

**Gordon Institute
of Business Science**
University of Pretoria

**Sustainable capital budgeting by SCOPE-1 greenhouse gas contributors in
South Africa**

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Abstract

The main purpose of this study was to establish whether South African Scope-1 greenhouse gas companies practise sustainable capital budgeting. Furthermore, this research aimed to establish whether, and how, companies adapt capital budgeting tools to embed sustainability impacts when evaluating capital budgets.

This study is a cross-sectional descriptive quantitative research about practices of sustainable capital budgeting and the adaptation of capital budgeting tools to incorporate sustainability impacts. Data were collected through an online survey via a Likert-type scale structured questionnaire. Quantitative data were analysed using summary tables, central tendencies, bar graphs, radars, Fisher's Exact Test, and Spearman's rank correlation coefficient (ρ), while qualitative data were analysed using patterns and categories.

The study concluded that Scope-1 companies practice sustainable capital budgeting because they prioritise sustainability and have motives related to competitive advantage as part of their approach to sustainability. Companies also deal with constraints related to sustainable capital budgeting tools, including discounted cash flows' deficiencies and the difficulty in measuring sustainability impacts. A holistic model to incorporate sustainability impacts is still imperative and a 'PPP' model has been suggested.

This study contributes to the literature and to business by bridging the gap between sustainability and accounting bodies of knowledge, which are normally regarded as distinct.

Keywords

Sustainability impacts

Sustainable capital budgeting

Capital projects

Capital investments

Capital budgeting

Agent level

Micro level

Meso level

Macro level

November 9, 2015

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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Date: 9 November 2015

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Abbreviations and acronyms

| | |
|-----------------|---|
| AICPA | American Institute of Certified Public Accountants |
| CFO | Chief Financial Officer |
| CICA | Canadian Institute of Chartered Accountants |
| CIMA | Chartered Institute of Management Accountants |
| CSR | Corporate Social Responsibility |
| DCF | Discounted Cash Flows |
| DNT | Department of National Treasury |
| GHG | Greenhouse Gas |
| GRI | Global Reporting Initiative |
| IRR | Internal Rate of Return |
| JSE | Johannesburg Stock Exchange |
| KPI | Key Performance Indicator |
| NPV | Net Present Value |
| OH&S | Occupational Health and Safety |
| PPP | Profit-People-Planet |
| RAG | Red, Amber, Green |
| RQ | Research Question |
| SAICA | South African Institute of Chartered Accountants |
| SAIPA | South African Institute of Professional Accountants |
| SCB | Sustainable Capital Budgeting |
| SOE | State Owned Entity or State Owned Company |
| UN | United Nations |

Definitions of key terms

| | |
|--------------------------------------|--|
| Agent-level | A unit of a particular company where operational decisions are taken. |
| Capital budgeting | The evaluation process used to determine whether capital projects are viable or not to yield the hurdle rate for investors. |
| Capital investment | A major layout of funds made by the company to purchase fixed assets such as property, a factory, or equipment. |
| Capital project | Synonymous with capital investment. |
| Commitment | The act of prioritising sustainability through the development of formal strategy and business cases to sustainability approaches. |
| Constraints | Set-backs or challenges that either hinder incorporation of sustainability impacts for capital budgeting. |
| Corporate | The word used synonymously with a company incorporated for profit-making purposes. |
| Leadership | The Board of Directors and/or CEO of the company |
| Macro-level | Broader political, economic, social, technological, environmental and legal environment. |
| Meso-level | The industry within which a particular company operates and competes. |
| Micro-level | Refers to company-wide level rather than units making up a particular company. |
| Motives | The objective or cause for which companies commit to sustainability. |
| Scope-1 | Direct GHG emissions from sources that are owned or controlled by the entity, such as emissions from fuel combustion and industrial processes. |
| Sustainability | An application of a strategy which systematically integrates the economic, environmental and social impact of a business into the management of that business. |
| Sustainable capital budgeting | The capital budgeting that incorporates all relevant sustainability impacts (i.e. economic impacts, social impacts and environmental impacts). |
| Tools | Techniques, models and frameworks such as DCF, payback period and IRR that are used to evaluate capital projects. |

1. Introduction to Research Problem

1.1 Introduction

This section will begin by crafting the motivation for conducting this study followed by a concise research problem definition. This Chapter will provide the purpose of the study and the contribution to both the literature and the business. The words capital investments and capital projects are used synonymously and interchangeably in this study (Schneider, 2008).

1.2 Research motivation

Elkington (1998) introduced the triple bottom line concept, which aims to balance an organisation's short term financial benefits with its long term sustainability. According to Elkington, sustainability integrates the economic, social and environmental impacts. Today this concept has been embraced by the Global Reporting Initiative (Brown, de Jong, & Lessidrenska, 2007) and incorporated into the King III code of corporate governance in South Africa (IRAS, 2012; King III, 2009). This is an "outside-in approach" that focuses on defusing the pressure from stakeholders such as employees, customers, regulators, and advocates for green practices. Sustainability accounting in the context of an "inside-out approach" incorporates managerial techniques used for resolving environmental and social impacts proactively (Burritt & Schaltegger, 2010).

Most studies conducted have focussed on accounting for sustainability by companies at company-wide level (Aras & Crowther, 2009a; Burritt & Schaltegger, 2010). Apart from these, Meyer and Kiyamaz (2015) argued that sustainability studies have focussed on developing models or techniques designed to incorporate the sustainability impacts of non-profit organisations, neglecting the profit-oriented ones. Various studies have also focussed on the types of capital investment techniques that are generally employed in decision making (Correia & Cramer, 2008; Vesty, Oliver & Brooks, 2013). Such studies have barely, if at all, addressed the impact of qualitative factors in capital investment decisions (Meyer & Kiyamaz, 2015). Meyer and Kiyamaz further argued that few studies dealt with non-financial information but did not specifically address the sustainability impacts.

Very little work has been conducted on understanding how corporates embed sustainability into capital budgeting decisions. Recently, Meyer and Kiyamaz (2015) established a disconnection between sustainability cognition and action in capital budgeting decision making, particularly in Africa. Meyer and Kiyamaz also concluded that most financial executives in the US do not consider sustainability to be an essential factor when evaluating capital projects, regardless of the existence of a formal sustainability programme. Contrary to Meyer and Kiyamaz (2015), Australian companies, due to stakeholder pressure, are

cognitive and do incorporate qualitative sustainability factors such as Occupational Health & Safety (OH&S), employee well-being, energy and water consumption, environmental penalties, and rehabilitation costs (Vesty, 2011; Vesty et al. 2013). Vesty et al. (2013) argued that constraints are still encountered, particularly relating to the measurement of sustainability impacts, data availability, collection costs and cost of external expertise. It is still not clear which technique is holistic enough and what techniques' specific constraints companies face when incorporating sustainability impacts in capital budgeting.

There have been mixed results concerning the incorporation of sustainability impacts into capital budgeting decisions. Meyer and Kiyamaz (2015) concluded that US companies do not factor sustainability into capital budgeting, while EY (2013), Kiron et al. (2013), and Vesty et al. (2013) concluded that sustainability impacts are incorporated into capital budgeting decisions in USA and Australia. One consistent conclusion is that the financial impact of capital projects is still considered an overriding criterion when evaluating capital projects (Kiron et al., 2013; Meyer & Kiyamaz, 2015; Vesty et al., 2013). There is a need to examine how managerial accounting etiquette is adapted to consider sustainability issues expected by various stakeholders (Arroyo, 2012). The motivation for this study was to conduct a contextual study in South Africa and to discern the dynamics companies face when implementing sustainable capital budgeting.

1.3 Research problem

The broad research objective asks whether, and if so how, corporates are adapting their capital budgeting tools and techniques to embed sustainability impacts when making capital budgeting decisions in South Africa. (Refer to Appendix 1 for a list of sustainability impacts.)

1.4 Research purpose and benefits

There is a gap between sustainability and accounting, and in particular capital budgeting, which creates a vacuum in integrating the two bodies of knowledge (Çalışkan, 2014). This study will augment the recent literature by Brooks (2013), EY (2013), Kiron et al. (2013), Meyer and Kiyamaz (2015) and Vesty et al. (2013) from a South African perspective, and will take a step further by establishing a deeper understanding of the adaptation of traditional capital budgeting techniques; the characteristics of the desired technique that have guided in designing and suggesting a new model - the "Profits, People, Planet" scorecard; and the role that the accounting profession could play.

It has been argued that traditional accounting techniques fail to incorporate non-financial information (Burrill & Schaltegger, 2010; Sookram & Kistow, 2012). The business in general will ostensibly face challenges embedding sustainability impacts into capital investment

decision making in the absence of theoretical and best practice guidelines, however the need arises as the Government of South Africa will be implementing a carbon tax policy to reduce greenhouse gas emissions (GHG) from 2016 (DNT, 2014). The study will contribute to the business in general in identifying the constraints they face as well as best practices in incorporating sustainability impacts into capital budgeting processes.

1.5 Research scope

This study dealt with sustainability impacts that are specific to, relevant to, and measured at, the capital projects level. The study excludes formal sustainability programmes that are company-wide overheads at “micro-level”, industry initiatives at “meso-level”, or political and national measures at “macro-level”. The study took place within the confinement of organic growth excluding mergers and acquisitions, and only focused on Scope-1 GHG sectors in South Africa. (Refer to Appendix 3 for a list of sectors under Scope-1).

2. Literature Review

2.1 Introduction

The literature review begins by identifying the major social and environmental issues that are creating a sense of urgency in terms of finding solutions, and attributes the responsibility to the relevant parties who need to address the issues at the appropriate level. The review further aims to gain an understanding of how companies address their sustainability issues in practice. Finally, the research questions are developed.

2.2 Sustainability impacts

2.2.1 Definition of sustainability impacts

2.2.1.1 *Conventional definition of sustainability impacts*

Bowen (1953) introduced the concept of CSR in his book entitled “Social Responsibilities of the Businessman” (Pirnea, Olaru, & Moisa, 2011). According to Pirnea et al. (2011, p. 36), “different terms have been used that refer to the same phenomenon viz. Corporate Responsibility (CR), Corporate Accountability (CA), Corporate Ethics (CE), Corporate Citizenship (CC), Corporate Sustainability (CS), Responsible Business (RB) and so on”. Votaw (1972, p. 25) once argued that “CSR means something, but not always the same thing to everybody”, which was supported by Dobson (1996).

In an attempt to comprehend the diverse meaning of CSR, the following table illustrates the evolution of CSR from CSR 1.0 to CSR 2.0 (Visser, 2015; Pirnea, Olaru, & Moisa, 2011).

Table 2-1: Evolution of CSR

| CSR 1.0 | | | | CSR 2.0 |
|------------------|-------------------------|----------------------|-----------------------|---------------------------|
| Responsibility | Social responsibility | | | Sustainability |
| The age of Greed | The age of Philanthropy | The age of Marketing | The age of Management | The age of Responsibility |
| 1970s | Early 1980s | Late 1990s | Early 2000s | Late 2000s |
| Defensive | Charitable | Promotional | Strategic | Systemic |

Although various definitions have been proposed, traditional social responsibility focussed on social matters whilst traditional sustainability focussed on environmental impacts. For example, one of the definitions of CSR by the World Business Council for Sustainable Development states that it “is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the work force and their families as well as a local community and society at large” (WBCSD, 2015, para. 4). The World Commission on Environment and Development (1987, p. 41), meanwhile, defined sustainability as “development that meets the needs of the present without

compromising the ability of future generations to meet their own needs”.

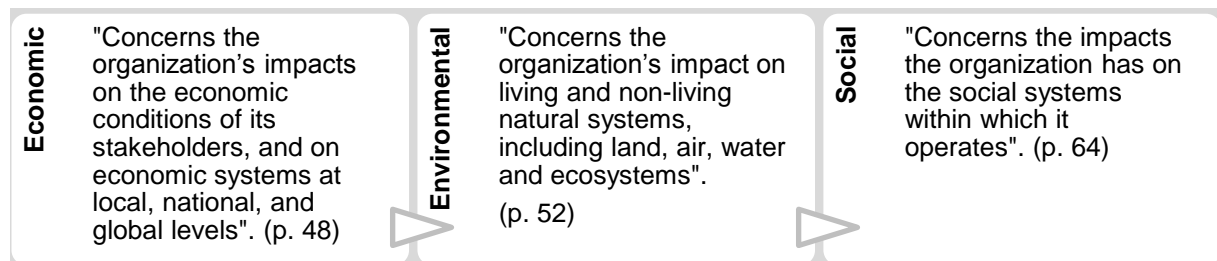
None of the traditional CSR definitions dealt with sustainable development that considers the environmental aspect (Pirnea et al., 2011), however sustainability has since been integrated to include both social and environmental impacts to echo Elkington’s (1998) triple bottom line.

2.2.1.2 Contemporary definition of sustainability impacts

Pirnea et al. (2011, p. 39) defined CSR in the context of Corporate Sustainability and Responsibility (CSR 2.0), by saying that “Corporate Social Responsibility is the application of a strategy which systematically integrates the economic, environmental and social impact of a business into management of that business”. Similarly, “Sustainable Development recognises that growth must be both inclusive and environmentally sound to reduce poverty and build shared prosperity for today’s population and to continue to meet the needs of future generations” (World Bank, 2015, para. 3).

The A4S Chief Financial Officer Leadership Network established in 2004 by HRH The Prince of Wales, defined sustainability as a “means of balancing social, environmental and economic issues – People, Planet and Profit” (A4S CFO Leadership Network, 2015). In a similar vein, GRI defined sustainability as three dimensional as outlined below (GRI, 2013).

Figure 2-1: GRI sustainability dimensions



This study will hereinafter refer to and focus on sustainability impacts from a contemporary and integrative definition perspective. (Refer to Appendix 1 for a list of sustainability impacts.).

2.2.2 Social and environmental impacts facing society

Companies perceive the most important aspects of sustainability to be on energy and water usage, pollution, waste management, OH&S and employee well-being (AICPA, CICA, and CIMA, 2010; Kiron et al., 2013; Sisaye and Birnberg, 2010). There are social issues relating to consumers including deceptive advertising (Reddy & Rampersad, 2012) and customers’ health and safety (GRI, 2013). DNT (2013, p. 47) stated that “the key GHGs emitted in South Africa are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and perfluorocarbons

(PFCs)". The DNT also mentioned that in total GHG emitted in 2000 and 2009 "amounted to 461 and 547 million tons respectively". The energy sector, which is under Scope-1 and involved in the generation of electricity, petroleum refineries and transport, "accounted for more than 80 per cent of total GHG emissions in 2000" (DNT, 2013, p. 13).

2.2.3 Who causes the social and environmental impacts?

The majority of the diverse impacts outlined above are due to business practices (Crane & Matten, 2010). Pollution is caused by "the production, transportation, and use of certain products such as cars, excessive product packaging and the dominance of a throw-away culture" (Crane & Matten, 2010, p. 31). Recently SASOL was sued by its current and former workers for lung diseases contracted whilst working for the company (Business Day, 2015).

Galbraith (1967) expressed that the unmitigated commitment to economic growth culminated in growing concern regarding the role of the corporation in the damage done to the natural environment. Cabezas, Pawlowski, Mayer, and Hoagland (2003), and Setthasakko (2009) argued that all economic activities require environmental and natural resources as inputs, which results in pollution. Industrialisation aiming at providing for human needs culminates in devastating results such as climate change, effluence, exhaustion of natural resources, and health and life hazards to humankind (Cabezas et al., 2009).

From a global warming perspective, the DNT (2013, p. 47) stated that the "sources of GHG emissions are diverse" and include the following ranked emitters:

"Scope-1: Direct GHG emissions from sources that are owned or controlled by the entity (such as emissions from fuel combustion and industrial processes);" which was the focal point of this study. (Refer to Appendix 3 for a list of sectors).

"Scope-2: Indirect GHG emissions resulting from the generation of electricity, heating and cooling, or steam generated off-site but purchased by the entity".

"Scope-3: Indirect GHG emissions (not included in Scope-2) from sources not owned or directly controlled by the entity but related to the entity's activities (such as emissions that occur in the value chain of the reporting company)".

2.2.4 Why must we address the social and environmental impacts?

The earth could be seen using a "spaceship" analogy, i.e. it is a closed system where nothing comes in or goes out (Boulding, 1966; Fuller, 1969; Ward, 1966). In other words we have limited resources but we cannot borrow resources elsewhere, implying that we must use our resources in a replenishable manner such that the spaceship does not exhaust its stock. The aftermaths of climate change include, amongst others, changes in "rainfall patterns and agriculture that will affect food security" (Kiron et al., 2013, p. 5). Crane and

Matten (2010) argued that the economic growth motives and dire consequences of the current business practices require a “paradigm shift”. Davis (1973), meanwhile, argued that business should not delay any further lest executives end up preoccupied “with putting out social fires” at the expense of business' primary goals (p. 317). According to Visser (2013, p. 22) we “need to act very quickly”. Sisaye and Birnberg (2010) argued that accountants may be instrumental in dealing with sustainability through sustainability reporting - an “outside-in” approach, and management accounting through an “inside-out” approach. There have been progressive actions on the former approach.

2.3 Attribution of social and environmental responsibility

A question needing more clarity is which parties are responsible for addressing these issues? Pesqueux (2012, p. 19) stated that “the Latin origin, *respondere*, shows that the entity involved is able to respond or answer for its acts, notably those causing damage to others, be it an individual as a third party, a community or even the environment”. Furthermore, he argued that in managing the concept of responsibility, responsibility appears to be a second-level question in philosophy, while examples of first-level questions include action, liberty, causality and autonomy. “Responsibility in terms of imputation” with no consideration to morality “consists of attributing action to someone”, argued Pesqueux (2012, p. 20), who went on to define responsibility as per the four profiles listed in the table below (p.26).

Table 2-2: Components of responsibility

| Definition of responsibility | | |
|--|----------------------------------|----------|
| (1) “One is responsible because of....” | Ascription (Causality) | Autonomy |
| (2) “One is responsible because he/she is prepared to account for his/her acts” | Subscription (Accountability) | |
| (3) “One is responsible according to a mandate” | Prescription (Mandate) | |
| (4) “One is responsible because of exercising his/her will in order to achieve or do something else” | Inscription (Will or Values) | Freedom |

2.3.1 Ascription: Cause and effect theory

In terms of ascription component of the definition of responsibility by Pesqueux (2012), he who causes the damage should be responsible for rectifying or preventing the impact. Pirnea et al. (2011) also argued that at times CSR conveys the responsibility in a causal mode.

It is hereby argued that this view of ascription as an attribution premise depends on unit of analysis. Dopfer, Foster, and Potts (2004, p. 265) conceptualised the “analytical framework

for evolutionary In terms of the ascription component of the definition of responsibility by Pesqueux (2012), he who causes the damage should be responsible for rectifying or preventing the impact. Pirnea et al. (2011), meanwhile, argued that at times CSR conveys the responsibility in a causal mode.

It is hereby argued that this view of ascription as an attribution premise depends on the unit of analysis. Dopfer, Foster and Potts (2004, p. 265) conceptualised the “analytical framework for evolutionary economics with micro-meso-macro architecture”, while they described “Micro–Meso–Macro” as a “clear way of seeing the economic system in its natural state for evolutionary economic analysis” (Dopfer et al., 2004). Freyens (2008) further expanded this framework to variables of service delivery as macro – economy wide; meso – industry-wide; and micro – corporate-wide.

Based on the ascription attribution it is conceptualised that sustainability issues should be addressed by parties in the following order as outlined in Table 2-3:

Table 2-3: Attribution of responsibility to cause

| Problem origin | Responsible party |
|-----------------------|--------------------------------|
| Agent level | Capital project |
| Micro level | Corporate |
| Meso level | Industry |
| Macro level | State – Government – Political |

Ascription is evidenced by current business practices. Kiron et al. (2013, p. 6) concluded that “most companies focus on demonstrable, measurable sustainability challenges such as energy efficiency, waste management or employee health and safety”, however, broader issues at macro-level, such as human rights, are perceived as being distant on the horizon.

2.3.2 Prescription: Political theories and ideologies

Corporate responsibility cannot be divorced from political ideologies (Walters, 1977). Applying a prescription of Pesqueux’s (2012) definition of responsibility within the political context results in attributing social and environmental responsibility based on the mandate and the political ideology one subscribes to. This study attempts to assess the CSR mandate between the state and corporates based on Marxism, Conservatism and Liberalism theories.

Conservatism: Milton Friedman (1912-2006)

Regarding the conservatism dynamic, the Nobel Prize laureate, Milton Friedman, argued that a corporate manager’s mandate is to maximise shareholders’ profits and not act a taxman by imposing an imputed tax to address social ills (Friedman, 1970), yet Walters

(1977) argued that business is more efficient than government in solving social welfare problems. From conservatism perspective, social ills should be addressed if demonstrated by a business case in the form of profit making; a competitive advantage such as the Creating Shared Value (CSV) concept developed by Porter and Kramer (2011); or marketing (Garriga & Melé, 2004). Indeed, previous studies concluded that there is correlation between CSR and profitability satisfied an argument in favour of CSR (Garriga and Melé, 2004).

Marxism: Karl Marx (1818-1883)

One of Marx's reasons for dismissing the free enterprise system is that business is driven by greed and unscrupulous behaviour with far reaching consequences (Shaw, 2009). Shaw further mentioned that another reason was about the irrelevance of business ethics, i.e. focusing on the morality of a firm's practice shifts attention away from the dangers of capitalism. The government is the only capable institution to address the social needs in terms of this theory; however Crane and Matten (2010) and Friedman (1970) argued that governments fail due to inefficiencies. Governments' failure to address the social challenges has little to do with business, save if the government is prepared to entirely transfer responsibility to business, in which case taxes should be cut significantly reducing the government to a mere regulator or a referee. Yet, corporates cannot play the role of players and referees concurrently.

Liberalism: Adam Smith (1723-1790)

Proponents of liberalism are of the view that CSR is anti-democratic; it is not the managers' mandate to address the broader social priorities (Walters, 1977). Walters, alongside Karnani (2010), concluded that greater government regulation and intervention through business/government cooperation and political responsibility is required, and it is ineffective to maintain a harmonised balance between profits and the social cause (Karnani, 2010).

Liberalism's view about government's intervention in social responsibility is consistent with the current South African setup of a hybrid economic system. Material sustainability concerns, according to Kiron et al. (2013), are the ones that are most relevant to a company's survival. Arguing this in conjunction with the ascription attribution concept requires broader systemic social issues, such as inequality, crime and poverty, to be addressed by the government or state, whilst the social issues relating to the conduct of the business such as OH&S are to be addressed by the corporates either at the micro-level or at the agent-level. After all, corporates pay taxes partly for that reason unless the government or state is prepared to only play a referee's role, through laws, regulations and policies, as intervention in correcting the social and environmental issues.

2.3.3 Subscription: Stakeholder theory, legitimacy and leadership

The changing business environment requires companies to engage in CSR to maintain their legitimacy and remain relevant to both their stakeholders (Pirnea, Olaru, & Moisa, 2011) and the environment within which they operate, which necessitates responsible leadership (Brønn & Vidaver-Cohen, 2009). Freeman (1984) argued that executives have a fiduciary duty to all stakeholders rather than ‘*per se*’ to shareholders. Stakeholders, according to Maak and Pless (2006), are those who have a stake in a leader’s projects and are affected by the leader’s decisions, including employees, customers, and the social and natural environment.

Reddy and Rampersad (2012) argued that business has a broader social role to play in terms of the Companies Act 71 of 2008 and the BBBEE Act 46 of 2013 to protect not only the interests of shareholders, but also those of the consumer and the broader community. Ketola (2010, p. 173) stated that “responsible leadership achieves best results when high levels of individual, organizational and societal leadership coincide”. Of paramount importance in responsible leadership is that leaders are custodians of resources as well as social, moral and environmental values (Maak & Pless, 2006).

2.3.4 Inscription: Ethical theories, legitimacy and leadership

CSR has to be underpinned by various underlying moral drivers such as duty, accountability, and stewardship to maintain a business’ legitimacy (Brønn & Vidaver-Cohen, 2009), and sometimes it is an ethical matter, charitable cause or social consciousness (Pirnea et al., 2011, p. 36). Ethics are required where the “decision is likely to have significant effects on others, is likely to be characterised by choice and is perceived as ethically relevant by one or more parties” (Crane & Matten, 2010, pp. 141-142). According to the inscription concept, corporates have the choice to implement CSR, triggering Crane and Matten’s ethical cause.

Crane and Matten (2010) argued that two normative theories guide moral judgements and ethical decision making. On one side of the coin lies the consequentialist theory which bases morality on the outcomes of a certain action (Crane & Matten, 2010) and is consistent with Marxism political ideology. This theory is analogous to the maxim “the end justifies the means” and it is also about “doing the right things”. Desirable outcomes under this theory have their actions deemed as morally correct. On the flip side of the coin lies the non-consequentialist theory, which bases the morality on the underlying principle and not on the desirability of outcomes, and is consistent with rights and duty (Crane & Matten, 2010) and with liberalism. This theory is analogous to the “golden rule”, “doing things right” and ethical decision making, such as Kant’s categorical imperative (Crane & Matten, 2010). Akin to the non-consequentialist theory is the maxim “prevention is better than cure” (Davis, 1973).

The failed former approach focussed on the profitability outcomes of business decisions and activities, as evidenced by financial-oriented capital project evaluation tools such as NPV, IRR and payback period. The rights and duty approach recognises fiduciary duty, imposing ethical behaviour on corporate executives to take into account the needs of stakeholders in decision making (Pirnea et al., 2011). This requires Crane and Matten's (2010) paradigm shift from the consequentialist approach towards the rights and duty approach, and indeed there has been a shift towards rights and duty away from the consequentialist CSR approach. Cassel (2001) stated that human rights are a basis for CSR in the global arena. Recently, some human rights based CSR approaches, such as the UN Global Compact, have been proposed (Garriga & Melé, 2004).

2.3.5 Summary on attribution of responsibility

Based on the literature review, it is conceptualised that the ascription attribution requires corporates to deal with sustainability impacts at the micro level at the most. Sustainability issues caused by, and relevant to, a particular project should be embedded into capital budgeting decisions. Based on the prescription and political theories, the liberalism perspective of public-private partnership is more appropriate and consistent with the ascription attribution.

From the subscription attribution and the stakeholder theory's perspective, responsible leadership that is conscious of social and environmental impacts is imperative. Lastly, based on the inscription attribution and ethical theories, it was conceptualised that corporates' CSR is shifting towards rights and duties, including the workers' safety. The discourse is not about "if" the companies should, but about the implementation of CSR at the appropriate level.

2.4 Corporate sustainability in action: Corporate decisions

2.4.1 Sustainable capital budgeting practices

2.4.1.1 *The need to embed sustainability impacts in capital budgeting decisions*

Sustainable success requires businesses to implement strategies and to hard-wire managerial support accordingly (AICPA, CICA, & CIMA, 2010; Kiron et al., 2013). There is a need to drift away from an "out-side-in approach" that focusses on satisfying stakeholders through external reporting initiatives such as GRI's sustainability reporting, to more of an "inside-out approach" (Burritt & Schaltegger, 2010). Furthermore, Burritt and Schaltegger argued that corporate managers require reliable and relevant information to support their sustainability decisions. Thus sustainability accounting in the context of an "inside-out" approach is "a set of pragmatic tools" that will aid management in taking sustainability decisions (Burritt & Schaltegger, 2010, p. 833). One of the recommendations is that

sustainability performance should be valued during capital budgeting decisions (Perera, Del Pino, & Oliveira, 2013).

Davis (1973) argued that “prevention is better than cure”, while Neuberger (1996) opined that a preventive approach is restricted by an independent concept of responsibility. Whilst it can be agreed that condoning responsibility limits the preventative actions of CSR, it is equally argued that it is almost impossible to absolve corporates of responsibility as not all actions allow for preventative measures. A typical case is mining companies who continue to drill the earth’s crust in a quest to extract minerals; such actions cannot be mitigated through preventative measures as this would imply doing nothing at all. “Management decision making through problem solving contributes to the development of sustainability accounting; however, the development of sustainability accounting should focus more towards improving management decision making” (Burritt & Schaltegger, 2010, p. 829).

