“Investigating whether environmental legislation promotes green investment practices in Johannesburg Stock Exchange (JSE) listed companies”

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Investigating whether environmental legislation promotes green investment practices in Johannesburg Stock Exchange (JSE) listed companies

Abstract

This paper discusses a broadened perspective of where gaps in prior studies exist with regard to the association involving environmental legislation and green investment practices. The study used a multiple case study method that evaluated 100 South African Carbon Disclosure Project (CDP) firms which are listed on the JSE. Content analysis techniques were employed to extract data from the company's 2012 sustainability and/or annual integrated reports and Chi-Square tests were utilized to analyze the data. The findings of the study indicated that environmental legislation influenced green investment practices in JSE listed firms. The strength of the relationship between environmental legislation and green investment practices was determined to be a positive linear association. The paper also identified the motivators of environmental legislation for the companies under study. In addition, company views in relation to environmental legislation were also discussed.

Keywords: environmental legislation, green investment practices, JSE listed firms, Carbon Disclosure Project (CDP), South Africa.
JEL Classification: M14, Q01, Q53, Q54, Q56.

Introduction

Environmental legislation has advanced at a fast pace in the latter periods of the twentieth century and the rate of its growth has continued to gradually develop (Burnett and Hansen, 2008). Environmental legislation, also identified as environmental law, refers to a collective term which explains the interconnected systems of statutes, regulations, customary treaties and common law which address the impact of corporate practices on the natural environment (Wei et al., 2011; Earnhart, 2004; Popp et al., 2011). Therefore, they develop the foundation for measuring and assigning environmental liabilities in situations when companies commit environmental crimes and corporate failure to adhere to or comply with outlined natural environment protection stipulations (Stafford, 2007; Sinkin et al., 2008). As such, when regulators enforce environmental laws, the main emphasis is focused on putting across "compliance" objectives which embrace co-operation, persuasion, conciliation and negotiation aspects (Geerts, 2014; Wei et al., 2011; Shimshack and Ward, 2005). Therefore, regulators attempt to let environmental offending companies understand that they are conscious of the challenges emissions releasing firms encounter and they prosecute when these firms have done serious environmental damage (Stafford, 2007; Popp et al., 2011; Peuckert, 2014). Within the South African context, the number of environmental legislations have also considerably increased in the last decade (Vermuelen, 2013; Creamer, 2011). Therefore, this study explores whether environmental legislation promotes green investment activities in JSE listed companies.

Hence, the major question which stimulates this research is: Do environmental legislations influence green investment practices in JSE listed companies? The main objective is therefore to examine if environmental legislations influence corporate green investment practices in JSE listed firms. Therefore, this paper is significant in light of the United Nations Environment Program (UNEP) principle on sustainable development, and thus, the enforcement of environmental legislations within corporate context enhances reduction of corporate environmental impacts in support of this principle (Kurukulasuriya and Robinson, 2014). As well, the introduction of environmental legislations is significant to promote UNEP objective of intergenerational equity, through improved corporate pollution control plus improved resources management. Moreover, environmental legislations are important to protect human health at the workplace and in the society at large (Kurukulasuriya and Robinson, 2014). Therefore, laws are important to support the "polluter pays principle" through putting pressure on companies to internalize environmental costs in their business operational activities (Wei et al., 2011). In addition, since environmental issues have heightened global attention, corporate stakeholders would like to be informed on the economic impact of environmental legislations.

1. Conceptual framework

This section will explore two main concepts: corporate green investment practices and environmental legislation.

1.1. Corporate green investment practices. Green investment represents a type of financing mechanism in which the investor gives preference to environmental preservation objectives in addition to conventional goals of investment (Kahlenborn,

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1999). Robert Haβler, cited in Ecologic (1998, p. 100), defines green investment as "investment in environmentally sound companies/projects such as: companies that systematically, comprehensively and successfully minimize their environmental impact by reducing the consumption of natural resources, substituting harmful substances with less damaging ones and lowering emissions to air, water and soil; companies/projects that try to maximize their environmental benefit by environmentally intelligent and innovative products and services". The World Economic Forum (2013, p. 12) defines green investment as "a broad term closely related to other investment approaches such as socially responsible investing (SRI) and sustainable, long-term investing". Therefore, amongst others, green investment practices are: waste management, green energy technologies, energy saving approaches, smart grid frameworks, carbon capture and storage, reforesting and green research and development (Eyraud et al., 2013). In this regard, various past studies have managed to identify green investment practices at organizational level.

