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Advantages, enablers and barriers to implementing circular economic principles in South African financial services organisations

by

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

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ABSTRACT

There has been a growing call from academics and society asking companies, especially manufacturing firms, to adopt more sustainable business practices and one potential solution could be the circular economy. New technology based companies are disrupting traditional businesses, the world is becoming more populous, placing a large burden on the earth's already stretched non-renewable resources and in addition, the world economy is volatile at present. It is proposed that the implementation of circular economic principles could lead to greater re-use, reducing the need for virgin materials, lowering the burden on the world's natural resources while at the same time increasing employment opportunities in the remanufacturing space and providing companies with more operational flexibility. This research aims to establish whether adopting circular economic principles in the financial services industry could provide these companies with a mechanism to be more sustainable and sufficiently agile in order to remain competitive in the current economic climate.

A qualitative research methodology in the form a cross-sectional study, gathering primary data through 13 semi-structured, in-depth, face-to-face or telephonic interviews with individuals representing three strata was used. Experts in the field of sustainability, the circular economy and green building standards; financial services business practitioners, as well as suppliers of products and equipment to financial services organisations, were interviewed to gain clarity on the research questions, aiming to understand the advantages, enablers and barriers to the circular economy for financial services organisations in South Africa.

The study found that financial services organisations can benefit through value creation and sustainability from the circular economy when implemented in their businesses. The barriers were found to be similar to known barriers but the lack of local manufacturing, high transport costs, inequality along with crime and corruption were additional barriers in South Africa. This research filled a gap in the current literature by adapting an existing model to include services organisations.

KEYWORDS

Circular economy, performance economy, financial services, sharing economy, product as a service

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.

Hayley Dill	7 November 2016
	Date

LIST OF ABBREVIATIONS AND GLOSSARY

ATM: Automated Teller Machine, a device that allows clients from financial institutions to withdraw cash. It can also allow for cash and cheque deposits, along with additional self-service functionality like paying fines, buying pre-paid electricity, buying pre-paid airtime and paying beneficiaries, depending on the model.

Biomimicry: Looking to nature to find inspiration for and solutions to problems or challenges and copying those solutions (Benyus, 2002).

Biophilia: The love of nature and living organisms as opposed to biophobia, which is the fear of nature and living things (Gunderson, 2014; Zhang, Goodale, & Chen, 2014).

Block-chain: A transparent, secure, distributed public ledger or database where transactions are recorded which facilitates cryptocurrencies such as Bitcoin (Koonce, 2016).

Circular Economy (CE): “a series of restorative and regenerative industrial systems” (Hobson, 2015, p. 1) that applies the 3R principles namely “reduce, reuse and recycle” (Yong, 2007, p. 122) and requires a focus to redesign products (Preston, 2012) with the product end of life in mind.

Fintec companies: Financial technology companies that provide some element of financial services such as mobile payments (Schneider, Shaul, & Lascelles, 2016).

Linear economy: The “take-make-use-dispose” (European Commission, 2014) economy, also sometimes referred to as the neo-classical economy (Hawken, Lovins, & Lovins, 1999d; Kemp, 2011).

Performance Economy: Product rental models, also referred to as product as a service which aims to retain products and equipment in the economy for as long as possible through firstly re-using products and where that is no longer possible, through the remanufacturing of products (Stahel & Clift, 2016).

Physical distribution channels: In this document, this term refers to the ATM and branch networks of financial services organisation.

SME: Small and medium enterprises.

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1. CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM

1.1. Introduction

The world is changing at an incredible pace (Davidow & Malone, 2014) and research indicates that companies need to be ambidextrous to ensure their own survival (O'Reilly III & Tushman, 2011; Visser, 2013). In addition, the slowdown of the economy, climate change (Galbreath, Charles, & Klass, 2014) as well as the limitation on natural resources (Hawken, Lovins, & Lovins, 1999a) are placing more strain on the survival of companies. The potential role that the circular economy can play to enable companies to be more flexible and sustainable is investigated in this study. As such, this research aims to understand the potential advantages that financial services organisations in South Africa can derive from implementing circular economic principles along with the barriers and enablers thereof.

1.2. Background to the problem

The world today is becoming more populace and this has resulted in an increase in mass urbanisation (Ghisellini, Cialani, & Ulgiati, 2016; United Nations, 2014), extraction of natural resources to ensure the livelihood and to improve the living conditions of the ever-growing population, a growth in solid waste generated per capita (Hoornweg & Bhada-tata, 2012) leading to overflowing landfills (Corder, Golev, Fyfe, & King, 2014; Ghisellini et al., 2016; Sehlabi & McKay, 2016) as well as an increase in unemployment in some countries. The World Bank has released a report in which they highlight the dangers of the growth in solid waste (Hoornweg & Bhada-tata, 2012) which is not only household and business waste, but a large contributor is also construction waste (Godfrey, 2014; Hawken, Lovins, & Lovins, 1999b).

The sustainability of businesses, not only financial sustainability but also social and environmental sustainability has been a key focus in recent years. This has resulted in concepts, measurements and reporting standards such as environmental, social and governance (ESG), the triple bottom line (Betts, 2015; Rogers & Hudson, 2011), corporate social responsibility (CSR), corporate social investment (CSI) and the concept of creating shared value (CSV) (Porter & Kramer, 2011). There are also indications that recommendations will be made to the G20 finance ministers as well as the central bank governors in the next coming months with regard to new environmental risks reporting standards to show investors what risk exposure they have due to climate change (Fisher, 2016). In South Africa, businesses follow a code of

principles and practices as set out by the King III code for governance principles which asks companies to “comply or explain” and this code includes a section on integrated sustainability reporting. The Johannesburg Stock Exchange (JSE) created a Socially Responsible Investment (SRI) index in 2004 which aimed to inform investors about companies that have comprehensive ESG strategies but it was found that companies placed a higher focus on the corporate governance component than on the social and environmental components of the King III code (Viviers, Mitchell, & Smit, 2015). Viviers et al. (2015) state that this reduced focus on the environmental aspect could be because companies view natural resources such as clean water and air as free resources.

Many researchers have also been highlighting concerns regarding the current linear economy which extracts natural resources (Lieder & Rashid, 2016), often times leading to conflict (Rus, 2012). The linear economy also uses unsustainable manufacturing practices with many negative, unaccounted for externalities (Clift & Druckman, 2015; Eaton, 2013; Ghisellini et al., 2016; Mathews & Tan, 2011; Shadymanova, Wahlen, & Horst, 2014; Trică & Papuc, 2013). These concerns have led to the creation of similar and related models like the circular economy, eco-innovation, the performance economy, the green economy, cradle-to-cradle designs, industrial ecology, zero waste and natural capitalism (Clift & Druckman, 2015; Crainer, 2013; European Commission, 2011; Lovins, Lovins, & Hawken, 1999; Stahel & Clift, 2016; The Product-Life Institute, n.d.; University of California TV, 2009).

The circular economy, an economic framework stemming from particular methodologies such as biomimicry, industrial ecology and the cradle-to-cradle concept, in which humans diverge from the present linear “take-make-use-dispose” economy (European Commission, 2014; Ghisellini et al., 2016), to a more environmentally viable economy which is circular in nature, has been proposed as a potential solution to a number of these problems. Bechtel, Bojko and Völkel (2013) however indicate that there are a number of problems with the circular economy especially relating to the implementation thereof which prevents this concept from aiding “strategic sustainable development” (Bechtel, Bojko, & Völkel, 2013, p. xi). The circular economy attempts to eliminate waste by re-using, upcycling or remanufacturing goods and according to Walter Stahel, this approach is more labour intensive at a local level than the current linear economic approach (Stahel, 1984). The European Commission conservatively estimates that the circular economy could create 50 000 employment opportunities in the UK and 54 000 in the Netherlands (European Commission, 2014) while a study by

the Institute for Local Self-Reliance found that "for every 10,000 tons of solid waste, one job will be created if it goes to the landfill, compared with 25 jobs if sent to a recycling-based manufacturer or up to 295 jobs if sent to a reuse operation" (Betts, 2015, p. 46).

1.3. Relevance to the financial services sector

In the financial services sector, there has been an emergence of *"Fintec"* companies, some of which compete with certain aspects of traditional retail financial services organisations while others, like SnapScan, have opted for a collaborative stance and partnered with Standard Bank (Accenture, 2016; Standard Bank, 2016). In the first quarter of 2016 alone, the investments into Fintecs have been $5.3 billion (Accenture, 2016). The growing Fintec space; new technologies such as blockchain and world connectedness are potentially reducing the requirement for traditional retail financial services organisations, while some speculate that banking will become interwoven into our daily lives to such an extent that banks will become invisible (KPMG, 2016). Even though financial services organisations have been difficult to disrupt traditionally, this trend seems to be changing and as such, these organisations need to find ways to adapt appropriately to stay relevant (Dietz, Khanna, Olanrewaju, & Rajgopal, 2016).

Financial services organisations have invested millions of dollars into their own technological capabilities resulting in their ability to serve customers on a variety of channels such as in-branch, internet, mobile devices and other devices. This is also referred to as an Omni-channel strategy, which is increasing the financial services organisations' cost to serve customers because they are not necessarily reducing the cost of their physical network in relation to their information technology investments. Financial services organisations were hoping that they could replace physical distribution channels with technology, and as a result, they try to push customers onto digital platforms but contrary to expectations, the traditional bank branch has not disappeared yet (Stermer, 2016; Troiano, 2014).

1.4. Relevance to the South African context

The current world economic climate is not favourable and South Africa's economy is set for slow, or no growth. This has resulted in South African financial services organisations operating in a constrained economy, one that doesn't seem to be recovering after the global financial crisis of 2008 (Bisseker, 2014; Economy et al.,

2016; Maynard, 2016; Staff Writer, 2016). In January 2016, the International Monetary Fund's (IMF) forecasted 2016 GDP growth rate for South Africa was lowered from 1.3% to a mere 0.7% (Staff Writer, 2016), but the actual GDP growth rate in the second quarter of 2016 was 0.6% (Trading Economics, 2016).

In a market such as South Africa, where there have traditionally been four large financial services organisations with traditional retail banking components, recently expanded to five large banks with the rise of Capitec, financial services organisations have been used to operate in an oligopoly market (Simatele, 2015; Simbanegavi, Greenberg, & Gwatidzo, 2012). This has resulted in financial services organisations exploiting their customers by charging exorbitant bank charges without questions being asked but those days are over. The competition commission's panel of the banking enquiry recommended that banks reduce fees as well as interbank charges (Competition Commission Enquiry Panel, 2008).

South African retail banks, similar to banks in southern Europe, haven't changed their reliance on a physical branch and ATM network in relation to their increase in technology investments. The total number of South African bank branches per financial services organisation in 2015 is very similar to the number in 2000/2001 for ABSA, FNB, and Standard Bank, while the number of branches for Nedbank and Capitec over the same period has increased substantially (Stermer, 2016). The build cost of the physical branch network in addition to the technology investment is high, pushing up the cost to income ratios of financial services organisations (Stermer, 2016). Due to the socio-economic climate and the high crime rate in South Africa, financial services organisations are forced to spend substantial amounts of money on security systems and other capital intensive equipment in an attempt to deter criminals from breaching their security systems. These organisations would need to find ways to reduce the cost of their physical infrastructure as well as methods to more agile in their physical infrastructure offering to remain competitive and relevant. It is proposed that adopting circular economic principles, particularly the use of products as services through rental models, could aid financial services firms in this pursuit.

In South Africa, the rise of unemployment, particularly among the youth has been a cause of growing concern (National Planning Commission, 2011; StatsSA, 2015). The country has very high unemployment figures (officially 24.5% but according to the expanded definition the percentage is indicated as 33.8%) (StatsSA, 2016); as such labour intensive industries or business models like the circular economy could be

beneficial for job creation, the reduction of inequality and the reliance on social grants (National Planning Commission, 2011). One of the reasons for the high unemployment and specifically the youth unemployment rate is due to the low levels of education achieved by high school students (StatsSA, 2015). According to StatsSA (2015), 55% of the youth do not have a matric qualification while 36.4% have only achieved a matric qualification. If these currently unskilled or low skilled youth can be educated to become economically active in the circular economy, this could benefit not only the unemployed youth and financial services organisations through a larger potential customer base, but also the country as a whole.