The information produced by the accountants serves as the basis for economic decision making (Çalışkan, 2014, p. 259), and accountants have the right skill set to analyse capital investment options to provide information to ensure organisations create strategies to mitigate the social and environmental risks (AICPA, CICA, & CIMA, 2010). There is growing pressure to better integrate sustainability into the decision making system (Çalışkan, 2014), and accountants are appropriately positioned to oversee the integration of sustainable business practices into the DNA of their organisations (AICPA, CICA, & CIMA, 2010).

The economic effects of sustainability decisions are already traceable through traditional accounting practices (Burritt & Schaltegger, 2010). Burritt and Schaltegger and Haugh and Talwar (2010) have advocated for sustainability to be embedded into management accounting and control. It has been argued that the accounting profession may contribute through managerial accounting that informs decision making as well as sustainability reporting (Sisaye & Birnberg, 2010). Arroyo (2012) also proposed a paradigm shift for the execution of sustainability tactics and novel managerial accounting processes, to consider both environmental and social issues. It is arguable that a company could be seen as a portfolio of capital projects, and as there is a need to embed sustainability impacts in capital projects, this concept is hereinafter referred to as sustainable capital budgeting (SCB).

2.4.1.2 Sustainability and capital budgeting relationship gap

Although several studies explored how companies should measure and incorporate sustainability in their strategies, little has been done to understand the relationship between sustainability and capital budgeting as well as potential solutions to overcome the existing constraints (Çalışkan, 2014; Meyer & Kiyamaz, 2015). It is important to conduct a literature review, firstly on tools and techniques that are available for sustainable capital budgeting,

and secondly on how companies incorporate sustainability impacts when appraising capital projects, either by adoption and/or adaptation of these tools or by developing new tools.

2.4.1.3 Sustainable capital budgeting tools and techniques

“Management accountants in business are not only confronted with a choice of appraisal techniques, but also must decide on the extent and type of data to be included to optimise decision making” (Vesty et al., 2013, p. 5). The survey on analysis of cost of capital, capital structure and capital budgeting practices conducted in South Africa is consistent with financial theory and other studies conducted that the most employed techniques to evaluate capital projects are DCF methods such as NPV and IRR (Correia & Cramer, 2008).

Although useful for evaluating economic viability, conventional models such as DCF techniques focus on monetary measures and are deficient in assessing the social and environmental impacts of capital budgets (Burritt & Schaltegger, 2010; Sookram & Kistow, 2012). Thus “conventional accounting continues to neglect corporate sustainability issues and leads to distorted information” as a basis for managerial decision making (Burritt & Schaltegger, 2010, p. 843). Sustainability has a non-financial aspect that requires measurement and observation (Çalışkan, 2014), thus it is hereby argued that the existence of a business case and measurable sustainability impacts facilitate the incorporation of sustainable impacts into the traditional capital budgeting tools. However, there is polarity between the two schools of thought about cash flows’ capability to capture all relevant data, including sustainability impacts. It has also been suggested that further research to explore these two opposing views is worthwhile (Vesty et al., 2013), hence this research studied the adequacy of DCF as a tool to incorporate sustainability impacts for capital projects’ appraisal.

There have been numerous suggestions of various frameworks that could incorporate sustainability impacts, both qualitative and quantitative, in accounting and decision making. These tools, according to Vesty et al. (2013) and Meyer and Kiyamaz (2015), include the portfolio-based model; a conjoint analysis – a multi-attribute; a Sustainability Impact Assessment (“SIA”); a cost-benefit analysis; a quantitative decision model; a framework for Managing a Portfolio of Socially Responsible Investments; comprehensive frameworks and methodologies; a life cycle costing analysis (LCCA); and environmental management accounting.

Much of the literature focuses on the quantification of environmental impacts to be incorporated into operational management accounting systems (Christ & Burritt, 2013) and accounting for sustainability by companies at the micro-level (Aras & Crowther, 2009a; Burritt & Schaltegger, 2010), but most of them, if not all, are frameworks rather than tools

that can inform the acceptance or rejection of capital projects. Only recently did the A4S Chief Financial Officer Leadership Network publish guidelines on how to embed sustainability impacts in capital budgeting decisions (A4S CFO Leadership Network, 2015), thus it is not expected that the majority of corporates would have implemented the A4S guidelines in South Africa.

It is not clear to what extent most of these suggested techniques are practically employed for the purpose of sustainable capital budgeting. The cost-benefit analysis has been employed for OH&S and regulatory decisions (Vesty et al., 2013). Does a cost-benefit analysis capture the information adequately for capital project decisions? Is the A4S practical guide adequate? What are the characteristics of a holistic tool that captures the economic, social and environmental impacts into capital budgeting? This research focussed on answering these questions. Furthermore, part of this study aimed at developing a tool called the “Triple-P Scorecard”, or Profits-People-Planet (PPP) Scorecard, which integrates both the A4S’ guidelines and the Global Reporting Initiative framework.

Some frameworks include measuring intangible effects that occur beyond the micro-level and are far detached from capital budgeting. Such effects are difficult to measure (Kiron et al., 2013; Vesty et al., 2013), yet regardless of all these frameworks companies still believe there are a lack of models to incorporate sustainability into their core business (Kiron et al., 2013). Vesty et al. (2013) established that there is some level of indecisiveness about whether sustainability data should be measured for inclusion in capital budgeting or is best kept at the micro-level. This study has argued that the only relevant sustainability impacts for deciding whether to accept or reject capital projects are those that originate at agent-level. It is not clear from the studies performed (EY, 2013; Kiron et al., 2013; Meyer and Kiyamaz, 2015; Vesty et al., 2013) how companies practicing sustainable capital budgeting embed sustainability impacts and which tools or frameworks they employ. There is thus a need to examine how conventional management accounting models are adapted in response to sustainability concerns (Arroyo, 2012).

There are constraints in incorporating sustainability impacts in capital budgeting (Vesty et al., 2013); the decision on which appraisal method to use depends upon the type of the decision, i.e. whether it is more strategic or operational, and if it is related to OH&S or to some other regulation (Vesty et al., 2013). AICPA, CICA and CIMA (2010) argued that although finance function’s contribution in terms of business case and investment analysis of sustainability programmes is highly valued, it is underdeveloped. Çalışkan (2014) suggested that research is needed to discern both the sustainability contribution and the constraints that the accounting profession face through a comparative and empirical analysis of businesses or the sectors in which they operate. Kiron et al. (2013) studied such constraints

at the micro-level, while Vesty et al. (2013, p. 24) argued that sustainable capital budgeting constraints include those relating to “people, skills and system boundary concerns”. Further research is required to study the detail of these constraints and the contributions that the accounting profession could make (Vesty et al., 2013).

2.4.1.4 How corporates embed sustainability impacts into capital projects

Australian companies are willing to address environmental and social issues, although they still face constraints in terms of embedding sustainability issues into capital projects evaluation (Vesty et al., 2013). Australian companies practice sustainable capital budgeting by incorporating OH&S, employee well-being, energy and water consumption, environmental penalties and rehabilitation costs; however the driver for this is company policies requiring such incorporation as well as stakeholder pressure (Vesty et al., 2013)

Kiron et al. (2013) discovered that many companies claim commitment, yet only 40% of them implement sustainability strategies. EY (2013) concluded that 50% of companies in the USA practice sustainable capital budgeting whilst AICPA, CICA and CIMA (2010) discovered that most large companies incorporate sustainability in capital and investment decisions.

Recently, Meyer and Kiyamaz (2015), to the contrary, concluded that although US companies show commitment towards sustainability, sustainability is not factored into capital investment decisions. They stated that in spite of it being a “nice thing” to do, it is not essential in capital budget appraisal, thus confirming Vesty et al.’s (2103) conclusion that financial analysis always overrides qualitative analysis. Meyer and Kiyamaz (2015) further concluded that there is a lack of correlation between a formal sustainability programme and sustainable capital budgeting. This research focussed on the correlation between constraints and sustainable capital budgeting, the correlation between commitment to sustainability and sustainable capital budgeting, and the correlation between motives for sustainability commitment and sustainable capital budgeting, all from a South African perspective.

Although all these studies were consistent about companies’ commitment to sustainability, it was not clear to what extent South African companies practice sustainable capital budgeting. Kiron et al. (2013) focussed on the global context, Vesty et al. (2013) focussed on the Australian context, whilst EY (2013), alongside Meyer and Kiyamaz (2015), focussed on the American context. The conclusions of these studies had mixed results on whether or not sustainability impacts are incorporated when evaluating capital projects. Sustainability impacts are normally viewed as a company-wide overhead (Vesty et al. 2013; White, Savage, Brody, & Cavander, 1995). Vesty et al. (2013) suggested an investigation into companies’ willingness and competency in identifying environmental and social impacts at agent-level.

2.4.2 Motives behind implementing sustainability programmes

There are various reasons for why corporates commit to social responsibility. Votaw's (1972, p. 25) perspective was that it means different things to different individuals, which was supported by Pesqueux's (2012) definition of responsibility. Pirnea et al. (2011), meanwhile, argued that CSR is an ethical matter; however Brønn and Vidaver-Cohen (2009) opined that ethics is less relevant than strategic motives.

One other reason is pressure from stakeholders or a legitimacy motive (Brønn & Vidaver-Cohen, 2009) as initially argued by Freeman (1984) that executives bear a fiduciary duty to all stakeholders. Hopkins (2009) and Kiron et al. (2013) reported that companies implement sustainability in response to pressure from, among others, customers (Reddy & Rampersad, 2012), competitors and investors. Contrary to this view, Vesty et al. (2013, p. 18) concluded that "the key drivers relate more to the business objectives than to the demands of external parties". Governments regulate companies' conduct and practices via the enforcement of standards, laws and regulations regarding sustainability (AICPA, CICA, and CIMA, 2010; Çalışkan, 2014; Kiron et al., 2013). Consistently, the Government of the South Africa, in terms of the Companies Act 71 of 2008 and the BBBEE act 46 of 2013, requires companies to act in the best interest of not only their shareholders, but also of consumers and the broader community (Reddy & Rampersad, 2012). Furthermore, the government has implemented the Occupational Health and Safety Act 181 of 1993, which is reinforced by the Compensation for Occupational Injuries and Diseases Act 130 of 1993, and is on a quest to implement a carbon tax policy in 2016 (DNT, 2013; DNT, 2014). For this reason it is crucial that corporate managers develop practices and procedures to manage their environmental impacts.

From a conservatism perspective, social ills should be addressed if the benefit is demonstrated through a business case in the form of profit making, competitive advantage, or marketing (Garriga & Melé, 2004). There is a direct positive correlation between social responsibility and financial performance (Garriga & Melé, 2004; Kiron et al., 2013). The motive behind sustainability commitment is that it provides companies with a competitive advantage and long term profits if it is embedded into their "core" business strategies (Burrirt & Schaltegger, 2010; Haanaes et al., 2011; Vesty et al., 2013; AICPA, CICA, and CIMA, 2010; Kiron et al., 2013; Porter & Kramer, 2011). Kiron et al. (2013), however, concluded that the majority of organisations struggle to establish such a business case and to marry sustainability with profitability. The motives for sustainability practices in South Africa were unknown, thus this study established the motives behind South African companies' commitment to sustainability.

3. Research questions

3.1 Introduction

This Chapter builds on the previous literature review Chapter, from which the research problem will be defined and the research questions created.

3.2 Research questions

The research questions (RQs) listed below emerged from the study's objectives of gaining an understanding of how corporates embed sustainability impacts in capital budgeting tools, the constraints corporates face in this regard, and how the accounting profession could contribute. Each broad question represents a construct and has sub-set of questions, except for the correlation questions, RQ₆-RQ₁₁, (Refer to Appendix 2 for detailed questions).

RQ₁: Are companies committed to sustainability and what are the motives behind?

RQ₂: Do companies practise sustainable capital budgeting (SCB)?

RQ₃: What are the constraints faced when practising sustainable capital budgeting and what role could the accounting profession play in dealing with the constraints identified?

RQ₄: How do companies, that practise sustainable capital budgeting, adapt their tools to incorporate sustainability impacts?

RQ₅: What are the characteristics of both the desired tools?

RQ₆: Is there a correlation between the motives and SCB practices?

RQ₇: Is there a correlation between the constraints and SCB practices?

RQ₈: Is there a correlation between the motives and adaptation of conventional capital budgeting tools?

RQ₉: Is there a correlation between the constraints and adaptation of conventional capital budgeting tools?

RQ₁₀: Is there a correlation between the commitment and SCB practices?

RQ₁₁: Is there a correlation between the commitment and adaptation of conventional capital budgeting tools?

4. Research Methodology

4.1 Introduction

This Chapter will describe the methodology followed in identifying the population, the sampling technique and sample size, the gathering of data that aimed at strengthening the construct validity (which was defined by Saunders and Lewis (2012) as the capability of questions to collect the data necessary to answer the research questions), and finally the techniques used to analyse the data collected. Refer to Figure 4-1 for a research design diagram.

4.2 Research design

This study followed a direct realism philosophical paradigm, which stresses that what we experience through our senses is an accurate representation of the world, in other words “what you see is what you get” (Saunders and Lewis, 2012, p. 105). This study is a cross-sectional, descriptive quantitative research as it sought to describe the practices of sustainable capital budgeting, as well as the adaptation of capital budgeting tools regarding the incorporation of sustainability impacts. Descriptive research includes the accurate portrayal of the situation (Reddy & Rampersad, 2012). Structured questions are used to collect quantifiable data, thus as structured questions were used, this research is classified as being quantitative (Saunders, Lewis, & Thornhill, 2009).

4.3 Population

According to Saunders and Lewis (2012, p. 132), “A population is a complete group of members”. The population for this research was defined as companies, including the state-owned companies, that operate within Scope-1 GHG sectors in South Africa, because environmental issues are most likely to be prevalent amongst these organisations (refer to Appendix 3 for a list of Scope-1 processes and sectors). The total population comprised of 101 companies of which 16 were state-owned entities (SOE) and 86 were other JSE-listed companies (refer to Table 5-1 for profiling of the companies surveyed) operating within Scope-1 GHG sectors in South Africa.

4.4 Sampling method and size

Saunders, Lewis and Thornhill (2009) stated that a census is used where there is a possibility to collect and analyse data from all the members of the population. In this study, a census-based sampling approach where data is gathered on every member of the population was adopted, as the population was manageable enough to allow for data collection and analysis across all members of the population. Amongst the 101 companies, 27 responded, yielding a response rate of 26.7%.

4.5 Unit of analysis

A unit of analysis is the subject that is being measured by the study about which conclusions could be made (Wegner, 2012). The unit of analysis in this research was the capital budgeting process and factors that are considered when companies decide whether to accept or reject a capital project.

4.6 Data gathering

Data were collected through a survey collection strategy; surveys are used mainly for descriptive research to answer questions such as who, what, where, how much and how many, and are employed where a deductive approach is followed. Surveys are popular in business and management research and they allow data to be collected from a larger population, such as in this study (Saunders, Lewis, & Thornhill, 2009). Saunders et al. (2009) also argued that surveys collect quantitative data to be analysed using descriptive statistics and inferential statistics, and to suggest reasons for variable relationships. This supports the use of a survey in this study as it is a quantitative research that, amongst other things, seeks to establish relationships between certain variables outlined in Chapter 3.

In this study, the survey comprised of both multiple closed-ended questions of a quantitative categorical data type, and open-ended questions of qualitative text data type. Questionnaires work best when standard questions are asked and are not ideal for open-ended questions, i.e. they are normally employed for descriptive and explanatory studies (Saunders & Lewis, 2012). As such, a Likert-type scale structured interview was used which required members of the population to complete an online questionnaire (refer to Appendix 2). All items of the questionnaire measured the intensity of responses based on a five-point scale, from strongly disagree to strongly agree with neutral at mid-point, except for the demographic profile questions, questions on tools that are currently employed, and open-ended questions.

The self-administered questionnaire was selected as opposed to interviews as result of the census sample size of 100, the amount of time that was available, and the fact that it was not necessary to meet the respondents in person. This was confirmed by Saunders et al. (1999), who stated that some of the considerations in favour of online surveys include the lower importance of meeting the respondents in person, as well as the sample size. A combination of an inductive and deductive approach to questions was used to analyse qualitative data and quantitative data respectively.

The key themes of the questionnaire that had sub-questions were as follows:

- Information about the demographic profiles of the companies (Q1a – Q1d)
- **RQ₁**: Information about the commitment of companies to sustainability (Q2 – Q8)

- **RQ₂**: Information about sustainable capital budgeting practices (Q9 – Q13)
- **RQ₃**: Information about the constraints faced in practising SCB (Q14 – Q16)
- **RQ₄**: Information on the adaptation of conventional capital budgeting tools (Q17 – Q22)
- **RQ₅**: Information about the characteristics of the desired tools (Q23 - Q29)

The correlation determination for RQ₆ to RQ₁₁ was performed using the key themes that are outlined above. The respondents were predominantly finance managers, CFOs and finance executives of the sampled companies. The respondents were selected based on their experience and understanding of the capital budgeting process in their respective companies, as they were best positioned to answer the technical capital budgeting questions. A few respondents refused to participate in the study and their view was respected. The non-returns were also not aggressively followed up for ethical reasons. The respondents were guided on how to complete the questionnaire, which took between 15 and 20 minutes to complete. The survey took place from the 2nd of September 2015 to the 25th of September 2015.

4.7 Reliability of measurement instrument

Saunders, Lewis and Thornhill (2009) referred to a questionnaire's validity as the ability of the questionnaire to measure what the researcher attempts to measure. These authors also state that reliability is concerned with the extent to which the measurement instruments will yield consistent results under different times and different sampling conditions. Although there are various methods of testing the internal consistency, the most common testing method is the Cronbach's alpha (Saunders et al., 2009).

As a result, in this study reliability of the measurement instrument was conducted by making use of the internal consistency tool, the Cronbach's alpha coefficient. According to (Pallant, 2007), a Cronbach's alpha coefficient of greater than .70 is considered acceptable, while an alpha of less than .70 indicates internal inconsistency. Internal consistency for iterative items of all scales was conducted and measured by the Cronbach's alpha coefficient.

4.8 Data analysis

4.8.1 Descriptive analysis

The quantitative data have been presented in summary tables, bar graphs for ranking of values from highest to lowest, and pie charts for relative proportions. Patterns and categories were performed to analyse the data of a qualitative nature. Ranked categorical quantitative data that may need to be grouped could be presented using tables and frequency distributions to depict one variable for easy reading, bar charts or pictograms to outline the frequencies of groups or values, line graphs or bar charts to show the trend of

variables, and pie charts or bar charts to depict the proportion of certain variables. This data could also be described statistically by using the mode to identify values that occur more frequently (Saunders, Lewis, & Thornhill, 2009).

Quantitative data and qualitative data gathered have been analysed using a deductive and an inductive approach respectively (Saunders & Lewis, 2012). Pattern matching and explanation building were used for deductive analysis and for qualitative data (Saunders, Lewis, & Thornhill, 2009). Data relating to the following research questions were analysed using the methods described above:

- RQ₁:** Are companies committed to sustainability and what are the motives behind this?
- RQ₂:** Do companies practise sustainable capital budgeting (SCB)?
- RQ₃:** What are the constraints faced in practising sustainable capital budgeting and what role could the accounting profession play in dealing with the constraints identified?
- RQ₄:** How do companies that practise sustainable capital budgeting adapt their tools to incorporate sustainability impacts?
- RQ₅:** What are the characteristics of both the desired tools?

4.8.1 Inferential analysis

The study made use of various other inferential statistical methods including non-parametric data analysis for relationships between ranked categorical variables. The relationships between ranked categorical variables could have been analysed using the Chi-Square to test the association between two variables and Spearman's rank correlation coefficient (ρ) to test the strengths of that relationship (Saunders & Lewis, 2012).

There are two challenges with the Chi-Square test, however. Firstly, the p -values obtained through the use of the Chi-Square are only an approximation of the true value p -values, particularly for smaller samples (Weinberg & Abramowitz, 2008). Secondly, Saunders et al. (2009) argued that for a Chi-Square Test to remain reliable, the expected value table should not have more than 25% of values that are less than five. Most of the expected values in this study were bound to be lower than the value of five as a result of the lower number of observations than would be required.

Weinberg and Abramowitz (2008) suggested the Fisher's Exact Test as an alternative approach to achieve more reliable results for smaller sample sizes akin to that of this research. The raw values for this study were in a 5x5 contingency table. It is acceptable to group rows (R) and columns (C) where meaningful results could be achieved (Saunders et al., 2009), thus, the "agree and strongly agree" groups were placed together and the "disagree and strongly disagree" groups were also placed together to mitigate the risk of zero values for categories, resulting in 3x3 contingency tables.

According to Weinberg and Abramowitz (2008), the Fisher's Exact Test only deals with 2x2 contingency tables, rendering it non-functional for the purposes of this study. Freeman and Halton (1951) developed an extension of Fisher's Exact Test to accommodate the RxC contingency tables. As a result, in this study the Freeman-Halton extension of the Fisher's' Exact Test was used to test the association between variables.

The relationships and the strengths thereof between the variables were thus examined using the Freeman-Halton extension of the Fisher's Exact Test and the Spearman's rank correlation coefficient (ρ) respectively, using Socscistatistic, SPSS and Vassarstats.

The following variables and research questions were analysed using Freeman-Halton extension of the Fisher's' Exact Test for correlation and Spearman's rank correlation coefficient (ρ) for strengths of correlation:

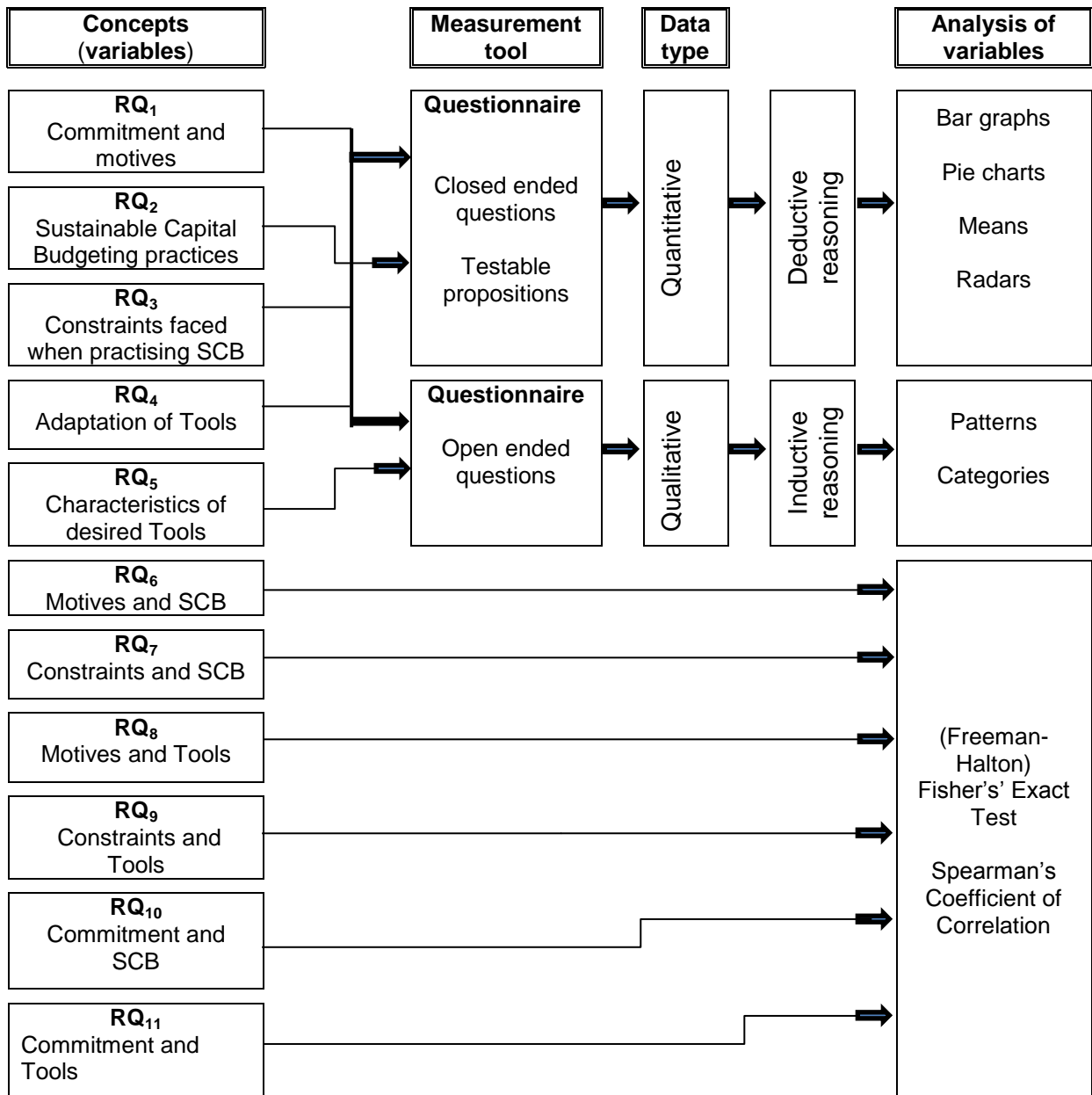
- RQ₆:** Is there a correlation between the motives and SCB practices?
- RQ₇:** Is there a correlation between the constraints and SCB practices?
- RQ₈:** Is there a correlation between the motives and adaptation of conventional capital budgeting tools?
- RQ₉:** Is there a correlation between the constraints and adaptation of conventional capital budgeting tools?
- RQ₁₀:** Is there a correlation between the commitment and SCB practices?
- RQ₁₁:** Is there a correlation between the commitment and adaptation of conventional capital budgeting tools?

4.9 Research limitations

The limitation of this study is that only Scope-1 GHG contributors were studied, which could imply that the results may not be extrapolative to represent all companies that are operating in South Africa. Another limitation is that no causal relationship between variables was found, thus the correlation results should be interpreted with care.

4.10 Schematic presentation of Research Design

Figure 4-1: Research design diagram



5. Results

5.1 Introduction

Chapter 4 dealt with the research methodology used for this research and provided a blueprint for how the research work was approached and conducted. Chapter 5 now presents the results of the study with the profile of the participating companies as a point of departure, followed by a descriptive statistics and inferential statistics for the results.

5.2 Profile of respondents

The profiles of the participating companies are presented in Table 5-1 below.

Table 5-1: Profile of the participating companies (N = 27)

| Variable | Category | Frequency (f) | Percentage (%) |
|---------------------------------|------------------------------------|---------------|----------------|
| Sector | Agriculture, forestry and land use | 3 | 11.1% |
| | Cement | 1 | 3.7% |
| | Coal and gas to liquid | 2 | 7.4% |
| | Electricity generation | 1 | 3.7% |
| | Mining | 13 | 48.1% |
| | Paper and pulp | 3 | 11.1% |
| | Other | 4 | 14.8% |
| Yearly revenue generated | R100 million or less | 1 | 3.7% |
| | R201 million to R500 million | 2 | 7.4% |
| | R501 million to R1 billion | 5 | 18.5% |
| | Between R1 billion and R10 billion | 8 | 29.6% |
| | R10 billion or greater | 11 | 40.7% |
| Number of employees | 1,000 or less | 6 | 22.2% |
| | 1,001 to 5,000 | 8 | 29.6% |
| | 5,001 to 10,000 | 3 | 11.1% |
| | 10,001 to 20,000 | 3 | 11.1% |
| | Greater than 20,000 | 7 | 25.9% |
| Ownership of the company | State owned company | 6 | 22.2% |
| | Widely held company (Listed) | 17 | 63.0% |
| | Widely held company (Unlisted) | 2 | 7.4% |
| | Other | 2 | 7.4% |

As reflected in Table 5-1, most companies were from the mining sector (48.1%). A total of 88.9% of the participating companies generated an income of R501 million or more, of which 40.7% generated an income of R10 billion or more. Fourteen (51.8%) companies had 5000 or fewer employees, while 48.2% of the participating companies employed more than 5000 employees. 70.4% were widely held and 63.0% of the widely held companies were listed.

