Profitability as a Factor That Spurs Corporate Green Investment Practices in Johannesburg Stock Exchange (JSE) Listed Firms

Fortune Ganda
University of Limpopo, South Africa
fochi555@yahoo.com

Collins C. Ngwakwe
University of Limpopo, South Africa
collins.ngwakwe@ul.ac.za

Cosmas M. Ambe
University of Limpopo, South Africa
cosmas.ambe@ul.ac.za

Present studies show corporate reluctance and a lack of interest regarding stimulation towards green investment initiative. This paper investigated the association involving profitability and corporate green investment practices in 100 South African CDP companies on the JSE. Using, Chi-square tests, the outcomes of the test demonstrate that profitability influences green investment practices in these JSE listed firms. Furthermore, a positive direct correlation between profitability and green investment practices in these JSE listed firms was determined. The paper hence indicates that firms can experience improved performance (profitability) if green investment activities are integrated.

Key Words: corporate profitability, green investment practices, JSE listed firms, Carbon Disclosure Project (CDP), South Africa
JEL Classification: M14, Q01 Q53, Q54, Q56

Introduction

Since the pre-industrial era, global carbon emissions concentration levels have continued to increase and have become an environmental nuisance to modern society (Chan et al. 2012). It is estimated that the survival of future generations might be endangered if efforts are not made to reduce carbon emissions by the present generation (Eyraud, Clements, and Wane 2013). South Africa is no exception as current environmental problems are resulting from heightening carbon emissions levels (Inderst, Kaminker, and Stewart 2012). Therefore, reducing global carbon emissions is an important responsibility in the 21st century (CDP 2010).

Despite widespread environmental problems, some corporations are still not willing to engage in carbon reduction and green investment practices (Kesidou and Demirel 2012). Some reasons cited for corporate reluctance in engaging in green investment activities include, amongst others: ineffectiveness of numerous environmental metrics (Telle 2006); buyers disinterest in considering green issues during purchasing (Berrone, Surroca, and Tribó 2007); lack of green expertise and motivation by organisations (Aragón-Correa and Rubio-López 2007); green initiatives not regarded as constituting sound business sense by some organisations (Wagner et al. 2002).

The continual unwillingness by some companies to participate in green investment initiatives contributes to growing negative impacts on climate change (Zhu, Sarkis, and Lai 2008). Although some companies are still reluctant toward incorporating green initiatives, a number of companies are participating in green investment practices; these include some companies in South Africa (CDP 2013). Therefore, it is important to ascertain the motivators that enhance corporate green investment practices. This study explores if profitability stimulates corporate green investment practices. The main philosophical systems are, the conventional perception of the company (profit oriented), and the emerging issues on green investment initiative. These views conflict in relation to the direction of the association. Thus, the conventional perception illustrate that green investment activities generates financial losses to the company. Nonetheless, growing corporate green-based studies argue that the traditional view appear to be not the case. As such, this study will investigate if profitability influences corporate green investment initiatives in the JSE listed firms.

Therefore, the major research question that stimulates this study is: Does profitability influence green investment practices of JSE listed firms? The objective of this study is, hence, to determine if profitability influence green investment activities in JSE listed companies. This study is important in light of evidence that introduce that that some investors are still hesitant about green investments since they perceive that such investments may not necessarily yield positive financial returns (Yemshanov et al. 2007). The cost of delaying green investment initiatives, however, may be huge and irreparable, not only to business, but to the entire society (CDP 2013). Nevertheless, despite apparent apathy by some firms towards embracing green investment (CDP 2010), a good number of companies in the South African JSE are adopting some green investment practices (Johannesburg Stock Exchange 2013), hence the concern of this study to

find out if profitability motivate corporate green investment practices. This is important because finding and publicising these practices will assist in promoting better plus strong green and environmental corporate policies.

The first section examines the conceptual framework of the study. This is followed by an examination of related literature plus the theoretical framework of the study. The research methodology and data analysis procedures are briefly discussed. An overall discussion and its conclusion are also presented and discussed.