1.5. Academic motivation for this research

The current linear economy is being questioned by researchers as the world has finite resources and the current business model is said to be outdated (Crainer, 2013; Ghisellini et al., 2016; Lieder & Rashid, 2016; Stahel & Clift, 2016; Visser, 2015). There is a growing call for business to adopt a more sustainable and regenerative method of operation and researchers argue that recycling alone will not solve the current ecological time bomb as it is still based on the extractive linear model (Crainer, 2013; Ghisellini et al., 2016). A suggested model, namely the circular economy is proposed and this model aims to turn consumers into users through “leasing, renting or sharing products” (Crainer, 2013, p. 17) but Bechtel et al. (2013) found gaps in the effectiveness of the Circular Economy towards sustainable development due to the difficulty of implementation. Research on the circular economy has focused mainly on the physical flows of materials and the recycling aspect specifically applicable to manufacturing firms (Ghisellini et al., 2016; Mathews & Tan, 2011) while the potential application in the services sector, of which the financial services are a part of, has not been fully explored.

The concept of natural capitalism, a similar concept to the circular economy, proposes whole systems thinking and a focus to remove waste from processes and materials as far as possible (Hawken, Lovins, & Lovins, 1999c) which leads to greater efficiencies and higher profits. According to a McKinsey study done in collaboration with the Ellen MacArthur foundation, implementing the circular economy in Europe could lead to an initial $380 billion savings, a figure that could grow to $630 billion per annum once the implementation is more advanced (Crainer, 2013; European Academies Science Advisory Council, 2015). There has been a call from researchers to quantify the potential benefits for manufacturing companies that implement the circular economy

(Drabe & Herstatt, 2016) but the purpose of this research is to establish whether there are benefits for services organisations such as financial services if they implement circular economic principles.

1.6. Research objectives

Due to the volatility of the economy, the rapid advances in technology and the quest for sustainability, traditional financial services organisations need to find ways to adapt in order to remain relevant to the markets that they serve. This research, therefore, aims to establish whether adopting circular economic and performance economy principles in the financial services industry, instead of only funding these initiatives for other organisations, will provide these companies with advantages in order to remain sustainable and competitive in the current economic climate.

It is proposed that the adoption of circular economic principles could be a method that financial services organisations utilise to reduce their capital investment on physical infrastructure, essentially turning these costs into variable operating costs. Also, if these organisations can lease their capital intensive equipment required in their physical distribution networks and back office facilities, it could provide these organisations with a more flexible physical distribution model, one in which they can quickly and easily add or remove functionality, which could assist them in combating the above-mentioned constraints. Another indirect benefit to financial services organisations could be that through the local remanufacturing of the capital intensive equipment, more employment opportunities will be created (Stahel & Clift, 2016; Trică & Papuc, 2013), which will lead to more bankable customers as well as a more stable economy.

In addition, this research aims to understand the barriers and enablers of implementing circular economic principles in financial services organisations based in South Africa. It is proposed that the current accounting principles, the short-term based reward systems of decision makers, the lack of systems thinking and poor collaboration are all current barriers while changes in government policies, transformational leadership, systems thinking and improved collaboration between suppliers and financial services organisations are potential enablers.

Most of the previous research on the circular economy that was found has focused on manufacturing firms and the reduction of environmental impact by re-using resources

and thus limiting the requirement for the extraction of virgin materials to produce new products. In contrast, this research is focussed on services organisations and the main research question that this study attempts to answer is what the potential advantages for the financial services organisation are when they implement circular economic principles. The additional research questions are to understand the barriers these organisations face as well as the enablers they require when implementing circular economic principles in their businesses and whether these differ from the current known barriers and enablers that mainly manufacturing organisations face. In order to understand the above questions, this research will also attempt to understand the current landscape with regard to the implementation of circular economic principles by financial services organisations in South Africa. The contribution that this research aims to make is to understand the relevance of the circular economy for the services sector, specifically for financial services organisations.

2. CHAPTER 2: LITERATURE REVIEW

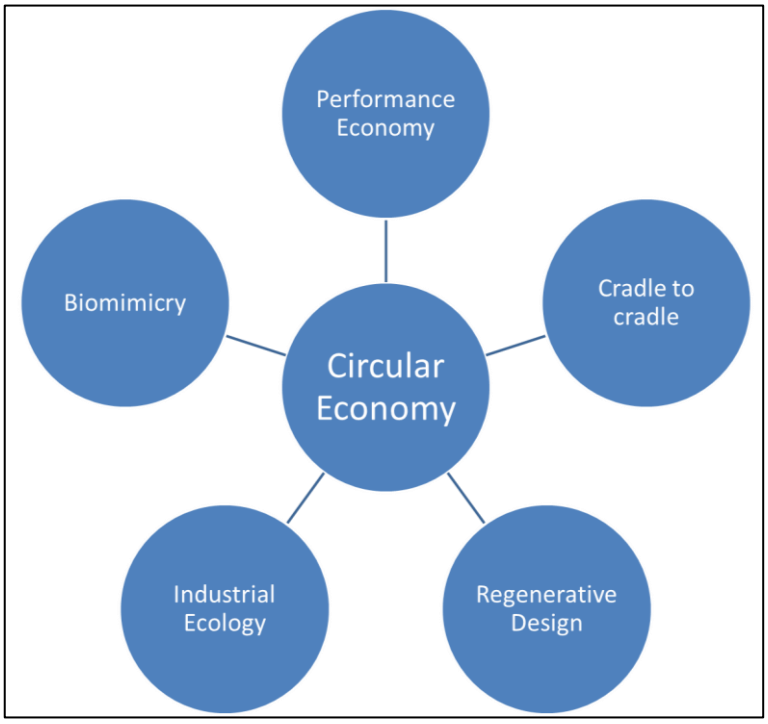
2.1. Introduction

The preceding chapter briefly introduced the circular economy concept and the relevance thereof for financial services organisations as it could aid them to remain sustainable and relevant in the current economy. This chapter reviews the literature concerning this topic and discusses the origins of the circular economy concept along with barriers and enablers for the implementation thereof. The literature review is based on academic articles on the topic of the circular economy and related theories and this assisted with refining the research problem and subsequent research questions.

2.2. Origins of the Circular Economy concept

It seems like there is no plain and uncomplicated exact meaning of the circular economy and it is based on a number of previously defined concepts (Ghisellini et al., 2016; Lieder & Rashid, 2016). This section of the document briefly covers the history and the concepts that have led to the creation of the circular economy concept along with its underlying principles. Figure 1 provides a summary of the concepts that preceded the circular economy and onto which the concept is built.

Figure 1 - Origins of the Circular Economy concept based on Crainer (2013)



The Club of Rome, an organisation that consists of individuals concerned about, and striving to contribute positively to the future of humanity, was created in 1968 following a chance encounter by a successful Italian industrialist named Aurelio Peccei and an eminent Scottish scientist named Alexander King in 1967 (Meadows, Meadows, Randers, & Behrens III, 1972). This organisation commissioned the research which was led by MIT researchers and was published in a non-technical book in 1972 called "The limits to growth" (Turner, 2008). This book highlighted the unsustainable use of the earth's resources and warned that the current consumption rates will lead to depletion by 2100 (Meadows et al., 1972). Numerous debates on the topic of sustainability with opposing viewpoints were sparked due to the book (Turner, 2008) and many have attempted to prove the findings as incorrect.

According to the Brundtland Report, a 1987 UN report entitled "Our Common Future", the notion of sustainable development, considered a paradox by some (Kopnina, 2014), is described as the current generation, meeting its own needs, but not "compromising the ability of future generations to meet their own needs" (Brundtland et al., 1987, p. 16) while Weidinger, Fischler and Schmidpeter (2014) argue that the current generation should rather strive for the protection, not simply non-compromising of, the needs of future generations (Weidinger, Fischler, & Schmidpeter, 2014). Kopnina (2014) defines sustainability as "the capacity to support, maintain or endure; indicating both a goal and a process" (Kopnina, 2014, p. 312), demonstrating the requirement to have a holistic systems approach to sustainability.

Researchers are also concerned with the rate of urbanisation which is leading to unsustainable development due partly to the extraction of natural resources and the growth in solid waste generated per capita, driven not only by household and business waste, but also construction waste (Frosch & Gallopoulos, 1989; Ghisellini et al., 2016; Hawken et al., 1999b; Talyan, Dahiya, & Sreekrishnan, 2008). All these concerns regarding the sustainable development of the human population have led to the creation of concepts such as circular economy, eco-innovation, the performance economy, the green economy, cradle-to-cradle designs, industrial ecology, zero waste and natural capitalism to try and ensure a sustainable future for all (Carrillo-Hermosilla, del Río, & Könnölä, 2010; Clift & Druckman, 2015; Ghisellini et al., 2016; Hawken et al., 1999a; Stahel & Clift, 2016).

To date, most of the research has focussed on manufacturing firms (Han, Li, Song, & Tong, 2006) as they have a large impact on the environment. Very little research has

been conducted on service orientated organisations although there has been a proposal for clean services that may lead to a more sustainable world (Wolfson, Tavor, & Mark, 2014). The clean services as proposed by Wolfson et al. (2014) recommend that companies combine products with services in order to create Product Services Systems (PSS) and these services are categorised as "prevention, reduction, replacement, efficiency and offset" (Wolfson et al., 2014, p. 410). As the successful move towards the circular economy involves multiple players and collaboration (Ghisellini et al., 2016), this study focusses on the advantages that services organisations such as the financial services sector can derive from implementing the circular economy in their businesses. It is believed that if the relevance of the circular economy concept to all business sectors can be illustrated, the adoption rates thereof will increase.

2.2.1. Performance economy

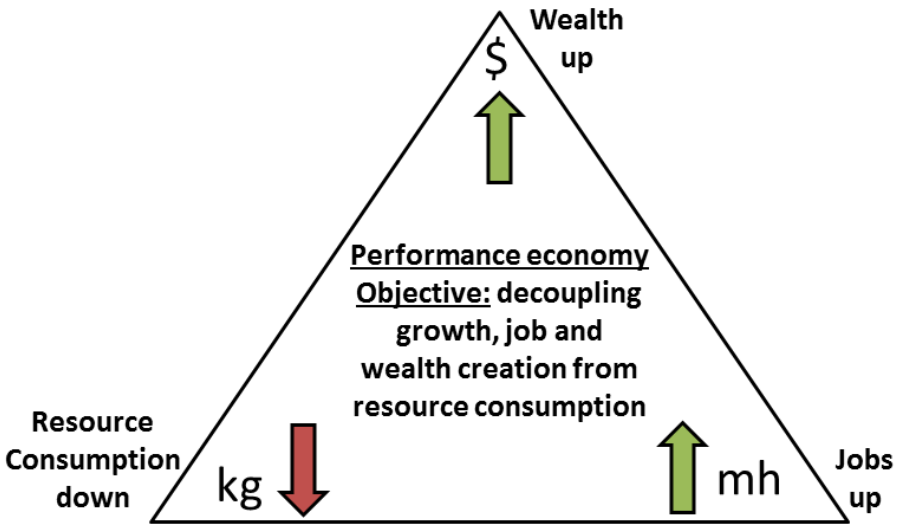
Walter Stahel (1984) introduces the self-replenishing system which he also refers to as product-life extension. This system is designed to reduce the use of virgin material and energy, reducing the environmental impact without minimising economic growth or technological improvement (Lieder & Rashid, 2016; Stahel, 1984). As such, many credit Stahel as the father of circular economy. Later, Stahel also proposes the performance economy; a commercial model which he deems has the greatest economic potential within the circular economy (Stahel, 2010). In the performance economy model, goods are consumed as a service and the manufacturer retains ownership, which in turn encourages them to develop products to last longer, removing planned obsolescence (Clift & Druckman, 2015) which lead to re-use, and development of products that can get disassembled and remanufactured more efficiently in the future (Stahel & Clift, 2016). The performance economy is a proposed service model (Stahel & Clift, 2016) and it promotes a decrease in the ownership of new personal property (Sikdar, 2014). According to Stahel and Clift (2016), the performance model is appropriate for developed countries where the number of new goods and the number of end-of-life goods are similar but it could be argued that it can also be effectively implemented in developing countries or a country like South Africa with an unequal society although, in these cases, more products will have to be introduced as the economy and the population expands.

The performance economy ultimately results in the resources required to produce goods for tomorrow, acquired at the prices of yesterday which makes business sense

due to the recent trend of rising commodity prices (Crainer, 2013; Pollard, Charnley, & Webster, 2016). The disassembly and remanufacturing process can also be more labour intensive, potentially resulting in more job creation (Borel-Saladin & Turok, 2013; Stahel & Clift, 2016), something that is urgently required not only in South Africa but also globally.

Based on the principles of the performance economy described above and depicted in Figure 2, it seems like the performance economy is the precursor to concepts such as the sharing economy, a concept that has gained popularity recently due to start-ups such as Uber and Airbnb among others (Martin, 2016). According to the European Commission's 2011 report, the most serious obstacle to the implementation of eco-innovation is ambiguity in the necessity of such products or services from the market (European Commission, 2011) but it seems like consumer behaviour and new business models might be forcing companies to adopt circular economic principles in the form of the performance economy or sharing economy model (Martin, 2016).