5.3 Companies' commitment to sustainability and their motives

The following themes were an attempt to understand whether participating companies were committed to sustainability and the reasons behind their commitment.

5.3.1 Is sustainability a priority for companies?

Figure 5-1: Frequency distribution of scores for companies sustainability priorities

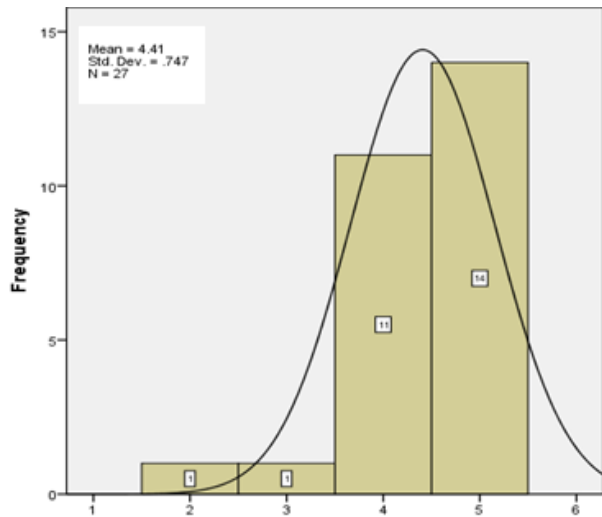
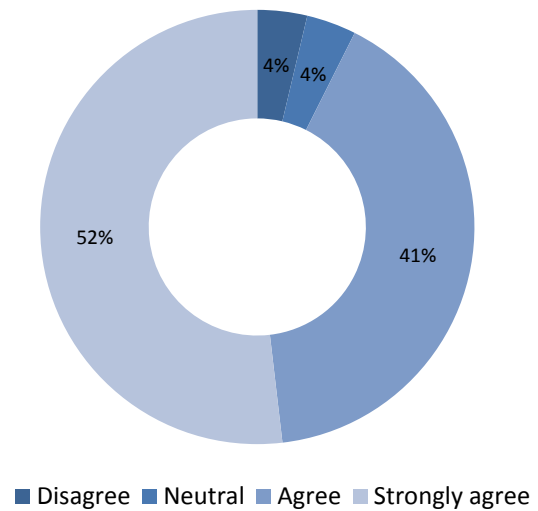


Figure 5-2: Pie chart for companies' sustainability priorities



As can be seen from Figure 5-1 and Figure 5-2, 93% of the companies agreed that sustainability is a priority for their companies. Of these, 52% strongly agreed that sustainability is a priority. The mean was at 4.41 indicating for agree.

5.3.2 Do companies have formal strategies related to sustainability?

Figure 5-3: Frequency distribution of companies' sustainability strategies

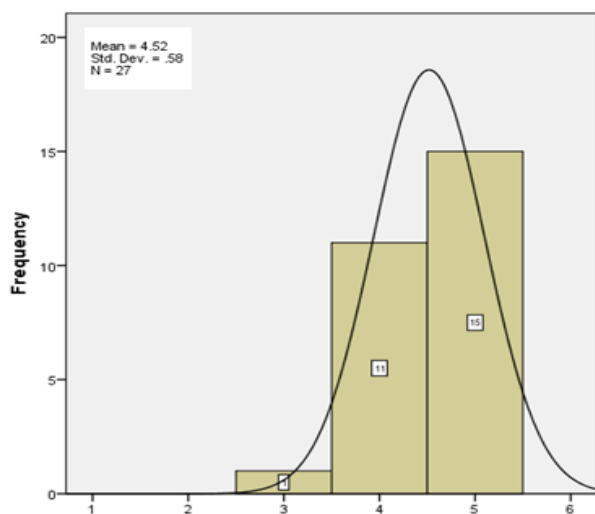


Figure 5-4: Pie chart for companies sustainability strategies

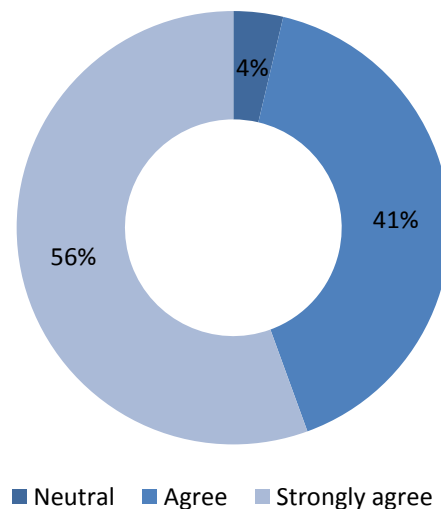


Figure 5-3 and Figure 5-4 show that 97% of the companies agree that they have a formal strategy related to sustainability. Of these, 56% agreed that they have a formal strategy.

5.3.3 Do companies have a clear business case for their approach to sustainability?

Figure 5-5: Frequency distribution of companies' sustainability business cases

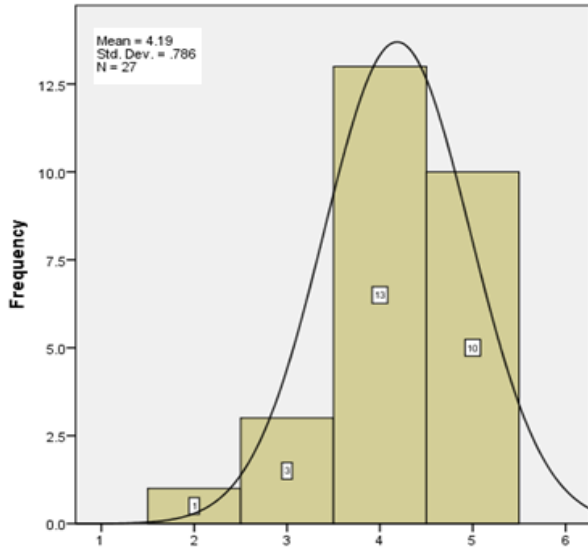


Figure 5-6: Pie chart for companies sustainability business cases

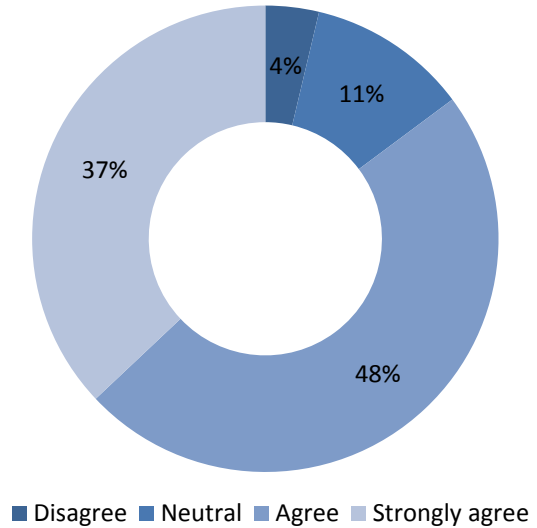


Figure 5-5 and Figure 5-6 show that 85% of the companies agree that they have a clear business case or value proposition for their approach to sustainability, while 15% did not have a clear business case to support their sustainability commitment.

5.3.4 Are companies addressing social impacts?

Table 5-2: Social impacts addressed by companies

| Social issues / impacts | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| Occupational Health and Safety | 4% | - | 4% | 22% | 70% |
| Training and Education | - | 4% | - | 41% | 56% |
| Supplier Assessment for Labour Practices | - | 11% | 37% | 41% | 11% |
| Security Practices (Training Security Personnel on Human Rights) | - | 11% | 44% | 30% | 15% |
| Supplier Human Rights Assessment | 4% | 18% | 41% | 30% | 7% |
| Anti-corruption | - | - | 11% | 33% | 56% |
| Anti-competitive behaviour | - | 4% | 11% | 41% | 44% |
| Supplier Assessment for Impacts on Society | 4% | 11% | 33% | 45% | 7% |
| Customer Health and Safety | - | - | 41% | 41% | 18% |
| Product and Service Labelling (Information on Content, Safe Use and Disposal) | 4% | - | 41% | 37% | 18% |
| Product Compliance with Rules and Regulations | 4% | - | 15% | 37% | 44% |

Table 5-2 outlines the fact that companies agree that they are addressing the social issues, OH&S (96%), product compliance with rules and regulations (93%), anti-corruption (85%), training and education (78%), customer health and safety (74%), product labelling about information on content, safe use and disposal (67%), anti-competitive behavior (67%), supplier assessment for impacts on society (52%).

5.3.5 Are companies addressing environmental impacts?

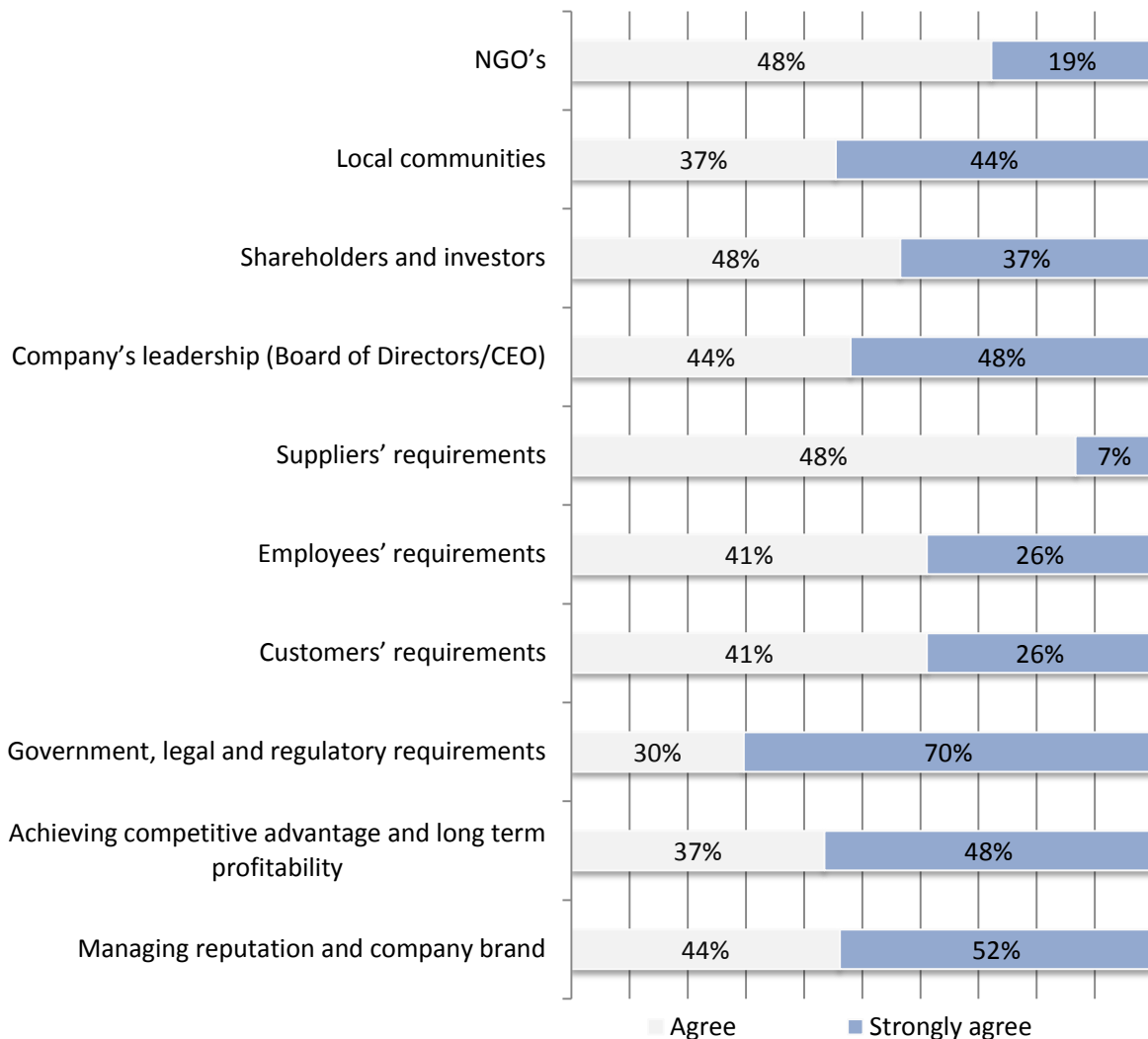
Table 5-3: Environmental impacts addressed by companies

| Social issues / impacts | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| Energy Consumption | - | 7% | 4% | 33% | 56% |
| Water Consumption | - | 4% | 7% | 22% | 67% |
| Biodiversity Loss | - | 7% | 19% | 37% | 37% |
| Emissions and Pollution (air, water, soil) | 4% | 4% | 15% | 30% | 47% |
| Effluents and Waste | - | 4% | 4% | 37% | 55% |
| Products and Services Impact on Environment | - | 4% | 15% | 41% | 40% |
| Environmental Compliance and Reporting | - | 4% | - | 33% | 63% |

Companies agree that they are addressing the listed environmental issues as per Table 5-3. The agreed that they address the environmental compliance and reporting (96%), effluents and waste (92%), energy consumption (89%) and water consumption (89%), products and services impact on environment (81%), biodiversity loss (74%), emissions and pollution such as air, water, soil (77%).

5.3.6 Motives driving the companies' sustainability commitments

Figure 5-7: Motives behind sustainability commitments



According to Figure 5-7, government is the biggest driver of the sustainability drives of companies at 100% agreement, followed by reputation and branding at 96%, the Board of directors/CEO at 92%, and competitive advantage at 85%.

5.3.7 Other motives driving companies' commitment to sustainability

In terms of Appendix 4, respondents reflected that other motives driving their sustainability efforts include government mandate, triple bottom line reporting, licensing requirements and industry requirements, job security, efficiencies, and funding requirements.

5.4 Sustainable capital budgeting practices

5.4.1 Consideration of social impacts when evaluating capital projects

Table 5-4: Social impacts considered when deciding upon capital projects

| Social issues / impacts | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| Occupational Health and Safety | - | 4% | - | 48% | 48% |
| Training and Education | - | 7% | 15% | 59% | 19% |
| Supplier Assessment for Labour Practices | 4% | 19% | 37% | 29% | 11% |
| Security Practices (Training Security Personnel on Human Rights) | 4% | 19% | 37% | 26% | 14% |
| Supplier Human Rights Assessment | 4% | 19% | 55% | 18% | 4% |
| Anti-corruption | - | 4% | 11% | 41% | 44% |
| Anti-competitive behaviour | - | 7% | 26% | 30% | 37% |
| Supplier Assessment for Impacts on Society | 4% | 7% | 37% | 30% | 22% |
| Customer Health and Safety | 4% | 7% | 15% | 52% | 22% |
| Product and Service Labelling (Information on Content, Safe Use and Disposal) | - | 11% | 22% | 41% | 26% |
| Product Compliance with Rules and Regulations | - | 7% | - | 41% | 52% |

Table 5-4 highlights that companies agree that they incorporate the listed social issues when deciding upon whether to accept or reject a capital project; supplier human rights issues lag behind the rest of the impacts at only 22% of the respondents. Companies agreed that they incorporate OH&S (96%), product compliance with rules and regulations (93%), anti-corruption (85%), training and education (78%), customer health and safety (74%), product labelling about information on content, safe use and disposal (67%), anti-competitive behavior (67%), supplier assessment for impacts on society (52%).

5.4.2 Consideration of environmental impacts when evaluating capital projects

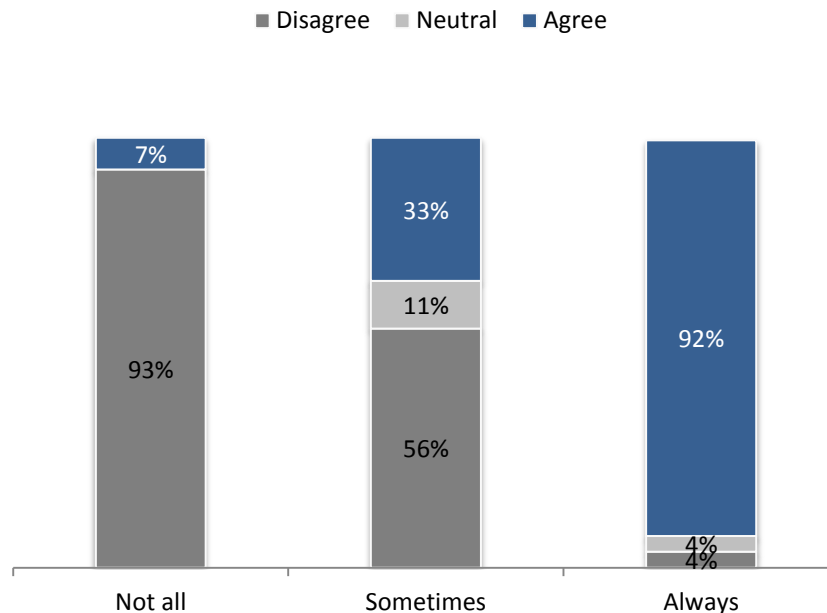
Table 5-5 shows that companies agree that they incorporate energy consumption (89%), water consumption (89%), biodiversity loss (70%), emissions and pollution (86%), effluents and waste (93%), products and services impact on environment (85%), environmental compliance and reporting (96%) and transport (88%).

Table 5-5: Environmental impacts considered when deciding upon capital projects

| Social issues / impacts | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| Energy Consumption | - | 4% | 7% | 33% | 56% |
| Water Consumption | - | 4% | 7% | 33% | 56% |
| Biodiversity Loss | - | 7% | 23% | 33% | 37% |
| Emissions and Pollution (air, water, soil) | - | 7% | 7% | 42% | 44% |
| Effluents and Waste | - | 7% | - | 41% | 52% |
| Products and Services Impact on Environment | - | 4% | 11% | 48% | 37% |
| Environmental Compliance and Reporting | - | 4% | - | 37% | 59% |
| Transport | - | 5% | 7% | 44% | 44% |

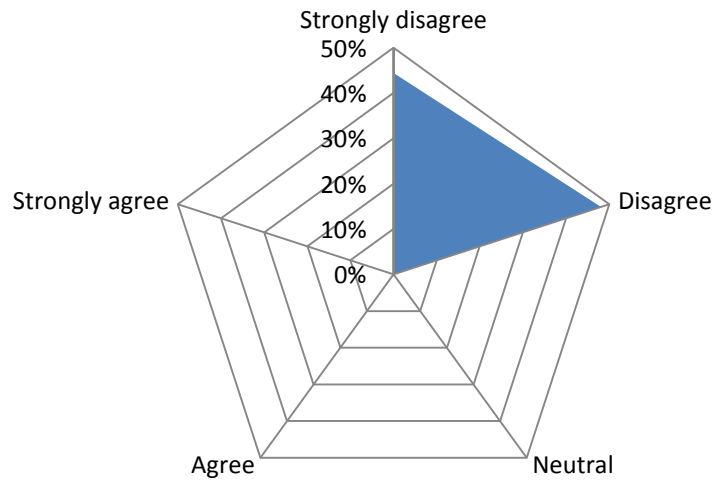
5.4.3 Consistency in practising sustainable capital budgeting

Figure 5-8: Frequency of sustainability impacts incorporation when evaluating capital projects



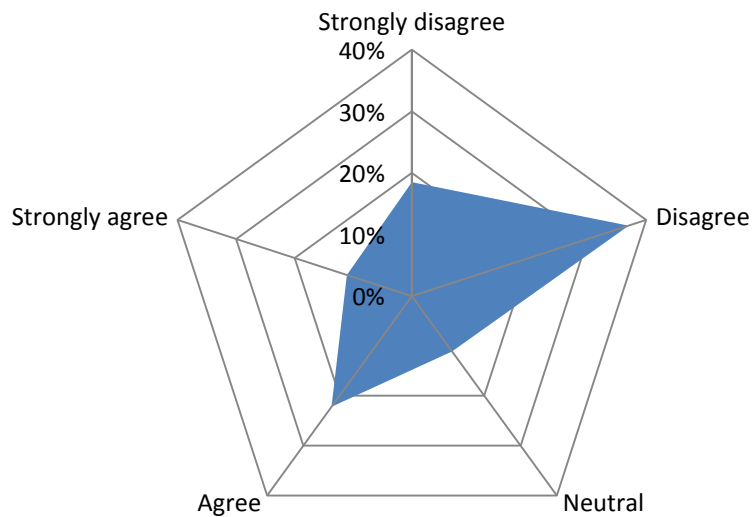
The above question intended to find out how often companies incorporate sustainability impacts in capital projects appraisals. Figure 5-8 illustrates the fact that 92% of companies agree that they always incorporate sustainability impacts when evaluating capital projects, with only 7% indicating that they do not incorporate sustainability impacts at all for their capital projects appraisals.

Figure 5-9: “Not at all” importance of sustainability impacts when evaluating capital projects



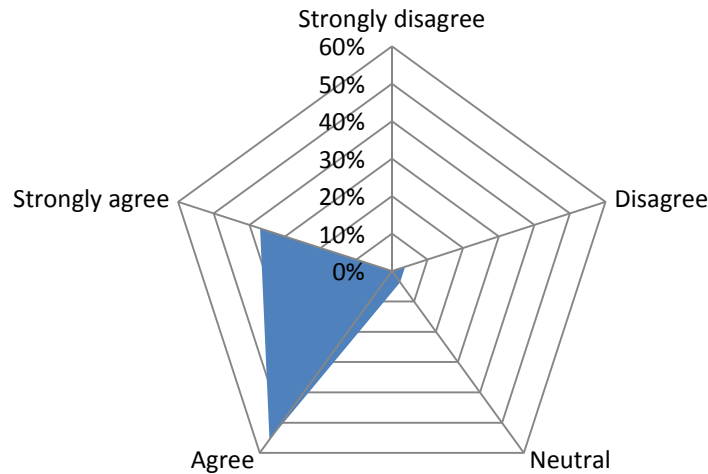
The radar depicted in Figure 5-9 above portrays that respondents disagreed that they do not incorporate sustainability impacts at all, as none of the neutral or agree responses were chosen.

Figure 5-10: “Sometimes” importance of sustainability impacts when evaluating capital projects



As depicted in Figure 5-10 most respondents disagreed that they sometimes incorporate sustainability impacts when they appraise capital projects.

Figure 5-11: “Always” importance of sustainability impacts when evaluating capital projects



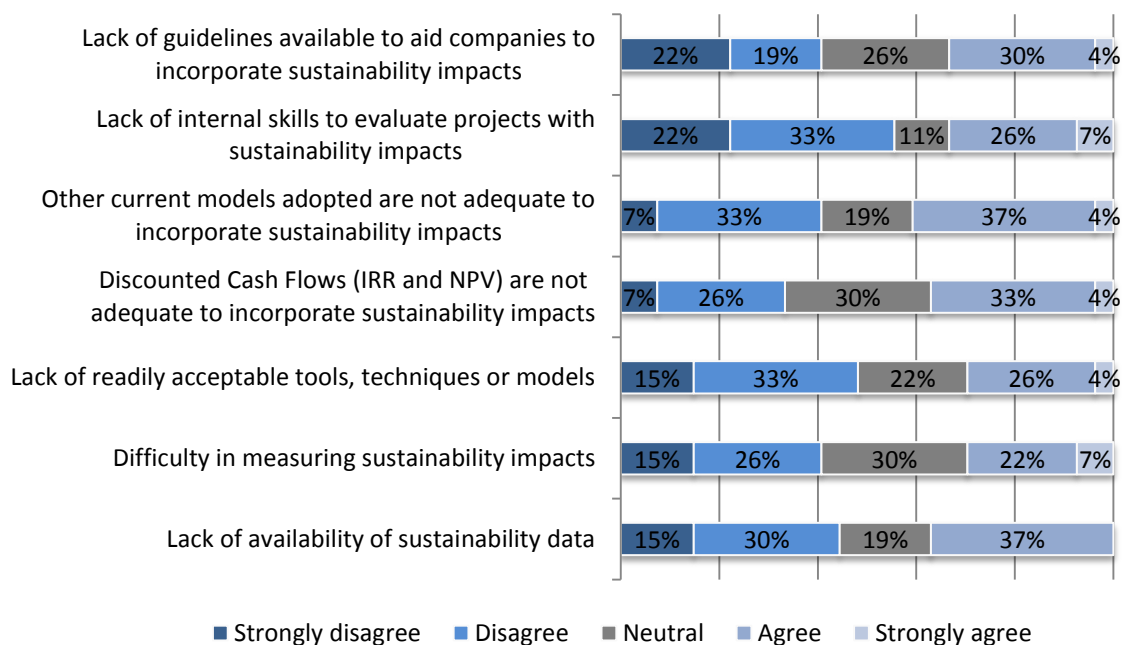
As illustrated in Figure 5-11, most respondents either agreed or strongly agreed that they always incorporate sustainability impacts when evaluating capital projects.

5.5 Constraints faced when practising sustainable capital budgeting

5.5.1 Constraints faced

The following was an attempt to establish the constraints that companies face when considering sustainability impacts (social impacts and environmental impacts) in capital budgeting tools or decision making that either (i) hinder the incorporation of those sustainability impacts, or (ii) make it difficult when incorporating those sustainability impacts in capital budgeting decision making.

Figure 5-12: Constraints faced when practising sustainable capital budgeting



According to Figure 5-12, the respondents were fairly split between agreeing whether they face constraints or not.

Respondents were asked what other constraints they face that hinder incorporation of sustainability impacts when evaluating capital projects. Constraints mentioned were, funding constraints and costs, market conditions, lack of government intervention and policies, resistance, financial focus, and subjectivity of assessment. (Refer to Appendix 5).

5.5.2 The role of the accounting profession in dealing with constraints

Respondents were asked to describe the role that the accountants and accounting profession could play in dealing with the constraints that they are facing related to the incorporation of sustainability impacts in capital decision making process. The following Figure depicts the main areas where accounting profession could play a role.

Figure 5-13: Suggested contribution required from the accounting profession

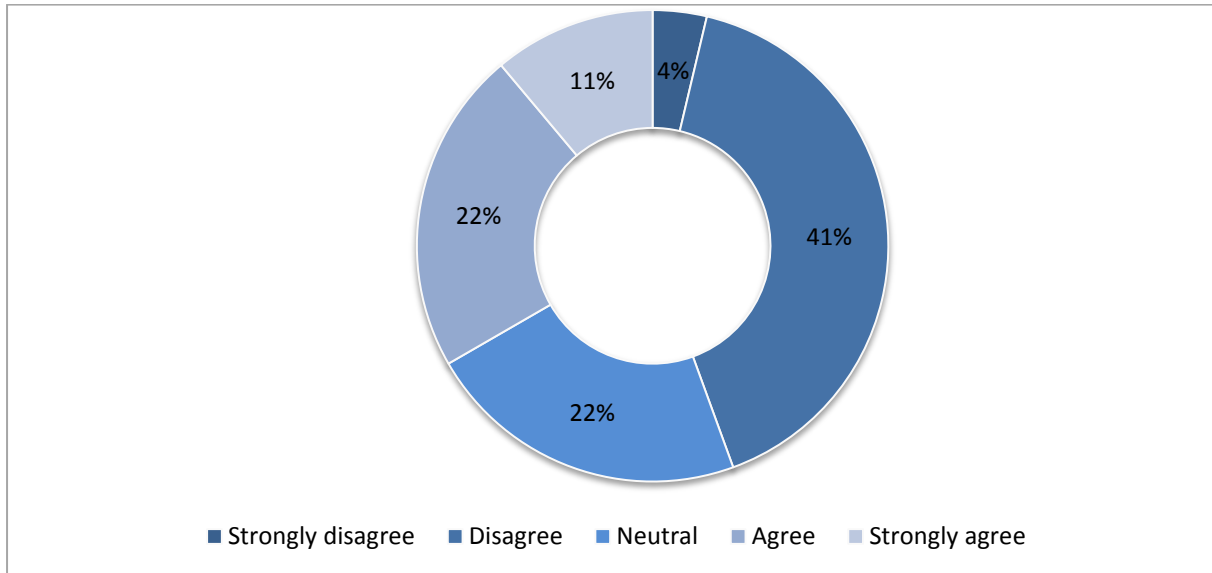


Figure 5-13 and Appendix 6 point to the fact that the accounting profession could play a role by providing guidance to business leaders, guidance on financial impact, skills development, practising sustainable capital budgeting, assurance and auditing, financial reporting, capital projects evaluation tools, collaboration with sustainability experts, and government policy influence.