Conceptual Framework

This section implements a detailed analysis of the main concepts of this study. Hence, it begins with issues on corporate green investment practices. Then, the concept on firm profitability is also analysed.

CORPORATE GREEN INVESTMENT PRACTICES

Corporate green investment practices represent one distinct feature of modern firm environmental responsibility. Green investment is when companies' financial environmentally sound practices systematically, comprehensively and successfully lead to resource efficiency, removal of harmful substances and reduced carbon emissions, thereby optimising environmental benefits through green commodity provision (Ecologic 1998). On the other hand, corporate green investment practices also referred to as 'low-carbon and climate resilient investments' relate to responsible investing, actions and/or initiatives that are consistent with environmental ethics toward the reduction of carbon emissions by principally focusing, amongst other practices, on supporting green energy, low-carbon or clean technology and green related markets (Inderst, Kaminker, and Stewart 2012; Eyraud, Clements, and Wane 2013; Barnea, Heinkel, and Kraus 2005).

For example, Andiç, Yurt, and Baltacıoğlub (2012) analysed Turkish firms found in the Ataturk Organized Industrial Zone (AOSB) and the Ulucak Industrial Zone (USBI) and discovered that they employed green supply chains. Aguilera-Caracuel, Hurtado-Torres, and Aragón-Correa (2012) studied 1556 export companies in Spanish food industry (that is fish, drinks, meat and agricultural goods) and demonstrated that they adopt environmental plus energy and carbon management mechanisms. Jaraitė and Kažukauskas (2013) investigated companies in 24 European Union countries from 2002 to 2010 using the Amadeus (Bureau van Dijk)

database and demonstrate that the firms employed green energy supporting structures such as Tradable Green Certificates (TGC) and Feed-in-Tariffs (FITS). Chan et al. (2012) investigated 194 foreign companies based in China and indicate that they integrate green supply chain management (GSCM) practices. Investec (2012) integrates energy efficient installations and green energy. African Bank Investments (2012) has incorporated a green procurement strategy and implemented waste and recycling schemes with firms such as Shred-IT. Sasol Ltd (2012) explains that the chemical and energy firm has integrated mechanisms that seek to evaluate the potential of Carbon Capture and Storage (CCS) practices.

FIRM PROFITABILITY

Profitability is the condition of acquiring financial profits or benefits by the company through integrating diversified business practices (Antonietti and Marzucchi 2013). It is the quality and capacity of yielding gains through operating activity of the firm (Stefan and Paul 2008; Lai and Wong 2012). Therefore, gains or simply profit may also refer to advantages that are acquired from financial benefits earned when all corporate initiative costs plus expenses associated with the earned income have been deducted (Tomasin et al. 2013). Hence, profitability represents the main objective of any business enterprise (Freedman 1962). Therefore, without profits the company is unable to maintain its current business operations in the long-term (Zhu et al. 2008). In this manner, measuring present and previous profitability plus estimating long-run business profitability prospects is significant (Nehrt 1996). Hence, a company that is experiencing high profits is empowered and has capability to provide its shareholders and other investor's high financial gains on investments made (Brammer and Pavelin 2006). In this regard, increasing profitability represents one significant aspect of corporate senior management teams (Melnyk, Sroufe, and Calantone 2003). Hence, firm managers are constantly devising techniques that transform the company in order to acquire high financial benefits (Vachon and Klassen 2008).

Related Literature

There has been an increase in literature, which attempt to develop an association between profitability, and corporate green investment practices. For example, Brammer and Pavelin (2006) analysed 447 large firms extracted from the FTSE All-Share Index in the UK and determined that voluntary environmental reporting was noticeable in companies that had

reduced debts and more divided ownership. Al-Tuwaijri, Christensen, and Hughes (2004) investigated 198 companies, which were part of the 1994 IRRC Environmental Profiles Directory in the USA on the connections involving environmental reporting, financial performance and environmental performance by applying a Three Stage Least Squares estimation, and discovered that the environmental performance of the firm is positively associated with economic performance. Antonietti and Marzucchi (2013) conducted a study on 851 manufacturing companies in Italy on the effect of greening on corporate productive efficiency from period 2001 to 2006. They explain that a corporate green investment policy results in positive company productivity if investment is aimed at minimising externalities and achieving resource efficiency.