Figure 2 - Performance economy objectives. Source: Stahel (2010)



2.2.2. Industrial ecology, Biomimicry and Natural capitalism

The industrial ecology concept is a fairly new one, believed by Clift and Druckman (2015) to have originated from a 1989 seminal paper by Robert Frosch and Nicholas Gallopoulos entitled "Strategies for Manufacturing", a title which differs from their proposed title because the journal would not accept "Manufacturing -- The Industrial Ecosystem View" (Frosch & Gallopoulos, 1989). In this article, they deliberated

manufacturing's environmental impacts by considering resource depletion and waste accumulation that they saw as future challenges (Clift & Druckman, 2015; Frosch & Gallopoulos, 1989). Frosch and Gallopoulos (1989) proposed a new integrated model to address these challenges which they envisioned as a type of "industrial ecosystem" through which energy and material usage is heightened while the unintentional fabrication of waste is reduced or in the event that waste is created, it becomes an input into another process (Clift & Druckman, 2015) which leads to a circular economic approach to manufacturing. The Industrial Ecology is described as a system that aims to manage the "flows and stocks of materials and energy" (Sikdar, 2014, p. 5) in the economy. Accordingly, the main driver of the industrial ecology concept was the realisation that we are destroying natural resources at an alarming rate which is not feasible for future sustainability (Clift & Druckman, 2015) and hence the aim to keep materials within the system for as long as possible, if not in perpetuity.

Biomimicry, a term coined by Janine Benyus (1997), is described as the process of imitating or drawing inspiration from nature so that one can find innovative solutions to problems by looking towards nature as firstly a model, secondly a measure and lastly a mentor. Benyus (1997) argues that the natural environment has had 3.8 billion years to make its designs, processes, and structures flawless and that the human species should use nature to learn from it, as oppose to simply extracting natural resources from it (Benyus, 2002) and polluting the world with discarded products and other toxins. The biomimicry concept is used within industrial ecology, and its application focusses on minimising resource usage along with the potentially undesirable effects on the natural world (Clift & Druckman, 2015).

Architects and industrial designers are starting to use biomimicry in their work. There are a number of proponents such as Michael Pawlyn (2013) who is excited about the prospect that 3D printing of biomimicry-based designs with natural materials might hold for the future of architectural designs (Pawlyn, 2013). As with most concepts, there is also criticism concerning biomimicry in architecture, stating that these concepts developed by imitating nature are not necessarily more sustainable or environmentally friendly than the traditional design concepts (Ramzy, 2015; Volstad & Boks, 2012). Another limiting factor is debates about "wasteful" research funding in the United States which could hamper the development of new innovative solutions, especially biomimicry research that often deliver solutions from the strangest sources (Brennan, Irschick, Johnson, & Albertson, 2014).

Natural capitalism is said to be an innovative "type of industrialism, one that differs in its philosophy, goals, and fundamental processes from the industrial system that is the standard today" (Hawken et al., 1999a) and this system consider all of the natural resources found in nature as capital worth protecting. Researchers argue that businesses which uses natural resources much more productively than they currently do have the ability to solve a number of our environmental problems while making increased profits (Lovins et al., 1999). Four major changes are required to move towards a natural capitalist system and according to Lovins et al. (1999) these include:

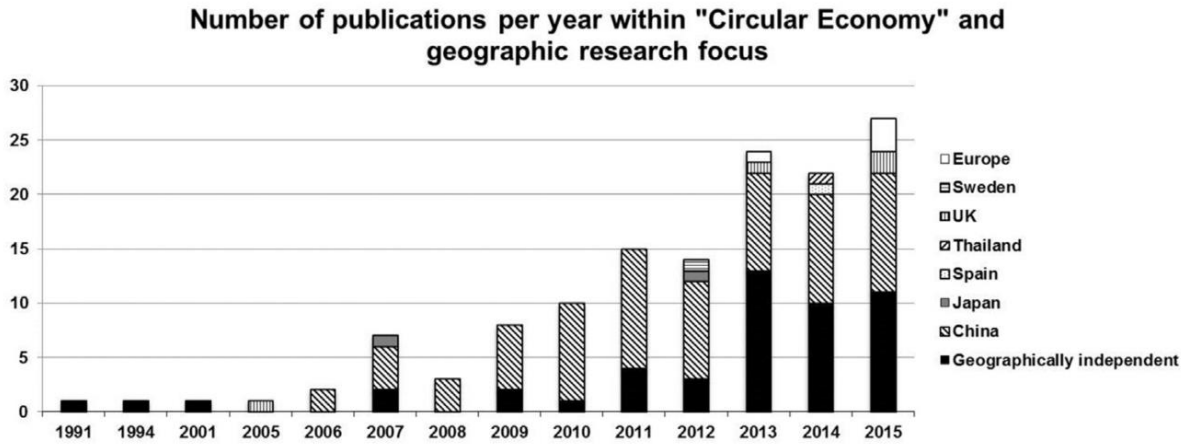
- "Dramatically increase the productivity of natural resources"
- "Shift to biologically inspired production models"
- "Move to a solutions-based business model"
- "Reinvest in natural capital"

The above-mentioned concepts, along with others have given rise to the concept of the circular economy; a concept which could enable sustained future prosperity although Bechtel et al. (2013) found gaps in the effectiveness of the Circular Economy towards sustainable development due to the difficulty of implementation. The circular economy, as defined for this research is described below.

2.2.3. Circular Economy

Our current industrial economy is based on a linear "take-make-use-dispose" (Lieder & Rashid, 2016, p. 37) economy which is unsustainable over a long period of time, hence, the drive by scholars and activists to adopt the circular economy, a topic which has gained popularity recently (Clift & Druckman, 2015; Crainer, 2013; Ghisellini et al., 2016; Lieder & Rashid, 2016). China is leading the way for the circular economy and they have implemented circular economy laws because they see it as a potential solution to the environmental impact of the linear economy (Li & Yu, 2011; Yijun & Ying, 2011; Yong, 2007; Yuan, Bi, & Moriguichi, 2006; Zhijun & Nailing, 2007; Zhou, 2006). Figure 3 provides an illustration of the research conducted on the circular economy and it highlights the geographical origin of the studies as well as the timeline within which this research was published (Lieder & Rashid, 2016).

Figure 3 - Distribution of reviewed academic publications including the geographic focus in which CE has been published since 1991 up to and including 2015. Source: Lieder and Rashid (2016)

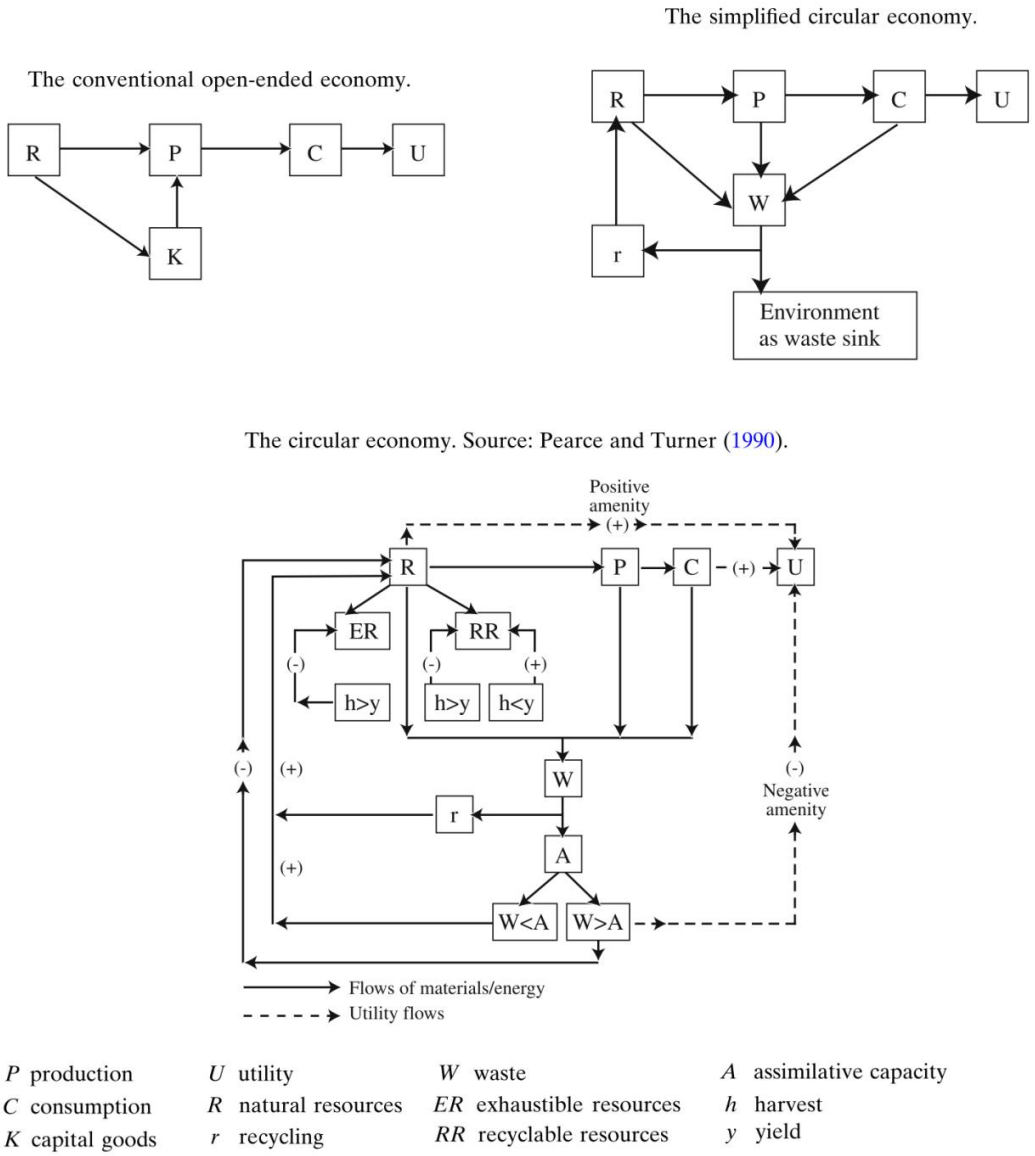


According to Anderson (2007), the circular economy stems from industrial ecology, a concept that promotes the reduction of the use of virgin materials through “a form of material symbiosis between otherwise very different companies and production processes” (Andersen, 2007, p. 1) which implies a great deal of collaboration. The core of the circular economy is based on three principles namely Reduce, Re-use and Recycle, also referred to as the 3R principles (Ghisellini et al., 2016; Lieder & Rashid, 2016; Yong, 2007; Yu, Jong, & Dijkema, 2014; Yuan et al., 2006; Zhou, 2006). In order to apply the 3R principles, a collaborative process between different and potentially competing companies to initiate the implementation of circular economic principles in business landscapes is required. The required collaboration could also result in clustering of organisations (Corder et al., 2014; Kuah, 2002) and this has led to the creation of eco-industrial parks in China (Mathews & Tan, 2011; Zhijun & Nailing, 2007) as well as other countries.

Dame Ellen MacArthur, a British lady, famous for breaking the world record in 2005 as the fastest person to sail solo around the world, realised how finite our resources on earth are during her journey and as a result, created a foundation to drive research into the circular economy (Crainer, 2013). Her foundation has partnered with McKinsey, a well-known management consulting firm, to work in three areas to investigate the circular economy (Crainer, 2013). These areas include firstly education, as the way that we design products with planned obsolescence (Clift & Druckman, 2015) and systems designs will have to change. Secondly, business, as collaborative partnerships will be required and lastly, analysis to uncover the financial gains that can be achieved in the

circular economy. According to research, Europe alone could save $380bn during the transitional phase while these savings could grow to $630bn per annum once an advanced stage of the circular economy is reached (Crainer, 2013). This massive economic savings prospect should make the environmentally sustainable circular economic approach appealing to business and provide a feasible business case for its adoption. **Error! Reference source not found.** shows how the open-ended economy s flawed and should be viewed as a circular economy while Figure 5 provides an illustration of the suggested circular economy where both the biological nutrient path as well as the technical nutrient path is shown.