5.6 Adaptation of tools to incorporate sustainability impacts

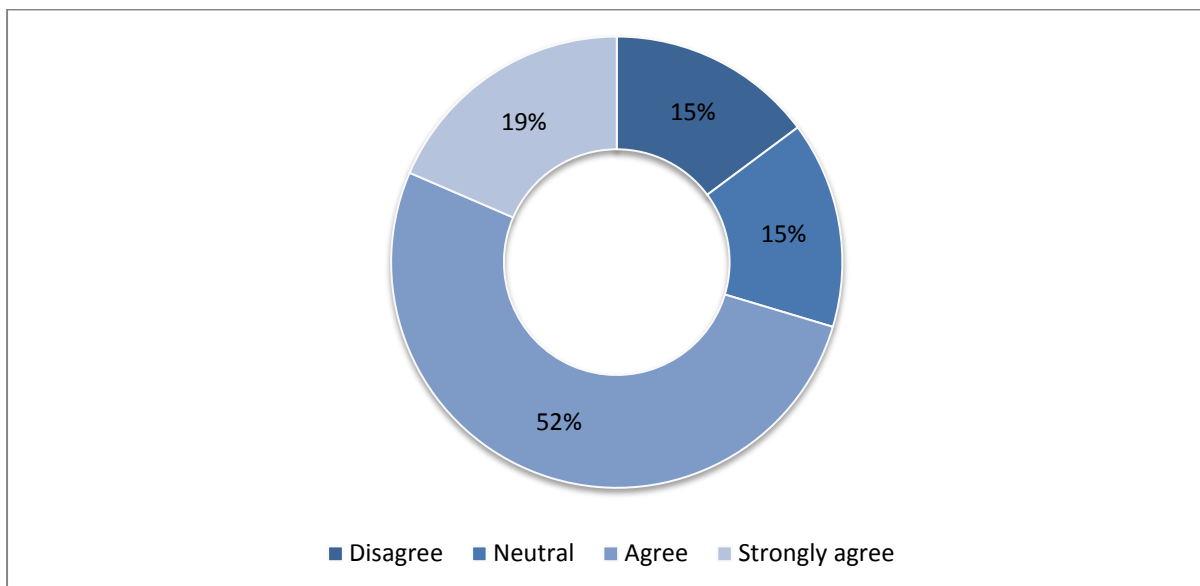
The following was an attempt to establish how companies have adapted their capital decision making tools to incorporate sustainability impacts when appraising capital projects. The question asked was whether sustainability impacts are measurable and if DCF captures all the relevant data including sustainability impacts.

Figure 5-14: DCF’s adequacy in incorporating sustainability impacts



From Figure 5-14 above, it can be seen that 33% of respondents agreed that sustainability impacts are measurable and that the DCF technique is adequate to capture them, while 45% disagreed with the statement.

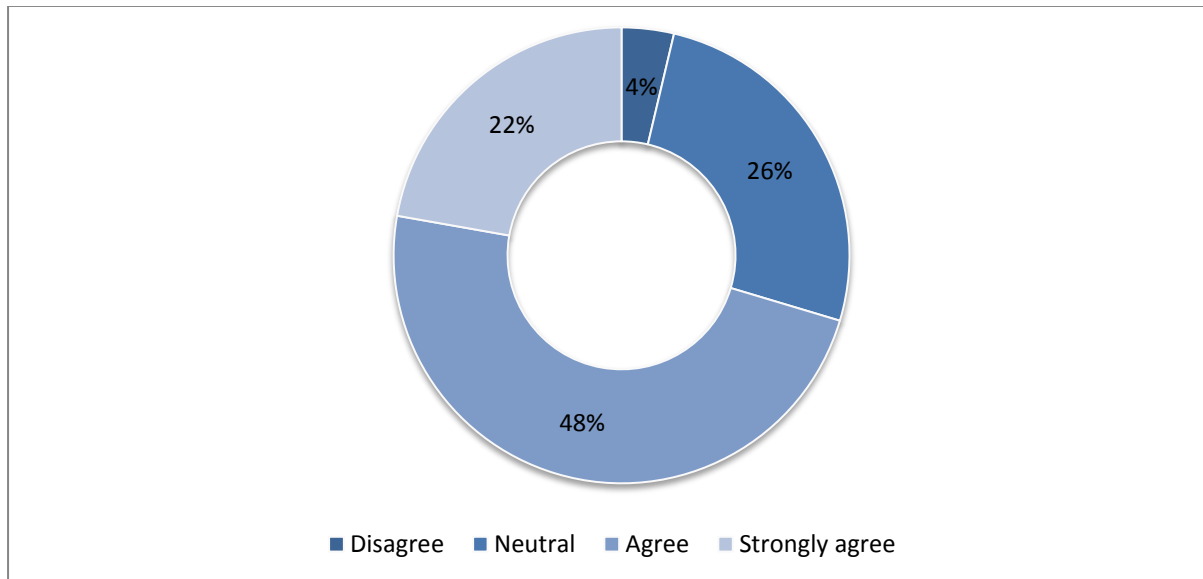
Figure 5-15: Sustainability impacts are not always measurable: DCF is not adequate



As per Figure 5-15 above, 71% of respondents agreed that sustainability impacts are not always measurable and that the DCF technique is not adequate to capture those impacts.

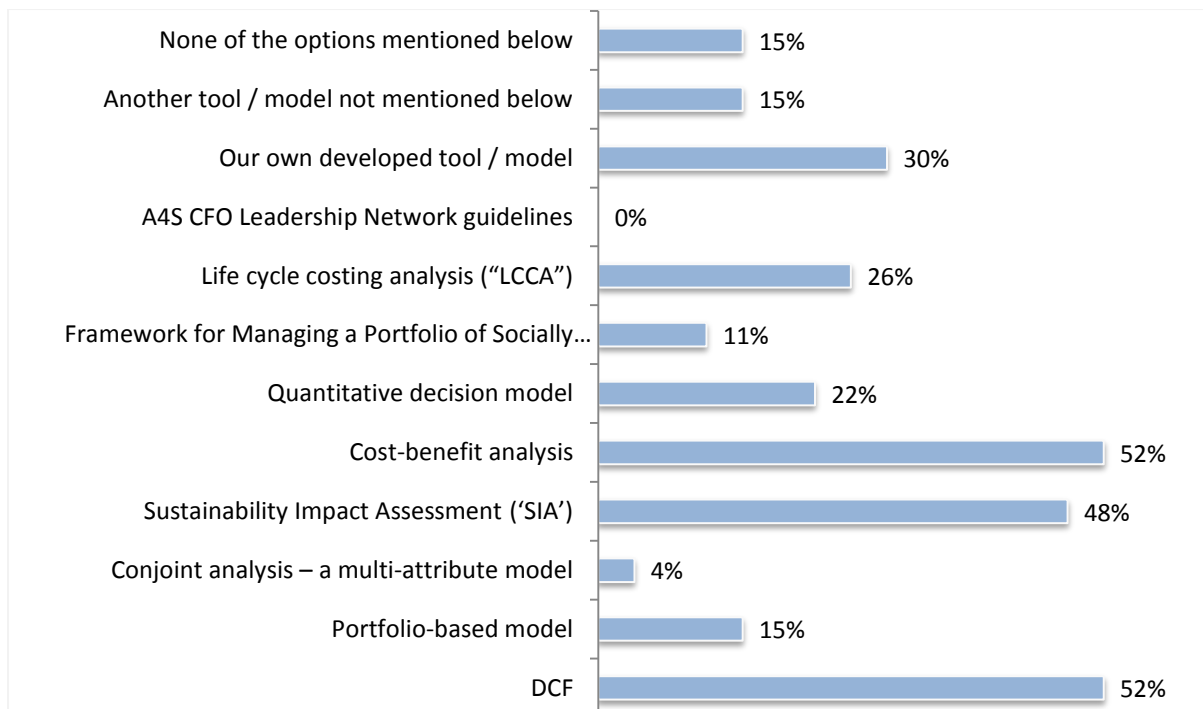
Only 15% disagreed that the DCF is not adequate.

Figure 5-16: Inclusion of qualitative information when evaluating capital projects



As per Figure 5-16 above, 70% of the respondents agreed that they incorporate sustainability impacts when evaluating capital projects, while 30% disagreed. This question did not, however, ask which tools respondents employ to embed sustainability impacts into their capital budgeting processes. Figure 5-16 below was an attempt to answer that question. The questions were structured such that the answers could be mutually exclusive.

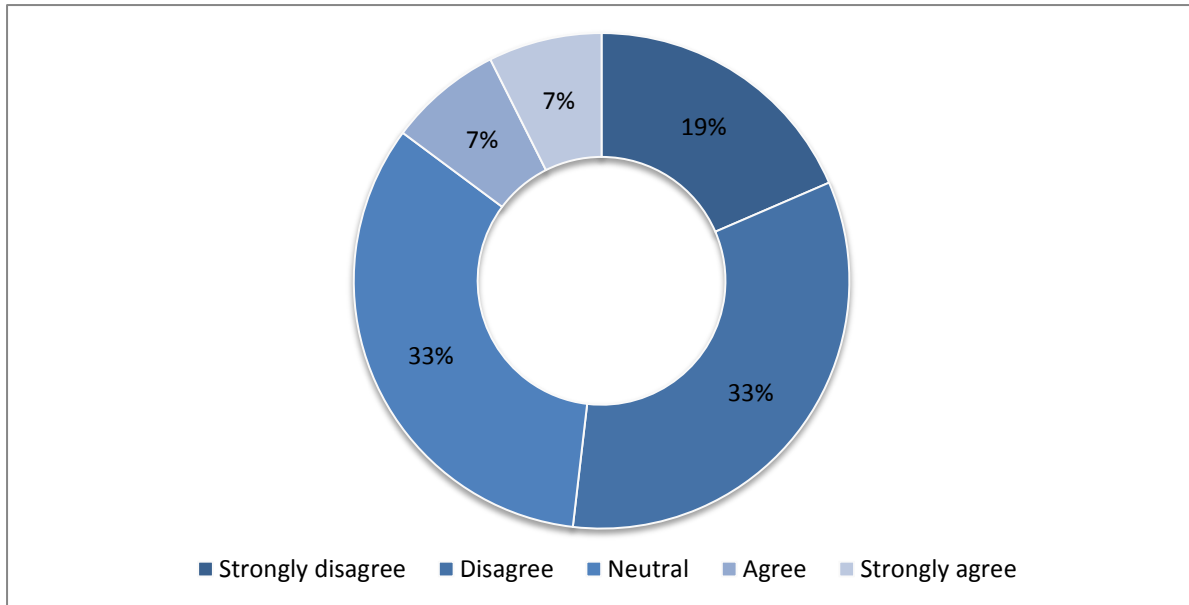
Figure 5-17: Types of adapted tools to incorporate sustainability impacts



Other tools adapted include Stage gate model, in-house proprietary tools, SLP plan, Multi Criteria Assessment investment framework, Project Definition Readiness Assessment (PDRA), Socio-economic assessment toolbox, and Group Economic Model. (Refer to Appendix 7).

Respondents were asked to confirm if they do not have a model to incorporate both the economic and sustainability impacts.

Figure 5-18: Non-existence of models to incorporate both economic and sustainability impacts



As can be seen in Figure 5-18, only 14% agreed that they do not have a model to incorporate all the dimensions of sustainability impacts in capital decision making. This is consistent with the 15% who agreed that they do not utilise any of the tools listed in Figure 5-17.

5.7 Characteristics of a sustainable capital budgeting model

The following question was an attempt to establish what companies consider to be a desirable or holistic tool that could be used to incorporate all the dimensions of sustainability impacts. Respondents were asked whether they see it as necessary to incorporate sustainability impacts (economic, social and environmental) in one holistic model for the evaluation of capital projects.

According to Figure 5-19, 75% of the respondents agreed that a holistic model is required to incorporate the economic, social and environmental impacts. Respondents were also asked about the characteristics of the model as depicted in Figure 5-20, Figure 5-21, Figure 5-22, and Figure 5-23 below.

Figure 5-19: Necessity of a holistic model

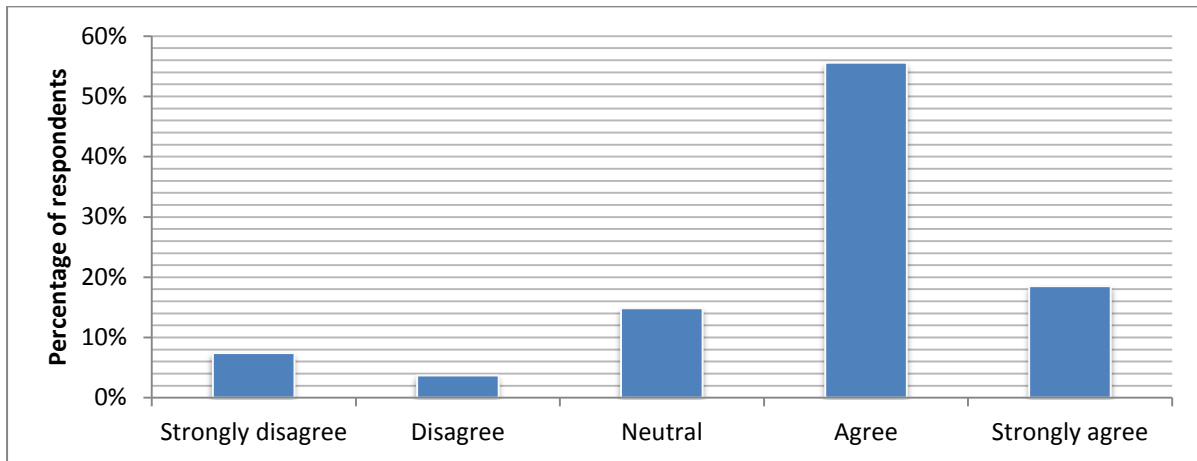


Figure 5-20: Holistic tool: consideration of qualitative factors

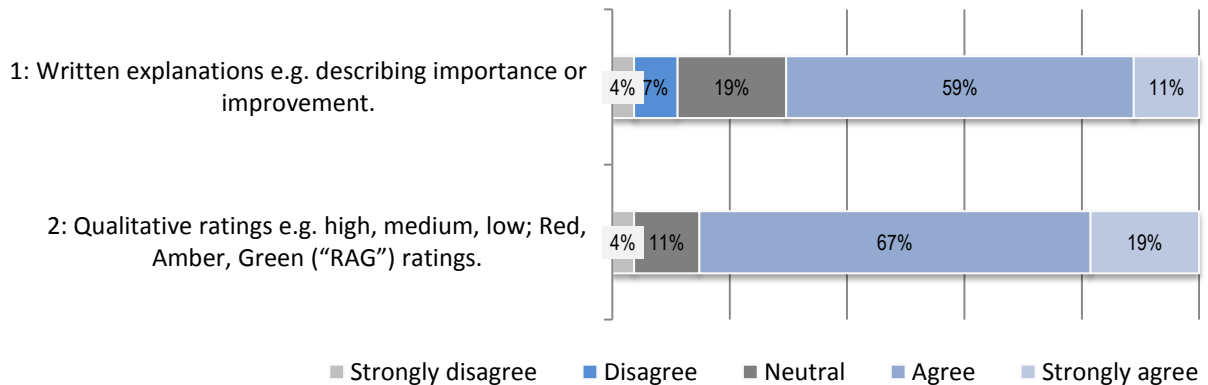


Figure 5-21: Holistic tool: consideration of quantitative factors other than monetary impacts

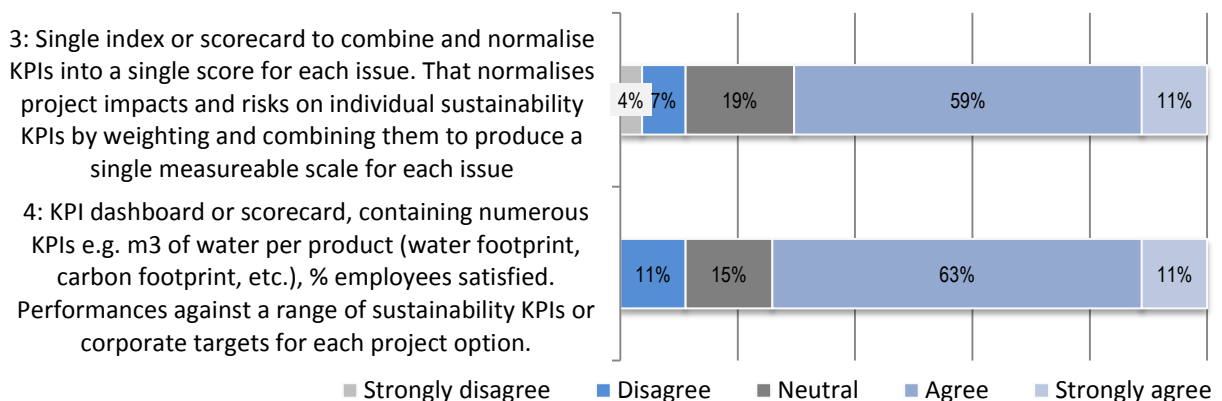


Figure 5-22: Holistic tool: consideration of monetary quantitative factors

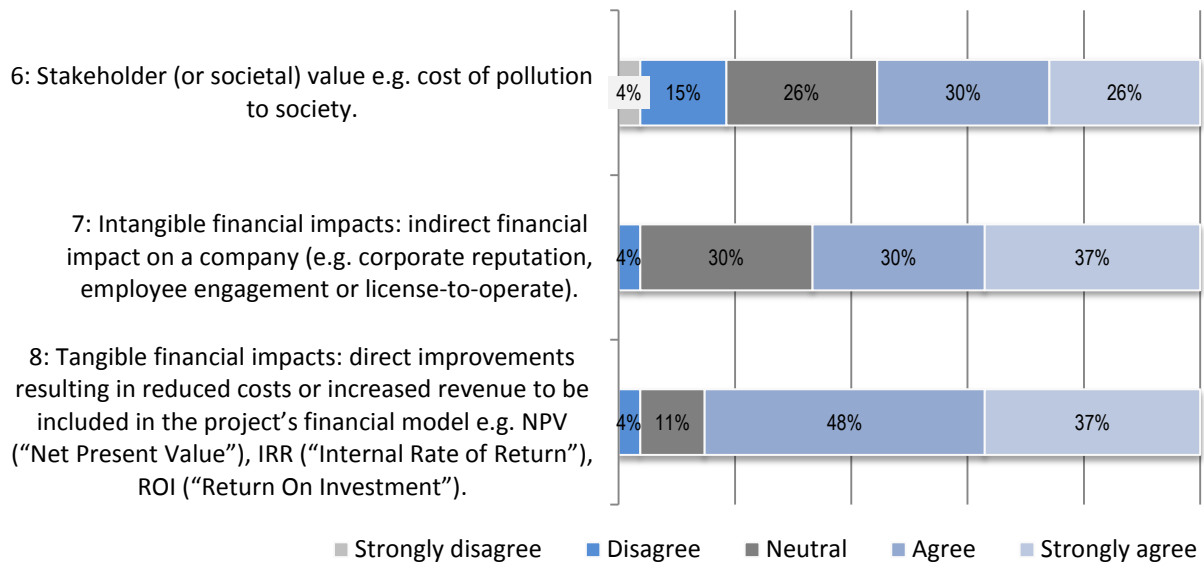
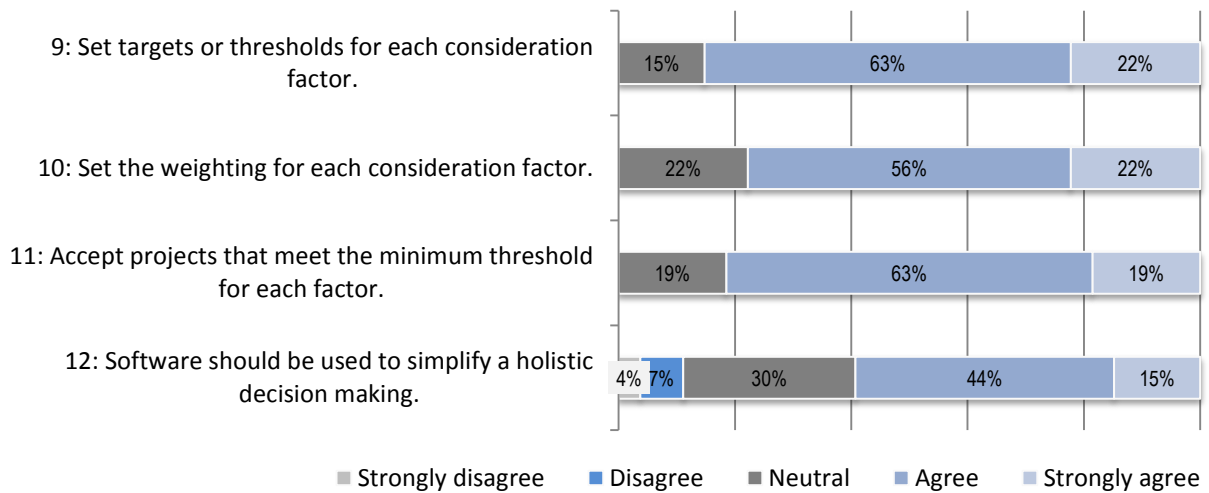


Figure 5-23: Holistic tool: capital projects decision making criteria



Other characteristics of a holistic model include corporate and project risk, flexibility, benefits tracking flexibility, benefits tracking, multi-stage evaluation, factor importance, and society review. (Refer to Appendix 8)

5.8 General comments by respondents on sustainable capital budgeting

Respondents were asked to give general comment about sustainable capital budgeting. They commented that there enforcement by government on sustainability should not be underestimated. One respondent commented that they had to reflect about sustainability at their companies and this led to them to consider on how to improve their current practices. (Refer to Appendix 9).

5.9 Correlation between motives and SCB practices

The purpose of this section was to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-6 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the motives behind companies' drives for sustainability and practices of sustainable capital budgeting. The Fisher's Exact Test tested the null hypothesis to determine how likely it was that two variables were associated.

Table 5-6: Motives that drive sustainability commitment versus SCB practices

| A: Motives companies considered | B: SCB practices |
|--|---|
| Q.7 (a) Reputation and company brand Q.7 (b) Competitive advantage & long term profitability Q.7 (c) Government, legal and regulatory requirements Q.7 (d) Customers' requirements Q.7 (e) Employees' requirements Q.7 (f) Suppliers' requirements Q.7 (g) Company's leadership (Board of Directors/CEO) Q.7 (h) Shareholders and investors Q.7 (i) Local communities Q.7 (j) NGO's | Q.11 Sustainability impacts are not considered (essential) when deciding upon capital projects (social impacts and environmental impacts) |

5.9.1 Hypothesis 1a: Reputation and company brand, and SCB practices

H_{1a} = There is no significant association between (i) the company's reputation and brand motive to sustainability and (ii) SCB practices.

A Fisher's Exact Test for independence was conducted to test an association between (i) company's reputation and (ii) brand motive for sustainability and SCB practices; $p = 0.074$, CI=95%.

Based on this finding, H_{1a} is supported by this data, concluding that there is no association between (i) company's reputation and brand motive to sustainability and (ii) SCB practices.

5.9.2 Hypothesis 1b: Competitive advantage and profitability, and SCB practices

H_{1b} = There is no significant association between (i) competitive advantage and long term profitability motive, and (ii) SCB practices.

A Fisher's Exact Test for independence was conducted to indicate an association between (i) competitive advantage and long term profitability motive, (ii) and SCB practices; $p =$

0.017, CI=95%.

Based on this finding, H_{1b} is not supported by this data, meaning that there is significant association between (i) competitive advantage and long term profitability motive, and (ii) SCB practices.

5.9.3 Hypothesis 1c: Government's requirements, and SCB practices

H_{1c} = There is no significant association between (i) Government, legal and regulatory requirements' motive and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) government's requirements, and (ii) SCB practices; $p = 1.0$, CI=95%.

Based on this finding, H_{1c} is supported by this data, meaning that there is no association between the Government, legal and regulatory requirements' motive and the SCB practices.

5.9.4 Hypothesis 1d: Customers' requirements, and SCB practices

H_{1c} = There is no significant association between (i) customers' requirements motive and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) customers' requirements motive, and (ii) SCB practices; $p = 0.564$, CI=95%.

Based on this finding, H_{1d} is supported by this data, meaning that there is no association between (i) customers' requirements motive and (ii) SCB practices.

5.9.5 Hypothesis 1e: Employees' requirements, and SCB practices

H_{1e} = There is no significant association between (i) employees' requirements motive and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) employees' requirements, and (ii) SCB practices; $p = 0.564$, CI=95%.

Based on this finding, H_{1e} is supported by this data, meaning that there is no association between (i) employees' requirements motive and (ii) SCB practices.

5.9.6 Hypothesis 1f: Suppliers' requirements, and SCB practices

H_{1f} = There is no significant association between (i) suppliers' requirements motive and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) suppliers' requirements motive and (ii) SCB practices; $p = 0.001$, CI=95%.

Based on this finding, H_{1f} is not supported by this data, meaning that there is significant association between (i) suppliers' requirements motive and (ii) SCB practices.

5.9.7 Hypothesis 1g: Company's leadership, and SCB practices

H_{1g} = There is no significant association between (i) company's leadership and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) pressure from companies leadership and (ii) SCB practices; $p = 0.999$, CI=95%.

Based on this finding, H_{1g} is supported by this data, meaning that there is no association between (i) company's leadership and (ii) SCB practices.

5.9.8 Hypothesis 1h: Shareholders and investors, and SCB practices

H_{1h} = There is no significant association between (i) shareholders and investors' motive, and (ii) SCB practices.

A Fisher's' Exact Test for independence to indicate an association between (i) shareholders and investors' motive and (ii) SCB practices; $p = 0.999$, CI=95%.

Based on this finding, H_{1h} is supported by this data, meaning that there is no association between (i) shareholders and investors' motive, and (ii) SCB practices.

5.9.9 Hypothesis 1i: Local communities and SCB practices

H_{1i} = There is no significant association between (i) local communities' motive and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) local communities' motive and (ii) SCB practices; $p = 1.0$, CI=95%.

Based on this finding, H_{1i} is supported by this data, meaning that there is no association between (i) local communities' motive and (ii) SCB practices.

5.9.10 Hypothesis 1j: NGOs' pressure and SCB practices

H_{1j} = There is no significant association between (i) NGOs' pressure motive and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between the NGOs' pressure motive and SCB practices; $p = 0.256$, CI=95%.

Based on this finding, H_{1j} is supported by this data, meaning that there is no association

between the NGOs' pressure motive and the SCB practices.

5.9.11 Hypothesis 2: Strengths of relationship between motives and SCB

H₂ = There is no strong relationship between the motives behind sustainability commitment and SCB practices.

Table 5-7: Spearman's rank correlation coefficient matrix (Motives and SCB)

| Spearman's rho | Q.7a | Q.7b | Q.7c | Q.7d | Q.7e | Q.7f | Q.7g | Q.7h | Q.7i | Q.7j |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|------|------|------|
| Q.11 Correlation Coefficient | -.239 | -.153 | -.349 | -.349 | -.333 | -.119 | -.077 | .184 | .261 | .096 |
| Sig. (2-tailed) | .229 | .447 | .074 | .074 | .090 | .554 | .702 | .357 | .189 | .634 |
| N | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |

The correlation matrix, as reflected in Table 5-7 shows that there was no strong statistically significant relationship between all the Q7 questions and Q11.