Zhu et al. (2008) analysed 11 manufacturing companies in China on company-level association with green supply chain management (GSCM) and spotlight that there was a positive association between organisational performance (learning procedures and institutional support) and GSCM initiatives thereby generating a competitive advantage to the firms. Zhu, Sarkis, and Lai (2008) surveyed 171 Chinese production companies (automobile, electrical, power generating and chemical) and found that green practices in the firms, supply chains improved logistics efficiency and minimised wasting of resource material. Lai and Wong (2012) surveyed 128 top managers of manufacturing exporting companies in China, acquired from the Dun & Bradstreet database, and outcomes spotlight that green practices generate a positive relationship with environmental and operational performance, while legislation promotes green performance association. Cagno, Trucco, and Tardini (2005) carried out research on 134 Pollution prevention (P2) schemes from United States (60%), Norway (%), Australia (19%), Morocco (1%), Spain (1%), New Zealand (9%), Mexico (1%), Turkey (2%) and Canada (6%) and point out that environmentally compatible manufacturing procedures are no longer viewed as an obligatory stance but a strategic initiative since they enhance the entity to achieve long-term competitiveness.

Vachon and Klassen (2008) instituted a survey on 28 manufacturing companies from North America (that is the United States and Canada) on environmental practices and manufacturing performance. They discovered that environmental planning initiatives and environmental problem solving processes have a positive association with the firm's manufacturing performance (competitive benefits, cost-effectiveness) since the firm is empowered to make use of their suppliers procedures, technology and

expertise. Melnyk, Sroufe, and Calantone (2003) undertook a research on 1510 US firms about their perceptions regarding environmental management systems (EMS) and ISO 14001 and the outcomes demonstrate that firms, which adopt environmental management practices, experience a positive overall company performance in all dimensions. Simmons and White (1999) examined 126 electronic Canadian and United States firms to establish the link involving ISO 9000 and company performance and the outcomes point out that ISO certified companies produce higher profits than non-certified firms do. Plouffe et al. (2011) analysed the eco-designed product performance of 15 French companies and 15 Quebec firms and found out that these firms' profits increased significantly as they managed to experience cost reductions in these products life cycles. Nehrt (1996) investigated the association involving timing and intensity of financing mechanisms concerning pollution reduction plus profitability of 50 paper and pulp companies (that focus on chemical bleaching) from 8 countries and the outcomes indicate that a positive connection involving early integrators of pollution prevention practices and financial gains was evident.

Nonetheless, this experience is highly unlikely in all companies since different companies have diversified structures and governance systems. For instance, Horváthová (2010) undertook a meta-regression evaluation of 64 results acquired from 37 previous researches conducted in USA, European, Canadian and Asian firms. The study highlights that portfolio researches had a tendency to indicate a negative association involving environmental performance and financial performance. The research further outlines that time requires to be considered if a positive association involving environmental and financial performance can be determined. Busch and Hoffman (2011) investigated 2500 companies from the Dow Jones Global Index on connecting carbon plus financial performance of the firms. The research demonstrates that procedure-oriented environmental activities (with respect to carbon management) generate a negative relationship with financial performance but results-oriented environmental activities (with respect to carbon management) generate a positive relationship with financial performance of the firm. King and Lenox (2002) analysed 614 US public companies on pollution minimisation practices which generate profits using 2837 company-annual observation records from 1991 to 1996 and point out that waste prevention practices generate profits but pollution reduction practices were found to generate no financial gains.