Figure 4 - Open-ended economy should be viewed as circular. Source: Andersen (2007)

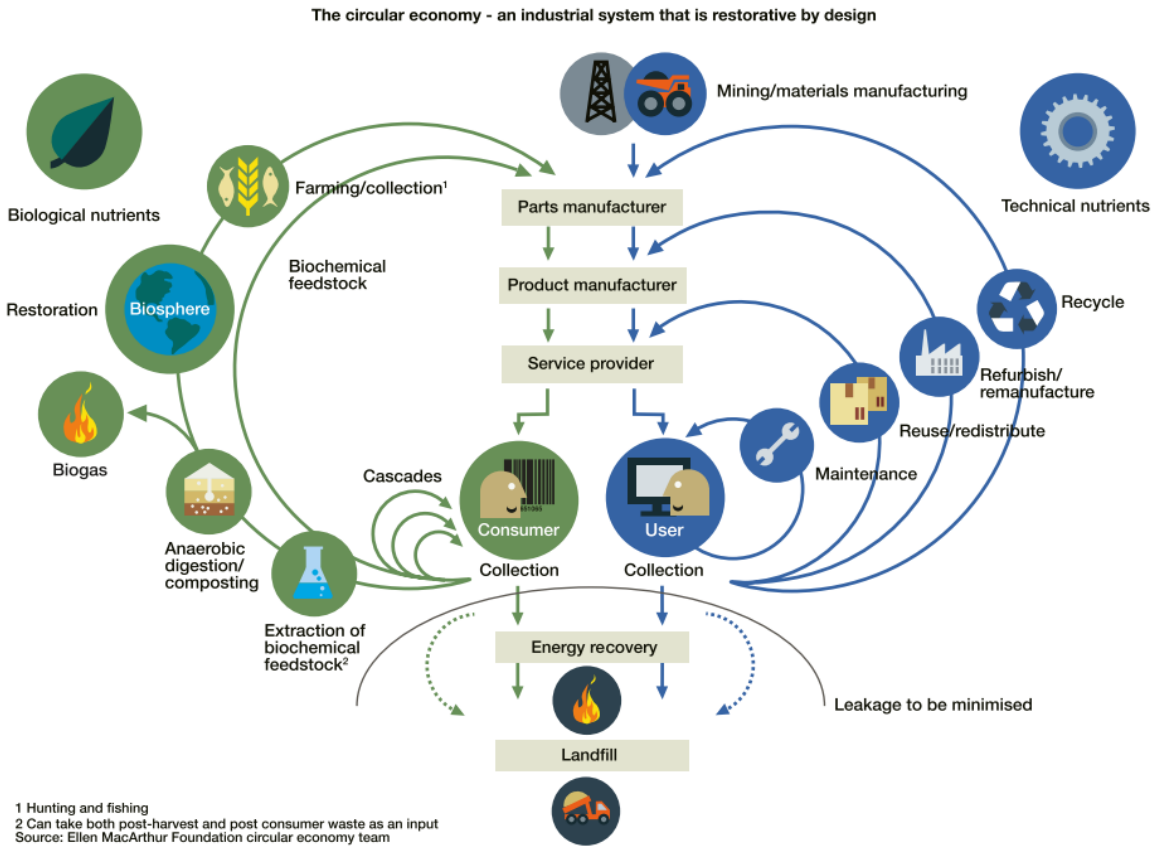


The circular economy. Source: Pearce and Turner (1990).

P production	*U* utility	*W* waste	*A* assimilative capacity
C consumption	*R* natural resources	*ER* exhaustible resources	*h* harvest
K capital goods	*r* recycling	*RR* recyclable resources	*y* yield

Figure 5 illustrates that the circular economy is more than simply recycling. The idea is to eliminate the use of toxins or non-biodegradable products, which is also a key principle from the cradle to cradle concept (McDonough & Braungart, 2002), then design and manufacture products for re-use as well as upcycling. Education will play a pivotal role in the future implementation of the circular economy as the product design has to start with the end in mind which changes the cognitive frames required by designers quite dramatically. There are still a lot of products designed with planned and perceived obsolescence (Clift & Druckman, 2015) as this is a way to increase consumption rates and designers are not skilled in designing products for product-life extension (Bakker, Wang, Huisman, & Den Hollander, 2014). Consumers will also require education regarding products produced with circular economic principles as the aim is to extend the lifespan of products through maintenance and upgrades which challenge the current discard and acquire new mindset. Only once the maintenance and upgrade options have run out, will the product be remanufactured and the aim is for little to none of the technical or biological nutrients to go to landfills.

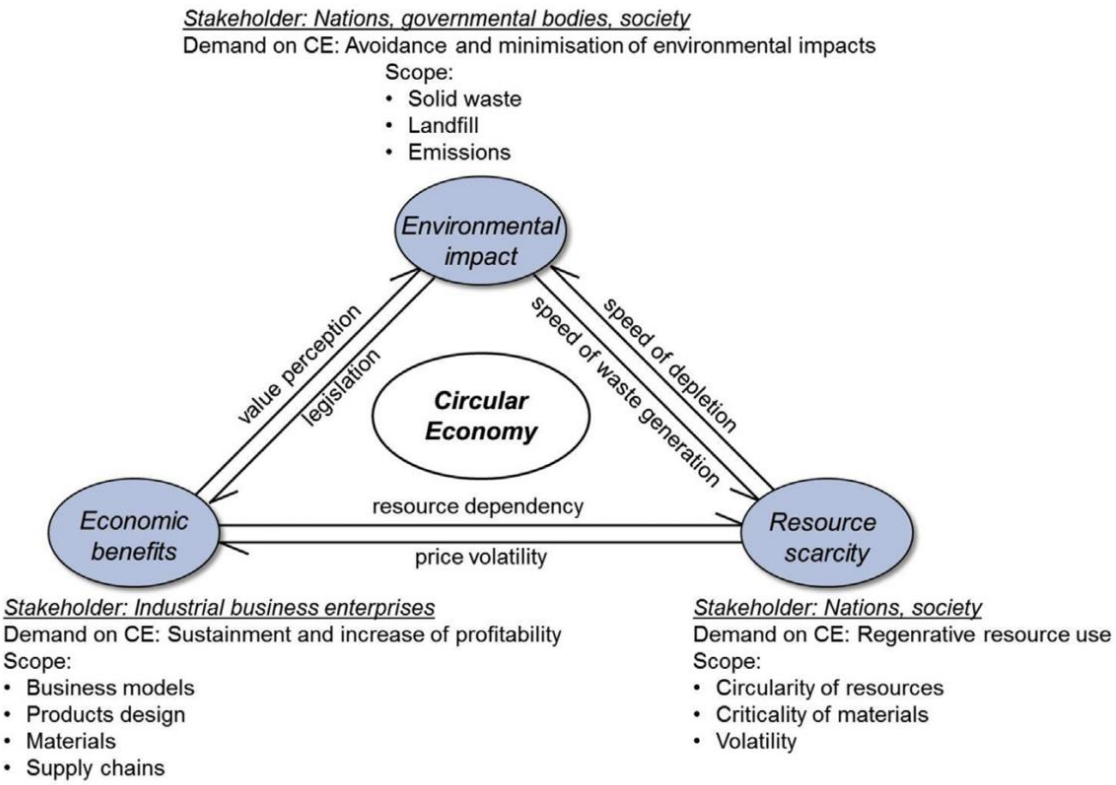
Figure 5 - The Circular Economy. Source: Roos (2014)



A comprehensive framework for the circular economy is provided by Figure 6 and indicates the various stakeholders to consider based on research by Lieder and Rashid (2016) but it could be argued that services organisations have been left out of the equation. This research aims to fill the gap in the literature by taking services organisations, in the form of financial services into consideration, not from the perspective of a funder of circular economic principles, but from a possible implementer of the circular economy.

For the circular economy to be successfully implemented it is vital that business rethinks the neoclassical economic system which is linear in nature and adopt circular economic principles (Bechtel et al., 2013; Hawken, Lovins, & Lovins, 1999e). Bechtel et al. (2013) found that the implementation of circular economic principles need refinement and that as with many innovative changes that challenge the current realities, there are numerous barriers and required enablers to the implementation of a circular economy (Bechtel et al., 2013; Ghisellini et al., 2016; Matus, Xiao, & Zimmerman, 2012).

Figure 6 - A comprehensive Circular Economy framework. Source: Lieder and Rashid (2016)



2.2.3.1 Barriers keeping companies from adopting the Circular Economy

Barriers to the circular economy, industrial ecology, and green engineering include among others, depending on the type of industry, a lack of research funding, regulations, economic and financial barriers, lack of external funding, insufficient subsidies, uncertain return on investment or long payback periods, information and technological challenges, behavioural limitations from business leaders and consumers, sub-optimal product designs and uncertain demand from the market (Bechtel et al., 2013; Corder et al., 2014; European Commission, 2011; Ghisellini et al., 2016; Matus et al., 2012). Lovins et al. (1999) indicate that the current tax and accounting systems actually reward companies for being wasteful, especially with regard to natural resources, while investing in technology or processes that increase resource productivity is penalised (Lovins et al., 1999). It seems like a reform in accounting principles and the tax system is required to allow companies to become more sustainable and companies should get charged an accurate price for natural resources such as fresh air and water instead of subsidised prices (Hawken et al., 1999e). Andersen (2007) also calls for the accurate measurement of externalities, which in effect places a price tag on the social costs of pollution and resource extraction as well as the usage of natural resources. Accurately measuring these costs allows them to be internalised by companies through appropriate environmental taxes which will allow the traditional market forces to take effect (Andersen, 2007) but these costs will most likely be passed on to consumers (Brundtland et al., 1987) which are concerning, especially to poorer consumers. Only once these costs are properly accounted for, an activity that will also require a great deal of collaboration (Andersen, 2007), will there be a viable business case for the circular economy.

Table 1 - Key barriers to implementing the Circular Economy for multinational companies. Source: Roos (2014).

Key barriers
Technological: Barriers connected to specific technologies (e.g., recycling technologies) and processes (e.g., product design) that hinder companies to fully adopt the concept.
Legal: Complexity of regulations, discrepancies between international regulations and their often outdated or rigid characteristics can unintentionally create additional barriers during the transformation.
Economic: Businesses experience difficulties in defining the business case for adopting the CE concept, which is even more intensified by the current economic situation.
Change in mindset: A reluctance to acknowledge that the current way cannot proceed and a change to a more long-term perspective is necessary can hinder the implementation of the circular economy.

Table 2 - Main limits and challenges to transition to the Circular Economy according to literature. Source: Ghisellini et al. (2016)

Principles of CE	Limits or challenges Optimal	Reference
Design	Optimal product life scenario.	Bakker et al., 2014
	Design for disassembly, re-use, recycling. Reduction	Wrinkler, 2011; Ellen MacArthur Foundation, 2012; Bakker et al., 2014
	Design for durable products.	Bakker et al., 2014
	Design for a new business model of consumption.	Ramani et al., 2010; Bakker et al., 2014
Reduction	Overcome rebound effect of eco-efficiency and eco-sufficiency strategies.	Figge et al., 2014
Re-use	Technical maximum reusability of materials.	Park and Chertow, 2014
	Increase of consumer demand towards re-use of products and materials.	Prendeville et al., 2014
	Development of take-back mechanisms from the companies.	Bilitewsky, 2012
	Ensuring repair and secondary use of products after their original use.	Bilitewsky, 2012
	Taxation based on non-renewable energy rather than labor and renewable energies	Stahel, 2010, 2013
Recycle	Reinforcement of local markets of recycled materials.	Sevignè -Itoiz et al., 2014
	Risks of global trade of materials. Plastic waste: unfeasibility due to the mixing of contaminants.	Bilitewsky, 2012; Reh, 2013
	Cellulose: feasible until 4-6 times.	Reh, 2013
	Rare metals (lack of economies of scale).	UNEP 2013b; Prendeville et al., 2014
	Food Waste: further transformations before being used requires high costs in research and development.	Mirabella et al., 2014
	Appropriate LCA modelling for re-use and recycling.	Thomas and Birat, 2013; Birat, 2015
Reclassification of materials into: Technical Nutrients	Re-use after the first cycle.	Ellen Macarthur Foundation, 2012
	Safe return to the Biosphere or in a cascade of subsequent uses (biorefinery)	Ellen Macarthur Foundation, 2012
Renewable Energy	Increase their share compared to the share of fossil fuels.	Ellen Macarthur Foundation, 2012; Preston, 2012

Another current limiting factor, although this might change when natural resources become scarcer or the supply thereof becomes less sustainable (Rosenau-Tornow, Buchholz, Riemann, & Wagner, 2009), is that the cost of virgin material is often lower than that of recycled material, and as such, until this changes, companies will have to

make a business case for the circular economy using environmental economy principles (Andersen, 2007). A barrier that can be difficult to overcome is the certification processes itself due to the cost and the required skills and resources to achieve certification; for example the cradle-to-cradle approach requires that all toxic materials be removed from a product which makes it essential for the company to be able to identify the toxins and have the knowledge on potential replacement materials (Drabe & Herstatt, 2016). **Error! Reference source not found.** indicates some of the hallenges that researchers have identified when certain principles of the circular economy were analysed (Ghisellini et al., 2016) while Table 1 highlights the key barriers to the circular economy as summarised by Roos (2014).