5.10 Correlation between constraints faced and SCB practices

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study, as reflected in Table 5-8 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the constraints companies face and the practice of sustainable capital budgeting.

Table 5-8: Constraints faced by companies versus SCB practices`

| A: Constraints companies face | B: SCB practices |
|---|--|
| Q.14 (a) Lack of availability of sustainability data | Q.11 Sustainability impacts are not considered (essential) when deciding upon capital projects |
| Q.14 (b) Difficulty in measuring sustainability impacts | |
| Q.14 (c) Lack of readily acceptable tools, techniques or models | |
| Q.14 (d) Discounted Cash Flows (such as IRR and NPV) are not adequate to incorporate sustainability impacts | |
| Q.14 (e) Other current models adopted are not adequate to incorporate sustainability impacts | |
| Q.14 (f) Lack of internal skills to evaluate projects with sustainability impacts | |
| Q.14 (g) Lack of guidelines available to aid companies to incorporate sustainability impacts | |

5.10.1 Hypothesis 3a: Unavailability of sustainability data, and SCB practices

H_{3a} = There is no significant association between (i) unavailability of sustainability data constraint, and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) unavailability of sustainability data and (ii) SCB practices; $p = 0.157$, CI=95%.

Based on this finding, H_{3a} is supported by this data, meaning that there is no association between (i) unavailability of sustainability data and (ii) SCB practices.

5.10.2 Hypothesis 3b: Difficulty in measuring sustainability impacts and SCB practices

H_{3b} = There is no significant association between (i) difficulty in measuring sustainability impacts constraints, and (ii) SCB practices.

A Fisher's' Exact Test for independence to indicate an association between difficulty in measuring sustainability impacts constraint and the SCB practices; $p = 0.499$, CI=95%.

Based on this finding, H_{3b} is supported by this data, meaning that there is no association between difficulty in measuring sustainability impacts constraint and the SCB practices.

5.10.3 Hypothesis 3c: Lack of tools, and SCB practices

H_{3c} = There is no significant association between (i) lack of readily acceptable tools and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) lack of readily acceptable tools, techniques or models and (ii) SCB practices; $p = 0.259$, CI=95%.

Based on this finding, H_{3c} is supported by this data, meaning that there is no association between (i) lack of readily acceptable tools, techniques or models and (ii) SCB practices.

5.10.4 Hypothesis 3d: Discounted Cash Flows' deficiencies, and SCB practices

H_{3d} = There is significant association between (i) Discounted Cash Flows' deficiencies and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) Discounted Cash Flows' deficiencies and (ii) SCB practices; $p = 0.744$, CI=95%.

Based on this finding, H_{3d} is supported by this data, meaning that there is no association between (i) Discounted Cash Flows' deficiencies and (ii) SCB practices.

5.10.5 Hypothesis 3e: Other current models' deficiencies, and SCB practices

H_{3e} = There is no association between (i) other current models' inability to incorporate sustainability impacts and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) other current models' inability to incorporate sustainability impacts and (ii) SCB practices; $p = 0.655$, CI=95%.

Based on this finding, H_{3e} is supported by this data, meaning that there is no association between (i) inability of current models to incorporate sustainability impacts and (ii) SCB practices.

5.10.6 Hypothesis 3f: Lack of internal skills, and SCB practices

H_{3f} = There is no association between (i) lack of internal skills and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between (i) lack of internal skills and (ii) SCB practices; $p = 1.0$, CI=95%.

Based on this finding, H_{3f} is supported by this data, meaning that there is no association between lack of internal skills and SCB practices.

5.10.7 Hypothesis 3g: Unavailability of guidelines and SCB practices

H_{3g} = There is no association between (i) unavailability of guidelines constraint has and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between unavailability of guidelines and SCB practices; $p = 0.499$, CI=95%.

Based on this finding, H_{3g} is supported by this data, meaning that there is no association between unavailability of guidelines and SCB practices.

5.10.8 Hypothesis 4: Strengths of relationship between variables

H₄ = There is no strong relationship between sustainable capital budgeting practices and the constraints companies face in incorporating sustainability impacts.

Table 5-9: Spearman's rank correlation coefficient matrix (Constraints and SCB)

| Spearman's rho | | Q.14a | Q.14b | Q.14c | Q.14d | Q.14e | Q.14f | Q.14g |
|----------------|-------------------------|-------|-------|-------|-------|-------|-------|--------|
| Q.11 | Correlation Coefficient | .349 | .429* | .348 | .373 | .397* | .368 | .553** |
| | Sig. (2-tailed) | .074 | .025 | .075 | .055 | .041 | .059 | .003 |
| | N | 27 | 27 | 27 | 27 | 27 | 27 | 27 |

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The correlation matrix, as reflected in Table 5-9 shows that there was no strong statistically significant relationship between all the Q14 questions and Q11 at 95% confidence.

5.11 Correlation between motives and adaptation of tools

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-10 below. The purpose of the Fisher's' Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's' Exact Test was used to test the association between the motives behind companies' drive for sustainability and the adaptation of tools to incorporate sustainability impacts. The Fisher's' Exact Test tested the null hypothesis to determine how likely two variables are associated.

Table 5-10: Motives behind companies' sustainability drive versus adaptation of tools

| A: Motives companies consider | B: Adaptation of tools |
|--|---|
| Q.7 (a) Reputation and company brand Q.7 (b) Competitive advantage & long term profitability Q.7 (c) Government, legal and regulatory requirements Q.7 (d) Customers' requirements Q.7 (e) Employees' requirements Q.7 (f) Suppliers' requirements Q.7 (g) Company's leadership (Board of Directors/CEO) Q.7 (h) Shareholders and investors Q.7 (i) Local communities Q.7 (j) NGO's | Q.22 We do not have a model to incorporate both economic and sustainability impacts |

5.11.1 Hypothesis 5a: Reputation and company brand and adaptation of tools

H_{5a} = There is no significant association between the company's reputation and brand motive to sustainability and adaptation of tools.

A Fisher's' Exact Test for independence to indicate an association between lack of availability of sustainability data and adaptation of tools; $p = 0.999$, CI=95%.

Based on this finding, H_{5a} is supported by this data meaning that there is no association between the constraint company's reputation and brand motive to sustainability and adaptation of tools.

5.11.2 Hypothesis 5b: Competitive advantage and profitability versus adaptation of tools

H_{5b} = There is no significant association between (i) competitive advantage and long term profitability motive, and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between competitive advantage and long term profitability motive and the adaptation of tools; $p = 0.859$, CI=95%.

Based on this finding, H_{5b} is supported by this data meaning that there is no association between competitive advantage and long term profitability motive and adaptation of tools.

5.11.3 Hypothesis 5c: Government's requirements and adaptation of tools

H_{5c} = There is no significant association between (i) Government, legal and regulatory requirements' motive, and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between the Government, legal and regulatory requirements' motive and the adaptation of tools, $p = 1.0$, CI=95%. Based on this finding, H_{5c} is supported by this data, meaning that there is no association between the Government, legal and regulatory requirements and the adaptation of tools.

5.11.4 Hypothesis 5d: Customers' requirements and adaptation of tools

H_{5c} = There is no significant association between (i) customers' requirements motive and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between the customers' requirements motive and the adaptation of tools, $p = 0.999$, CI=95%.

Based on this finding, H_{5d} is supported by this data, meaning that there is no association between the customers' requirements motive and the adaptation of tools.

5.11.5 Hypothesis 5e: Employees' requirements and adaptation of tools

H_{5e} = There is no significant association between (i) employees' requirements motive and (ii) adaptation of tools.

A Fisher's' Exact Test for independence to indicate an association between the employees' requirements motive and the adaptation of tools; $p = 0.072$, CI=95%.

Based on this finding, H_{5e} is supported by this data, meaning that there is no association between the employees' requirements motive and the adaptation of tools.

5.11.6 Hypothesis 5f: Suppliers' requirements and adaptation of tools

H_{5f} = There is no significant association between (i) suppliers' requirements motive and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between the suppliers' requirements motive and the adaptation of tools; $p = 0.548$, CI=95%.

Based on this finding, H_{5f} is supported by this data, meaning that there is no association between the suppliers' requirements motive and the adaptation of tools.

5.11.7 Hypothesis 5g: Company's leadership and adaptation of tools

H_{5g} = There is no significant association between (i) company's leadership (Board of Directors/CEO) motive and (ii) adaptation of tools.

A Fisher's' Exact Test for independence to indicate an association between the company's leadership (Board of Directors/CEO) motive and the adaptation of tools; $p = 0.741$, CI=95%.

Based on this finding, H_{5g} is supported by this data, meaning that there is no association between the company's leadership (Board of Directors/CEO) motive and adaptation of tools.

5.11.8 Hypothesis 5h: Shareholders' and investors' motives versus adaptation of tools

H_{5h} = There is no significant association between (i) shareholders' and investors' motive and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between the shareholders and investors' motive and the adaptation of tools; $p = 0.424$, CI=95%.

Based on this finding, H_{5h} is supported by this data, meaning that there is no association between the shareholders and investors' motive and the adaptation of tools.

5.11.9 Hypothesis 5i: Local communities and adaptation of tools

H_{5i} = There is no significant association between (i) local communities' motive and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between the local communities' motive and the adaptation of tools; $p = 0.229$, CI=95%.

Based on this finding, H_{5i} is supported by this data, meaning that there is no association between the local communities' motive and the adaptation of tools.

5.11.10 Hypothesis 5j: NGOs' pressure and adaptation of tools

H_{5j} = There is no significant association between (i) NGOs' pressure motive and (ii) adaptation of tools.

A Fisher's Exact Test for independence was conducted to indicate an association between the NGOs' pressure motive and the adaptation of tools; $p = 0.027$, $CI=95\%$.

Based on this finding, H_{5j} is not supported by this data, meaning that there is significant association between the NGOs' pressure motive and the adaptation of tools.

5.11.11 Hypothesis 6: Strengths of relationship between variables

H_6 = There is no strong relationship between the adaption of capital budgeting tools and the motives driving sustainability commitment.

Table 5-11: Spearman's rank correlation coefficient matrix (Motives and Adaptation of Tools)

| Spearman's rho | Q.7a | Q.7b | Q.7c | Q.7d | Q.7e | Q.7f | Q.7g | Q.7h | Q.7i | Q.7j |
|------------------------------|------|------|-------|------|-------|-------|------|-------|-------|-------|
| Q.22 Correlation Coefficient | .230 | .137 | -.206 | .007 | -.371 | -.060 | .062 | -.131 | -.182 | -.125 |
| Sig. (2-tailed) | .247 | .497 | .302 | .972 | .057 | .765 | .758 | .516 | .363 | .536 |
| N | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |

The correlation matrix, as reflected in Table 5-11 shows that there was no strong statistically significant relationship between all the Q7 questions and Q22.

5.12 Correlation between constraints faced and adaptation of tools

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-12 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the constraints faced and the adaptation of tools to incorporate sustainability impacts. The Fisher's Exact statistical test tested the null hypothesis to determine how likely it is that the two variables are associated.

Table 5-12: Constraints faced versus adaptation of tools

| A: Constraints companies face | B: Adaptation of tools |
|--|---|
| Q.14 (a) Lack of availability of sustainability data | Q.22 We do not have a model to incorporate both economic and sustainability impacts |
| Q.14 (b) Difficulty in measuring sustainability impacts | |
| Q.14 (c) Lack of readily acceptable tools, techniques or models | |
| Q.14 (d) Discounted Cash Flows (such as -IRR and NPV) are not adequate to incorporate sustainability impacts | |
| Q.14 (e) Other current models adopted are not adequate to incorporate sustainability impacts | |
| Q.14 (f) Lack of internal skills | |
| Q.14 (g) Lack of guidelines | |

5.12.1 Hypothesis 7a: Unavailability of sustainability data and adaptation of tools

H_{7a} = There is no significant association between (i) unavailability of sustainability data and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between unavailability of sustainability data and adaptation of tools; $p = 0.425$, CI=95%.

Based on this finding, H_{7a} is supported by this data, meaning that there is no association between unavailability of sustainability data and adaptation of tools.

5.12.2 Hypothesis 7b: Difficulty in measuring sustainability impacts and adaptation of tools

H_{7b} = There is no significant association between (i) difficulty in measuring sustainability impacts and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between difficulty in measuring sustainability impacts constraint and the adaptation of tools, $p = 0.015$, CI=95%.

Based on this finding, H_{7b} is not supported by this data meaning that there is significant association between difficulty in measuring sustainability impacts constraint and the adaptation of tools.

5.12.3 Hypothesis 7c: Lack of tools and adaptation of tools

H_{7c} = There is no significant association between (i) lack of readily acceptable tools, techniques or models and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between lack of readily acceptable tools, techniques or models and the adaptation of tools; $p = 0.413$, CI=95%. Based on this finding, H_{7c} is supported by this data, meaning that there is no association between lack of readily acceptable tools, techniques or models and the adaptation of tools.

5.12.4 Hypothesis 7d: Discounted Cash Flows' deficiencies and adaptation of tools

H_{7d} = There is significant association between (i) Discounted Cash Flows' inability to incorporate sustainability impacts and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between Discounted Cash Flows deficiencies and adaptation of tools; $p = 0.035$, CI=95%.

Based on this finding, H_{7d} is not supported by this data meaning that there is significant association between the DCF sustainability deficiencies and adaptation of tools.

5.12.5 Hypothesis 7e: Other current models' deficiencies and adaptation of tools

H_{7e} = There is no association between (i) other current models' inability to incorporate sustainability impacts and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between the inability of current models' deficiencies and adaptation of tools; $p = 0.126$, CI=95%.

Based on this finding, H_{7e} is supported by this data, meaning that there is no association between the inability of current models to incorporate sustainability impacts and adaptation of tools.

5.12.6 Hypothesis 7f: Lack of internal skills and adaptation of tools

H_{7f} = There is no association between (i) lack of internal skills and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between lack of internal skills and adaptation of tools; $p = 0.192$, CI=95%.

Based on this finding, H_{7f} is supported by this data, meaning that there is no association between lack of internal skills and adaptation of tools.

5.12.7 Hypothesis 7g: Unavailability of guidelines and adaptation of tools

H_{7g} = There is no association between (i) unavailability of guidelines and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between unavailability of guidelines and adaptation of tools; $p = 0.035$, CI=95%.

Based on this finding, H_{7g} is not supported by this data, meaning that there is significant association between unavailability of guidelines and adaptation of tools.

5.12.8 Hypothesis 8: Strengths of relationship between variables

H₈ = There is no strong relationship between the adaption of capital budgeting tools and the constraints companies face in incorporating sustainability impacts.

Table 5-13: Spearman's rank correlation coefficient matrix (Constraints and Adaptation of Tools)

| Spearman's rho | Q.14a | Q.14b | Q.14c | Q.14d | Q.14e | Q.14f | Q.14g |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Q.22 Correlation Coefficient | .224 | .457* | .384* | .281 | .359 | .169 | .280 |
| Sig. (2-tailed) | .262 | .017 | .048 | .155 | .066 | .399 | .157 |
| N | 27 | 27 | 27 | 27 | 27 | 27 | 27 |

*. Correlation is significant at the 0.05 level (2-tailed).

The correlation matrix, as reflected in Table 5-13 shows that there was no strong statistically

significant relationship between all the Q14 questions and Q22 except for Q14b, and Q14c against Q22.

5.13 Correlation between commitment and SCB practices

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-14 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the companies' commitment to sustainability and the practice of sustainable capital budgeting. The Fisher's Exact tested the null hypothesis to determine how likely it is that the two variables are associated.

Table 5-14: Commitment that drives sustainability commitment versus SCB practices

| A: Commitment | B: SCB practices |
|---|---|
| Q.2 Sustainability's priority to companies Q.3 Existence of formal strategy related to sustainability Q.4 Existence of business case to sustainability approach | Q.11 Sustainability impacts are not considered (essential) when deciding upon capital projects (social impacts and environmental impacts) |

5.13.1 Hypothesis 9a: Sustainability priority and SCB practices

H_{9a} = There is no significant association between (i) sustainability priority and (ii) SCB practices.

A Fisher's Exact Test for independence was conducted to indicate an association between Sustainability priority and SCB practices; $p = 0.003$, CI=95%.

Based on this finding, H_{9a} is not supported by this data, meaning that there is a significant association between Sustainability priority and SCB practices.

5.13.2 Hypothesis 9b: Formal sustainability strategy and SCB practices

H_{9b} = There is no significant association between (i) existence of formal strategy related to sustainability and (ii) SCB practices.

A Fisher's Exact Test for independence was conducted to indicate an association between the existence of a formal strategy related to sustainability and the SCB practices; $p = 0.999$, CI=95%. Based on this finding H_{9b} is supported by the data, meaning that there is no

association between the existence of a formal strategy related to sustainability and the SCB practices.

5.13.3 Hypothesis 9c: Sustainability business case and SCB practices

H_{9c} = There is no significant association between (i) existence of business case for sustainability approach and (ii) SCB practices.

A Fisher's' Exact Test for independence was conducted to indicate an association between existence of business case for sustainability approach and SCB practices; $p = 0.279$, $CI=95\%$.

Based on this finding, H_{9c} is supported by this data, meaning that there is no association between existence of business case for sustainability approach and the SCB practices.

5.13.1 Hypothesis 10: Strengths of relationship between variables

H₁₀ = There is no strong relationship between the sustainable capital budgeting practices and the companies' commitment to sustainability.

Table 5-15: Spearman's rank correlation coefficient matrix (Commitment and SCB practices)

| Spearman's rho | | Q.2 | Q.3 | Q.4 |
|----------------|-------------------------|---------|--------|-------|
| Q.11 | Correlation Coefficient | -.651** | -.404* | -.311 |
| | Sig. (2-tailed) | .000 | .036 | .114 |
| | N | 27 | 27 | 27 |

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The correlation matrix, as reflected in Table 5-15 shows that there was strong statistically significant relationship between all the questions except for Q4 and Q11.

5.14 Correlation between commitment and adaptation of tools

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-16 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables.

In this study the Fisher's Exact Test was used to test the association between the companies' commitment to sustainability and the adaptation of tools to incorporate sustainability impacts. The Fisher's Exact statistical test tested the null hypothesis to determine how likely it is that two variables are associated.

Table 5-16: Commitment that drives sustainability commitment versus SCB practices

| A: Commitment | B: Adaptation of tools |
|---|---|
| Q.2 Sustainability's priority to companies Q.3 Existence of formal strategy related to sustainability Q.4 Existence of business case to sustainability approach | Q.22 We do not have a model to incorporate both economic and sustainability impacts |

5.14.1 Hypothesis 11a: Sustainability priority and adaptation of tools

H_{11a} = There is no significant association between (i) sustainability priority and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between sustainability priority and adaptation of tools; $p = 0.740$, CI=95%.

Based on this finding, H_{11a} is supported by this data, meaning that there is no association between sustainability priority and adaptation of tools.

5.14.2 Hypothesis 10b: Formal sustainability strategy and adaptation of tools

H_{11b} = There is no significant association between (i) existence of formal strategy related to sustainability and (ii) adaptation of tools.

A Fisher's' Exact Test for independence was conducted to indicate an association between existence of formal strategy related to sustainability and adaptation of tools; $p = 0.481$, CI=95%.

Based on this finding, H_{11b} is supported by this data, meaning that there is no association between existence of formal strategy related to sustainability and adaptation of tools.

5.14.3 Hypothesis 11c: Sustainability business and adaptation of tools

H_{11c} = There is no significant association between (i) existence of business case for sustainability approach and (ii) adaptation of tools.

A Fisher's' Exact Test for independence to indicate an association between existence of business case for sustainability approach adaptation of tools; $p = 0.518$, CI=95%.

Based on this finding, H_{11c} is supported by this data, meaning that there is no association between existence of business case for sustainability approach and adaptation of tools.

5.14.4 Hypothesis 12: Strengths of relationship between variables

H_{12} = There is no strong relationship between the adaptation of tools and the companies' commitment to sustainability.

Table 5-17: Spearman's rank correlation coefficient matrix (Commitment and Adaptation of tools)

| Spearman's rho | Q.2 | Q.3 | Q.4 |
|------------------------------|-------|-------|-------|
| Q.22 Correlation Coefficient | -.234 | -.065 | -.123 |
| Sig. (2-tailed) | .241 | .749 | .542 |
| N | 27 | 27 | 27 |

The correlation matrix, as reflected in Table 5-17 shows that there was no strong statistically significant relationship between all the questions.

5.15 Measurement instrument reliability testing

According to Pallant (2007), a Cronbach's alpha coefficient of greater than .70 is considered acceptable and an alpha of less than .70 is an indication that the scale is not internally consistent.

In this study, all the scales, as depicted in Table 5-18, Table 5-19 and Table 5-20, show that all the values are above .7, indicating that all the constructs were internally consistent.

Table 5-18: Cronbach's Alpha coefficient for sustainability

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| Q.2 Sustainability is a priority for my company | 122.30 | 171.447 | .526 | .894 |
| Q.3 My company has a formal strategy related to sustainability | 122.19 | 174.618 | .479 | .895 |
| Q.4 My company has developed a clear business case or a proven value proposition for its approach to sustainability | 122.52 | 170.721 | .533 | .894 |
| Q.5.a Occupational Health & Safety | 122.15 | 172.516 | .384 | .896 |
| Q.5.b Training and Education (training security personnel on human rights) | 122.22 | 172.487 | .507 | .894 |
| Q.5.c Supplier Assessment for Labour Practices | 123.19 | 171.080 | .472 | .894 |
| Q.5.d Security Practices | 123.22 | 175.333 | .261 | .898 |
| Q.5.e Supplier Human Rights Assessment | 123.52 | 168.413 | .519 | .893 |
| Q.5.f Anti-corruption | 122.26 | 175.430 | .345 | .897 |
| Q.5.g Anti-competitive Behavior | 122.44 | 177.564 | .188 | .899 |
| Q.5.h Supplier Assessment for Impacts on Society | 123.30 | 171.678 | .400 | .896 |
| Q.5.i Customer Health and Safety | 122.93 | 177.687 | .202 | .899 |
| Q.5.j Product and Service Labelling (content, safe use, and disposal) | 123.04 | 173.191 | .341 | .897 |
| Q.5.k Product Compliance | 122.52 | 177.413 | .154 | .901 |
| Q6.a Energy Consumption | 122.33 | 166.000 | .681 | .891 |
| Q6.b Water Consumption (Water use efficiency) | 122.19 | 167.849 | .664 | .891 |
| Q6.c Biodiversity loss | 122.67 | 164.000 | .723 | .889 |

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| | | | | |
|--|--------|---------|------|------|
| Q6.d Emissions and pollution (air, water, soil) | 122.56 | 160.872 | .752 | .888 |
| Q6.e Effluents and Waste | 122.26 | 169.046 | .649 | .892 |
| Q6.f Products and Services | 122.52 | 170.952 | .488 | .894 |
| Q6.g Environmental Compliance (and reporting) | 122.15 | 174.516 | .395 | .896 |
| Q7.a Managing reputation and company brand | 122.26 | 174.507 | .396 | .896 |
| Q7.b Achieving competitive advantage and long term profitability | 122.41 | 169.866 | .547 | .893 |
| Q7.c Government, legal and regulatory requirements | 122.00 | 176.692 | .435 | .896 |
| Q7.d Customers' requirements | 122.96 | 172.883 | .297 | .898 |
| Q7.e Employees' requirements | 123.00 | 162.385 | .642 | .891 |
| Q7.f Suppliers' requirements | 123.44 | 165.487 | .516 | .894 |
| Q7.g Company's leadership (Board of Directors/CEO) | 122.33 | 172.308 | .485 | .894 |
| Q7.h Shareholders and investors | 122.59 | 171.481 | .387 | .896 |
| Q7.i Local communities | 122.63 | 170.319 | .358 | .897 |
| Q7.j NGO's | 123.04 | 171.652 | .337 | .898 |

Table 5-19: Cronbach's Alpha coefficient for sustainability incorporation

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|--|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| Q9.a Occupational Health & Safety | 84.22 | 115.256 | .617 | .885 |
| Q9.b Training and Education (training security personnel on human rights) | 84.74 | 115.353 | .520 | .887 |
| Q9.c Supplier Assessment for Labour Practices | 85.37 | 112.319 | .534 | .886 |
| Q9.d Security Practices | 85.33 | 112.846 | .483 | .888 |
| Q9.e Supplier Human Rights Assessment | 85.63 | 116.011 | .459 | .888 |
| Q9.f Anti-corruption | 84.37 | 112.242 | .698 | .883 |
| Q9.g Anti-competitive Behavior | 84.67 | 112.692 | .542 | .886 |
| Q9.h Supplier Assessment for Impacts on Society | 85.04 | 110.268 | .617 | .884 |
| Q9.i Customer Health and Safety | 84.81 | 113.849 | .472 | .888 |
| Q9.j Product and Service Labelling (content, safe use, and disposal) | 84.81 | 112.080 | .585 | .885 |
| Q9.k Product Compliance | 84.26 | 111.969 | .691 | .883 |
| Q10.a Energy Consumption | 84.22 | 113.410 | .641 | .884 |
| Q10.b Water Consumption | 84.22 | 113.487 | .637 | .884 |
| Q10.c Biodiversity loss | 84.63 | 111.781 | .602 | .884 |
| Q10.d Emissions and pollution (air, water, soil) | 84.41 | 111.405 | .677 | .883 |
| Q10.e Effluents and Waste | 84.26 | 112.046 | .686 | .883 |
| Q10.f Products and Services impact on environment | 84.44 | 113.795 | .627 | .885 |
| Q10.g Environmental Compliance and reporting | 84.11 | 113.718 | .718 | .883 |
| Q10.h Transport | 84.33 | 116.846 | .447 | .889 |
| Q11 Sustainability impacts are not considered (essential) when deciding upon capital projects (social impacts and environmental impacts) | 86.93 | 136.302 | -.626 | .912 |
| Q12 Sustainability impacts are sometimes considered when deciding upon capital projects (social impacts and environmental impacts) | 85.93 | 120.456 | .094 | .903 |
| Q13 Sustainability impacts are always considered when deciding upon capital projects (social impacts and environmental impacts) | 84.37 | 116.781 | .497 | .888 |
| Q.19 We include the qualitative factors when deciding upon capital projects | 84.74 | 117.046 | .418 | .889 |

Table 5-20: Cronbach's Alpha coefficient for constraints

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|--|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| Q14.a Lack of availability of sustainability data | 16.85 | 35.131 | .690 | .921 |
| Q14.b Difficulty in measuring sustainability impacts | 16.81 | 33.080 | .818 | .909 |
| Q14.c Lack of readily acceptable tools, techniques or models | 16.93 | 32.994 | .862 | .905 |
| Q14.d Discounted Cash Flows (such as Internal Rate of Return-IRR and Net Present Value-NPV) are not adequate to incorporate sustainability impacts | 16.63 | 37.011 | .591 | .930 |
| Q14.e Other current models adopted are not adequate to incorporate sustainability impacts | 16.67 | 35.000 | .725 | .918 |
| Q14.f Lack of internal skills to evaluate projects with sustainability impacts | 17.00 | 31.846 | .815 | .909 |
| Q14.g Lack of guidelines available to aid companies to incorporate sustainability impacts | 16.89 | 32.103 | .858 | .904 |

5.16 Summary of findings

The following is a summary of the findings, beginning with descriptive findings followed by inferential findings.

