5	38.5	1	0.19	1.00	0.04	5.00	26.67
20	Diversified services / investments	12	7	17.5	36.5	2	0.03	0.00	0.50	8.00	24.75
21	Diversified services / investments	19	12	18	49	3	0.46	0.00	0.27	7.00	24.59
22	Chemicals & Pharma	20	8	21.5	49.5	3	0.55	0.00	0.43	14.00	24.01
25	FMCG / Retail	23	19	24.5	66.5	3	0.31	1.00	0.21	10.00	22.93
26	Mining & Metals	23	11	29.5	63.5	3	0.03	0.00	0.78	8.00	24.20
27	FMCG / Retail	20	1	14	35	2	0.03	1.00	0.13	8.00	22.55
28	FMCG / Retail	24	17	17.5	58.5	2	0.08	1.00	0.37	8.00	23.57
30	Diversified services / investments	15	7	14	36	2	0.18	0.00	0.65	13.00	24.32
31	Mining & Metals	17	14	30	61	3	0.04	0.00	0.90	11.00	24.41
32	Financial Services	20	10	19.5	49.5	2	0.08	1.00	0.51	4.00	24.64
33	Medical services	17	15	14	46	1	0.36	1.00	0.00	9.00	24.15
34	Financial Services	19	9	13.5	41.5	1	0.53	1.00	0.00	10.00	26.73
35	Financial Services	15	10	13	38	1	0.03	0.00	0.04	11.00	26.40

36	Paper / Forestry / Packaging	19	19	19.5	57.5	3	0.90	0.00	0.50	11.00	24.76
37	Mining & Metals	17	8	8	33	3	0.22	0.00	0.75	9.00	24.20
38	FMCG / Retail	17	7	9	33	2	0.04	1.00	0.20	9.00	22.07
39	Financial Services	22	14	19	55	1	0.01	1.00	0.01	10.00	26.26
41	Medical services	23	13	20	56	2	0.54	1.00	0.16	10.00	24.50
42	Diversified services / investments	22	19	16.5	57.5	2	0.21	0.00	0.40	8.00	24.16
43	FMCG / Retail	21	16	12	49	3	0.25	1.00	0.77	8.00	23.13
44	FMCG / Retail	19	7	14	40	3	0.00	1.00	0.60	7.00	22.84
45	Medical services	20	8	16.5	44.5	2	0.42	1.00	0.50	8.00	24.65
46	Financial Services	21	15	17	53	1	0.10	1.00	0.33	12.00	23.65
47	Construction	23	6	22	51	3	0.17	0.00	0.41	11.00	22.58
48	FMCG / Retail	21	17	6.5	44.5	3	0.23	0.00	0.36	9.00	22.86
49	Construction	20	6	16.5	42.5	3	0.49	0.00	0.36	8.00	23.92
50	Paper / Forestry / Packaging	21	13	20	54	3	0.18	0.00	0.65	8.00	23.28
51	Paper / Forestry / Packaging	23	20	26	69	3	0.76	0.00	0.62	8.00	24.64
52	Diversified services / investments	15	9	7	31	2	0.03	0.00	0.25	9.00	22.53
53	FMCG / Retail	17	3	14.5	34.5	2	0.00	1.00	0.42	5.00	22.17
54	Construction	20	13	19	52	3	0.39	0.00	0.60	7.00	23.70
56	Telecoms	18	7	23	48	1	0.01	1.00	0.72	10.00	24.76
58	Chemicals & Pharma	17	10	14	41	3	0.29	0.00	0.10	7.00	23.25
59	Diversified services / investments	19	11	5	35	2	0.09	0.00	0.38	2.00	23.49
60	Paper / Forestry / Packaging	17	10	18.5	45.5	3	0.20	0.00	0.74	6.00	23.40
61	Chemicals & Pharma	8	10	15	33	3	0.06	0.00	0.30	11.00	22.38
63	Freight and Shipping Logistics	20	21	12	53	3	0.24	0.00	0.39	8.00	23.74
64	Construction	18	8	18.5	44.5	3	0.43	0.00	0.25	6.00	22.97
66	Mining & Metals	13	15	25.5	53.5	3	0.21	0.00	0.47	8.00	23.18
67	FMCG / Retail	18	6	10.5	34.5	2	0.09	1.00	0.20	6.00	22.44
70	Oil & Gas	20	12	14	46	3	0.95	1.00	0.31	6.00	22.35
71	Telecoms	16	13	21.5	50.5	1	0.11	1.00	0.07	7.00	22.24
72	Construction	20	9	21.5	50.5	3	0.22	0.00	0.19	9.00	22.77