Wagner et al. (2002) studied European paper production industries on the impact of environmental performance on financial performance measured by Return on Capital Employed (ROCE) and a negative relationship between environmental and financial performance was generated. Telle (2006) scrutinised Norwegian plants from 4 industries (non-metallic, chemicals, pulp and paper and basic metals) on whether corporate greening pays for the time period 1990 to 2001 and concludes from different results generated on the relationship involving environmental and financial performances; it cannot be ascertained if greening pays (that is premature) but can be viewed in terms of when or who it affords financial gains. Wayhan, Kirche, and Khumawala (2002) evaluated environmental certification (ISO 9000) integration in USA companies and put forward that adoption of ISO 9000 generates a weak (limited) effect on the companies' economic achievements. Aragón-Correa and Rubio-Lopez (2007) analysed 140 food-manufacturing firms in France and the UK about proactive environmental policies and outline that incorporating green activities will not result in improved firm financial benefits. Berrone, Surroca, and Tribó (2007) conducted a study on 398 firms acquired from 26 countries and obtained results that state that environmental pro-activeness of the firm on its own will not produce financial gains. Zhu, Sarkis, and Lai (2007) evaluated 89 Chinese automotive firms regarding their green supply chain management (GSCM) initiatives and found that green practices in firms supply chain operations have a negative association with the firms' economic performance. Graves and Waddock (1999) utilised *Fortune* data to analyse 653 companies from 1984 to 1994 and highlight that the association involving organisational environmental and financial performance yielded insignificant findings.

Theoretical Framework: Goal Framing Theory

The goal framing theory has been associated with firm environmental conduct (Lindenberg 2008; Lindenberg and Steg 2007). In this manner, goals frames determine corporate environmental conduct (Lindenberg and Steg 2007). Hence, when the company establishes a particular goal, there is a high probability that the firm becomes more receptive to information, which supports realisation of the set goal (Lindenberg 2008). Therefore, in this globalisation era, which is constituted by high natural environmental concerns and issues, the goal framing theory fits settings linked to corporate environmental conduct (Lindenberg 2006). Now, within corporate settings, profitability represents the core goal; but

to acquire high profits, the company must also meet other background environmentally oriented goals. These background goals can be a corporate green image, environmental consciousness and environmental legislation. Thus, it is evident that profitability, corporate image, legislation and environmental consciousness represent multiple corporate motivations, which influence the environmental behaviour of the company towards adopting green investment practices; hence, they are not homogenous (Lindenberg 2008). In this case, activating the focal goal (that is profitability in this study) influences corporate environmental information processing the most since it represents the goal-frame (Lindenberg 2006). On the other hand, other goals, namely, corporate image, legislation and environmental consciousness heighten or minimise that ability or strength of the focal goal (profitability).

Consequently, when background goals, namely, corporate image, legislation and environmental consciousness are compatible with the focal goal (profitability), then they are able to empower and strengthen profitability. On the other hand, if the background goals, namely, corporate image, legislation and environmental consciousness are conflicting with each other, then there is a tendency to weaken the focal goal (profitability) thereby reducing its strength (Lindenberg and Steg 2007). Therefore, in this study, the goal framing theory is seen as fitting since we demonstrate that the micro-foundations developed through theory enhance generation of major strategy questions in a novel approach-specifically, how strategic goals determine firm environmental behaviour.

Methodology

This study made use of secondary data retrieved from the firms' 2012 sustainability reports or annual integrated reports. This study was a multiple case study since the research considered 100 South African Carbon Disclosure Project (CDP) companies on the JSE. Hence, 100 sustainability reports or annual integrated reports of the South African Carbon Disclosure Project (CDP) firms were examined. Using content analysis, the researchers extracted information which indicate profitability as a factor that promote corporate green investment practices in JSE listed firms. In this study, the researchers created a list of phrases that relates to the influence of the specific variable (profitability) on corporate green investment practices. The use of classification themes in corporate social and environmental sustainability research has been applied by Gray, Kouhy, and Lavers (1995) and also Hackston and Milne (1996). The researchers re-

TABLE 1 Results on JSE Listed Companies Indicating the Extent to Which Profitability Influence Green Investment Practices