Descriptive statistics findings

- Sustainability is a priority for most of the companies.
- Most companies have strategies related to sustainability.
- Most companies have a clear business case or value proposition for their approach to sustainability.
- Most companies agree that they are addressing both the social and environmental impacts.
- Government regulations are the biggest driver behind companies' commitment to sustainability.
- Most companies agreed that they consider both the social and the environmental impacts when evaluating capital projects and that there is high consistency in considering sustainability impacts among companies.
- 71% of the respondents agreed that DCF is inadequate whilst 41% of the respondents agreed that the current models are not adequate to incorporate sustainability impacts when evaluating capital projects.
- Tools mostly used include DCF and Cost Benefit Analysis, followed by Sustainability Impact Assessment (SIA) and in-house tools.
- There is lack of Government intervention to ensure sustainability impacts are considered when capital projects are evaluated.
- The accounting profession could play a role by providing business guidance through skills development, practice of sustainable capital budgeting, assurance of sustainability incorporation through audits, financial reporting, development of frameworks and models for incorporation of sustainability impacts, and Government policy influence.
- The respondents agreed that a holistic model that is capable of incorporating the economic impacts, social impacts, and environmental impacts, is necessary.

Inferential statistics findings

- H 1a There is no association between reputation and company brand, and SCB practices.
- H 1b There is significant association between competitive advantage and long term profitability, and SCB practices.
- H 1c There is no association between Government, legal and regulatory requirements, and SCB practices.
- H 1d There is no association between customers' requirements, and SCB practices.
- H 1e There is no association between employees' requirements, and SCB practices.
- H 1f There is significant association between suppliers' requirements, and SCB practices.
- H 1g There is no association between a company's leadership, and SCB practices.
- H 1h There is no association between shareholders and investors, and SCB practices.
- H 1i There is no association between caring for local communities, and SCB practices.
- H 1j There is no association between NGO pressure, and SCB practices.
- H 3a There is no association between lack of availability of sustainability data, and SCB practices.
- H 3b There is no association between difficulty in measuring sustainability impacts, and SBC practices.
- H 3c There is no association between a lack of readily acceptable tools, techniques or models, and SCB practices.
- H 3d There is no association between DCF's deficiencies, and SCB practices.
- H 3e There is no association between other current models' deficiencies, and SCB practices.
- H 3f There is no association between a lack of internal skills to evaluate projects with sustainability impacts, and SCB practices.
- H 3g There is no association between a lack of guidelines available to aid companies to incorporate sustainability impacts, and SCB practices.
- H 5a There is no association between reputation and company brand, and the adaptation of tools.
- H 5b There is no association between competitive advantage and long term profitability, and the adaptation of tools.
- H 5c There is an association between Government, legal and regulatory requirements, and the adaptation of tools
- H 5d There is no association between customers' requirements, and the adaptation of tools.
- H 5e There is no association between employees' requirements, and the adaptation of tools.
- H 5f There is no association between suppliers' requirements, and the adaptation of tools.
- H 5g There is no association between a company's leadership, and the adaptation of tools.
- H 5h There is no association between shareholders and investors, and the adaptation of tools.
- H 5i There is no association between caring for local communities, and the adaptation of tools.
- H 5j There is significant association between NGO pressure, and the adaptation of tools.
- H 7a There is no association between lack of availability of sustainability data, and the adaptation of tools.
- H 7b There is significant association between difficulty in measuring sustainability impacts, and the adaptation of tools.
- H 7c There is no association between a lack of readily acceptable tools, techniques or models, and SCB practices.
- H 7d There is significant association between DCF's deficiencies, and the adaptation of tools.
- H 7e There is no association between other current models' deficiencies, and the adaptation

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of tools.

- H 7f There is no association between lack of internal skills to evaluate projects with sustainability impacts, and the adaptation of tools.
- H 7g There significant association between the lack of guidelines available to aid companies to incorporate sustainability impacts, and the adaptation of tools.
- H 9a There is significant association between sustainability's priority to companies, and SCB practices.
- H 9b There is no association between the existence of a formal strategy related to sustainability, and SCB practices.
- H 9c There is no association between the existence of a business case to sustainability approach, and SCB practices.
- H 11a There is a significant association between sustainability's priority to companies, and the adaptation of tools.
- H 11b There is no association between the existence of a formal strategy related to sustainability, and the adaptation of tools.
- H 11c There is no association between the existence of a business case to sustainability approach, and the adaptation of tools.

6. Discussion of results

6.1 Introduction

In this Chapter the results presented in Chapter 5 will be discussed in relation to the literature review in Chapter 2, the research questions in Chapter 3 and the problem identification in Chapter 1. Thus this Chapter offers a holistic discussion within the context of the research objectives.

6.2 Profile of respondents

The majority of the respondents were from the mining sector (48.1%). This could be an indication that most Scope-1 GHG companies are mining companies and that sustainability impacts are more prevalent in the mining sector due to higher number of mining companies observed in this study. It has been noted that 89% of the respondents generate revenues above R500 million. The majority of the companies are JSE-listed, whose conduct is under public scrutiny and thus they have a duty to disclose their business affairs. These companies are required to comply with the King III code of ethics by preparing sustainability reports (King III, 2009).

6.3 Companies' commitment to sustainability and motives

6.3.1 Companies commitment to sustainability

It was indicated in Chapter 2 that the majority of the sustainability impacts are ascribed to business practices (Crane & Matten, 2010). As a "spaceship", planet earth needs to be preserved due to the limited resources available; we cannot delay any further lest we run into crisis (Davis, 1973; Visser, 2013). The responsibility in terms of the attribution conclusion in Chapter 3 requires companies to deal with sustainability impacts that are caused at agent-level and micro-level, as the discourse was not about whether or not companies should address the sustainability impacts at micro level at most. Indeed, as can be seen in Figure 5-1 and Figure 5-2, 93% of companies agreed that sustainability was a priority for their companies, thus confirming that corporates accept the responsibility for dealing with sustainability impacts.

Not only do Scope-1 companies prioritise sustainability, but 97% of the companies agree that they have a formal strategy related to sustainability, whilst 85% also pointed out that they have a clear business case for sustainability initiatives. Paradoxically, some companies do not consider sustainability to be a priority yet they have formal strategies to address sustainability impacts, i.e. some of them commit without a clear value proposition to support their profit making agenda. This commitment is akin to Burritt and Schaltegger's (2010) "outside-in" approach to sustainability, as measured by government regulations and

requirements to coerce corporates to address sustainability impacts.

Of the social impacts, OH&S is the main impact that is addressed, followed by training and education and anti-corruption. From a social impact perspective, Table 5-2 outlines the fact that companies agreed on addressing training and education (97%), OH&S (92%), anti-corruption (89%), anti-competitive behaviour (85%), product compliance with rules and regulations (81%), customer health and safety (69%), product labelling about information on content, safe use and disposal (55%), supplier assessment for labour practices (52%) and supplier assessment for impact on society (52%).

As per Table 5-3, companies address environmental compliance and reporting (96%), effluent and waste (92%), energy consumption (89%) and water consumption (89%), products' and services' impact on the environment (81%), biodiversity loss (74%) and emissions and pollution such as air, water and soil (77%). The leading environmental issues addressed are due to the nature of the mining business constituting the majority of the respondents.

It is thus concluded that South African companies are committed to sustainability. The motives behind this commitment are addressed below.

6.3.2 Motives that are driving the companies' sustainability commitment

Now that we are aware that Scope-1 companies in South Africa are committed to sustainability, it is crucial to discern what the driving forces behind this sustainability commitment are. Is it driven externally by stakeholders, or is it internally driven through proactive leadership?

Votaw's (1972) perspective was that CSR has different connotations for different interpreters, for example CSR could be seen as an ethical matter (Pirnea et al., 2011). In other contexts, CSR is seen as a legitimacy matter that is driven by stakeholders (Brønn & Vidaver-Cohen, 2009; Freeman, 1984; Hopkins, 2009; Kiron et al., 2013; Reddy and Rampersad, 2012). It could also be seen as being driven by strong business cases rather than external factors or stakeholders (Vesty et al., 2013) in the context of profitability. The business case approach could be in the form of efficiencies, profit making, or competitive advantage, amongst other motives.

Prior to this study it was neither clear nor known what South African companies' drives for sustainability were. According to Figure 5-7, Scope-1 companies in South Africa agreed that government regulations and company leadership are the biggest stakeholders driving sustainability. All companies agreed that government regulations impact their sustainability motives; most mining companies are regulated in terms of rehabilitation requirements and

other sustainability requirements to secure their mineral exploration and extraction licences. Other drivers were reputation and branding at 96% and competitive advantage at 85%, as well as efficiencies. Other stakeholders, although at lower agreement percentages, also exert an influence on sustainability, with suppliers' requirements ranking last. Most importantly, it is clear that South African companies are also ethical, as they agreed that their sustainability initiatives are driven by local communities. Some respondents also pointed out that lenders do require a sustainability commitment for funding purposes.

6.4 Sustainable capital budgeting practices

Commitments and motives for sustainability are nothing more than sustainability cognition. Meyer and Kiyamaz (2015) established a disconnection between sustainability cognition and sustainable capital budgeting practices in the U.S. The extent to which South African companies commit to sustainability and act upon such commitment was one of the questions that this study sought to clarify.

There is a need to be both cognitive and active when dealing with sustainability commitment, by practising sustainable capital budgeting as per Burritt and Schaltegger's (2010) "inside-out approach" and Perera, Del Pino and Oliveira, (2013). Sustainability needs to be coded within the DNA of the companies' decision making (AICPA, CICA, & CIMA, 2010). One way of doing this is through embedding sustainability in capital budgeting decision making, as per Perera et al. (2013). It has been argued in this study that a company should be seen as a portfolio of capital projects. Addressing sustainability impacts at agent-level would almost be equivalent to dealing with sustainability impacts at micro-level, save for the fact that dealing with sustainability impacts at agent level is proactive rather than reactive. It could be too little too late for companies to take remedial actions at a micro-level, as the damage could be irreversible.

In South Africa, from a social impact perspective, Table 5-4 illustrates the fact that companies agreed that they incorporate OH&S (96%), product compliance with rules and regulations (93%), anti-corruption (85%), training and education (78%), customer health and safety (74%), product labelling about information on content, safe use and disposal (67%), anti-competitive behaviour (67%) and supplier assessment for impacts on society (52%).

Arguably, from this analysis, companies incorporate employee related health and safety more than their customers' health and safety. In addition, product information also ranks lower relative to employees' health and safety concern. The rationale behind this is unclear; it could be argued that from a business model point of view, customers come first for economic sustainability reasons. Under no circumstances does this argument undermine the importance of employees, save for critiquing the balance between these two impacts.

The companies also agreed that they address the following environmental impacts: energy consumption, water consumption, biodiversity loss, emissions and pollution (air, water, soil) effluent and waste, products' and services' impact on the environment, environmental compliance and reporting, and transport. (Refer to Table 5-5)

It is thus concluded that Scope-1 GHG companies incorporate the above social and environmental impacts consistently (refer to Figure 5-8), however it is unknown whether this is only practiced in the sectors covered by this study or across industries.

Actions that are taken to incorporate sustainability impacts are preventative in nature. "Prevention is better than cure" (Brønn and Vidaver-Cohen, 2009; Davis, 1973).

6.5 Constraints faced when practising sustainable capital budgeting

It is clear that companies are committed to sustainability for various causes, as discussed in section 6.3.2. Companies also embed sustainability impacts when evaluating capital investments. Although it was clarified that the respondent companies practice sustainable capital budgeting, it was imperative to establish what types of constraints corporates face in practicing such sustainable capital budgeting. Australian companies still encounter constraints relating to the measurement of sustainability impacts, data availability and collection costs, as well as costs of external expertise (Vesty et al., 2013).

In South Africa, companies do not encounter constraints as much as they do in Australia; the results were split between those who agreed and those who disagreed about the constraints (refer to Figure 5-12). To a lesser degree, the companies agreed that a lack of availability of sustainability data (37%), difficulty in measuring sustainability impacts (30%), a lack of readily acceptable tools, techniques or models (30%), DCF's deficiencies in incorporating sustainability impacts (37%), other current models' deficiencies in incorporating sustainability impacts (41%), a lack of internal skills to evaluate projects with sustainability impacts (33%), and a lack of guidelines available to aid companies to incorporate sustainability impacts (33%) are constraints faced in South Africa. Some respondents reflected that funding constraints, a lack of government intervention and policies as well as subjectivity in evaluating capital projects hinder their efforts to practise sustainable capital budgeting. Only from 2016 will the government of South Africa implement the mooted carbon tax policy, which has the potential to swing the results of this study in terms of sustainability practices (DNT, 2014).

Although DCF is deficient, it is not considered a sufficient constraint when practising sustainable capital budgeting in South Africa. It is thus concluded that the constraints in South Africa are lesser than those in Australia.

6.6 The role of the accounting profession in dealing with constraints

Undoubtedly there is a gap between sustainability and accounting (Çalışkan, 2014), thus the respondents were asked to describe the role that accountants and the accounting profession could play in dealing with the constraints that they face, if ever, when incorporating sustainability impacts in capital projects appraisal.

Some respondents believed that accountants could play a leading role in providing business and financial guidance to business leaders and by starting to accept that the cost related to sustainability practices is part of business. Confirmation of this is that accountants, through managerial accounting, provide information that informs the decision making as well as sustainability reporting (Sisaye & Birnberg, 2010; Çalışkan, 2014).

Two of the respondents commented that focus should also be on training and development, either through adapting school curricula or through informal training, which confirms Çalışkan's (2014) suggestion. Another area of contribution is through the use of experts due to the complexity of sustainability assessment as it is non-financial in nature; specialists from the relevant fields could be insourced, supporting Çalışkan's (2014) suggestion that a "certified sustainability accountant" who has sustainability engineering acumen must deal with the technical matters relating to sustainability. 'Walking the talk' through consistent SCB practices is another way accountants could contribute by devoting their efforts towards incorporating sustainability impacts into capital budgeting bounds. To better achieve this, tools could be developed to aid them in evaluating the impacts within capital budgeting bounds. Although one respondent felt that accountants could also play a role through influencing the government, the imminent carbon tax policy due in 2016 will pre-empt this role, save for continuous government stakeholder management to ensure ongoing improvement. One respondent asserted that a sustainability balance sheet - a non-financial statement - to track sustainability performance is imperative. Lastly, two respondents opined that the accounting profession could contribute by providing assurance to audit sustainability practices at the relevant reporting levels. It is argued that a certified sustainability accountant, as suggested by Çalışkan (2014), could provide such an assurance.

6.7 Adaptation of tools to incorporate sustainability impacts

It was argued in Chapter 2 that conventional capital budgeting tools such as the DCF are deficient in incorporating sustainability impacts (Burrill & Schaltegger, 2010; Sookram and Kistow, 2012). This study also confirmed this view (refer to Figure 5-14 and Figure 5-16), and it has been established that 71% of Scope-1 companies in South Africa find DCF deficient in dealing with sustainability impacts. Still, according to Correia and Cramer (2008),

the most widely used technique in South Africa is the DCF. Despite its conceded deficiencies, it has been concluded in this study that 52% of the respondents use DCF to incorporate sustainability impacts. The results conclude that DCF has been adapted to deal with sustainability impacts, as evidenced by the fact that DCF is not considered a sufficient constraint (see Figure 5-12). It is intriguing to consider how this is possible, due to the fact that DCF is a financial and a quantitative tool; to adapt it for SCB will require two premises to be fulfilled. Firstly, all sustainability impacts should be measurable quantitatively, and secondly, the measurement should be in monetary form. It has yet to be established how the DCF and cost benefit analysis have been adapted to incorporate sustainability impacts, in spite of the difficulty in fulfilling the two premises described above.

Other models that were ranked higher by respondents include a cost benefit analysis (52%), a sustainability impact assessment (48%), an in-house tool (30%), a life cycle analysis (26%), a state gate model, a SLP plan, a multi-criteria assessment investment framework, a project definition readiness assessment (PDRA) and a socio-economic assessment toolbox.

The commitment that companies claim regarding sustainability is corroborated by the conclusions of this study as follows: firstly, it is through their determination to adapt deficient tools such as DCF in an attempt to practice sustainable capital budgeting. A case study needs to be conducted to establish how these tools are operationalised to incorporate sustainability impacts. Secondly, only 14% of the respondents agreed that they do not have a model to incorporate sustainability impacts when evaluating capital projects, whilst 52% agreed that they currently have a model to deal with sustainability during the capital budgeting process. The rest of the respondents were neutral.

6.8 Characteristics of a sustainable capital budgeting model

6.8.1 Holistic tool characteristics

Despite the fact that companies adapt their tools, Figure 5-19 indicates that 71% of the respondents believed that a holistic model is necessary to ensure incorporation of the economic impacts, the social impacts and the environmental impacts. Seventy percent of the respondents felt that qualitative factors should be included in written form to explain sustainability importance, while 86% believed that qualitative factors should also be in a ranking format using methods such as the “RAG” method.

Most respondents (71%) felt that non-monetary quantitative measures should be evaluated using a single scorecard by combining and weighting the factors or variables. Seventy-four percent of the respondents believed that KPIs such as m³ water consumption per product should be included in the model. Only 56% of the respondents agreed that stakeholder's value, such as the product impact on society, needs to be factored into the model, while 67%

of the respondents agreed that indirect financial impact should be included in the model. The danger, however, of measuring an indirect financial impact such as this could be subjectivity; the difficulty with measuring these impacts could render the model unreliable. It has been noted that an astounding 85% of the respondents believed that the direct financial impact needs to be included using computations such as NPV and IRR; 85% believed that the hurdle target against which evaluation will be conducted needs to be set up front, and that projects that do not meet the minimum set target must be rejected. A holistic tool called the “Triple-P Scorecard” or the Profits-People-Planet (“PPP”) Scorecard is proposed as attached in Appendix 10. It is concluded that a holistic model is imperative, however only 59% of the respondents agreed that software needs to be used to evaluate the capital projects against the hurdle rate using the characteristics described.

6.9 Correlation between motives and SCB practices

The purpose of this section is to discuss the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-6.

6.9.1 Hypothesis 1a: Reputation and company brand and SCB practices

There is no significant association between the company’s reputation and brand motive to sustainability and SCB practices.

A Fisher’s Exact Test at p value of 0.074 indicates that there is 95% confidence that there is no correlation between the company’s reputation and brand motive for sustainability and SCB practices. This is an indication that the relationship between a company’s reputation and brand and the incorporation of sustainability impacts when evaluating capital projects is due to chance. The drive to engage in sustainability initiatives for the purposes of branding is independent of sustainability capital budgeting practices. The reason could be that the branding is associated with philanthropic motives and are far removed from the capital budgeting processes and purposes, as they occur at the micro level rather than at the agent-level.

6.9.2 Hypothesis 1b: Competitive advantage and profitability versus SCB practices

There is significant association between the competitive advantage and long term profitability motive and the SCB practices.

A Fisher’s Exact Test p value of 0.017 for independence indicates that there is 95% confidence that there is a significant association between competitive advantage and long term profitability motive and the SCB practices. This indicates that the relationship between

competitive advantage and long term profitability motive and the SCB practices is not due to chance. Engaging in sustainability initiatives for competitive advantage and thus for long term profitability is not independent of sustainability practices. Contrary to the branding motive, strategies related to profitability and the competitive advantage motive can be cascaded down to an agent level, where capital project decision making is done. It has been argued in this study that a company could be viewed as a portfolio of capital projects and that the profitability of a company begins with margin contributions from that portfolio of implemented capital projects.

6.9.3 Hypothesis 1c: Government's requirements and SCB practices

There is no significant association between the Government's legal and regulatory requirements' motive and the SCB practices.

Although Government was identified as the biggest driver for sustainability among companies, at $p = 1.0$ of Fisher's Exact Test, there is 95% confidence that there is no association between the Government's requirements and the incorporation of sustainability impacts in capital budgeting. This implies that the relationship between these two variables is due to chance. Commitment to sustainability due to government pressure and requirements is independent of the incorporation of sustainability impacts when evaluating capital projects. It could be for this reason that sustainability impacts resulting from government requirements are considered at the micro or even the meso level, rather than at the agent level.

6.9.4 Hypothesis 1d: Customers' requirements and SCB practices

There is no significant association between the customers' requirements motive and the SCB practices.

A Fisher's Exact Test p value of 0.564 for independence indicates that there is 95% confidence that there is no association between customer requirements and consideration of sustainability impacts when evaluating capital projects, thus the relationship between these two variables is due to chance. The conclusion reached is that customers' requirements and the incorporation of sustainability impacts in capital budgeting are independent of each other.

6.9.5 Hypothesis 1e: Employees' requirements and SCB practices

There is a significant association between the employees' requirements motive and the SCB practices.

A Fisher's Exact Test p value of 0.564 for independence shows that there is 95% confidence that there is no correlation between the employee requirements and the incorporation of

sustainability impacts in capital projects, thus the relationship between the employees' requirements and incorporation of sustainability impacts is due to chance. It is thus concluded that the employees' requirements and incorporation of sustainability impacts are independent of each other.

6.9.6 Hypothesis 1f: Suppliers' requirements and SCB practices

There is a significant association between the suppliers' requirements motive and the SCB practices.

A Fisher's Exact Test at p value of 0.001 for independence indicated an association between the suppliers' requirements motive and the incorporation of sustainability impacts in capital budgeting decisions. The relationship between suppliers' requirements and the incorporation of sustainability impacts in capital projects is not due to chance. It is concluded that the suppliers' requirements and the practice of sustainable capital budgeting are not independent of each other.

6.9.7 Hypothesis 1g: Company's leadership and SCB practices

There is no significant association between the company's leadership (Board of Directors/CEO) motive and the SCB practices.

A Fisher's Exact Test for independence at p value of 0.999 indicated a lack of an association between pressure from companies' leadership and the incorporation of sustainability impacts in capital decision making, thus the relationship between the companies' leadership requirements and the incorporation of sustainability impacts in capital budgeting decisions is due to chance. It is concluded with 95% confidence that the companies' leadership and SCB practices are independent of each other.

6.9.8 Hypothesis 1h: Shareholders and investors versus SCB practices

There is no significant association between the shareholders and investors' motive and the SCB practices.

As with the leadership, shareholders' pressure at p value of 0.999 of the Fisher's Exact Test indicates that there is no association between the incorporation of sustainability impacts when evaluating capital projects and shareholder pressure, thus the relationship between these two variables is due to chance. It is concluded with 95% confidence that the shareholders' requirements and SCB practices are independent of each other.

6.9.9 Hypothesis 1i: Local communities and SCB practices

There is no significant association between the local communities' motive and the SCB practices.

A Fisher's Exact Test for independence indicated a lack of an association between the local communities' motive and the SCB practices at p value of 1.0, thus the relationship between these two variables is due to chance. Based on this finding, it is concluded with 95% confidence that local communities' requirements and the incorporation of sustainability impacts in capital budgeting decisions are independent of each other.

6.9.10 Hypothesis 1j: NGOs' pressure and SCB practices

There is no significant association between the NGOs' pressure motive and the SCB practices.

A Fisher's Exact Test for independence at p value of 0.256 indicated a lack of an association between pressure from companies' leadership and the incorporation of sustainability impacts in capital decision making, thus the relationship between NGO pressure and the incorporation of sustainability impacts in capital budgeting decisions is due to chance. It is concluded with 95% confidence that NGO's requirements and incorporation of sustainability impacts in capital decision making are independent of each other.

6.9.11 Hypothesis 2: Strengths of relationship between motives and SCB

There is no strong relationship between the motives behind sustainability commitment and SCB.

The correlation matrix, as reflected in Table 5-7, shows that there was no statistically strong significant relationship between all the Q7 questions and Q11.

6.10 Correlation between constraints faced and SCB practices

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study, as reflected in Table 5-8 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the motives behind the companies' drive for sustainability and the practice of sustainable capital budgeting.

6.10.1 Hypothesis 3a: Unavailability of sustainability data and SCB practices

There is no significant association between the unavailability of sustainability data and SCB practices.

A Fisher's Exact Test of p of 0.157 for independence indicates that there is no association between the unavailability of sustainability data and the incorporation of sustainability impacts in capital budgeting decisions making, thus the relationship between the unavailability of data and the incorporation of sustainability impacts in capital budgeting is due to chance. It is concluded with 95% confidence that the lack of available sustainable data and the incorporation of sustainability impacts in capital budgeting decision making are independent of each other.

6.10.2 Hypothesis 3b: Difficulty in measuring sustainability impacts and SCB practices

There is no significant association between difficulty in measuring sustainability impacts and SCB practices.

A Fisher's Exact Test p of 0.499 for independence indicated that there is no association between difficulty in measuring sustainability impacts and the incorporation of sustainable impacts in capital budgeting decisions, thus the relationship between the two variables is due to chance. Based on this finding it can be concluded with 95% confidence that difficulty in measuring sustainability impacts and the incorporation of sustainability impacts in capital decision making are independent of each other.

6.10.3 Hypothesis 3c: Lack of tools and SCB practices

There is no significant association between a lack of readily acceptable tools, techniques or models and the SCB practices.

A Fisher's Exact Test for independence indicated that there is no association between a lack of readily acceptable tools, techniques or models and the incorporation of sustainability impacts in capital budgeting decision making at a p value of 0.259. The relationship between the lack of readily acceptable tools and the practice of sustainable capital budgeting is due to chance. Based on this finding, it is concluded with 95% confidence that there is no association between a lack of readily acceptable tools, techniques or models and the incorporation of sustainability impacts when evaluating capital projects.

6.10.4 Hypothesis 3d: Discounted Cash Flows' deficiencies and SCB practices

There is a significant association between the Discounted Cash Flows' deficiencies and the SCB practices.

A Fisher's Exact Test for independence indicated a lack of association between the Discounted Cash Flows' deficiencies and the incorporation of sustainability impacts when evaluating capital projects at a p value 0.744. The relationship between DCF's deficiencies

and the incorporation of sustainability impacts in capital projects is due to chance. Based on this finding, it is concluded with 95% confidence that the Discounted Cash Flows' deficiencies and the incorporation of sustainability impacts when evaluating capital projects are independent of each other.

6.10.5 Hypothesis 3e: Other current models' deficiencies and SCB practices

There is no association between other current models' inability to incorporate sustainability impacts and SCB practices.

Similar to the DCF deficiencies, a Fisher's Exact Test at p value of 0.655 for independence indicated a lack of association between other current models' inability to incorporate sustainability impacts and the incorporation of sustainability impacts in capital projects decisions, thus the relationship between other adapted models' deficiencies and the SCB practices is due to chance. Based on this finding, it is concluded with 95% confidence that the inability of current models to incorporate sustainability impacts and the incorporation of sustainability impacts in capital project decision making are independent of each other.

6.10.6 Hypothesis 3f: Lack of internal skills and SCB practices

There is no association between a lack of internal skills and SCB practices.

A Fisher's Exact Test at p value of 1.0 for independence indicates a lack of association between an absence of internal skills and the incorporation of sustainability impacts in capital projects decisions, thus the relationship between a lack of internal skills and SCB practices are due to chance. Based on this finding, it is concluded with 95% confidence that the lack of internal skills and the incorporation of sustainability impacts in capital project decision making are independent of each other.

6.10.7 Hypothesis 3g: Unavailability of guidelines and SCB practices

There is no association between the unavailability of guidelines constraint has and the SCB practices.

A Fisher's Exact Test for independence indicated lack of association between the unavailability of guidelines and the incorporation of sustainability impacts when evaluating capital projects at p value 0.499. The relationship between unavailability of guidelines and incorporation of sustainability impacts in capital projects is due to chance. Based on this finding, it is concluded with 95% confidence that unavailability of guidelines and the incorporation of sustainability impacts when evaluating capital projects are independent of each other.

6.10.8 Hypothesis 4: Strengths of relationship between variables

There is no strong relationship between the sustainable capital budgeting practices and the constraints companies face in incorporating sustainability impacts.

The correlation matrix, as reflected in Table 5-9 shows that there was no strong statistically significant relationship between all the Q14 questions and Q11.

6.11 Correlation between motives and adaptation of tools

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-10 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the motives behind companies' drive for sustainability and the adaptation of tools to incorporate sustainability impacts. The Fisher's Exact Test is testing the null hypothesis to determine how likely two variables are associated.

6.11.1 Hypothesis 5a: Reputation and company brand and adaptation of tools

There is no significant association between the company's reputation and brand motive to sustainability and adaptation of tools.