For example, Zeng et al. (2010) implemented a study on 125 companies in China and demonstrated that the enterprises integrated cleaner production (investment in environmental preservation, recycling and waste control, minimizing package use, renewable energy adoption and emissions control) practices in business operations. Hui et al., (2001) undertook research on 11 medium sized firms in Hong Kong and outline that these companies implemented Green Manufacturing (GM) activities as part of the firm's cleaner production. Baris and Kucukali (2012) examined private organizations and other institutions in Turkey and highlight that these entities have adopted green energy technologies such as, hydropower, wind, geothermal, solar and bioenergy. Cuerva et al. (2014) conducted a research on 2493 Spanish Food and Beverage small and medium sized enterprise (SMEs) firms in the Low-Tech sector and posit that among the 301 firms which responded, some of these companies integrated green innovation practices namely, producing ecological products, recycling waste material, employing environmental technologies, are resource efficient and implement energy saving mechanisms. Schumacher (2010) carried out a study on 22 568 individuals from different countries and points out that some consumers indicated that some companies are ecolabeling their green products which have increased their environmental consciousness. Ustaoğlu and Yıldız (2012) undertook a research on Turkish contexts and posit that extended adoption of Electric Vehicles in organizations is significant. Helby (2002) analyzed 47 enterprises in Sweden and outlines that the companies adopted the "Swedish EKO-Energi program" designed to promote energy efficiency and energy management for environmental protection.

1.2. Environmental legislation. McGarity (2004) defines environmental legislations as "….regulatory in nature; they are designed to change private conduct in ways that will help preserve and protect human health and the environment. Such laws invariably delegate the details of implementation to a regulatory agency that is empowered to set standards, write regulations, and issue permits, all of which are designed to protect the environment to some degree." Artikinson (1972, p. 48) defines environmental legislation as "Laws governing the sustainable use of natural resources such as air, minerals, water, soil and vegetation". Sands (1990, p. 688) outlines that enforcement of environmental legislation is designed "… (1) to preserve, protect and improve the quality of the environment; (2) to contribute towards protecting human health; (3) to ensure a prudent and rational utilization of natural resources." Within the South African context, the constitution of the country demonstrates the overarching environmental law basis by emphasizing that "Everyone has the right – (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (1) prevent pollution and ecological degradation; (2) promote conservation; and (3) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development," (Constitution of the Republic of South Africa, 1996, p. 6).

2. Related literature

Notable global studies have managed to find an association between legislation and corporate green investment practices. For example, Burnett and Hansen (2008) studied 186 electrical utility firm plants in the United States before and after the 1990 Clean Air Amendments and concluded that environmental legislations demand companies to engage extended environmental initiatives that reduce pollution. Earnhart (2004) analyzed 42 wastewater treatment schemes in Kansas City, United States from 1990 to 1998 and suggests that environmental legislations which are characterized by inspections, fines and charges result in considerably improved firm environmental performance. Wei et al. (2011) scrutinized 475 environmental civil lawsuit entries (comprised of government departments, publicly traded companies and private firms) acquired from the US Circuit Courts. The research argues that environmental statutes are capable of determining stock returns of companies such that defendant companies undergo considerable decrease in equity

value if they have not met desirable environmental benchmarks. Popp et al. (2011) surveyed development of bleaching technology in the pulp industry of 5 countries (Sweden, Finland, US, Japan and Canada) from 1975 to 1993 and explain that environmental regulations enhance firms to establish eco-innovation standards.