		Green investment practices		Total
		High	Low	
Profitability	No	41	59	100
	Yes	59	41	100
Total		100	100	200

ferred closely to sentences and sections (paragraphs) on sustainability or annualised integrated reports of the selected firms. Sentences or phrases which have an association with the classification list under the relevant variable (profitability) were extracted (Holsti 1969). Therefore, the classification list this study adopted about profitability was constructed under the following headings: marketability from green investments; green business opportunities; reductions in costs from green investments; competitive advantages from green practices; productive efficiency realised by greening; minimised green business risks; financial entity green demands and market shares and growth from green practices. In this study, the researcher considered sentences or sentence contexts and not independent words, and this approach is recognised for improving reliability, meaning and complete comprehension of facts for further examination (Hackston and Milne 1996). Thus, if management declares that profitability does drive their initiative, the number of such declarations from various companies was inserted in the 'Yes' row, and if there is no declaration regarding profitability as a driving factor, the number of such non-declaration statements was inserted under the 'No' row. Hence, this study converted analysed textual data to a numerical form. The data in this study was therefore analysed using the Chi-square tests.

DATA ANALYSIS

The major approach for data analysis in this study was both quantitative and qualitative analysis. The quantitative approach, which is Chi-square tests is presented as follows:

The calculations of the IBM SPSS Version 22 produced the Chi-square tests results as demonstrated in table 2 and table 3.

In this study the χ^2 critical value with $df = 1$ and $\alpha = 0.05$ (level of significance) is 3.843. The χ^2 statistic value was determined as 6.480 as indicated in table 2. The χ^2 statistic value is the Pearson Chi-square

TABLE 2 The Relationship between Profitability and Green Investment Practices in JSE Listed Firms: Chi-Square Tests

Item	(1)	(2)	(3)	(4)	(5)
Pearson χ^2	6.480[a]	1	0.011		
Continuity correction[b]	5.780	1	0.016		
Likelihood ratio	6.515	1	0.011		
Fisher's exact test				0.016	0.008
Linear-by-linear association	6.448	1	0.011		
Number 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 × 2 table. Column headings are as follows: (1) value, (2) degrees of freedom, (3) asymp. sig. (2-sided), (4) exact sig. (2-sided), (5) exact sig. (1-sided).

TABLE 3 Results on the Correlation between Profitability and Green Investment Practices in JSE Listed Firms

Item		Value	Approx. Sig.
Nominal by Nominal	ϕ	0.180	0.011
	Cramer's V	0.180	0.011
Number of Valid Cases		200	

value. Therefore, the decision was that we reject H0 and accept H1 since χ^2 statistic value (6.480) is greater than χ^2 critical value (3.843). Thus, profitability influence green investment practices in JSE listed firms.

With respect to this research, Phi and Cramer's V were two tests deployed to ascertain the strength of the relationship between profitability and green investment practices in JSE listed firms. The results obtained from table 3, show that the strength of this relationship was obtained to be 0.180. The outcomes indicate a positive linear relationship involving profitability and green investment practices in the JSE listed firms. Therefore, a positive direct relationship between profitability and green investment practices in JSE listed firms was ascertained.

DISCUSSION OF THE FINDINGS

The findings from the Chi-square tests outline that profitability influences green investment practices in JSE listed firms. To harmonise these outcomes, Phi and Cramer's V tests were employed to test the strength of the relationship involving profitability and green investment practices in JSE listed firms. The findings determined that the strength was 0.180

thereby illustrating a positive direct correlation between profitability and green investment practices in JSE listed firms. The findings could therefore suggest that some South African companies have begun to realise that green investment activities are not financial sacrifices. This perception is based on the study findings, which demonstrated a positive linear relationship involving profitability, and green investment practices in JSE listed firms. Thus, earlier studies, for example, De Cleene and Sonnenberg (2004) examined social responsible investing in South African firms and highlight that these firms view sustainability investments as ones, which generate financial losses. It is against this background that JSE listed firms could be changing towards expanded green initiative incorporation.

Therefore, the study outcomes that profitability influences green investment activities of JSE firms can also be supported in light of various findings. For example, SAICA (2009) demonstrates that South African companies, which incorporate green programmes, sustain business competitiveness. *SAnews* ('Call for Collective Approach to Climate Policy' 2011) proclaims that green practice adoption improves South African firms' performance and productivity. Tech-Pro ('Going Green in the SA Supply Chain' 2014) highlights that greening the corporate supply chain leads to improved energy efficiency and lowered transport costs in South African companies. Greenfinder ('IDC – Green Energy Efficiency Fund' 2014) contributes that energy efficiency practices in South African firms reduce investment risks, create high product quality, which increases sales and generates improved company market value.