This study aims to understand whether the known barriers of implementing the circular economy are the same for financial services organisations or whether there are other factors at play in these types of organisations.

2.2.3.2 Enablers to move towards the Circular Economy

The drivers or enablers that could fast-track eco-innovation and the adoption of the circular economy include technological capabilities, leadership, collaboration, consumer behaviour, access to standing financial aid and economic incentives, good commercial associates, innovation, biophilia, existing high material and energy costs and imminent surges in energy rates (Bechtel et al., 2013; European Commission, 2011; Matan & Newman, 2015; Seebode, Jeanrenaud, & Bessant, 2012). Drabe and Herstatt (2016) also found that it is important for the company's philosophy to fit with the cradle-to-cradle concept. Clift and Druckman (2015) as well as Ghisellini et al. (2016) state that removing taxes from activities that preserve value for example re-using or remanufacturing of products, while keeping the tax on newly produced items will incentivise consumers to rather opt for products from the circular economy as these products will have a substantial cost advantage.

The circular economy concept is not something that individual companies can implement in isolation; as such systems thinking and collaboration between companies are vital for the successful implementation thereof. The interdisciplinary nature of the circular economy and environmental economics requires a great deal of collaboration, often with diverse individuals or companies (Andersen, 2007). Shafiq, Klassen and Johnson (2014) actually state that an organisation's supply chain, which is often a system consisting of different companies, can provide the company with operational

competitiveness while collaboration, to the extent of co-creation, can lead to breakthrough innovations which can resolve a variety of problems (Seebode et al., 2012; Weidinger et al., 2014). Boughzala and De Vreede (2015) argue that collaboration is critically important for organisations to achieve and maintain their competitive advantage and they have developed a maturity model to assess collaboration called Col-MM as a way for organisations to assess the maturity of team collaboration both within as well as between organisations (Boughzala & de Vreede, 2015). The Col-MM model classifies the maturity of collaboration as “ad hoc, exploring, managing, and optimizing” (Boughzala & de Vreede, 2015), with the optimising level the most mature and the ad hoc level the least mature.

In addition to collaboration, the need for companies to be in close proximity to one another in order to aid the implementation of the circular economy could lead to the formation of clusters, although waste exchange networks, for example, does not have to be contained within small geographical locations, these networks can be global (Corder et al., 2014). Clusters are formed where related companies physically locate themselves in a nearby geographical vicinity to one another, and these are said to lead to economic growth, profitability, innovation and collaboration (Galbreath et al., 2014; Kuah, 2002; Lieder & Rashid, 2016). Clift and Druckman (2015) mentions that SMEs, especially those from developing countries, could become globally competitive if they create complementary clusters as opposed to operating in isolation. Based on a case study on the Devens eco-industrial park in Massachusetts, USA, companies stated the following reasons for relocating to that specific industrial park (Veleva, Todorova, Lowitt, Angus, & Neely, 2015):

- access to appropriate infrastructure such as environmentally friendly green rated buildings, railways and roads with the option to take part in a shared shuttle service to transport employees to and from the commuter rail terminal
- reduction in the cost of real estate
- certain tax incentives
- collaboration with other companies is easier due to proximity
- the eco park's sustainability vision and policies which links to their company values

The complexity, new design mentality and the required collaboration make it important for organisations to apply systems thinking, which can also be referred to as systems theory (Sigler, 1999), to the circular economy. Cole (2012) states that for regenerative

design to gain momentum, it is vital that humans change their perspective from one where humans are seen as superior and separate from nature to one where humans are seen as an important but co-dependent element within the natural system. Systems thinking assist with the integration of a multitude of disciplines which includes both natural sciences as well as social sciences and is based on the simplistic view that "Everything is connected to everything else" (Sigler, 1999, p. 45). Cole (2012) argues that the current green building approach does not provide guidance in-line with systems thinking while regenerative designs "promote a co-evolutionary, partnered relationship between humans and natural systems" (Cole, 2012, p. 40). Sigler (1999) starts his article with a delightful story that depicts how integrated the world is and how one small action or lack of action on one continent can potentially influence the survival of a species on the other side of the world; to read the story please see Appendix E – A systems view of the world illustrated through this story. Source: (Sigler, 1999).

Table 3 - Key enablers to implementing the circular economy for multinational companies. Source: Roos (2014)

Key enablers
Leadership: Leadership that appreciates the new strategic direction, understands its benefits but also its risks, and is able to establish a common understanding of the business, can be a powerful enabler during the transformation process.
Collaboration: A company can never achieve full circularity on its own: It is dependent on a network of collaborating organisations to enable the adoption of the concept. Fostering internal, as well as external collaboration, can, therefore, be a powerful factor.
Motivation through the concept itself: The concept of Circular Economy unleashes creativity and improves morale by getting the idea that being sustainable, and at the same time benefiting economically, is possible for companies.
Customer behaviour: Customers are increasingly demanding environmentally friendly products and by this are putting more pressure on businesses to adopt more environmentally cautious practices; this can be a significant enabler.

The workforce and the consumers of the future are millennials and researchers found that millennials new to the job market, prefer to seek employers that operate in an environmentally sustainable fashion (Hanson-rasmussen, Lauver, & Lester, 2014) and they are also more inclined to use the products as a service model, essentially opting out of ownership of products (Clift & Druckman, 2015). This could result in sustainable business practices being driven from within organisations as a result of hiring millennials, especially once these millennials get into leadership positions. Once these millennials become consumers, the pull factor from these consumers can also drive the circular economy. The role of leaders should change to such an extent that they become "social-systems architects who enable innovation and collaboration" (Hamel, 2009, p. 94).

This study aims to understand whether the known enablers of implementing the circular economy are the same for financial services organisations or whether there are other factors that influence the implementation thereof in these types of organisations.

2.3. Advantages of Circular Economic approaches

According to Andersen (2007), the main initial benefit of the circular economy is the reduction in waste that would have been lost to the system and the requirement for new raw material and thus, the circular economy can be seen as turning adverse externalities into positive ones by converting waste into resources. In addition, Andersen (2007) lists four other benefits of the circular economy if market prices were to reflect the external costs appropriately. These are firstly allocative efficiency where companies "may choose to employ more labour and ''less environment'' by, for example, promoting recycling and reuse activities" (Andersen, 2007, p. 137) which are more labour intensive (Ghisellini et al., 2016). This creates benefits to society as more jobs can be created in the process while the extraction of natural resources is reduced which links in with the view of replacing energy with manual labour (Clift & Druckman, 2015).

Secondly, abatement efficiency where companies may choose to implement measures to reduce, for example, their level of pollution while they might pay the additional tax in the event where it would be more costly to reduce their impact (Andersen, 2007). Thirdly, companies may continuously innovate to generate cost-effective clean technology solutions (Andersen, 2007) and the cradle-to-cradle concept, a concept closely related to the circular economy, actually forces companies to come up with radically different products due to the end-of-life considerations at the genesis of product design (Drabe & Herstatt, 2016). Lastly, Andersen (2007) state that the circular economy might provide companies with more flexibility to create individualised solutions.

Clift and Druckman (2015) is of the opinion that companies whom retain ownership of their products can generate more profit through re-use and remanufacturing practices, essentially selling products as services (Ghisellini et al., 2016), than through the current linear economy whereby they sell the products for a once-off profit and have to purchase new raw materials to create new products. Companies can also benefit by implementing circular economic principles in that they can cut costs in the form of new raw material, they can potentially create new revenue streams by selling their waste as

a resource to another company, and the products as a service model allows companies to create much closer working relationships with their customers which can create long-lasting profitable relationships (Roos, 2014). In addition to selling waste as a resource, companies can also potentially save costs by using different, potentially cheaper materials as well as simplified designs for their products (Drabe & Herstatt, 2016). Mathews and Tan (2011) found that the circular economy could provide companies and even countries with important competitive advantages.

2.4. Services industry

Most research on the circular economy have focussed on manufacturing organisations (Han et al., 2006), but Wolfson, Tavor and Mark (2014) have suggested a service-dominant logical paradigm which advocates co-creation to enhance the value for both the customer and the provider of a service (Wolfson et al., 2014). This approach requires multidisciplinary research and IBM has suggested the creation of a discipline called service science (Wolfson et al., 2014).

The services sector which is enabled through collaboration between technology, people and structural systems is growing and becoming more complex (Wolfson et al., 2014) and financial institutions form part of this sector. Due to the growth in this sector and the subsequent impacts it is important for organisations to consider not only the economic sustainability but also the social and environmental sustainability (Wolfson et al., 2014). Increasingly often, innovations stem from various actors working together, essentially co-creating and this is taking place outside the boundaries of one organisation (Lusch & Nambisan, 2015).

This research aims to provide insights into the implementation of the circular economy in financial services organisations which will enhance the literature as the dominant focus has been on manufacturing organisations (Han et al., 2006).

2.5. Conclusion

As can be seen from the literature review, researchers have been grappling with solutions to our current, unsustainable liner economy model to ensure the future sustainability of humankind for a number of years. The circular economy has been suggested as a potential solution but some researchers have their reservations about this being the silver bullet to the climate change and resource extraction problems. Currently, there are still numerous barriers to the implementation of the circular

economy, and most of the research has been focused on manufacturing firms (Han et al., 2006) and the reduction of the environmental impact when the circular economy is implemented.

This research aims to fill the gaps in the literature by investigating financial services organisations and to identify potential advantages in the event that these organisations implement circular economic principles. In addition, this research aims to understand the barriers and enablers of implementing the circular economy in financial services organisations and to determine whether these differ from the current known barriers and enablers.

It is proposed that financial services organisations can benefit from the implementation of circular economic principles in a number of ways. These advantages could include:

- Flexibility in their branch and ATM network functionality
- Reduction in upfront capital expenditure, essentially turning capital expenditure into variable costs
- Reduced environmental impact
- Co-creation of innovative solutions

In terms of barriers, it is expected that the financial services organisations face similar barriers to manufacturing firms, but that they also have the additional barrier around security due to the cash component in both branches and ATMs. Another potential barrier is their back end IT systems as these would prevent financial services organisations to easily plug and play new technology which tends to tie them into their current service providers. Lastly, financial services might also be limited by their service providers as they would need to buy into the idea of offering their equipment as a service to financial services organisations which would impact on their current business models.

The expectation is that financial services organisations would require similar enablers to the manufacturing firms. The current tax legislation has led financial services organisations to attempt to capitalise as much of their branch build and revamp costs and moving towards a circular economy would turn these costs into variable operating costs which would impact on their stated assets and depreciation. As such, a change in the current legislation would be required. As with any organisation, leadership would also play a vital part in order to progress towards a circular economy. Co-creation and

collaborative relationships between financial services organisations and their suppliers would likely be vital to enable successful implementation of circular economic principles.

In order to achieve the objectives of this research, three research questions, with one sub-question were identified and these are answered using data gathered through qualitative, semi-structured interviews. These research questions are described in detail in chapter three below.

3. CHAPTER 3: RESEARCH QUESTIONS

3.1. Introduction

This chapter outlines the research questions and also specifies the specific purpose of the research. The preceding literature review shows that numerous academics and practitioners have grappled with and come up with concepts to reduce business and society's impact on the environment, without necessarily compromising business's ability to make a profit (Stahel, 2010). They refer to these concepts as the industrial ecology, natural capitalism, cradle to cradle, the circular economy and the performance economy among others (Carrillo-Hermosilla et al., 2010; Clift & Druckman, 2015; Ghisellini et al., 2016; Hawken et al., 1999a; Stahel & Clift, 2016).

The main research question that this study attempts to answer is what the potential advantages for the financial services organisation are when they implement circular economic principles. The sub-question of this study aims to understand the barriers as well as the enablers these organisations face when implementing circular economic principles in their businesses and whether these differ from the current known barriers and enablers that mainly manufacturing organisations face.

The literature indicates that utilising these concepts can boost the profitability of companies by reducing waste and increasing the productivity of resources (Lovins et al., 1999). The importance of the circular economy for sustainability as well as the complexity of implementation due to the multiple role players required is clearly exhibited in the preceding literature. The literature also illustrates that a different mindset is required, that of systems thinking and it highlights the importance of transformational leaders in the process as well as the current known barriers and enablers of implementing circular economic principles.

In order to answer the main research question, it was necessary to understand the current landscape, thus a sub-question was used to understand whether the financial services industry in South Africa is making use of any circular economic principles and if so, whether any of these principles are employed in their physical branch and ATM networks.