Stafford (2007) investigated the impact of the United States Environmental Protection Agency's striking heightening of fines and charges connected with waste laws in 1991 on 631 000 regulated waste plants extracted from the EPA's RCRA Infor database. The study discovered that environmental offences declined after fines and charges, plus facilities which voluntarily report to EPA encountered reduced inspections in the future. Sinkin et al. (2008) evaluated eco-efficiency practices of both 90 green oriented companies and 341 firms which were used as the control group of companies (obtained from the 2003 *Fortune* 500 listing) and expressed that environmental mandatory regulations forced firms to improve the allocation of resources towards environmental initiatives, thereby increasing the probability of corporate environmental reporting. Geerts (2014) investigated 21 managers from London based hotels and surveyed 196 websites of London based hotels and hints that environmental regulations support extended incorporation of sustainability initiatives, raise financial benefits and mitigate greenwashing tactics. Peuckert (2014) considered two "Executive Opinion Surveys" findings that were constituted with information from 43 nations (observed from 2000 to 2004) and adds that environmental regulations have a positive effect on the long-term environmental outlook and performance of the firm.

Shimshack and Ward (2005) surveyed 217 of the largest pulp and paper industries in twenty-three regulatory jurisdictions of the US which have pulp and paper plants and posit that environmental legislations can have spillover effects to the extent that if an industry is fined, other industries that commit environmental crimes will also experience similar charges. Hence, legislation stimulated corporate environmental participation to avoid fines. Ford et al. (2014) assessed 80 Australian oil and gas enterprises on how environmental regulation influence innovation and point out that both environmental regulations and firm competitive benefits were important in driving firm environmental innovativeness. Del Rio Gonzalez (2005) investigated factors which ascertain clean technology integration in pulp and paper firms in Spain and pronounce that green regulation interests and firm reputation factors were principal stimulators which encouraged cleaner production incorporation. Jacob et al. (2006) suggest that green legislations instituted in one country can motivate green innovation in other industries of another country, for example green legislations in US stimulated green innovation in pollution intensive firms in Japan. Brunnermeier and Cohen (2003) scrutinized 3680 environmental patents (toxic waste, air pollution, water pollution, prevention of acid rain, recycling and solid waste management) of 146 US manufacturing firms from 1983 to 1992. The authors convey that the intensity of environmental regulations is determined through counting the number of implemented inspections. Moreover, environmental innovation heightened as a result of enforced regulations.

Some studies found that legislation does not influence corporate green investment activities. For instance, Li et al. (1997) conducted research on 10 industrial sectors (metallurgical, transport, forestry, food processing, utilities, mining, pulp & paper, chemical and other manufacturing) in Ontario, Canada and outlines that these industries experienced 14 772 spills from 1980 to 1992. However, the researchers suggested that environmental reporting was negatively related to sanctions imposed by judicial prosecutions. Peters and Romi (2013) examined non-superfund United States Environmental Protection Agency (US-EPA) sanctions from 1996 to year 2005 of 300 companies which were under the US Securities and Exchange Commission (SEC) regulations S-K, Item 103. They argued that forthright reporting of environmental aspects increase the probability of future regulations because some regulators can use that disclosed information to build cases against organizations which discourage corporate environmental initiative. Hence, legislation does not stimulate environmental engagement of the firm. Cormier and Magnan (1997) analyzed water pollution records of industries (oil, chemical and pulp and paper) in Québec and Ontario, Canada, from 1986 to 1991 and demonstrate that environmentally practising firms are prone to extended levels of inherent environmental liabilities plus accompanying decrease in market ratings. Therefore, environmental legislation does not motivate environmental commitment of the company.