Destinyman.com ('How to Keep Your Company's Carbon Footprint Low' 2011) also express that South African firms, which embrace and promote green initiatives attract an increased number of green investors. Therefore, it is now evident that given all these financial advantages associated with greening, profitability has indeed influenced green investment activities in JSE listed firms. Moreover, some international studies support these study findings and report that profitability influences the firm's green investment practices. For example, amongst others research by Brammer and Pavelin (2006), Al-Tuwaijri, Christensen, and Hughes (2004), Antonietti and Marzucchi (2013) and Zhu et al. (2008). However, some studies have demonstrated that profitability does not influence green investment practices, thereby conflicting with these study results. For example, amongst others, studies by Wagner et al. (2002), Telle (2006) and Wayhan, Kirche, and Khumawala (2002). The next section presents

the drivers of profitability as a factor, which spurs green investment activities in JSE listed companies.

Drivers of Profitability as a Factor That Support Corporate Green Investment Initiatives in JSE Listed Firms

Table 4 illustrates common motivators of profitability as a variable, which spur corporate green investment initiatives in JSE listed companies.

As from table 4, important drivers of profitability as a factor that spur corporate green initiatives in JSE listed firms are, efficient employment of energy (4 firms supported this driver), zero carbon schemes produce financial benefits (3 firms supported this driver), sustainable green business opportunities are generated (3 firms supported this driver), environmental and energy risks are lessened and controlled (3 firms supported this driver), resources are effectively allocated (3 firms supported this driver) and green investments improve firm competitiveness (3 firms supported this driver). Overally, the findings presented in table 4 generally outline that JSE listed companies are turning green programmes into profit generating business ventures. Thus, profitability has become a stimulator on why JSE listed companies integrate green investment practices.

FINDINGS ON JSE LISTED FIRMS' PERCEPTIONS IN RELATION TO PROFITABILITY AS A FACTOR THAT SPURS CORPORATE GREEN INVESTMENT PRACTICES

This section presents 10 verbatims of selected JSE listed companies under study. The verbatims are illustrated in relation to the studied variable, namely, profitability. The verbatims were extracted from the companies' 2012 sustainability reports and/or integrated annual reports using a simple random sampling method as all the 100 CDP companies integrate green practices. However, it must be emphasised that consideration of a company's verbatim in this study is based on what the company management declares about the variable as a driver or non-driver of their green initiative.

COMPANY VIEWS REGARDING PROFITABILITY AS A FACTOR, WHICH PROMOTES GREEN INVESTMENT ACTIVITIES IN JSE LISTED COMPANIES

> We recognise the substantial opportunities for our clients and our various business's activities in areas such as cleaner and renewable

TABLE 4 Drivers of Profitability as a factor Which Support Corporate Green Investment Activities in JSE Listed Firms

Summarised drivers of profitability	(1)
Zero carbon schemes generate financial gains.	3
Sustainable green business opportunities are created.	3
Carbon management investments encourage firm growth when the economic environment gives way.	1
Green investments manage climate related risks in core business operations.	1
Environmental investments make use of natural environment elements to improve green building performance which lowers energy related costs.	1
Energy management practices lessen costs.	1
Co-generation projects of energy minimise costs.	1
Efficient use of energy reduces overhead costs.	4
Green investments improve firm overall productivity.	1
Carbon emissions control investments enhance firm competitive advantages.	3
Manufacturing machinery and procedures which are environmentally friendly maximise energy savings.	1
Green investment and divestment decisions promote efficient allocation of financial and other important resources.	3
Smart metering schemes save energy and ultimately lessen costs.	2
Energy efficiency interventions maximise returns.	1
Continual employment of green technologies supports efficient production.	1
The firm considers that its share price is also deter. by green metrics available.	2
Security in energy provision is enhanced by green energy integration.	1
Sustainability operations generate environmental benefits.	1
Energy and environmental risks are assessed and controlled.	3
Prom. company marketability results from adopted green designs and green policies.	1
By-products from processing sugar cane generate green energy which promotes business prospects and lessens energy associated costs.	1
Environmental tax and connected fines for green non-compliance are regularly monitored in the business risk register.	1