3.2. Research question 1: Advantages

Are there any potential advantages that the implementation of circular economic principles can provide financial services organisations when they apply it to their businesses?

Previous research have highlighted advantages such as waste reduction (Andersen, 2007), job creation (Stahel & Clift, 2016), cost savings (Andersen, 2007), increased profit (Clift & Druckman, 2015; Ghisellini et al., 2016), more innovative products as well as flexibility to create individualised products (Andersen, 2007) when organisations adopt circular economic principles. This research aims to establish whether financial services organisations would potentially derive these same benefits as manufacturing firms or not. In order to answer this research question, it was deemed necessary to first understand the current landscape especially with regard to the implementation of circular economic principles in financial services organisations. As such, the following sub-question was needed:

3.2.1. Research sub-question 1: Landscape

What circular economic principles, if any, are currently employed in the financial services industry in South Africa?

According to Ghisellini et al. (2016) and Stahel (2010), the principles of the circular economy include:

- Design
- Reduce
- Re-use
- Recycle
- Reclassification of materials into technical
- Nutrients
- Renewable energy
- Product as a service

This question aims to understand whether any of the above mentioned circular economic principles are currently employed in the financial services sector in South Africa, either in their branch and ATM networks or at their head office and other regional office buildings.

It is proposed that the adoption of circular economic principles could be a method that financial services organisations utilise to reduce their capital investment on physical infrastructure, essentially turning these costs into variable operating costs. Also, if these organisations can lease their capital intensive equipment required in their physical distribution networks, it could provide these organisations with a more flexible physical distribution model, one in which they can quickly and easily add or remove functionality, which could assist them in combating the new fintec competitors and stay relevant in the volatile market. Another indirect benefit to financial services organisations could be that through the local remanufacturing of the capital intensive equipment, more employment opportunities will be created (Stahel & Clift, 2016; Trică & Papuc, 2013), which could lead to more bankable customers in the economy.

3.3. Research question 2: Enablers

Which enablers are needed in order to implement the circular economic principles in financial services and are these enablers the same or different to the current known enablers?

Previous literature had identified a number of enablers that are required to assist with the implementation of the circular economy, but these enablers were mainly focussed on manufacturing or industrial types of businesses. This question aims to establish whether these same enablers are also applicable to services organisations such as financial services, or whether there are different or additional enablers to the implementation of the circular economy in these businesses.

It is proposed that changes in government policies (Mathews & Tan, 2011), transformational leadership, systems thinking and improved collaboration between suppliers and financial services organisations to the extent of forming an “industrial symbiosis” (Mathews & Tan, 2011) ecosystem are potential enablers.

3.4. Research question 3: Barriers

What barriers are currently preventing circular economic principles from being implemented in the financial services industry in South Africa, and are these the same as the current known barriers identified in the literature?

Previous literature has identified a number of barriers to the implementation of the circular economy, but these were mainly focussed on manufacturing or industrial type of businesses. This question aims to establish whether these barriers are also applicable to services organisations such as financial services, or whether there are different or additional barriers to the implementation of the circular economy in these businesses. It is proposed that the current accounting principles, the short-term based reward systems of decision makers, the lack of systems thinking and poor collaboration are all current barriers to the implementation of the circular economy in the financial services organisations.

This chapter introduced the research questions which were formulated based on the preceding literature review that was presented in chapter two. The next chapter describes the research methodology that was followed to answer these research questions.

4. CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

This study aimed to determine the potential advantages for financial services organisation in the event that they implement circular economic principles in their own businesses, more specifically with regard to their physical distribution channels. The study also investigated the current barriers and the enablers of implementing circular economic principles in financial services organisations in South Africa. Previous literature predominantly looked at manufacturing organisations (Mathews & Tan, 2011), and when financial services organisations are mentioned, the literature only covers the financial service organisation's role in financing other organisations when they implement circular economic principles and related sustainability initiatives.

This chapter covers the details of the qualitative research methodology used in this study to answer the research questions described in chapter three which were developed based on the literature reviewed in chapter two. These details include the definition of the unit of analysis, the population, the sample size and sampling method, the research instrument, the data collection method as well as the process used to analyse the collected data. The limitations of the methodology followed for this study are also outlined below.

4.2. Proposed research methodology and design

Previous research into the circular economy have either focused on measuring the environmental impact of the circular economic approach using quantitative research methods or recently, researchers have been using case study methods and detailed, sequential literature reviews (Carrillo-Hermosilla et al., 2010; Ghisellini et al., 2016; Lieder & Rashid, 2016; Schiederig, Tietze, & Herstatt, 2012) to make sense of the concept as there does not seem to be a widely accepted definition of the circular economy. Due to previous literature that have focused on manufacturing organisations and have not covered the advantages that services organisations like financial services organisations can derive when implementing circular economic principles in their own physical distribution networks as well as the fact that that research on the circular economy is fairly new (Lieder & Rashid, 2016), it was deemed appropriate to utilise an exploratory, qualitative research methodology.

To the author's knowledge, the advantages of the circular economy for services organisations is studied here for the first time and as such, an exploratory study was deemed appropriate (Galbreath et al., 2014; Shafiq, Klassen, & Johnson, 2014). Qualitative research methodologies, such as in-depth interviews, are also useful tools to apply when an understanding of multiple and complex realities are necessary (Vaismoradi, Turunen, & Bondas, 2013) and due to the three different strata, different perspectives were investigated. As such, the data for this research were gathered through the use of in-depth, semi-structured interviews where the researcher learned from the interviewees (Creswell, 2013; Saunders & Lewis, 2012) and the findings of the research incorporated the voices of the participants (Vaismoradi et al., 2013).

John Creswell colourfully defines qualitative research as follows: “Qualitative research begins with assumptions, a worldview, the possible use of a theoretical lens, … researchers use an emerging qualitative approach to inquiry, the collection of data in a natural setting sensitive to the people and places under study, and data analysis that is inductive and establishes patterns or themes. The final written report or presentation includes the voices of participants, the reflexivity of the researcher, and a complex description and interpretation of the problem, and it extends the literature or signals a call for action” (Creswell, 2007, p. 37). It is important for the researcher to fully understand the interviewee’s viewpoints and to incorporate their comments into the research findings (Vaismoradi et al., 2013), as such the researcher was careful not to succumb to her personal biases and misinterpret the views of the interviewees, although this is easier said than done.

According to Erik Hofstee (2011), a survey-based research method “can range from highly structured questionnaires to unstructured in-depth interviews” (Hofstee, 2011, p. 122) and is an outstanding technique to discover opinions or solve dilemmas (Culiberg, 2014) from a restricted amount of people who is deemed knowledgeable on the information that one is trying to uncover. Myers (2013) suggests that context can best be understood by “talking to people” and that qualitative research is the best research methodology when required to gain in-depth insights into people’s motivations (Myers, 2013). The qualitative research methodology thus endeavoured to deliver a unified account of the problem by finding and categorising the intricate connections of influences in any situation for which simple cause and effect relationships doesn’t necessarily exist (Creswell, 2007).

The qualitative research process can be emergent, indicating that the research design can change during the process of data collection (Creswell, 2007). In this case, the results from the pilot interview, as well as the first interviews, greatly influenced the questions asked in subsequent interviews. As such, the interview guide, as per appendix D, evolved continuously throughout the process to uncover as much information as possible in order to answer the research questions set out in chapter three.

Semi-structured in-depth face-to-face or telephonic interviews with experts in the field of sustainability, the circular economy and green buildings; financial services business practitioners, as well as suppliers of capital intensive equipment to the financial services organisations, were conducted in order to gather primary data to gain clarity on the research questions (Zikmund, Babin, Carr, & Griffin, 2010). As interviews were conducted with people from different sectors within a set time-frame (24th of September to the 6th of October 2016), this constituted a cross-sectional study (Culiberg, 2014). Please see Appendix B - List of interviewees for the detailed list.

4.2.1. Scope of this research

The scope of this research focussed on South African financial services organisations which have a physical branch and ATM network. There currently are five organisations that are deemed large retail banks in South Africa with physical branch and ATM networks and these were deemed the focus of this research. The research study aimed at understanding the potential advantages of and barriers and enablers to the implementation of circular economic principles in these service organisations.

4.2.2. The universe or population of the study

The population deemed relevant for this research consisted of multiple groups or strata of people. If the study aimed to test for changes in perceptions of a specific group over time, then a time series or longitudinal study with one of the stratum would have been sufficient (Culiberg, 2014) but the aim of the study was different and hence a cross-sectional method was used. Through the use of three different strata, it was possible to triangulate the common themes from the interviews (Lamb & Sutherland, 2010).

The first stratum consisted of financial services representatives across the industry in South Africa with experience in the sustainability initiatives or the procurement, design

and build processes utilised during the construction of physical infrastructure or revamp of existing infrastructure in this industry. The second stratum was representatives from firms that supply capital intensive equipment to financial services organisations which they utilise in their physical distribution network. The last stratum was made up of sustainability experts who are deemed to have relevant insights into the circular economy and other green initiatives or regulation in South Africa.

Table 4 - Selection criteria for the strata

Group	Criteria
1. Financial services representatives	• People working or that worked for financial services organisations within the last year • Knowledgeable on either: ➢ Sustainability initiatives ➢ Procurement ➢ Design, build and revamp processes of physical infrastructure including the branch and or ATM networks
2. Suppliers to financial services organisations that operate within South Africa	• People working or that worked for companies within the last year that supply the financial services organisations with: ➢ Equipment ➢ Furniture ➢ Flooring ➢ Services
3. Sustainability experts	• People that are experts in sustainability and/ or the circular economy and/ or South African environmental or waste management regulations • People that work for institutions such as the Green Building Council of South Africa

4.2.3. Sampling

Sample sizes for qualitative research tend to be much smaller than for quantitative research as one tends to gather very rich data and reach saturation sooner but the data cannot be used to make generalised inferences (Marshall, Cardon, Poddar, & Fontenot, 2013; Mason, 2010; Yin, 2009). As such, this study made use of 13 interviews to gather primary data in order to answer the research questions set out in chapter three. The following section describes the sampling technique used, along with

the sampling frame and the reason for the sample size.

4.2.3.1 Sampling technique

A complete list of people that form the identified universe for this study does not exist and would have been very difficult and time-consuming to create. Due to the fact that "the complete list of all members of the total population" (Saunders & Lewis, 2012, p. 133) for this study is unknown, the study was not able to make use of a sampling frame. If this list was known, the researcher could have made use of a probability sampling technique as opposed to the current non-probability sampling technique (Saunders & Lewis, 2012) that was employed. As a result, the selection of the interviewees was based on the researcher's judgement as well as the accessibility of the identified interviewees to the researcher. This led to non-probability sampling in the form of purposive convenience quota sampling (Saunders & Lewis, 2012) and was supplemented with snowball sampling. At the end each interview, the respondent was asked to assist with the names and contact detail of people they knew to be involved in sustainability, procurement or the physical building of financial services branch and ATM networks, suppliers of capital intensive equipment to financial services organisations, or experts in sustainability, circular economy or regulatory fields that would potentially be willing to assist with this research by allowing the researcher to conduct an interview with them. The snowball process, as well as asking other contacts in the researcher's existing network for relevant contacts, resulted in a list of twelve additional contacts, six of which were successfully interviewed.

4.2.3.2 Sample size

The sample sizes of exploratory qualitative research that makes use of in-depth interviews is normally much smaller than that of quantitative research (Marshall et al., 2013), and research "suggest anywhere from 5 to 50 participants as adequate" (Dworkin, 2012, p. 1319). The size of the sample for the semi-structured interviews that were used to gather primary data for this research was relatively small with 13 in-depth, mainly face-to-face, interviews that were conducted and this was deemed sufficient as these in-depth interviews provided very rich data (Dawson, 2006).

Three different strata were targeted for this research to allow for triangulation (Creswell & Miller, 2000) of the results and an attempt was made to interview representatives from the five large retail banks in South Africa but only four of the five banks are

represented. Five financial services representatives, four supplier representatives that supply products or services to a number of financial institutions in South Africa and four experts were interviewed. Please see Appendix B - List of interviewees for more details regarding the types of people that were interviewed.

4.2.4. Unit of analysis

According to Zikmund et al. (2010), the unit of analysis "indicates what or who should provide the data and at what level of aggregation" (Zikmund et al., 2010, p. 119) and researchers are warned that utilising an incorrect unit of analysis may result in unusable data and inconclusive results (Silverman & Solmon, 1998). As such, the unit of analysis for this research was defined as the opinions and observations of individuals that were interviewed. As stated, these individuals represented either the financial services industry in South Africa, suppliers to financial services organisations or experts in the field of sustainability, green buildings or the circular economy.