Boyd and McClelland (1999) studied paper mill manufacturing plants in the US from 1988 to 1992 and demonstrate that environmental command and control regulations demand companies to adopt inefficient water and air pollution reduction techniques which negatively affect company production capacity by up to 9%. Rehfeld et al. (2007) evaluated environmental product innovations in Germany, selecting 371 manufacturing industries and identified that environmental regulations have a negative relationship with eco-innovation practices. Pashigian (1984) examined industrial records of high and low polluting industries from 1972 to 1977 in the US and posits that environmental laws resulted in a considerable

decrease in number of firms in each industrial sector as a result of high environmental underperformance. Mickwitz et al. (2008) investigated the 3 largest pulp and paper industrial firms and a few internationally based marine engine firms in Finland on the impact of environmental regulations on environmentally compatible technologies. The outcomes indicate that regulation does not promote environmental innovation. Managi et al. (2005) examined the US Oil and Gas Industry from 1968 to 1998 and explain that environmental command and control legislations discourage growth of new innovation bases because such regulations specialize in particular technology and the slightest environmental benchmarks. Sharma (2001) evaluated command and control laws in comparison with other less stringent regulations concerning environmental advancement in 12 United States and Canadian firms. The results show that there is no considerable variance in the results in favor of environmental performance.

Theoretical framework: stakeholder theory. The Stakeholder theory posits that all corporate stakeholders deserve recognition, and that their interest should be considered in the policies, operations and practices of the corporation (Haigh and Griffiths, 2007). Freeman (1984) defines stakeholders as groups or individual people who influence or are influenced by the operations of the firm. Hence, Clarke and Clegg (1998), as well as Haigh and Griffiths (2007) identify corporate stakeholder groups as, including amongst others: customers, suppliers, shareholders, the local community, the media, government, employees and the natural environment. The natural environment is considered as a corporate stakeholder because the environment is a habitat for living and non-living things that sustain corporate activities (Haigh and Griffiths, 2007). The current global increase in natural disasters, shifts in weather patterns and heightening carbon emissions have and will continue to impact on business operations (Eyraud et al., 2013). Accordingly, organizations are morally or persuasively compelled to adhere to the exigencies of the environment, considering the environment's capability to provide productive resources and the limitations it may offer if not preserved (Popp et al., 2011). Consequently, all business resources, namely natural assets, physical, financial and human, are part of the natural environment (McGarity, 2004). Therefore, since the environment is a stakeholder, this research inclines to the stakeholder theory – the firms' greening initiatives are, and/or should be, on the basis of the recognition of the existentiality of the environment as a principal corporate stakeholder. Unlike shareholders who demand cash rewards, the environment demands greening to sustain its existence, reason being that the survival of the environment means the survival of the corporation and the society at large.

3. Methodology

This paper acquired data from the company's 2012 sustainability and/or yearly integrated report publications. In this case, a multiple case study technique which was constituted with all 100 South African Carbon Disclosure Project (CDP) companies registered on the JSE, was adopted. Therefore 100 sustainability and/or yearly integrated report of these 100 South African Carbon Disclosure Project (CDP) firms were investigated. This paper utilised content analysis methods to gather information that showed that environmental legislation promotes green investment initiative of the firms under study. In this case, the researcher made use of a list of phrases which express environmental legislation as a variable that motivates company green investment practices. The deployment of business sustainability classification themes has been identified in corporate environmental literature (Gray et al., 1995; Hackston and Milne, 1996). In this study the classification themes involving environmental legislation were identified as namely, validity of licenses and permits; monitoring of compliance; inspections undertaken; related fines, liabilities and penalties; bribery issues; government and company relationships; applicability of green and/or environmental laws; any green and/or environmental legal proceedings. In this manner, paragraphs and sentences that had an association with environmental legislation as a stimulator of the company's green programs in the examined reports were collected. Therefore, organizations which illustrated that environmental legislation motivates their green investment activity were studied, the number of such declarations were considered in the "yes" row while non-declarations were collected in the "no" row. Thus, this procedure gathered data in textual presentations and transformed them into numerical layouts. The data in numerical arrangements were therefore analyzed by using Chi-square tests.

3.1. Data analysis. The computations of the IBM SPSS Version 22 generated the Chi-square tests findings as presented in Table 1 and Table 2 below:

Table 1. Showing the relationship between environmental legislation and green investment practices in JSE listed firms: Chi-square tests

	Value	df	Asymp. sig. (2-sided)
Pearson Chi-square	23.120[a]	1	.000
Continuity correction[b]	21.780	1	.000

Table 1 (cont.). Showing the relationship between environmental legislation and green investment practices in JSE listed firms: Chi-square tests

	Value	df	Asymp. sig. (2-sided)
Likelihood ratio	23.587	1	.000
Fisher's exact test			
Linear-by-linear association	23.004	1	.000
N of valid cases	200		

Notes: [a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 50.00. [b]Computed only for a 2 x 2 Table.