Continued on the next page

> energy sources, energy efficiency and responsible lending and investing. [Investec 2012, 5]

The above verbatim indicates that that practices associated with green energy adoption, energy saving and management mechanisms plus green

TABLE 4 *Continued from the previous page*

Summarised drivers of profitability	(1)
Green investment indicates responsible lending and investing approaches which avoid crime and possible high costs associated with litigation.	1
Operational efficiency on carbon issues is undertaken to minimise oper. costs.	1
Investing in properties by focusing on energy efficiency and green star ratings to improve marketability and financial gains.	1
Have green product life cycle proced. which reuse waste that lower buying costs.	2
Products attributes and manufacturing processes are designed to reduce energy costs.	1
Recycle used products which increase profits as it is cheaper than employing virgin materials.	1
Offer green bonds and carbon financing mechanisms which develop green markets and favourable long-lasting sustained performance of the firm.	2
Environmental Key Performance Indicators (KPIS) have been designed and adopted to assists monitoring energy use which improves finance gains.	2
Environmental practices protect the firm's brand and avoid green fines and penalties.	1
Incorporated sustainability data and ratings into the electronic tools used daily by listed equity analyst portfolio managers reduce business risks.	1
Green product range increases sales and therefore, revenue.	1
Inflationary pressures cause the firm to integrate energy saving technologies thereby lowering energy costs.	1
Environmental impacts are connected with the portfolio of investment properties hence possible green risks are mitigated.	1
Climate change is viewed as systemic risk so green goals are monitored regularly.	2
Responsible control of the environmental footprint generates sound business sense and high firm competence.	1
Promoted green supply chain innovation lowers carbon related costs.	3

NOTES Column headings are as follows: (1) number of companies which supported the driver.

financing practices and decisions create business prospects that can generate financial rewards to companies. In this case, profitability influences JSE listed companies to integrate green programmes, which support outcomes in the quantitative phase.

> [...] create economic opportunities by stimulating demand for green building products and services. [Emira Property Fund 2012, 55]

The statement by Emira Property Fund implies that green initiatives in the form of green building commodities promote development of new business economic prospects. As such, there are economic first mover benefits linked with corporate greening policy.

> At each of our operations and owned plantations, legal compliance (emissions, solid waste, effluent) and other specific company targets are monitored and appropriate action is taken to improve or mitigate identified environmental risks. [Sappi 2012, 83]

The above statement indicates that compliance may avert environmental risks which may also affect corporate profitability.

> Through financing innovation we can turn climate challenges into market opportunities. [Standard Bank 2012, 82]

The company suggest that climate problems have also resulted in development of green financing developments which create market prospects that companies can take advantage of. In this regard, there are financial benefits associated with introducing financing mechanisms that support climate change mitigating initiatives at corporate level.

> One of the financial risks associated with greenhouse gas (GHG) emissions is the introduction of a carbon tax in South Africa, which could result in increased cost for electricity and transportation, as well as higher operational costs related to GHG emission monitoring, reporting and accounting [...] We have established a four year history of our carbon footprint between 2009 and December 2012. We conduct an annual assessment of our carbon emissions with aim of improving our carbon intensity and reducing our absolute emissions. We also continue to participate in the carbon disclosure project [...] [Royal Bafokeng Platinum 2012, 71]

This above verbatim simply elaborates the view that carbon emission reduction approaches improve firm performance through minimisation of green financial risks.

> Our clients can support environmental causes through the Green Affinity simply by choosing to use Nedbank Green Affinity banking, investment or insurance products. [Nedbank 2012, 62]

The statement above indicates that green innovation has resulted in a growth of green financial instruments. These green financial tools are, green bonds, green financing decisions, and green insurance products

which have been specifically designed to support practices which mitigate climate change.