A Fisher's Exact Test at p value of 0.999 indicates that there is 95% confidence that there is no correlation between the company's reputation and brand motive for sustainability and adaptation of tools. This is an indication that the relationship between company's reputation and brand and adaptation of tools is due to chance. The drive to engage in sustainability initiatives for purposes of branding is independent of adaptation of tools.

6.11.2 Hypothesis 5b: Competitive advantage and profitability versus adaptation of tools

There is no significant association between the competitive advantage and long term profitability motive and the adaptation of tools.

A Fisher's Exact Test p value of 0.859 for independence indicates that there is 95% confidence that there is a significant association between competitive advantage and the adaptation of tools. This indicates that the relationship between competitive advantage and long term profitability motive and the adaptation of tools is due to chance. Engaging in sustainability initiatives for competitive advantage and thus for long term profitability is independent of the adaptation of tools.

6.11.3 Hypothesis 5c: Government's requirements and adaptation of tools

There is no significant association between the Government's legal and regulatory requirements' motive and the adaptation of tools.

Although government was identified as the biggest driver for sustainability among companies at a p value of 1.0 of Fisher's Exact Test, there is 95% confidence that there is no association between government requirements and the adaptation of tools, which implies that the relationship between these two variables is due to chance. Commitment to sustainability due to government pressure and requirements is independent of the adaptation of tools. This could be the reason that sustainability impacts resulting from government requirements are considered at the micro level or even at the meso level, rather than at the agent level.

6.11.4 Hypothesis 5d: Customers' requirements and adaptation of tools

There is no significant association between the customers' requirements motive and the adaptation of tools.

A Fisher's Exact Test p value of 0.999 for independence indicates that there is 95% confidence that there is no association between customer requirements and the adaptation of tools, thus the relationship between these two variables is due to chance. The conclusion reached is that customers' requirements and the adaptation of tools are independent of each other.

6.11.5 Hypothesis 5e: Employees' requirements and adaptation of tools

There is no significant association between the employees' requirements motive and the adaptation of tools.

A Fisher's Exact Test p value of 0.072 for independence shows that there is 95% confidence that there is no correlation between employees' requirements and the adaptation of tools to incorporate sustainability impacts; therefore the relationship between the employees' requirements and the adaptation of tools to incorporate sustainability impacts is due to chance. It is thus concluded that the employees' requirements and the adaptation of tools to incorporate sustainability impacts are independent of each other.

6.11.6 Hypothesis 5f: Suppliers' requirements and adaptation of tools

There is no significant association between the suppliers' requirements motive and the adaptation of tools.

A Fisher's Exact Test at p value of 0.548 for independence indicated that there is a lack of an association between the supplier requirements and the adaptation of tools to incorporate

sustainability impacts. The relationship between suppliers' requirements and the adaptation of tools to incorporate sustainability impacts is not due to chance, thus it is concluded with 95% confidence that the suppliers' requirements and the adaptation of tools to incorporate sustainability impacts are independent of each other

6.11.7 Hypothesis 5g: Company's leadership and adaptation of tools

There is no significant association between the company's leadership (Board of Directors/CEO) motive and the adaptation of tools.

A Fisher's Exact Test for independence at p value of 0.741 indicated a lack of an association between pressure from companies' leadership and the adaptation of tools to incorporate sustainability impacts, thus the relationship between the companies' leadership requirements and the adaptation of tools to incorporate sustainability impacts is due to chance. It is concluded with 95% confidence that the companies' leadership and adaptation of tools to incorporate sustainability impacts are independent of each other.

6.11.8 Hypothesis 5h: Shareholders and investors motives versus adaptation of tools

There is no significant association between the shareholders 'and investors' motive and the adaptation of tools.

As with the leadership, shareholders' pressure at p value of 0.424 of the Fisher's Exact Test indicates that there is no association between the adaptation of tools to incorporate sustainability impacts and shareholders' pressure, therefore the relationship between these two variables is due to chance. It is thus concluded with 95% confidence that the shareholders' requirements and the adaptation of tools to incorporate sustainability impacts are independent of each other.

6.11.9 Hypothesis 5i: Local communities and adaptation of tools

There is no significant association between the local communities' motive and the adaptation of tools.

A Fisher's Exact Test for independence indicated a lack of an association between the local communities' motive and the adaptation of tools to incorporate sustainability impacts at p value of 0.229. The relationship between these two variables is thus due to chance. Based on this finding, it is concluded with 95% confidence that local communities' requirements and the adaptation of tools to incorporate sustainability impacts are independent of each other.

6.11.10 Hypothesis 5j: NGOs' pressure and adaptation of tools

There is no significant association between the NGOs' pressure motive and the adaptation of tools.

A Fisher's Exact Test for independence at p value of 0.027 indicated a significant association between pressure from companies' leadership and the adaptation of tools to incorporate sustainability impacts, thus the relationship between the NGO pressure and the adaptation of tools to incorporate sustainability impacts is not due to chance. It is therefore concluded with 95% confidence that NGO's requirements and the adaptation of tools to incorporate sustainability impacts are not independent of each other.

6.11.11 Hypothesis 6: Strengths of relationship between variables

There is no strong relationship between the adaption of capital budgeting tools and the motives driving sustainability commitment.

The correlation matrix, as reflected in Table 5-11, shows that there was no strong statistically significant relationship between all the Q7 questions and Q22.

6.12 Correlation between constraints faced and the adaptation of tools

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-12 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the motives behind the companies' drive for sustainability and the adaptation of tools to incorporate sustainability impacts. The Fisher's Exact statistical test tested the null hypothesis to determine how likely it is that two variables are associated.

6.12.1 Hypothesis 7a: Unavailability of sustainability data and adaptation of tools

There is no significant association between the unavailability of sustainability data and the adaptation of tools.

A Fisher's Exact Test of p of 0.425 for independence indicates that there is no association between the unavailability of sustainability data and the adaptation of tools to incorporate sustainability impacts, thus the relationship between the unavailability of sustainability data and adaptation of tools to incorporate sustainability impacts is due to chance. It is concluded with 95% confidence that a lack of available sustainable data and the adaptation of tools to incorporate sustainability impacts are independent of each other.

6.12.2 Hypothesis 7b: Difficulty in measuring sustainability impacts and adaptation of tools

There is a significant association between difficulty in measuring sustainability impacts and the adaptation of tools.

A Fisher's Exact Test p of 0.015 for independence indicated that there is significant association between difficulty in measuring sustainability impacts and the adaptation of tools to incorporate sustainability impacts, thus the relationship between the two variables is not due to chance. Based on this finding, it could be concluded with 95% confidence that difficulty in measuring sustainability impacts and the adaptation of tools to incorporate sustainability impacts are not independent of each other.

6.12.3 Hypothesis 7c: Lack of tools and adaptation of tools

There is no significant association between a lack of readily acceptable tools, techniques or models and the adaptation of tools.

A Fisher's Exact Test for independence indicated that there is no association between a lack of readily acceptable tools, techniques or models and the adaptation of tools to incorporate sustainability impacts at p value of 0.413.

The relationship between the lack of readily acceptable tools and the adaptation of tools to incorporate sustainability impacts is thus due to chance. Based on this finding, it is concluded with 95% confidence that there is no association between a lack of readily acceptable tools, techniques or models and the adaptation of tools to incorporate sustainability impacts.

6.12.4 Hypothesis 7d: Discounted Cash Flows' deficiencies and adaptation of tools

There is a significant association between the Discounted Cash Flows' inability to incorporate sustainability impacts and the adaptation of tools.

A Fisher's Exact Test for independence indicated a significant association between the Discounted Cash Flows' deficiencies and the adaptation of tools to incorporate sustainability impacts at p value 0.035.

The relationship between DCF's deficiencies and the adaptation of tools to incorporate sustainability impacts is therefore not due to chance. Based on this finding, it is concluded with 95% confidence that the Discounted Cash Flows' deficiencies and the adaptation of tools to incorporate sustainability impacts are not independent of each other.

6.12.5 Hypothesis 7e: Other current models' deficiencies and adaptation of tools

There is no association between other current models' inability to incorporate sustainability impacts and the adaptation of tools.

Similar to the DCF deficiencies, a Fisher's Exact Test at p value of 0.126 for independence indicated a lack of association between other current models' inability to incorporate sustainability impacts and the adaptation of tools to incorporate sustainability impacts. Thus the relationship between other adapted models' deficiencies and the adaptation of tools to incorporate sustainability impacts is due to chance. Based on this finding, it is concluded with 95% confidence that the inability of current models to incorporate sustainability impacts and the adaptation of tools to incorporate sustainability impacts are independent of each other.

6.12.6 Hypothesis 7f: Lack of internal skills and adaptation of tools

There is no association between a lack of internal skills and the adaptation of tools.

A Fisher's Exact Test at p value of 0.192 for independence indicates a lack of association between an absence of internal skills and the adaptation of tools to incorporate sustainability impacts, thus the relationship between a lack of internal skills and the adaptation of tools to incorporate sustainability impacts is due to chance. Based on this finding, it is concluded with 95% confidence that the lack of internal skills and the adaptation of tools to incorporate sustainability impacts are independent of each other.

6.12.7 Hypothesis 7g: Unavailability of guidelines and adaptation of tools

There is a significant association between the unavailability of guidelines and the adaptation of tools.

A Fisher's Exact Test for independence indicated a significant association between the unavailability of guidelines and the adaptation of tools to incorporate sustainability impacts at p value 0.035, thus the relationship between the unavailability of guidelines and the adaptation of tools to incorporate sustainability impacts is not due to chance. Based on this finding, it is concluded with 95% confidence that the unavailability of guidelines and the adaptation of tools to incorporate sustainability impacts are not independent of each other.

6.12.8 Hypothesis 8: Strengths of relationship between variables

There is no strong relationship between the adaption of capital budgeting tools and the constraints companies face in incorporating sustainability impacts.

The correlation matrix, as reflected in Table 5-15 shows that there was strong statistically significant relationship between all the questions except for Q4 and Q11. This implies that

difficulty in measuring sustainability data has a strong association with adaptation of tools.

6.13 Correlation between commitment and SCB practices

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-14 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables. In this study the Fisher's Exact Test was used to test the association between the companies' commitment to sustainability and the practice of sustainable capital budgeting. The Fisher's Exact statistical test tested the null hypothesis to determine how likely it is that two variables are associated.

6.13.1 Hypothesis 9a: Sustainability priority and SCB practices

There is a significant association between sustainability priority and SCB practices.

A Fisher's Exact Test at p value of 0.003 indicates that there is 95% confidence that there is significant correlation between sustainability priority and SCB practices. This is an indication that the relationship between sustainability priority and the incorporation of sustainability impacts when evaluating capital projects is not due to chance. It is thus concluded that sustainability priority is not independent of sustainability capital budgeting practices.

6.13.2 Hypothesis 9b: Formal sustainability strategy and SCB practices

There is no significant association between the existence of a formal strategy related to sustainability and the SCB practices.

A Fisher's Exact Test at p value of 0.999 indicates that there is 95% confidence that there is no significant correlation between the existence of a formal strategy related to sustainability and SCB practices. This is an indication that the relationship between formal strategies related to sustainability and the incorporation of sustainability impacts when evaluating capital projects is due to chance. It is thus concluded that the existence of a formal strategy related to sustainability is independent of sustainability capital budgeting practices.

6.13.3 Hypothesis 9c: Sustainability business case and SCB practices

There is no significant association between the existence of a business case for a sustainability approach and the SCB practices.

A Fisher's Exact Test at p value of 0.279 indicates that there is 95% confidence that there is no significant correlation between the existence of a business case for a sustainability approach and SCB practices. This is an indication that the relationship between the existence of a business case for a sustainability approach and the incorporation of sustainability impacts when evaluating capital projects is due to chance. It is thus concluded

that the existence of a business case for a sustainability approach is independent of sustainability capital budgeting practices.

6.13.4 Hypothesis 10: Strengths of relationship between variables

There is no strong relationship between the sustainable capital budgeting practices and the companies' commitment to sustainability.

The correlation matrix, as reflected in Table 5-15, shows that there was no strong statistically significant relationship between all the questions except for Q2 and Q11.

6.14 Correlation between commitment and adaptation of tools

The purpose of this section is to report the results of the statistical calculations to test the two sets of categorical variables that were used in the study as reflected in Table 5-16 below. The purpose of the Fisher's Exact Test for independence was to determine the relationships between two categorical variables.

In this study the Fisher's Exact Test was used to test the association between the companies' commitment to sustainability and the adaptation of tools to incorporate sustainability impacts. The Fisher's Exact statistical test tested the null hypothesis to determine how likely it is that two variables are associated.

6.14.1 Hypothesis 11a: Sustainability priority and the adaptation of tools

There is no significant association between sustainability priority and the adaptation of tools.

A Fisher's Exact Test at p value of 0.740 indicates that there is 95% confidence that there is no significant correlation between the existence of a business case for a sustainability approach and the adaptation of tools to incorporate sustainability impacts. This is an indication that the relationship between the existence of a business case for a sustainability approach and the adaptation of tools to incorporate sustainability impacts is due to chance. It is thus concluded that the existence of a business case for a sustainability approach is independent of the adaptation of tools to incorporate sustainability impacts.

6.14.2 Hypothesis 10b: Formal sustainability strategy and adaptation of tools

There is no significant association between the existence of a formal strategy related to sustainability and the adaptation of tools.

A Fisher's Exact Test at p value of 0.481 indicates that there is 95% confidence that there is no significant correlation between the existence of a formal strategy related to sustainability and the adaptation of tools to incorporate sustainability impacts. This is an indication that the

relationship between formal strategies related to sustainability and the adaptation of tools to incorporate sustainability impacts is due to chance. It is thus concluded that the existence of a formal strategy related to sustainability is independent of the adaptation of tools to incorporate sustainability impacts.

6.14.3 Hypothesis 11c: Sustainability business case and SCB practices

There is no significant association between the existence of a business case for a sustainability approach and the SCB practices.

A Fisher's Exact Test at p value of 0.518 indicates that there is 95% confidence that there is no significant correlation between the existence of a business case for a sustainability approach and the adaptation of tools to incorporate sustainability impacts. This is an indication that a relationship between the existence of a business case for a sustainability approach and the adaptation of tools to incorporate sustainability impacts is due to chance. It is thus concluded that the existence of a business case for a sustainability approach is independent of the adaptation of tools to incorporate sustainability impacts.

6.14.4 Hypothesis 12: Strengths of relationship between variables

There is no strong relationship between the adaptation of tools and the companies' commitment to sustainability.

The correlation matrix reflected in Table 5-17 shows that there was no strong statistically significant relationship between all the questions.

6.15 Measurement instrument reliability testing

In this study, all the scales were tested using Cronbach's alpha coefficient for internal consistency as depicted in Table 5-18, Table 5-19 and Table 5-20. The results showed that all the values are above 7, indicating that the constructs are internally consistent (Pallant, 2007). It is thus concluded that the sustainability construct, the sustainability incorporation construct, and the constraints construct are internally consistent and that the measurement instrument was reliable to measure these constructs.

7. Conclusion

7.1 Introduction

This Chapter will amalgamate the main findings of the research into a cohesive set of findings. This concluding Chapter will also discuss the value add and recommendations for stakeholders based on the findings. Furthermore, the limitations of the research will be discussed as well as suggestions for future research.

7.2 Principal findings

7.2.1 South African companies are committed to sustainability

This study found that sustainability is a priority for companies in South Africa; in addition, they also have formal strategies and business cases to support their commitment to sustainability. Various international studies conducted concluded that many companies claim commitment but do not act upon this (Kiyamaz, 2015; Kiron et al., 2013). Contrary to these conclusions, however, South African companies not only claim commitment towards sustainability, but they act upon it. They address various social impacts and environmental impacts, mostly driven by government regulations, company leadership, company reputation and branding, as well as efficiency.

These findings put South African companies on the global map in terms of sustainability, as already noticed through their first class sustainability reporting, which is part of integrated reporting (SAICA, 2015). It is likely that South African companies will not face challenges when the carbon tax policy is implemented in 2016, as the commitment is already present and supported by conscious leadership. The imminent carbon tax policy should be a success as all companies surveyed agreed that government regulations drive their sustainability commitment. It appears that to drive company behaviour in South Africa, government policies are extremely effective.

7.2.2 South African companies practise sustainable capital budgeting

Although there has been progress in sustainability reporting as driven by the GRI, sustainability reporting focusses on external reporting to satisfy the information needs of, and to defuse the pressure exerted by, various stakeholders (Brown, de Jong, & Lessidrenska, 2007). Yet there is a need for sustainability accounting to be proactive and to apply what Burritt and Schaltegger (2010) called an “inside-out” approach. This requires robust sustainable capital budgeting processes as one of the proactive approaches to deal with sustainability impacts to pre-empt sustainability reporting “green washing”. Very little work had been done to understand how corporates in South Africa embed sustainability impacts when evaluating capital projects (Meyer & Kiyamaz, 2015), and there have been

mixed results between USA and Australian companies. This research concluded that South African companies incorporate sustainability impacts when evaluating capital projects, and thus practise sustainable capital budgeting, which is consistent with the results reached by Kiron et al. (2013). It has been concluded in this research that practising sustainable capital budgeting in South Africa is done consistently. South African companies are proactive in dealing with financial matters in the auditing and reporting field, as evidenced by the repeat of a first place in the Global Economic Forum's ranking in terms of reporting and auditing (SAICA, 2015). South African accountants could be seen as the epitome of socially responsible leaders based on the premise that capital budgeting processes lie predominantly within their domain. Regarding sustainable capital budgeting, it is incomprehensible how companies manage to practise it as South Africa has yet to implement proactive sustainability accounting curricula in support of a suggestion made by Çalışkan (2014).

7.2.3 The SCB constraints encountered have somewhat been dealt with

In Australia, Vesty et al. (2013) found that constraints are still encountered when embedding sustainability impacts during capital projects decision making. Conversely, this study indicated that South African companies encounter constraints to a lesser degree, although the respondents agreed to disagree about constraints faced. Not more than 42% of the respondents agreed on all the constraints that were tested.

For this reason it could not be concluded if South African companies face constraints when practising SCB. This is not surprising as evidence has proven that they do practice sustainable capital budgeting implying that they are able to overcome the constraints. It is intriguing how they managed to overcome these challenges suffice it to say there is strong evidence that commitment to sustainability by South African companies; commitment to sustainability by South African companies is beyond reproach.

7.2.4 A holistic model is required to evaluate capital projects

It has been argued that traditional accounting techniques fail to incorporate non-financial information (Burritt & Schaltegger, 2010; Sookram & Kistow, 2012). Respondents were asked about the characteristics of a holistic model that could incorporate all the dimensions of sustainability and agreed that a holistic model with capabilities to incorporate economic, social and environmental impacts is imperative. A holistic model should have the following characteristics:

- Qualitative information to explain the impact, this should also be ranked using 'RAG'.
- Non-monetary quantitative measures should be evaluated using KPI's a single scorecard by combining and weighting the factors or variables.

- The direct monetary quantitative impacts using the existing techniques of DCF and IRR.
- The indirect monetary quantitative impacts such as company reputation and employee engagement costs, or costs saving.
- A hurdle rate should be set against which outputs of the model are evaluated regarding whether to accept a capital project or to reject it. If the hurdle rate is achieved the capital project should be accepted, if not it should be rejected.

The suggested model, the “Profits, People, Planet scorecard” or the “PPP” scorecard and its guidelines, is included in Appendix 10.

7.2.5 The competitive advantage motive is correlated to SCB practices

Engaging in sustainability initiatives for competitive advantage and thus for long term profitability motives is associated with sustainability practices. It is not surprising that companies with strong business cases also practise sustainable capital budgeting. Once a value proposition for sustainability commitment has been developed, it is arguable that the strategy cascades down with ease to all levels, including capital projects agents. It is incumbent upon business leaders and policy makers to enforce companies to develop business cases in support for their sustainability commitment. By implication, sustainability remedial efforts, in the interest of company branding and reputation for example, are more philanthropic and difficult to enforce into capital budgeting processes.

7.2.6 Suppliers’ requirements motive is correlated to SCB practices

This study concluded that suppliers’ requirements and practising sustainable capital budgeting are not independent of each other. The implications are that suppliers have more power relative to the other stakeholders in terms of sustainable capital budgeting practices. This is understood as suppliers are directly related to the products and services that companies provide to their customers. These products and services are the major inputs into capital project evaluation and decision making. This appears to be an automatic result as companies have to decide whether they incorporate the suppliers’ requirements or not when they evaluate capital projects. This is a matter of inclusion during decision making rather than evaluating the acceptance or rejection of the requirements, which is akin to the maxim, “you are damned if you do, and you are damned if you don’t”. Suppliers’ requirements will always be automatically incorporated; however these are not associated with the adaptation of tools to evaluate projects.

7.2.7 Sustainability prioritisation is correlated to SCB practices

The relationship between sustainability priority and the incorporation of sustainability impacts when evaluating capital projects is not due to chance. It has been concluded that sustainability priority and sustainability capital budgeting practices are significantly associated; companies that generally prioritise sustainability also incorporate sustainability impacts when deciding upon capital projects.

7.2.8 NGOs' pressure is correlated to adaptation of SCB tools

NGO's requirements and the adaptation of tools to incorporate sustainability impacts are independent of each other. NGOs deal with a variety of issues ranging from products to human rights and employees' rights, amongst others, which could have the potential to be associated with variables or considerations for capital budgeting decision making purposes.

7.2.9 The measurability of sustainability impacts is correlated to the adaptation of SCB tools

The difficulty of measuring sustainability impacts, as a constraint, and the adaptation of tools to incorporate sustainability impacts, are not independent of each other. Current models such as DCF require two premises to be fulfilled prior to making use of the tool. Firstly, sustainability impacts should be measurable, and secondly, the measurement should be in monetary form. Thus it is not surprising that difficulty in measuring sustainability impacts coexists with failure to adapt tools for SCB practices. The question that remains unanswered, however, is how 41% of the respondents believed that this is not a constraint yet the majority of companies are able to incorporate sustainability impacts.

7.2.10 The DCF's deficiencies constraint is correlated to the adaptation of SCB tools

The relationship between DCF's deficiencies and the adaptation of tools to incorporate sustainability impacts is not due to chance. It has been concluded in this study that Discounted Cash Flows' deficiencies and the adaptation of tools to incorporate sustainability impacts are not independent of each other. Failure to overcome the DCF constraint will result in a failure to incorporate sustainability impacts onto the evaluation of capital projects. This deficiency is closely related to the difficulty in measuring sustainability impacts, as DCF only deals with quantifiable monetary inputs. This could mean that South African companies depend on a DCF tool to evaluate capital projects, as is evidenced by the results of this study that 52% of respondents have adopted DCF for sustainable capital budgeting. Correia and Cramer (2008) concluded that DCF is the most widely used technique in South Africa.

7.2.11 Unavailability of guidelines is correlated to adaptation of SCB tools

The relationship between the unavailability of guidelines and the adaptation of tools to incorporate sustainability impacts is statistically not due to chance. Guidelines could be important in directing the decisions that agents of the companies take on a day-to-day basis. Without guidelines discretionary decision making could result in inconsistent decisions being made and it could be difficult to incorporate sustainability impacts in the absence of a business case or a strong value proposition.

7.3 Recommendations to stakeholders

7.3.1 Government

It has been noted that companies respond effectively to government policies and regulations relative to other stakeholders. One of the respondents said that “Although the pressure on private companies is high, and rightfully so, with respect to sustainability considerations, government’s enforcement role should not be underestimated”. Another respondent said that a “Lack of enforcement leads to bad behaviour going unpunished and all the ‘gains’ of good process and practices being lost”. Thus Government should play a major role in enforcing the sustainability practices of both public and private enterprises. The proposed carbon tax policy could see companies complying and improving their sustainability practices.

7.3.2 Suppliers

Once the government implements the carbon tax policy, suppliers should ensure they incorporate robust sustainability practices into their products. In so doing they will roll out sustainability practices throughout the entire value chain. This should be done in the interest of managing their reputations as their products are inputs to their customers’ products. As such suppliers should have guidelines to support the usage of their sustainable products.

7.3.3 Leaders and managers of companies

It is recommended that leaders and managers of companies should develop a strong business case, with clear value propositions, as a point of departure for their sustainability initiatives. This will ensure that the initiatives are cascaded down through the entire business resulting in sustainable capital budgeting practices. To ensure this happens, guidelines should be developed to aid decision makers in implementing sustainable capital budgeting using effective tools and techniques. Furthermore, to ensure the techniques and tools are effective, sustainability measurement constraints should be overcome as well as DCF deficiencies. It is recommended that companies use the PPP scorecard as a guideline for implementing sustainable capital budgeting.

7.3.4 The accounting profession

Accountants could play a major role by providing business and financial guidance to business leaders and by practising sustainable capital budgeting. To achieve this, sustainability accounting needs to be included in curricula as well as in training and development within the accounting field. Meanwhile, accountants should make use of experts due to the qualitative nature of sustainability assessments which is a specialised field. Specialists in the relevant fields, such as engineers, could be insourced to promote robust sustainability practices. Lastly, the accounting profession, through various professional bodies including SAICA, SAIPA, and CIMA, could influence the government and other relevant stakeholders to implement policies related to sustainability, and in particular sustainability accounting.

7.4 Research contribution

This research contributed to the literature by bridging the gap between sustainability and accounting and through a convergence of the two bodies of knowledge. These two fields are normally considered to be distinct and mutually exclusive. This study augments the recent literature on sustainable capital budgeting from a South African perspective. Furthermore, there is now a better understanding of how traditional tools are adapted to incorporate sustainability impacts, as well as the characteristics of the desired model that could integrate the impacts related to the economic, social and environmental aspects of sustainability.

This research contributes to business by suggesting that there is a need for a business case and a value proposition complemented by guidelines to be presented to business decision makers for efforts to remain effective in implementing sustainability practices. The business fraternity needs to understand this due to the imminent carbon tax policy which they will need to comply with.

7.5 Limitations of the research

Only Scope-1 GHG contributors were studied, which could mean that the results may not be extrapolated to represent all the companies that are operating in South Africa. Another limitation is that no causal relationship between variables was tested in this study. As such, correlation results should be interpreted with care as they do not indicate causal relationships between variables tested.

7.6 Suggestions for future research

This research focussed on Scope-1 GHG companies, therefore it is suggested that further research should be conducted to understand whether Scope-2 and Scope-3 companies, which are indirect emitters of greenhouse gases, reveal the same commitment and

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sustainable capital budgeting practices as those of Scope-1 emitters. It has been quite intriguing to establish that Scope-1 companies prefer to address employees' safety and health more than customers' safety and health. A study to analyse this deeper is required as a better balance between these two is imperative.

The government, as indicated in this research, is planning to implement a carbon tax regime in 2016. Although this study was cross-sectional by design, it could be considered to be the first phase of a longitudinal research or a time series research to understand the impact of the carbon tax policy on sustainability practices, sustainable capital budgeting and their related tools.

This study concluded that most companies use DCF and cost benefit analyses to incorporate sustainability impacts when evaluating capital projects. Such companies have managed to overcome the inability to measure sustainability impacts that normally face organisations when practising sustainable capital budgeting. It is suggested that a study should be conducted to understand how these companies overcame their constraints.