3.2. Rejection and acceptance of hypotheses. Given the level of significance, $\alpha = 0.05$ (5% significance level).

The *degrees of freedom* formula is: $df = (r - 1)(c - 1)$, where r = the number of rows in the cross-tabulation table and c = the number of columns in the cross-tabulation table.

In this example, $df = (r - 1)(c - 1) = (2 - 1)(2 - 1) = 1$.

Then the X^2-critical value will be determined using $df = 1$ and $\alpha = 5\%$ or 0.05. The region for acceptance for H_o is X^2-Stat $\leq X^2$-critical value.

X^2-critical value with $df = 1$ and $\alpha = 5\%$ or 0.05 is 3.843. The X^2-statistic value was determined as 23.120 as indicated in Table 1 above. The X^2-statistic value is the Pearson Chi-square value. Therefore, the decision was that we reject H_o and accept H_1 since X^2-Stat. (23.120) is greater than X^2-critical value (3.843). Thus, environmental legislation influences green investment practices in JSE listed firms.

Table 2. Results on the correlation between environmental legislation and green investment practices in JSE listed firms

Symmetric measures			
		Value	Approx. sig.
Nominal by nominal	Phi	.340	.000
	Cramer's V	.340	.000
N of valid cases		200	

The Phi and Cramer's V are both tests which investigated the strength of the relationship between environmental legislation and green investment practices in JSE listed firms. As from Table 2 above; it can be deduced that the strength of the relationship between environmental legislation and green investment practices is 0.340, which indicates a positive linear association between environmental legislation and green investment practices in JSE listed firms. Therefore, a weak moderately positive direct relationship involving environmental legislation and green investment practices in the JSE listed firms was discovered.

4. Discussion of the findings

The findings on the Chi-square tests indicate that environmental legislation influences green investment practices in JSE listed firms. Moreover, the tests also managed to establish the strength of that association using Phi and Cramer's V tests. Both these tests (Phi and Cramer's V tests) determined that the strength of the relationship between environmental legislation and green investment practices in JSE listed firms is 0.340. Therefore, the findings illustrate a positive linear association between environmental legislation and green investment practices in JSE listed firms. Numerous reasons could explain these findings within the South African context. For instance, Vermuelen (2013) indicated that tough environmental laws are significant to foster energy saving initiatives and carbon emission reducing practices in South African firms. Therefore, the association and strength of legislation and green investment practices in JSE listed firms demonstrate that companies are integrating green investment activities in response to environmental law demands. BuaNews (2011) highlights that the South African Industrial Policy Action Plan and the National Climate Change Response Strategy White Paper are supported by public policies and laws which aim to propel energy efficiency and develop green firms. Creamer (2011) also contributes that the present South African government stance indicates that firms which are continuously emitting high greenhouse gas emissions and pollution will face increased carbon taxes and penalties.

Thus, the author substantiates that the integration of carbon tax in South Africa (in January 2015) will result in broadened acceptance and incorporation of green investment practices within businesses. As such, there is a wide possibility that South African firms are introducing expanded green initiatives green initiatives indicated by the positive connection between legislation and green investment practices since tough environmental regulations are continuously being introduced in the country. Adherence to these environmental regulations will thus inevitably result in low environmental law costs. This perception was also ascertained by Tshesane and Seroka (2012) who elaborate that South African companies who fail to support green initiatives are liable to increased regulation risks (heavy fines, stiff penalties and company closure). Moreover, the growth of other numerous environmental laws in South Africa, namely, the Constitution of South Africa 108 of 1996, the Environmental Conservation Act 73 of 1989 and the

Environmental Management Act 107 of 1998 ultimately increase environmental demands expected of companies (Barker et al., 2004).