> Developing cost-efficient, high-performance and environmentally sound solutions is a cornerstone of our business strategy. [Mondi Group 2012, 4]

This statement reveals that JSE listed firms have incorporated environmental practices in their company policy. As such, environmentally compatible activities empower the company to experience costs reductions and gain competitive advantages through superior performance. The view establishes a connection between profitability and green investment practices.

> Eco-wise branded product sales increased by an estimated 30% for the reporting period. In addition Builders Warehouse together with Ellies sold 225,000 LEDS and 22,000 water efficient showerheads through their 'Green Stand Partnership.' [Massmart 2012, 16]

The development of green products results in heightening sales which inevitably generates high profits for the company. Furthermore, green growth creates new markets to support the introduction of new green development mechanism products.

> During the year Hyprop's Green Design and Environmental Sustainability Strategy was introduced and implementation began. The strategy outlines the opportunities, expected ease of implementation of each objective and resultant benefits. Opportunities include: Lower operating costs: related to energy, water and waste consumption [. . .] [Hyprop Investments Ltd 2012, 52]

The above verbatim illustrates that the firm's greening activities lead to minimised operating expenses through practices such as, energy efficiency, water efficiency and waste management (reuse, reduce, recycle). Therefore, the statement supports the quantitative outcome that profitability determines corporate green investment practices.

> [. . .] energy already makes up just over 21% of our cost base amid a global trend of rising energy prices and shortages of supply. Under this strategy, we are targeting a 10% energy saving over the baseline by 2016 – subject to capital expenditure restrictions. To support our achievement of this target, all new mine developments must now meet a minimum requirement of at least 20% renewable energy use. [Gold Fields 2012, 86]

The statement indicates that green energy integration assists the company to support energy saving targets thereby creating opportunities that lower energy costs. Thus, green energy adoption leads to reduced energy expenses.

Overall Discussion

This section endeavours to substantiate corporate green investment benefits for both companies and the research community. Accordingly, the quantitative results phase of the research demonstrates that profitability influence green investment practices in JSE listed firms (see table 2 and its evaluation). Phi and Cramer's V test further satisfy this assertion by generating a positive direct relationship between profitability and green investment practices in JSE listed firms (see table 3). In this integration stage, the quantitative findings on profitability concur with results in the qualitative stage. For example, the study produced numerous drivers of profitability as a factor which supports green investment activities in JSE listed firms (see table 4). These motivators of corporate profitability strengthen the outcomes in the quantitative phase. In addition, the fifth section on company view regarding profitability as a factor which promotes green investment activities in JSE listed firms also support the drivers of profitability (see table 4) and the quantitative findings. Therefore, the results are important to encourage companies to identify competitive benefits through integrating green investment activities. Thus, there are some corporate green investment practices which have the potential to generate spin-off advantages to other components of the business operations. For example, energy efficiency, waste management and cleaner production are possible firm green activities which are beneficial in addition to producing reduced cost implications. In this regard, the findings of the association involving corporate green investment practices and profitability are important given the absence of adequate literature in the field. Hence, further study is required by implementing the same research using companies of another country (since the results of this study reflect the specifics of South Africa), in addition to undertaking multi-study explorations in which firms from various countries can be analysed and then later compared at the same time is important.

Conclusion

In light of global corporate reluctance and lack of interest regarding stimulation for green investment efforts, this study undertook a multiple case

study of 100 South African CDP companies on the Johannesburg Stock Exchange (JSE) to investigate the association between profitability and green investment practices. Thus the paper is necessary to outline a practical mechanism which adds towards subduing the traditional perception which explains that green investment activities generate financial losses to the company. Therefore, using Chi-square tests the findings indicated that profitability influences green investment practices in JSE listed firms. Moreover, a positive direct correlation between profitability and green investment practices in JSE listed firms was discovered (0.180). The study also managed to outline the drivers of profitability as a factor which spurs corporate green investment practices. Corporate perceptions from selected JSE listed firms regarding profitability also appear to support the green investment initiative. As such, an analysis of the results show that companies that adopts green policies and programmes do not necessarily experience reduced firm performance. Thus, integrating green investment initiatives generates dual benefits – reducing greenhouse gas emissions and improving corporate performance.

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