Appendix C – Indicator summary

Reference	Indicator	Count of limited / vague responses	Count of Conclusive, quantifiable, qualifiable responses	TOTAL	TOTAL SCORE
EC1	Traditional indicators of financial performance	1	59	60	119
EC1	Employees	1	58	59	117
EC1	Public sector	1	57	58	115
EN3/EN4	Direct and indirect energy usage	7	52	59	111
EC1	Providers of capital	5	53	58	111
EC1	Suppliers	6	52	58	110
EC1	Customers	17	41	58	99
EC8	- Description of infrastructure investment and services supported that provide public benefit	20	39	59	98
ADD6/7/8	BEE, social investment. Disclosure of programmes, policies and practices in place, including BEE	22	37	59	96
LA4	Disclosure of percentage of employees represented by independent trade unions	7	44	51	95
EN16/17/18/19/20	Greenhouse gas emissions / Use and emissions of ozone-depleting substances	24	34	58	92
LA10	Training investment	26	31	57	88
EC3	Coverage of the organisation's defined benefit pension plan	13	36	49	85
	Whether company and subsidiaries comply with applicable law regarding SHE	28	26	54	80
LA13/14	Reporting using indicators against targets, bench markets and historical info: - Diversity management - BEE	39	17	56	73
LA1	Number of staff (demographics, gender disabilities and age)	43	13	56	69
EN8	Total water use including reporting in relation to water available from sources	36	15	51	66
EN5/6	Initiatives to use renewable energy sources and increase energy efficiency	35	15	50	65
EC6	- Practices and proportion of spending on locally based suppliers at significant locations of operation	41	11	52	63
	How legal compliance is tested and SHE performance monitored	31	15	46	61
	Efforts made regarding continual improvements in SHE efforts, targets, benchmarks	24	18	42	60
HR5	Incidents of violation of freedom of association and collective bargaining	33	13	46	59
EC4	Financial assistance received from	7	26	33	59

Towards a better understanding of factors influencing social, environmental and economic disclosures

Reference	Indicator	Count of limited / vague responses	Count of Conclusive, quantifiable, qualifiable responses	TOTAL	TOTAL SCORE
	government				
ADD3	HIV - adoption of appropriate strategy, plan and policies	34	12	46	58
EN22	Total amount of waste by type and destination	30	14	44	58
ADD1 /2	HIV - identification of HIV issue, understanding social and economic impact on business activities	42	6	48	54
EN26	Significant environmental impacts of principal products and services	32	11	43	54
EC2	Financial implications of climate change	37	7	44	51
ADD4	HIV - monitoring and measurement of performance using indicators	21	15	36	51
LA2	Staff turnover	28	11	39	50
PR1	Policy for preserving customer health and safety during product use	39	5	44	49
EN23	Significant spills of chemicals, oils and fuels	14	16	30	46
PR3	Description of policy, procedures and systems related to product info and labelling	36	4	40	44
EN1	Total material usage	17	13	30	43
ADD5	Primary health issues - community in which co operate	27	7	34	41
EN11/EN12	Biodiversity issues	25	8	33	41
EN2	Info on significant environmental impacts of transportation used for logistical purposes	22	8	30	38
EN27	Percentage of the weight of products sold that is reclaimable and % actually reclaimed	26	5	31	36
EN21	Significant discharges to water by type	20	6	26	32
EN2	Information on paper consumption. Proof of, and info on recycling initiatives	23	3	26	29
	Incidents of and fines for non-compliance, as well as notification procedures	12	7	19	26
EN7	Annualised lifetime energy requirements of major products	22	1	23	24
EC7	- Procedures for hiring local, and proportion of senior management in locations of significant operations	16	4	20	24
HR1	Percentage of significant investment agreements that include human rights clauses or that underwent human right screening	20	1	21	22
ADD11	Environmental performance of suppliers	18	2	20	22

Reference	Indicator	Count of limited / vague responses	Count of Conclusive, quantifiable, qualifiable responses	TOTAL	TOTAL SCORE
LA5	Policy and procedures involving information, consultation and negotiation with employees over changes in ops	14	2	16	18
EC5	- Entry level wage compared with local minimum wage for significant locations of operation	12	3	15	18

Appendix D – LAB/SP heat-map

Average of SDRDL	SP												
LAB	2	4	5	6	7	8	9	10	11	12	13	14	Grand Total
0-0.04			38.50				46.00	48.25	38.00				43.80
0.04-0.08					50.50								50.50
0.08-0.12					41.00					44.50			42.75
0.12-0.16					43.50	35.00		56.00					44.83
0.16-0.2							50.50						50.50
0.2-0.24				34.50			33.00	66.50					44.67
0.24-0.28				44.50	49.00		31.00						41.50
0.28-0.32				46.00		47.50			33.00				42.17
0.32-0.36						42.50				53.00			47.75
0.36-0.4	35.00			56.00		53.33	44.50						49.25
0.4-0.44			34.50			57.50			51.00			49.50	48.13
0.44-0.48						53.50							53.50
0.48-0.52		49.50				40.50			56.50				48.70
0.52-0.56										65.00			65.00
0.6-0.64					47.17	69.00		59.50					54.00
0.64-0.68			44.50			54.00		64.50			36.00		49.75
0.68-0.72								48.00	66.00				60.00
0.72-0.76				45.50		68.00	33.00						48.83
0.76-0.8						56.25							56.25
0.8-0.84											73.00		73.00
0.84-0.88							54.50						54.50
0.88-0.92									61.00				61.00
0.92-0.96				59.50									59.50
Grand Total	35.00	49.50	39.17	47.67	46.50	52.03	41.79	55.86	53.50	54.17	54.50	49.50	49.61