Esser (2011) substantiates that sustainability practices of South African companies have been embedded in the Companies Act 71 of 2008, the King III report and JSE listing requirements. Engel (2008) also demonstrates that the green economy objective by South Africa has stimulated growth and adoption of numerous environmental laws and environmental initiatives. Hence, Hatch and Hounsome (1998), using a CSIR analysis on 140 South African firms in 1998, report that environmental legislation has been an important instrument towards improved engagement of environmental issues by the companies. In the same vein, Mbadlanyana (2013) contributes that the South African Department of Environmental Affairs and Tourism (DEAT) 2004 report has outlined that tough environmental laws will focus on energy intensive, electricity generating and oil refinery companies to minimize greenhouse gases. Hesloop (2006) also conveys that South Africa produces the largest quantity of carbon emissions in Africa, hence the introduction of green air quality legislation will promote green policy advancement and planning in companies.

Therefore, it can be seen that the South African government's stance towards creating a green economy, has heightened the introduction of environmental legislation which attempts to influence the behavior of South African companies through widened adoption of green programs. Previous international findings which support the study findings that environmental legislation influence green investment practices in JSE listed firms have also been discovered, for example, findings by Burnett and Hansen (2008), Earnhart (2004), Wei et al. (2011), Popp et al. (2011), Stafford (2007), Sinkin et al. (2008), Geerts (2014), Peuckert (2014), Shimshack and Ward (2005), Ford et al. (2014), Del Rio Gonzalez (2005), Jacob et al. (2006) and Brunnermeier and Cohen (2003). On the other hand, international results which conflict with these study outcomes (that environmental legislation influences green investment practices) have also been found, for example, findings by Li et al. (1997), Peters and Romi (2013), Cormier and Magnan (1997), Boyd and McClelland (1999), Rehfeld et al. (2007), Pashigian (1984), Mickwitz et al. (2008), Managi et al. (2005) and Sharma (2001).

4.1. Drivers of legislation as a factor which spurs corporate green investment practices in JSE listed firms. The common drivers of legislation as a variable which propels adoption of green investment activities in JSE listed companies were extracted from sustainability reports and/or annual integrated reports of the firms, then summarised and presented in Table 3 below.

Table 3. Drivers of legislation as a factor which spurs corporate green investment practices in JSE listed firms

Summarized drivers of environmental legislation	Number of companies which supported the driver
Adhere to Johannesburg Stock Exchange (JSE) Socially Responsible Index listing requirements.	11
Comply with integrated King Report demands (South Africa).	5
Abide with Kyoto Protocol requirements where they are registered.	3
Adhere with United Nations Framework on Climate Change (UNFCCC) demands where they are registered.	3
Law require air emission licences to operate.	4
Internal control methods uphold regional green law demands.	1
The firm is committed to green and environmental legal compliance mandate of the country.	16
The company adhere to environmental certifications which include ISO14001.	1
Abide with SANS 204 Energy Efficiency in Buildings requirements.	6
Comply with Global Reporting Initiative (GRI) G3 and GRI's G4 guidelines.	4
Adhere to AccountAbility's AA1000 principles and requirements.	3
The company aims to meet or even exceed applicable environmental legislation interests.	2
Consider Climate Markets and Investment Association (CMIA) business operating green requirements.	1
Take into account of International Emissions Trading Association (IETA) green requirements.	4
Adopts Equator Principles sustainability model in implementing project finance decisions.	3

An analysis of all the legislation drivers presented in Table 3 above demonstrates that though legislations can be adhered to at local or international level, they all have one goal which is to support environmental preservation. Some of the environmental regulations can be at industrial level, type of trade and governmental but they serve to protect the interests of the natural environment through motivating JSE listed firms to integrate green investment practices. Therefore Table 3 indicates that environmental laws introduced by the country influenced most companies (16) towards integrating green investment initiatives. Moreover, adhe-

rence to Johannesburg Stock Exchange (JSE) Socially Responsible Index listing requirements has also forced companies to introduce green investment activities as up to 11 companies mentioned JSE listing requirements as a driver. Other important drivers include King Report demands, licence demands (air emission), Global Reporting Initiative (GRI) G3 and GRI's G4 guidelines requirements, SANS 204 Energy Efficiency in Buildings requirements and International Emissions Trading Association (IETA) green requirements.