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Appendices

Appendix 1: List of sustainability impacts

| Economic impacts | Environmental impacts | Social impacts | | | |
|--|--|--|---|---|---|
| | | Labour Practices and Decent Work | Human Rights | Society | Product Responsibility |
| <ul style="list-style-type: none"> • Economic Performance * • Market Presence ** • Indirect Economic Impacts ** • Procurement Practices ** | <ul style="list-style-type: none"> • Energy * • Water * • Biodiversity * • Emissions * • Effluents and Waste * • Products and Services * • Compliance * • Transport * • Overall ** • Supplier Environmental Assessment ** • Environmental Grievance Mechanisms ** | <ul style="list-style-type: none"> • Employment ** • Labour/Management Relations ** • Occupational Health & Safety * • Training and Education * or ** • Diversity and Equal Opportunity ** • Equal Remuneration for Women and Men ** • Supplier Assessment for Labour Practices * or ** • Labour Practices Grievance Mechanisms ** | <ul style="list-style-type: none"> • Investment ** • Non-discrimination ** • Freedom of Association and Collective Bargaining ** • Child Labour ** • Forced or Compulsory Labour ** • Security Practices * • Indigenous Rights ** • Assessment ** • Supplier Human Rights Assessment * or ** • Human Rights Grievance Mechanisms ** | <ul style="list-style-type: none"> • Local Communities ** • Anti-corruption * or ** • Public Policy ** • Anti-competitive Behavior * or ** • Compliance ** • Supplier Assessment for Impacts on Society * or ** • Grievance Mechanisms for Impacts on Society ** | <ul style="list-style-type: none"> • Customer Health and Safety * • Product and Service Labelling * • Marketing Communications ** • Customer Privacy ** • Compliance * or ** |

Source: GRI (2013)

Legend:

Agent level *

Micro level **

Appendix 2: Survey questionnaire

The questionnaire was adapted from the following sources: (A4S CFO Leadership Network, 2015; Vesty et al., 2013; Meyer & Kiyamaz, 2015; Kiron et al., 2013; EY, 2013; AICPA, CICA, & CIMA, 2010.

| NB: Please read questions carefully and be mindful when selecting an option | | Sector | Revenue | Employees | Ownership |
|---|---|-------------------|-----------------|----------------------------|-------------------------|
| Select from the following options a profile that describes your Company best | | Choose an item. | Choose an item. | Choose an item. | Choose an item. |
| RQ1: Commitment to sustainability and motives: The following questions attempt to understand whether your Company is committed to sustainability and the reasons behind the commitment. | | Strongly disagree | Disagree | Neither agree nor disagree | Agree Strongly agree |
| Q2 | Sustainability is a priority for my company | | | | |
| Q3 | My company has a formal strategy related to sustainability | | | | |
| Q4 | My company has developed a clear business case or a proven value proposition for its approach to sustainability | | | | |
| Q5 | My company is addressing the following social issues/impacts: | | | | |
| Q5.a | - Occupational Health & Safety | | | | |
| Q5.b | - Training and Education (training security personnel on human rights) | | | | |
| Q5.c | - Supplier Assessment for Labour Practices | | | | |
| Q5.d | - Security Practices | | | | |
| Q5.e | - Supplier Human Rights Assessment | | | | |
| Q5.f | - Anti-corruption | | | | |
| Q5.g | - Anti-competitive Behavior | | | | |
| Q5.h | - Supplier Assessment for Impacts on Society | | | | |
| Q5.i | - Customer Health and Safety | | | | |
| Q5.j | - Product and Service Labelling (content, safe use, and disposal) | | | | |
| Q5.k | - Product Compliance | | | | |
| Q6 | My company is addressing the following environmental issues/impacts: | | | | |
| Q6.a | - Energy Consumption | | | | |
| Q6.b | - Water Consumption (Water use efficiency) | | | | |
| Q6.c | - Biodiversity loss | | | | |
| Q6.d | - Emissions and pollution (air, water, soil) | | | | |
| Q6.e | - Effluents and Waste | | | | |
| Q6.f | - Products and Services | | | | |
| Q6.g | - Environmental Compliance (and reporting) | | | | |
| Q6 | The following factors are driving my company's sustainability efforts: | | | | |
| Q7.a | - Managing reputation and company brand | | | | |
| Q7.b | - Achieving competitive advantage and long term profitability | | | | |
| Q7.c | - Government, legal and regulatory requirements | | | | |
| Q7.d | - Customers' requirements | | | | |
| Q7.e | - Employees' requirements | | | | |
| Q7.f | - Suppliers' requirements | | | | |
| Q7.g | - Company's leadership (Board of Directors/CEO) | | | | |
| Q7.h | - Shareholders and investors | | | | |
| Q7.i | - Local communities | | | | |
| Q7.j | - NGO's | | | | |
| Q8 | Name any other reason why your company is committed to sustainability | | | | |
| RQ2: Practice of sustainable capital budgeting ('SCB'): The following questions attempt to find out whether your company practices sustainable capital budgeting (i.e. consideration of social and environmental issues/impacts) | | Strongly disagree | Disagree | Neither agree nor disagree | Agree Strongly agree |
| Q9 | My company includes the following social impacts when deciding upon accepting or rejecting capital projects: | | | | |
| Q9.a | - Occupational Health & Safety | | | | |
| Q9.b | - Training and Education (training security personnel on human rights) | | | | |
| Q9.c | - Supplier Assessment for Labour Practices | | | | |
| Q9.d | - Security Practices | | | | |

| | | | | | | |
|---|--|-----------------------|----------|----------------------------|-------|----------------|
| Q9.e | - Supplier Human Rights Assessment | | | | | |
| Q9.f | - Anti-corruption | | | | | |
| Q9.g | - Anti-competitive Behavior | | | | | |
| Q9.h | - Supplier Assessment for Impacts on Society | | | | | |
| Q9.i | - Customer Health and Safety | | | | | |
| Q9.j | - Product and Service Labelling (content, safe use, and disposal) | | | | | |
| Q9.k | - Product Compliance | | | | | |
| Q10 | My company includes the following environmental impacts when deciding upon accepting or rejecting capital projects: | | | | | |
| Q10.a | - Energy Consumption | | | | | |
| Q10.b | - Water Consumption | | | | | |
| Q10.c | - Biodiversity loss | | | | | |
| Q10.d | - Emissions and pollution (air, water, soil) | | | | | |
| Q10.e | - Effluents and Waste | | | | | |
| Q10.f | - Products and Services impact on environment | | | | | |
| Q10.g | - Environmental Compliance and reporting | | | | | |
| Q10.h | - Transport | | | | | |
| Q11 | Sustainability impacts are not considered (essential) when deciding upon capital projects (social impacts and environmental impacts) | | | | | |
| Q12 | Sustainability impacts are sometimes considered when deciding upon capital projects (social impacts and environmental impacts) | | | | | |
| Q13 | Sustainability impacts are always considered when deciding upon capital projects (social impacts and environmental impacts) | | | | | |
| RQ3: Constraints faced in practising sustainable capital budgeting (i.e. consideration of social and environmental issues/impacts): | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
| The following questions attempt to establish the constraints your company is facing in considering the sustainability impacts (i.e. social and environmental issues/impacts) in capital budgeting techniques/decision making that either (i) hinder the incorporation of those sustainability impacts or (ii) make it difficult when incorporating those sustainability impacts in capital budgeting decision making | | | | | | |
| Q14 | The following items are the constraints my company faces when incorporating sustainability impacts | | | | | |
| Q14.a | - Lack of availability of sustainability data | | | | | |
| Q14.b | - Difficulty in measuring sustainability impacts | | | | | |
| Q14.c | - Lack of readily acceptable tools, techniques or models | | | | | |
| Q14.d | Discounted Cash Flows (such as Internal Rate of Return-IRR and Net Present Value-NPV) are not adequate to incorporate sustainability impacts | | | | | |
| Q14.e | - Other current models adopted are not adequate to incorporate sustainability impacts | | | | | |
| Q14.f | - Lack of internal skills to evaluate projects with sustainability impacts | | | | | |
| Q14.g | - Lack of guidelines available to aid companies to incorporate sustainability impacts | | | | | |
| Q15 | Name any other constraints your company is facing when embedding sustainability impacts in capital projects | | | | | |
| Q16 | Describe the role that the accountants and accounting profession could play in dealing with the constraints that your company is facing | | | | | |
| RQ4: Adaptation of tools to incorporate sustainability impacts (i.e. social and environmental issues/impacts): | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
| The following questions attempt to establish how your company has adapted the capital decision making techniques/tools to incorporate the sustainability impacts in capital budgeting decision making | | | | | | |
| Q17 | Sustainability impacts are measurable and DCF and cash flows capture all the relevant data including sustainability impacts | | | | | |
| Q18 | Sustainability impacts are not always measurable; some are of qualitative nature and DCF and cash flows are not adequate to capture all the data | | | | | |
| Q19 | We include the qualitative factors when deciding upon capital projects | | | | | |
| Q20 | We include sustainability impacts using the following evaluation tool: | | | | | |
| Q20.a | - DCF | | | | | |
| Q20.b | - Portfolio-based model | | | | | |
| Q20.c | - Conjoint analysis – a multi-attribute model | | | | | |
| | | Tick on the option/s. | | | | |

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| | | | | | | |
|--|---|-------------------|----------|----------------------------|-------|----------------|
| Q20.d | - Sustainability Impact Assessment ('SIA') | | | | | |
| Q20.e | - Cost-benefit analysis | | | | | |
| Q20.f | - Quantitative decision model | | | | | |
| Q20.g | - Framework for Managing a Portfolio of Socially Responsible Investments | | | | | |
| Q20.h | - Life cycle costing analysis ("LCCA") | | | | | |
| Q20.i | - A4S CFO Leadership Network guidelines | | | | | |
| Q20.j | - Our own developed tool/model | | | | | |
| Q20.k | - Another tool/model not mentioned above | | | | | |
| Q20.l | - None of the options mentioned above | | | | | |
| Q21 | If you have developed your own tool, or use another tool/model not in listed above, provide the name of the tool you are using? | | | | | |
| Q22 | We do not have a model to incorporate both the economic impact and sustainability impacts | | | | | |
| RQ5: Characteristics of the desired tools: | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
| The following questions attempt to establish what you consider as the desirable (holistic) tool/technique that can be used to incorporate the sustainability impacts (i.e. social and environmental issues/impacts) | | | | | | |
| Q23 | We see it necessary to incorporate sustainability impacts and economic impacts in one holistic model for evaluation of capital projects | | | | | |
| Q24 | The holistic model should have the following characteristics: | | | | | |
| Q24 | • Considerations of qualitative factors | | | | | |
| Q24.a | - Written explanations e.g. describing importance or improvement | | | | | |
| Q24.b | - Qualitative ratings e.g. high, medium, low; Red, Amber, Green ("RAG") ratings | | | | | |
| Q25 | • Considerations of quantitative factors – non monetary factors | | | | | |
| Q25.a | - KPI dashboard or scorecard, containing numerous KPIs e.g. m ³ of water per product (water footprint, carbon footprint, etc.), % employees satisfied. Presents the project's performances against a range of sustainability KPIs or corporate targets for each project option. | | | | | |
| Q25.b | - Single index or score scorecard, which combines and normalises KPIs into a single score for each issue. A method that normalises project impacts and risks on individual sustainability KPIs by weighting and combining them to produce a single measureable scale for each issue (e.g. a score of 1 to 10 or a sustainability index) | | | | | |
| Q26 | • Considerations of monetary factors | | | | | |
| Q26.a | - Tangible financial impacts: direct improvements resulting in reduced costs or increased revenue to be included in the project's financial model e.g. NPV ("Net Present Value"), IRR ("Internal Rate of Return"), ROI ("Return On Investment") | | | | | |
| Q26.b | - Intangible financial impacts: indirect financial impact on a company (e.g. corporate reputation, employee engagement or licence-to-operate) | | | | | |
| Q26.c | - Stakeholder (or societal) value e.g. cost of pollution to society | | | | | |
| | • Decision making criteria | | | | | |
| Q27.a | Set targets or thresholds for each consideration factor | | | | | |
| Q27.b | Set the weighting for each consideration factor | | | | | |
| Q27.c | Accept projects that meet the minimum threshold for each factor | | | | | |
| Q27.d | Software should be used to simplify a holistic decision making | | | | | |
| Q28 | What other characteristics do you consider necessary for the holistic model? | | | | | |
| Q29 | Any comments will be appreciated | | | | | |

Appendix 3: Scope-1 GHG emitters (processes and sectors)

| Processor or sector | Energy inputs | GHG Type | Description |
|---------------------------------------|--|--|--|
| Electricity generation | Coal, natural gas, petroleum products (e.g. diesel), renewable fuels | CO ₂ , CH ₄ | Fuel inputs are used to generate heat or steam in order to power boilers and turbines that generate electricity. |
| Coal and gas to liquid (gasification) | Coal, natural gas, crude oil, diesel | CO ₂ , CH ₄ | Gas preparation in the coal-to-liquid process. Coal is converted to synthesis gas consisting of hydrogen and carbon monoxide, as feedstock into the Fischer-Tropsch process. The hydrogen-to-carbon ratio is adjusted by injecting carbon in the form of carbon dioxide. |
| Crude oil refining | Crude oil | CO ₂ | Direct emissions result from fired steam boilers, fired process heaters and catalytic cracking unit regeneration. |
| Mining | Electricity, coal | CO ₂ , CH ₄ | Surface mining and underground mining activities result in methane emissions. |
| Cement | Coal, electricity, limestone or calcium carbonate | CO ₂ | Process emissions result from the calcination of calcium carbonate to calcium oxide, which produces CO ₂ as a by-product and clinker production emissions. |
| Paper and pulp | Coal, gas, oil, biomass | CO ₂ | Direct process emissions derive from coal and gas-fired boilers used for electricity generation. Oil is used in the start-up phase. Biomass-based renewable fuel is combined with coal to generate electricity where the renewable fuel (e.g. black liquor) is deemed to be a waste product from the paper and pulp process. |
| Iron and steel | Coal, natural gas, electricity, liquid fuels | CO ₂ | Process emissions due to the production of iron and steel as follows: <ul style="list-style-type: none"> • Integrated or coal-based production route comprising coke making, sinter, blast furnace and basic oxygen furnace facilities. • Coal-based direct reduction facilities where the main inputs are coal & electricity and the primary role of coal is that of a reductant • Emissions from the recovery of waste metal. Direct use of electricity as an input in electric arc furnace operations where scrap metal is recycled. |
| Aluminium | Liquefied petroleum gas, low sulphur oil, diesel, petrol and electricity | CO ₂ , PFCs | Process emissions from melting primary and scrap aluminium, heating of ingots for hot rolling, and homogenising and annealing of metal in the process. |
| Chemicals | | CO ₂ , N ₂ O, CH ₄ | Direct process emissions from: Calcium carbide production, Carbon black formation, Titanium dioxide production, Ammonia production, Nitric acid production. |
| Glass | Natural gas, electricity, liquid fuels | CO ₂ | Direct emissions from: <ul style="list-style-type: none"> • Processes at glass melting furnaces for melting raw materials, glass conditioning, container-forming machines, and glass annealing. • Flat glass manufacture for glass melting. • Decomposition of soda ash, dolomite and limestone. CO ₂ emissions from natural gas used to produce electricity. |
| Transport | Diesel, petrol, compressed natural gas, aviation fuel, electricity | CO ₂ , CH ₄ | Combustion of fuels used in vehicles, aircraft and railways. |
| Agriculture, forestry & land use | | CO ₂ , CH ₄ , N ₂ O | Direct emissions resulting from specific processes, as well as net emissions arising from agriculture, forestry and land-use related activities. These include enteric fermentation, manure management and land use (forest land and cropland). |
| Waste | | CO ₂ , CH ₄ , N ₂ O | Emissions arising from solid waste disposal, biological treatment of solid waste, incineration and open burning of waste, wastewater treatment or discharge. The treatment of wastewater from domestic, commercial and industrial sources contributes to anthropogenic emissions of methane and nitrous oxide. |

Source: (DNT, 2013)

Appendix 4: Other motives behind sustainability commitment

| Theme/Pattern | Quoted and grouped responses |
|--|---|
| Government mandate | "Aim is to relieve pressure from the Government fiscus, by supplying water in a sustainable manner. We also have a mandate to ensure that water conservation is maintained. Water is scarce resource and it has no substitute". |
| Triple bottom line reporting | "Triple bottom line is critical for business sustainability in the short, medium and long term". |
| Licensing requirements and industry requirements | "As a mining company part of the requirements to keep the mining licence is to comply with all regulations including that of sustainability and environmental management". |
| Job security | "Because of public interest such job security etc". |
| Efficiencies | "Sustainability initiatives normally results in cost savings over to long run and protects the integrity of our services". |
| Funding Requirements | "To comply with funding requirements from lenders". |

Appendix 5: Other constraints faced that hinder sustainable capital budgeting.

| Themes/Patterns | Quoted and grouped responses |
|--|--|
| Funding constraints and costs | Capital cost constraints and cost of capital goods. Funding constraints, some of the environmentally projects are very expensive to implement. It's mainly the acceptance of the associated costs which affect the business case negatively. |
| Market conditions | Current market conditions |
| Lack of government intervention and policies | Government is sometimes not decided in policies relating to environmental issues which slow down sustainable capital budgeting processes. Inconsistency by Government in terms of taxation legislation and creating opportunities and incentives to growth. Slow pace of Government agency responses. Uncertain regulatory framework |
| Resistance | Resistance |
| Financial focus | Short term measurement of financial performance. The main objective of the commercial entity is generating sustainable returns so that we can fund social projects. In some cases some people want to prioritise social issues above financial objectives. |
| Subjectivity of assessment | Some project might rank high in terms of social benefits but financial sustainability rank low. Therefore multi criteria assessment to rank such projects becomes difficult and becomes more subjective decision than anything |

Appendix 6: Accounting profession's role required to deal with constraints faced

| Themes/Patterns | Quoted grouped responses |
|---------------------------------|---|
| Business guidance | Accountants could play a leading role in decisions on accepting or rejecting projects as opposed to business playing a leading role (debatable). Give guidance. They can only advise but the decision makers need to make peace with the impact these cost have on the business case |
| Guidance on financial impact | Accountants play a key role in determining the financial impact of the of the constraints facing the company. This is taken into account when calculating the returns on the projects. Accountants are arguably better placed to understand the implications of the long term cash flow impact. Adept IRR and other project evaluation models to truly reflect the long term cost of a specific project if not managed on a sustainable manner - What if analysis. Budgets and cash flow projections. Ensuring cost effectiveness of projects, no over runs. Accountants are key for cost engineering to ensure that project management is enhanced and projects are not only completed on time but are completed at estimated cost. Making provision for adequate capital cost associated with ensuring sustainability. Supply the costs and associated information. |
| Skills development | Curriculum. The accounting profession has made good progress in developing specialist accountants with excellent knowledge of relevant reporting requirements regarding sustainability, and the profession should continue to develop these skills. |
| Practising SCB | Embed it in SCM process. Ensure that sustainability issues are considered in capital budgeting. Take into account other impacts apart from the financial factors. Understand that sustainability cannot be measured just in rand and cents but on the impact these have on the quality of lives of people. |
| Assurance | Audit it. Auditors and presentations as part of financial reporting. |
| Financial reporting | Establish simple form of environmental and social capital accounting (non-financial balance sheet based on 5 capital principles). The accountants play a major role in allocating and capturing all amounts spent on SLP interventions for the annual reports. Auditors and presentations as part of financial reporting. |
| Evaluation frameworks and tools | Financial Skills are key in influencing the investment decision through financial modelling techniques. Accountants should ensure tools are incorporated to deal with sustainability as it is a focus point of the company. The problem with evaluation of projects is not with the accounting profession but rather with the business philosophy that people pursue. in order for accountants to have a meaningful impact on issues of growth, which includes capital budgeting, the accounting tools must be based on theories that have moved from descriptive stage to normative stage. Ensure that there are standard questions incorporated in the motivation for projects that projects owners should answer during the project motivation stage. |
| The use of experts | Very limited as sustainability issues are typically non-financial in nature and requires specialist consideration. Working with Engineers to find cheaper ways of executing the project, e.g. optimising the number of resources required in the project. |
| Government policy influence | Nothing further accountants could do on this; perhaps government lobbying to get more decided and clarify policies. |

Appendix 7: Other tools to incorporate sustainability impacts

| Name of tool | Motivation |
|--|--|
| Stage gate model | In our projects we use a stage gate model to assess projects as tools such as DCF only work when you are doing established projects and DCF is ill-equipped to address the issue of technology risk and how people will respond to the innovation. |
| In-house proprietary tools | No further information was provided. |
| SLP plan | Mining companies are requested to submit an SLP plan every 5 years and we measure ourselves against this plan using templates from the DMR. |
| Multi Criteria Assessment investment framework | The aim is to link financial assessments (DCF) and qualitative factors such as corporate objectives and risk register in ranking and prioritising projects. |
| Project Definition Readiness Assessment (PDRA) | No further information was provided. |
| Socio-economic assessment toolbox | Valuing sustainability in projects |
| Group Economic Model | To assess the economics of all the projects and calculates key KPIs that we assess in making a decision on the project. |

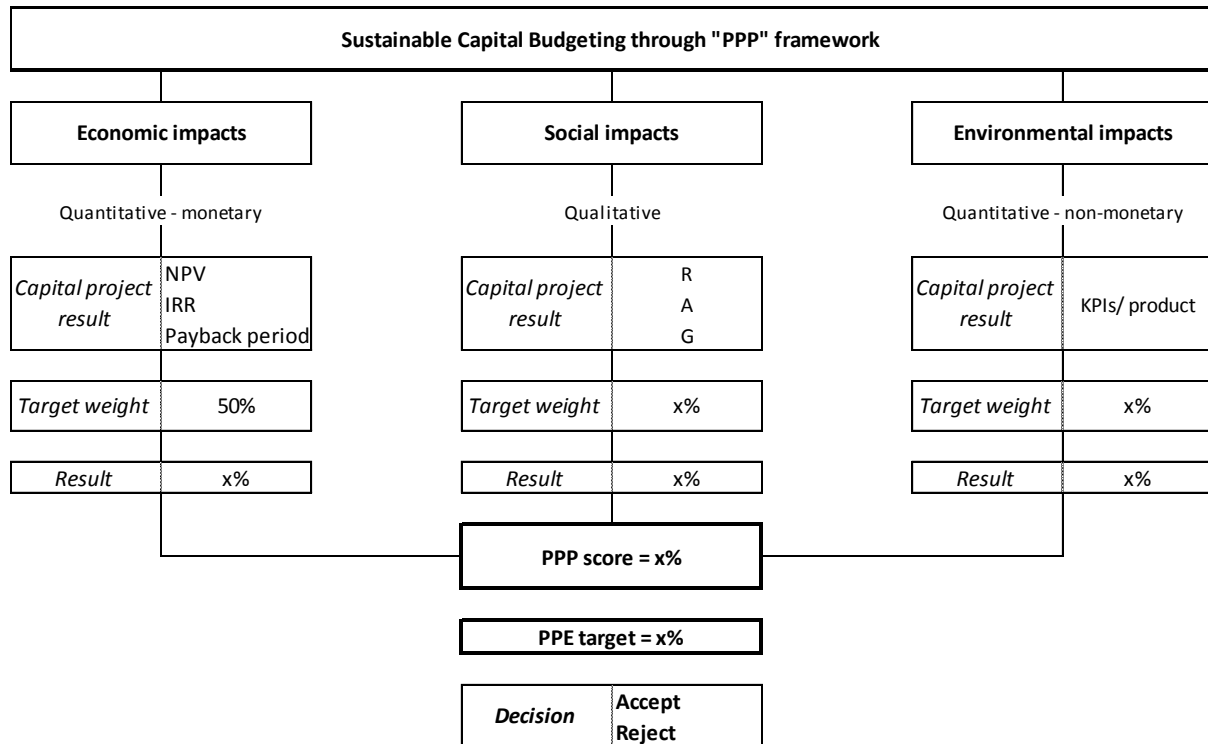
Appendix 8: Other characteristics considered necessary for the holistic model

| Description | Motivation |
|----------------------------|---|
| Corporate and project Risk | Must be considered and factored in decision making. Also the relationship between CFROI to GDP growth, this is an important measure. |
| Flexibility | More creative analytic techniques |
| Benefits tracking | Providing feedback to equity investors demonstrating the cost benefit achieved through a long term sustainability approach. The model should also look at allowing for a constant review. |
| Multi-stage evaluation | The accounting/finance techniques must be designed to assist management in assessing projects through various phases of development such concept and feasibility stage. The current tools only work when projects have reached financial close stage. |
| Factor importance | The model should also consider if any factors are mandatory or discretionary and when mandatory then the question is not whether a project must be done or not, but rather how best can we implement the project in beneficial way to the company. |
| Society review | The model should also look at allowing for inputs by the society with a view to have inclusion as opposed to business directing. |

Appendix 9: General comments by respondents on sustainable capital budgeting

| Theme | Quoted comment |
|---|---|
| Enforcement by government | “Although the pressure on private companies is high (and rightfully so) wrt Sustainability considerations, government's enforcement role should not be underestimated. Lack of enforcement leads to bad behaviour going unpunished and all the "gains" of good process and practices being lost”. |
| Lack of consciousness | “Our tools are not sufficient and this assessment has made me think on how I can improve my companies' capital process to ensure we focus on sustainability”. |
| Presence of consciousness | “Our projects go through a project adjudication process which involves three levels of engineering before sign-off and at any stage they could fail the tests on any number of financial and sustainable factors disused. Sustainability is important especially when mines close down”. |
| Proactiveness versus frameworks and tools | “The focus must not be on the tools for evaluation of projects but it must be how bad projects can be stopped before they consume resources and how to develop winning projects. If all the energy is dedicated to perfecting the measurement tools, then accountants and their friends will be doing a disservice to society”. |
| Towards shared value | “The regulatory framework is just a guide and companies should be moving towards a shared value and define these models based on that”. |
| Prioritisation according to corporate objectives and mandate | “Understanding the mandate of the organisation is key in investment decisions. This influences the organisational objectives and hence also project rankings - it is important to first (gate 1) rank projects in order of importance according to the corporate objectives. Projects at all times should be aligned to the corporate objectives. The second gate will then be financial/ economical sustainability. We found this methodology to always keep us aligned to shareholder requirements and also at the same time remaining financially viable”. |
| Disintergration between project evaluation and sustainability impacts | We do not value customer/supplier impacts when we do motivations for capital projects, these are done in marketing and SCM. In other words customer or supplier issues do not deter the company from deciding on the projects. Projects are determined on a standalone and other sustainability impacts on the company. |

Appendix 10: The “PPP” score card



Framework notes and guidelines

Background and assumptions

This model builds on the work done by the A4S CFO Leadership Network, (2015). The assumption made for this framework is that economic impacts are measurable in monetary terms. It is suggested that only the direct financial impacts be considered and indirect impacts such as the impact of the product on the society in general be excluded as they are not measurable or the measurement is more subjective in nature.

Capital project result

The assesment of each separate impact (i.e. economic, social, and environmental) may be performed seperately outside the model; the results can then be collated and captured on the model to get a holistic view of all the impact assessments. Alternatively, all the impacts could be assessed in one tool. Capital project result for each impact category constitute 100%. For example, if the NPV target has been achieved then 100% is scored for that result. If the NPV is negative, the score is zero %. For social impacts, the Green rating will achieve a 100% score, an Amber rating will achieve 50%, whilst a Red rating gets a zero score. For environmental impact results, if the major KPI, such as m³ of water consumption per/product, or weighetd KPI's is achieved, the project gets a score of 100%, if not it gets zero score.

Target weight

A holistic assessment begins by identifying the social and environmental impacts applicable to an industry within which a company performing the assessment operates. Some industries such as in the chemical industry, have a high potential to have a negative impact on employees, customers as well as the society in general. It is suggested that each industry will have its own impacts prevalent in that industry. For this framework to be effective and objective, only the impacts that are applicable at agent-level need to be considered and company-wide impacts should be excluded. It is recommended that the economic target be set at 50% as it is the main cause for companies' survival. A company using this framework should then set targets between the social impacts and the environmental impacts which would then constitute 50% of the total score. This percentage split between social and environmental aspect of the model will depend on the industry specific impacts as explained.

Result

Each impact category will multiply its result by the target weight set upfront for that particular impact category. All results from the three categories are summed up to arrive at the "PPP" score. This score is then compared against the set target, that is the hurdle "PPP" score. It is suggested that projects with at least 75% of the PPP" score be accepted and those scoring below 75% be rejected.