4.2.5. Research instrument

During the literature review process, previous studies on the circular economy that used qualitative interview processes were found and the questions used for these studies formed the basis of the initial list of questions (Bechtel et al., 2013; Persson, 2015). The literature also revealed lists of known barriers and enablers to the circular economy, mainly applicable to manufacturing organisations in countries where manufacturing takes place and this study wanted to understand whether these barriers and enablers (Bechtel et al., 2013; Ghisellini et al., 2016; Lieder & Rashid, 2016; Roos, 2014) were the same for services organisations such as financial services organisations especially in the context of South Africa, a country with limited manufacturing activities.

The main aim of this research was to understand potential advantages of as well as barriers and enablers to the circular economy in financial institutions in South Africa. In order to answer the research questions outlined in chapter three and to understand the problem documented in chapter one, it was also necessary to understand the current landscape regarding the use of circular economic principles in financial services organisations. As a result, the initial list of questions were adjusted for the South African financial services context and can be found in Appendix D - Interview guide with questions and prompts for semi-structured interviews. Open-ended questions were

used extensively to enable the researcher to gather as much information on the subject as possible during the in-depth, semi-structured interviews (Saunders & Lewis, 2012).

The researcher was very deliberate in the order of the questions and the first two questions were meant to get the interviewee comfortable with answering questions, while at the same time getting a feel for the type of person and their role within the company that they were employed at. The next question aimed at understanding the current landscape with regard to circular economic principles. The question that followed asked the interviewee about the enablers required, and this was modelled on the appreciative inquiry method (Finegold, Holland, & Lingham, 2002) as it can be hard for people to mention positives after they were asked to comment on the barriers or negatives which were then covered in the next question. Lastly, the interviewees were asked to comment on the potential benefits that the circular economy could hold for the various stakeholders involved. The questions used in the interview guide were mapped to the research questions to ensure that the researcher was able to gather the required information in order to answer the set-out research questions.

4.2.5.1 Pre-testing and piloting of the interview guide

The initial list of questions that formed the basis of the interview guide was piloted through the use of a mock interview which turned into a discussion with an ex-colleague that worked on the construction component of branches in the financial services industry for a number of years but that had moved into a completely new role at a different company in 2015. It was deemed necessary to conduct a pre-test of the interview guide as Saunders and Lewis (2012) suggests that it ensures identification of potential issues with the interview guide. The interview guide was substantially adjusted as a result of the feedback from this mock interview and discussion to the extent that it was split into three guides, one for each of the strata, and reduced from 37 questions to either 6 or 7 questions depending on the specific stratum. These altered questions were telephonically tested with the ex-colleague who provided positive feedback.

After the first few interviews, the researcher made further adjustments to the questions to specifically probe for the types of circular economic principles that were employed in the financial services sector as there seemed to be a wide range of discussion topics when one used the term sustainability or green initiatives as opposed to principles such as the 3Rs namely reduce, re-use, remanufacture (Ghisellini et al., 2016; Lieder &

Rashid, 2016; Yong, 2007; Yu et al., 2014; Yuan et al., 2006; Zhou, 2006); product as a service or leasing models. It was found that the experts interviewed were familiar with the circular economy, and as such very valuable information was obtained from them.

The recording equipment and the ability to make detailed but short-hand notes were also tested during this mock interview and discussion process. It was found that the quality of the recordings on the researcher's mobile phone was better and more compressed than on the other recording device.

4.2.5.2 Ethical considerations

Interviewees were asked to sign a consent form before the commencement of the interview which stated the high-level purpose of the research, along with the assurance that no personal details would be shared or disclosed in the research report. The consent form also explicitly asked the interviewee for permission to allow the interview to be recorded. These recordings aided the researcher during the data analysis phase of the research. All relevant collected data from the interviews were aggregated in Microsoft Excel during the data analysis phase and this data is presented in chapter five and discussed in chapter six of this report.

4.2.6. Data collection process

Interviews were set up either via email, WhatsApp or telephonically with individuals identified by the researcher that fulfilled the criteria as set out above in section 4.2.2. A total of 23 individuals were approached of which 13 were successfully interviewed, representing a 56.5% response rate. The interviews were conducted with people working in specific speciality areas within the financial services sector in South Africa, suppliers of equipment to the financial services organisations as well as experts in the field of environmental sustainability, circular economy and other green related elements and regulations. The majority of interviews were conducted face-to-face at the interviewee's place of work, although there were a few exceptions. Two interviews were conducted at the interviewee's home, while two interviews were conducted one telephonically and one via skype due to the geographical location of the interviewee.

Primary data for this research was gathered with the use of an interview guide; please see List of potential interview questions in Appendix D - Interview guide with questions and prompts for semi-structured interviews for more details. The interview guide made

use of open-ended questions and also contained prompts to press interviewees for more detail when required, but due to the open-ended nature of the questions, prompts were not used frequently. The informed letter of consent, which interviewees was asked to sign, was attached to the interview guide and assured the participant that the researcher will keep their personal information obtained from them confidential which was also a condition as per the ethical clearance process. The guide, which was mainly printed single sided, contained the questions along with blank sections that the researcher used to make notes on during semi-structured interviews, which also subtly indicated to the participant the amount of data that the researcher aimed to gather with each question. In the event that the blank section did not allow sufficient space for notes, the blank page on the opposite side of the question was used to make additional notes on.

In all instances, the interviewees provided their consent to the researcher to conduct the interview with them and they also explicitly allowed for the interview to be recorded. Even though the pre-test process found that the quality of the recordings on the mobile phone was best, the researcher still used both recording devices during the interview process to cater for potential device malfunction, recorded file corruption or the loss of one of the devices. The recordings were also copied onto the researcher's private Google drive account shortly after the interview was conducted as an additional back-up of the recorded interviews. The signed informed letters of consent were scanned in to allow for these to be stored electronically along with the interview recordings as per the requirement of the University of Pretoria.

These recordings allowed the researcher to repeatedly listen to the interviews and refine the interview notes that were taken during the interview. These notes were subsequently captured in Microsoft Excel and refined during the data analysis phase of the research. When the researcher felt that the interviewee said something particularly insightful or made a statement that was deemed a powerful quote that illustrated a particular finding, that section of the recording was transcribed using a website called speachnotes.co and manually refined further as the site's transcription was not perfectly accurate. Table 5 contains more details on the interviews that were conducted as part of the data gathering process of this research.

Table 5 - Details of the interviews that were conducted

Date	Interview number	Strata	Duration	Face to face or telephonic
2016/09/24	1	Financial Services	00:35:28	Face to face
2016/09/27	2	Financial Services	00:35:21	Face to face
2016/09/28	3	Financial Services	00:47:52	Face to face
2016/09/28	4	Financial Services	00:32:35	Face to face
2016/09/29	5	Financial Services	00:28:40	Face to face
2016/09/29	6	Supplier	00:37:50	Face to face
2016/09/29	7	Supplier	00:16:08*	Face to face
2016/10/04	8	Supplier	00:45:16	Face to face
2016/10/04	9	Supplier	00:56:32	Face to face
2016/10/04	10	Expert	01:15:14	Telephonic
2016/10/05	11	Expert	00:37:09	Face to face
2016/10/06	12	Expert	01:04:32	Telephonic via skype
2016/10/06	13	Expert	00:46:57	Face to face

** Time constraint, this interviewee had another meeting scheduled directly after the interview and was called out of the interview early.*

4.2.7. Data analysis

The data analysis was conducted in an iterative process, using a theoretical thematic analysis method (Braun & Clarke, 2006) and the purpose was to identify common themes derived from the semi-structured interviews that were held with the identified interviewees. Both a deductive, in that the literature review identified key themes applicable to the circular economy, as well as an inductive approach, where codes and themes were identified purely based on the interviewee's perceptions, were followed to generate the themes from the data captured during the interview process (Braun & Clarke, 2006). Figure 7 provides a visual representation of the thematic analysis process that was followed (Braun & Clarke, 2006).

Figure 7 - Phases of thematic analysis adapted from Braun and Clarke (2006, p. 87)

The data coding was done shortly after the interview throughout the interview process. The interview process took place from the 24th of September to the 6th of October while the coding process continued until the 16th of October 2016. The data coding influenced subsequent interviews conducted by the researcher which was useful as certain observations could be clarified in subsequent interviews but it also made the researcher more biased which could have influenced the data obtained in subsequent interviews.

The detailed interview notes were digitised by retyping the notes into data tables on separate worksheets in Microsoft Excel. Each worksheet was specifically designed by the researcher in order to answer the different research questions. Each separate worksheet represented a different research question and there were also sheets for overall insights obtained; details of the interview such as date conducted and time taken as well as the interviewee themselves in terms of their experience, qualification and job role. These notes on the worksheets relating to the research questions were refined by repeatedly listening to the recorded interviews and using software to break the audio file into data extracts (Braun & Clarke, 2006). In all instances, the interviews were replayed at least three times in order to accurately capture the information contained in the recording. Some of these data extracts were transcribed in order to include them in chapter five of this report.

Once all the data was captured, these data tables were further refined by grouping the data through the creation of pivot tables based on keywords, phrases, and identified related themes and changing themes that were similar, into one overarching theme. This refinement process reduced the initial themes for each of the research questions. The initial number of themes compared to the final number of themes once the themes had been refined is illustrated in Table 6. The table also provides an indication of the total number of data extracts, in brackets next to the research question header, that was derived from the 13 data items or interviews (Braun & Clarke, 2006).

Table 6 - Refinement of themes per research question

Current landscape (86)		**Enablers (134)**		**Barriers (133)**		**Potential Advantages (83)**	
Initial number	Refined number	Initial number	Refined number	Initial number	Refined number	Initial number	Refined number
35	14	62	21	43	18	22	10

After the themes that emerged from the interviews were refined into the higher level themes, frequency tables comparing the total number of times that the theme was mentioned as well as the number of interviewees that mentioned the theme per strata were created. These frequency tables were used to make sense of the data as it became clear which of the themes were deemed more important by the interviewees. These frequency tables along with a description of the aggregated data can be found in chapter five of this report.

4.2.8. Data reliability and validity

Data reliability and validity are very important for research to provide credible results (Golafshani, 2003). Due to the lack of a sample frame, and the judgmental sampling method employed, the subject selection, namely the identified list of interviewees could cause concerns with regards to the validity of the research as the selected sample might not be representative of the entire identified population (Saunders & Lewis, 2012). In order to enhance the data validity, a consistency matrix, please see Appendix H, was created and the data for the research questions were analysed using frequency tables and triangulation between strata (Halme, Lindeman, & Linna, 2012).

The identified interviewees could also create subject bias, in that the interviewee provides the answers that do not reflect negatively on themselves (Saunders & Lewis, 2012) which might lead to dependability or reliability concerns (Golafshani, 2003). Also, due to the intensive involvement of the researcher in the entire process, interviewer bias could also have influenced both the validity as well as the reliability of the research. In order to improve the reliability of the research, an interview guide, please see Appendix D – 9.4.2. Interview questions, with open-ended questions, were created and followed although the prompts used was different for the different interviews depending on the depth of data extracted from the interviewee.

4.2.9. Research limitations

The first limitation of this study is that it was done as an exploratory study and further research will be required to confirm the findings of the research (Shafiq et al., 2014). Although it would have been better to use an interpretivist research philosophy, a more pragmatic philosophy have been employed as the sampling method used was purposive, convenience, snowball sampling (Saunders & Lewis, 2012). The face-to-face or telephonic interviews required more engagement than if the research was

based on publicly available data and this engagement most likely reduced the objectivity and independence of the researcher (Easterby-Smith, Thorpe, & Jackson, 2015) but it has probably also led to greater insights than what would have been obtained from secondary sources or surveys where the researcher would not have been able to ask for more insights from the respondents. The researcher attempted a process called bracketing, an important process within phenomenological studies, whereby the researcher had to set aside preconceived ideas to enable her to understand the potential advantages as well as the barriers and enablers to the circular economy in financial services organisations from the interviewee's perspective (Nieswiadomy, 2011) without which a lot of personal biases would have been introduced.

Due to the interpretivist nature of qualitative research, several interpretations of the problem could have been developed (Creswell, 2007) and the small sample size, which consisted of 13 individuals, limited the researcher to infer the research findings to the universe (Yin, 2009). Potentially, the identified interviewees could have represented an additional limitation on this research as they might not have been representative of the universe. Representatives from four of the five large retail financial services organisations were interviewed and as such, the sample did not represent the entire financial services landscape within South Africa.