4.2. Corporate perceptions on legislation as a factor which motivates green investment practices in JSE listed firms. Emira Property Fund (2012, p. 5): *"Ensures compliance with JSE listing requirements and provides a market for trading Pls."*

This statement demonstrates that JSE listing requirements are not voluntary but mandatory for listed firms. Environmental demands expected by JSE possibly stimulate these firms to incorporate green initiatives so that they meet environmental listing requirements. This statement also provides evidence that non-compliance with JSE requirements can possibly work to the detriment of the firm.

Anglo American (2012, p. 60): *"We have established a Group carbon steering committee to coordinate activities that will lower our exposure to carbon compliance costs, including building our capacity to buy and sell carbon allowances. The committee provides guidance on how each business unit settles its carbon compliance costs …"*

This company's view illustrates that environmental laws stimulate JSE listed firms to introduce green programs at least up to standards expected by environmental regulations. In this case, these firms highlight the importance and impact of environmental legislations towards putting pressure on these firms' environmental accountability obligations.

BHP Billiton (2012, p. 4): *"Our ability to operate globally is dependent upon gaining access to natural resources and maintaining our licence to operate."*

The above perception spotlights the importance of doing away with "greenwashing" practices. The JSE firms believe that greenwashing or non-effective environmental practices do not permit them to get business permits and licences to undertake their business activities. As such, they need to show regulators that they are environmentally responsible. Consequently, they will be permitted to acquire environmental licences which will allow them to operate legally, thereby preventing legal prosecutions.

KAP Industrial Holdings (2012, p. 52): *"The company secretary is responsible for duties set out in section 88 of the Companies Act and for ensuring compliance with the Listings Requirements of the JSE Limited."*

The above view clearly outlines that JSE listed firms are under command and control of environmental regulations which provide them with no opportunity to negotiate but to introduce environmental practices and activities which meet the demands of the law. The statement also offers an insight into the fact that South African regulators expect their law interest to be effectively addressed in relation to prescribed guidelines without giving room for corporate abidance failures.

Woolworth Holdings (2012, p. 76): *"The Board is of the opinion that the group has applied all significant governance principles in King III and that the company is fully compliant with all significant requirements of the Listings Requirements of the JSE. The company has not breached any regulatory requirements and has not failed any statutory obligation."*

The statement by Woolworths Holdings indicates that the King III report and JSE listing requirements are reputable regulatory instruments which expect high environmental, social and governance performance from the company. As such, these regulatory tools are regulatory mechanisms which are generally strict.

Vodacom (2012, p. 103): *"Our South African operations are IS0 9001, ISO 14001 and OHSAS 18001 accredited by the independent certification agency Price Waterhouse Coopers."*

This perception outlines that environmental certifications improve the firm's environmental consciousness which leads to high environmental engagement. Moreover, ISO regulations adherence permit the company to accept prescribed national environmental legislation and in their interest, then implements suitable environmental practices to meet expected benchmarks.

Trencor Ltd (2012, p. 21): *" …is subject to federal, state, local and foreign laws and regulations relating to the protection of the environment, including those governing the discharge of pollutants to air and water, the management of hazardous substances and wastes and the clean-up of contaminated sites. In addition to environmental regulations affecting container movement, shipping, movement and spillage, environmental regulations also impact container production and operation, including regulations on the use of chemical refrigerants due to their ozone depleting and global warming effects."*

The statement by Trencor Ltd illustrates the effect of environmental legislation on firm operations. This statement shows that there are numerous environmental regulations which govern firm performance at any

level of production depending on the type of material and processes available. As such, the statement appears to demonstrate that the firms are conscious of their environmental obligations in particular industrial levels of production and distribution.

Standard Bank (2012, p. 84): *"We monitor evolving environmental regulations and put in place the necessary measures to comply. New legislation such as the proposed carbon tax in South Africa could have a notable financial impact on our operations and on those of our customers. We are actively engaging with go-vernment to ensure an effective balance between addressing climate change and the impacts of related regulation on the economy and business."*

This view suggests that environmental legislation determines corporate environmental participation. The JSE firms seem to outline that they introduce appropriate environmental activities that address environmental law interest in addition to setting up environmental measures which consider environmental legislations, demands that the government wants to introduce. As such, these firms are environmentally pro-active.

Sasol (2012, p. 38): *"South Africa and other countries are in the process of considering new climate change requirements, including a carbon tax. Significant challenges are associated with meeting the requirements of the new Air Quality Act, the Waste Act and new fuels specifications in South Africa. The government is also reviewing the Mine Health and Safety Act and is intensifying its enforcement of environmental laws."*

The statement by Sasol indicates that climate issues are topical environmental issues which governments have continuously considered by enforcing ever-evolving environmental laws in order to mitigate climate change in relation to prevailing scientific findings on climate change. Therefore, the statement highlights that JSE firms' environmental performance will be extensively monitored by diversified and intensive environmental legislations.

Sappi (2012, p. 23): *"In his February 2012 budget speech, the Minister of Finance confirmed the Government's commitment to the implementation of a carbon tax in South Africa. The tax is to come into effect in 2013-14 and increase by 10% a year until 2020. Our view is that papers imported from countries without carbon taxes would mean unfair competition. While we wait clarity on the final nature of carbon tax, we are mitigating this risk by engaging with a number of bodies including Business Unity South Africa (BUSA), Treasury, the Department of Energy and the Department of Environmental Affairs."*

In this case, company 10 tends to disagree with the quantitative finding of the study which posits that legislation influences corporate green investment practices. Rather, the statement implication is that environmental legislation negatively effects firm performance. Thus the company is opposing the introduction of South African environmental legislations.

Overall discussion

The outcomes of this paper show that environmental legislation influences green investment practices in JSE listed firms. The strength of the relationship between environmental legislation and green investment practices in JSE listed firms was discovered to be 0.340. Therefore, the findings indicate a positive linear association between environmental legislation and green investment practices in JSE listed companies. Thus, this paper highlights that government led interventions in corporate practices can produce considerable effects on business financing decisions. Therefore, business entities should not underestimate the impact of environmental laws as they can possibly result in high costs to the company in cases of non-compliance through legal prosecutions, penalties and charges. The drivers of environmental legislation (see section 4.1) and corporate perceptions on environmental legislation (see section 4.2) to a greater extent demonstrate that companies regard law enforcement as a non-negotiable stimulator towards integration of green-oriented activities. Therefore, corporate adherence to environmental legislations is significant to reduce negative effects which can be generated from their implementation. As such, the paper demonstrated that environmental laws exercise a major role since it bridges divergences involving company's profit-oriented goals (self-interest) and environmental demands (interest) of the society. Thus, when government introduce environmental legislation it is now up to the firm to develop mechanisms that ensure effective compliance to such laws and such an action also ascertains the effectiveness of the enforced environmental legislation. This study found that environmental regulations have evolved to become an important component of company operations through increased familiarity (see section 4.2). Therefore, there is a need for companies to undertake greater responsibility for applicable environmental regulations as it improves awareness and mitigate environmental liabilities.

Conclusion

This study explored the relationship between environmental legislation and corporate green investment activities. This paper differs from previous environmental sustainability studies as it provides a specialised test on the association within the South

African contexts. The study explained that environmental legislation influences green investment practices in companies on the JSE. The strength of the relationship between environmental legislation and green investment practices in JSE listed firms was discovered to be 0.340. Therefore, the findings indicate a positive linear association between environmental legislation and green investment practices.

The linked drivers of environmental legislation in relation to JSE listed firms were also presented. Moreover, selected company views regarding environmental legislation were also discussed. Future research is significant since this study only evaluated self-disclosed subject matter by the companies under study, hence more studies could replicate this research by employing extended directly targeted dimensions of the theoretical constructs. Moreover, it is important to implement a study which found other factors influencing corporate green investment practices owing to its multidimensional attributes.

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