The chosen context of this study, namely the financial services organisations within South Africa has added additional limiting factors to this research both from a sector point of view but also from a geographical point of view (Shafiq et al., 2014). Future research could consider focusing on a larger geographical area or analysing financial services organisations in countries with a high proportion of local manufacturing, and/or it could consider covering a wider variety of services organisations. Lastly, another major limitation of this study was the fact that the researcher has not done academic research before and as such was inexperienced with conducting qualitative research.

5. CHAPTER 5: RESULTS

5.1. Introduction

This study was qualitative in nature and this chapter firstly describes the sample of people that were interviewed and secondly the data obtained from the interviews and subsequent data analysis. The data was gathered in order to answer the research questions developed in chapter three which was based on the literature review presented in chapter two. The results derived from the interviews and subsequent data analysis along with the researcher's interpretation of the data is set out in a similar order to the research questions in chapter three although the current landscape will be discussed before the advantages that the circular economy offers.

5.2. Sample description

In-depth, semi-structured interviews were conducted from the 24th of September to the 6th of October 2016 with individuals from three different strata. The one group consisted of five individuals that work at various financial services organisations and these individuals provided insights on four of the large retail banks in South Africa. One of the interviewees had insights on two different South African retail banks. The second group consisted of four individuals that work for different suppliers that supply a variety of products and services to, among others, financial institutions while the last group of four individuals are considered experts in the field of circular economy, sustainability or green buildings due to their qualifications and their current roles within their respective organisations. Interviewees were selected based on their current roles or previous roles, their level of seniority and their expertise either within financial services organisations, suppliers that supply to financial services organisations or sustainability experts. Appendix B - List of interviewees, contains more details on the individuals although no names are mentioned as confidentiality was promised to the participants and was also a condition to obtaining ethical clearance from the research committee for this research.

The researcher used judgemental and snowball sampling techniques (Saunders & Lewis, 2012) to generate a list of 23 candidates of which 13 were successfully interviewed. Most of the interviews were conducted in a face-to-face setting, mainly at the interviewee's place of work although due to geographic constraints; one interview was conducted telephonically while the other interview was conducted via skype. Two of the interviews were conducted at the interviewee's home as that was more

convenient for them.

5.3. Presentation of results

The following section presents the results from the interviews and subsequent data analysis that were conducted in order to answer the research questions presented in chapter three. The results were obtained by digitising the interview notes, refining the notes by listening to and cutting the data extracts (Braun & Clarke, 2006) from the interview recordings and then applying thematic analysis in Microsoft Excel. Frequency tables were drawn up per research question to establish the theme that was mentioned most often by the interviewees. Additional frequency tables were also created that compared the number of interviewees that mentioned a theme per strata, in order to triangulate the data between the different strata (Braun & Clarke, 2006; Halme et al., 2012) and this data is presented in a quantitative and qualitative style below.

5.4. Results for research sub-question 1: Landscape

Sub-question 1: What circular economic principles, if any, are currently employed in the financial services industry in South Africa?

It was deemed necessary to first understand the extent to which circular economic principles have been employed in the financial services industry in South Africa, specifically within the retail banks with a large branch and ATM network. This was required in order to answer the principal research question namely, will financial services organisations derive benefits if they implement circular economic principles as well as the second and third research questions which were respectively concerned with the enablers and the barriers of implementing circular economic principles in South African financial services organisations.

5.4.1. Context of South African retail banks

The South African retail banks operate nationally as well as on the African continent, unlike some of the regional retail banks that can be found in the United States of America. As such, their networks are large and cover a large geographic area, diverse in nature, wealth and population density. Metro areas are typically well developed with high population density while some rural areas and small towns are still very basic in nature and often have very low population densities. A financial services representative mentioned “It's very different. I mean in this country already you struggling with ...

you've got pockets of metros that's first-world, by all means, the banking system in South Africa is one of the, at the stage top 10, but you still have what, 70% of the population that doesn't have the means or doesn't have the required literacy or doesn't have the employment that's required to just run a full on first world type of setup. You have to cater for the rest of the country".

Prior to the information age, retail banks used very manual, paper-based systems to keep track of their clients' banking activity and this has resulted in large back office areas with very small front office space. Throughout the years, as banks have become more digitally enabled, they have attempted to adjust their branch layouts to increase the front office space while reducing the back office space but this has been a slow and tedious process due to the costs involved when changing layouts mainly due to the security equipment and teller line. Another reason for the slow progress is that one typically finds that retail banks will revamp their metro branches far more frequently than their branches in rural areas and small towns which have resulted in quite a mixed look and feel as well as variances in branch layouts. One of the financial services representatives mentioned "I call it the youngest child syndrome. So what happens is, so we take the ... in the metros you normally put most of your investment so your newest stuff goes there and then you basically down cycle it to the rural areas where you struggling to make the required profits to invest that amount of money. So we physically will take the furniture there or we re-use the tellers so at this stage we are even re-using some of the ceiling tiles where we can".

5.4.2. Context of suppliers to financial services organisations in South Africa

The South African retail banks make use of a lot of security equipment such as safes, security doors, security cameras and bulletproof glass which are all very costly but necessary items, especially with the high crime rates that are experienced in the country. The suppliers of capital intensive products and equipment for the financial services industry in South Africa typically import and distribute these products with very limited local manufacturing that takes place. One supplier stated that "We've built one or two local products and we exporting, actually this week, the first product to Australia that they saw the demonstration and they were interested. We made it in Port Elizabeth, we had an engineering firm make it and we are exporting that device now so let's see how it goes but that's not the norm, it's a new thing ..." while another supplier mentioned that "they have done [local manufacturing] a very long time ago but it worked out that the cost factor was actually debilitating it, it didn't work … So they did

do it once and it was not working from a financial standpoint and then they moved it back to the UK". The lack of local manufacturing reduces the supplier's ability to remanufacture products and as such most of their business models are focussed on outright sales as opposed to leasing models though there are a few suppliers that offer leasing models on some of their products or to some of their clients.

The suppliers found that financial services organisations typically have access to "cheap" funding as they would not pay retail rates for their financing and this has reduced the requirement for rental models to financial services organisations while there is a need for these models when it comes to other types of retail businesses. The suppliers which are able to finance their products, or have ties to companies that are willing to do the financing on their behalf, are able to provide their "products as a service" or offer leasing models.

5.4.3. Results obtained for research sub-question 1

The term "Circular economy" is not a well-known term although the 3R principles namely reduce, re-use and recycle along with additional elements from the waste hierarchy such as energy recovery, treatment of waste and waste disposal are known terms. As such, in order to understand the current landscape, the interviewees were initially asked about sustainability or green policies but as the responses were too broad when asking this question, the question was adjusted to specifically ask about any reduce, re-use or recycling initiatives and whether there were any "products as services" or leasing models in place in their respective organisation, or in the event of suppliers, whether they were remanufacturing or leasing equipment or other products to financial services organisations.

The experts were asked to comment on initiatives or regulations applicable to South Africa either in the waste management space or the green building space. Table 7 summarises the frequency at which themes relating to the current landscape were mentioned during the 13 interviews and it also highlights the most important themes through the use of cumulative frequency calculation. Using this calculation, it was found that the top seven themes that were mentioned represented almost 80% of mentions in relation to the current landscape. Table 8 indicates how many of the interviewees per strata, mentioned each of the themes. Interestingly, the ranking order of the third and fourth themes swapped around between the two different frequency tables although in both cases, the theme regulation was ranked first while the re-use theme was ranked

second.

From Table 7 it can be seen that regulation came through very strongly and this is supported by Table 8 where it can be seen that nine of the 13 interviewees highlighted regulation as being part of the current landscape. The responses from financial services organisations and the experts, in terms of regulation, are more aligned whereas only two of the four supplier representatives mentioned regulation specifically.

Table 7 - Landscape theme frequency table

Rank	Landscape	Number of times the theme is mentioned	Cumulative frequency %
1	Regulation	22	26%
2	Re-use	13	41%
3	Certification	9	51%
4	Recycle	9	62%
5	Reduce	5	67%
6	Inequality	5	73%
7	Remanufacture	4	78%
8	Product as service	4	83%
9	Reporting	3	86%
10	Externalities	3	90%
11	Research	3	93%
12	Leadership	2	95%
13	Collaboration	2	98%
14	Design	2	100%
Grand Total		**86**	

One of the experts stated that South Africa has some of the best legislation with regard to waste management, and the principles of the sustainable development goals are incorporated into the national development plan, while another expert was of the opinion that South Africa is “at the point of over regulation which is now having negative impact on the private sector” but the enforcement of the legislation is lacking. This lack of enforcement was also mentioned by a supplier that said “they just don't have the teeth that they used to have, with the SABS previously you could not get away with much, they were watchdogs and they kept high standards. I think there has been quite a bit shifted around, maybe they'll get back to there because there have been some good changes lately, maybe they'll get back to there but they're not so, such a watchdog at the moment”.

The financial services organisations are highly regulated and “pretty much all the banks in South Africa are signatories of the equator principles and once you become a signatory of it, what it is, is that any deal, so it's really meant to make sure that banks

don't do anything irresponsible socially or environmentally for big investments. So it's gotta be an investment of 100 thousand US dollars or more." A financial services representative had a challenge "between the mother company as it was with local regulations and to try and get that resolved is quite a bit of a ball of spaghetti" while another financial services representative stated that when it comes to green products "all our products that we get from suppliers is something that we very hard and fast about".

Table 8 - Landscape theme per strata frequency table

Rank	Landscape	Strata			Total (13 interviewees)
		Expert (4 interviewees)	Financial Services (5 interviewees)	Supplier (4 interviewees)	
1	Regulation	3	4	2	9
2	Re-use	1	3	2	6
3	Recycle	2	1	3	6
4	Certification	2	3	0	5
5	Inequality	2	2	0	4
6	Remanufacture	1	1	2	4
7	Product as service	0	2	2	4
8	Reduce	0	2	1	3
9	Externalities	0	2	1	3
10	Reporting	1	1	0	2
11	Leadership	0	2	0	2
12	Collaboration	1	1	0	2
13	Design	0	1	1	2
14	Research	0	1	0	1

In terms of the second-ranked theme that emerged from the interviews, there was a strong indication from the financial services representatives that there is quite a bit of re-use that takes place either within their organisations or through donations while half of the suppliers indicated an element of re-use. The experts saw the re-use as a low factor in the current landscape and mentioned that it is very haphazard and uncoordinated at present and that "in South Africa the last data, the last official data that we have, which is from 2011, shows that we send 90% of all of our waste, end of life products, to Landfill. 90%. So in fact in South Africa, the waste hierarchy is actually on its head".

A financial services representative mentioned that "a lot of the carpet manufacturers are now very much into doing sustainable products in their processes which also means that they'll buy back after a period, let say it's 5 years on average the carpet is designed for and then obviously either recycle or do a donation to housing schemes et

cetera, low-cost housing schemes to go and re-use that" while another financial services representative said that "there's areas where you can get brilliant ceiling tiles, there's nothing wrong with them and you can effectively take them to somewhere else and you give them newer furniture and then you can actually spend the money on what the clients really need, you know, better queueing lines, more space to sit if they have to wait, especially in the month end peak times". A third financial services representative said that "we also try and if something is looking old and dull we try and reupholster, wash, you know we have millicare that does our cleaning" and also mentioned that "we have a warehouse based in Northriding" where furniture is stored in order to do swap outs where required.

The third and fourth highest ranking themes namely "certification" and "recycling" relate to green building and green product certification as well as operational and construction waste recycling initiatives which also assists with another element of the circular economy namely reduction in emissions as well as waste sent to landfill. One expert mentioned "there's a big component for the actual, so for the new build, for the demolition waste that you ensure that as much as possible of that is either re-used or recycled. There's lots of opportunities for that, for example a product like steel is very easy to re-use or meltdown and recycle so there's real opportunities in things like that that have very high embedded energy so it makes a lot of sense if you can try and not have to mine it and like all that stuff".

As can be seen from the above discussion on the current landscape relating to circular economic principles in South Africa and specifically within the financial services sector, there are some elements that have been implemented, but there is still massive room for improvement in this space. The following section will explore the advantages that financial services organisations within South Africa can derive when they implement more circular economic principles within their businesses. It also touches on the direct and indirect advantages that other role players such as the suppliers, society and the environment can derive as a result of the implementation of circular economic principles.

5.6. Results for research question 1: Advantages

Are there any potential advantages that the implementation of circular economic principles can provide financial services organisations when they apply it to their businesses?

The purpose of the principal research question was to understand whether financial services organisations would benefit from the implementation of circular economic principles, and if they would, what the advantages would be. This question came about as most of the previous research had focussed on manufacturing organisations, specifically with regard to environmental sustainability and methods to reduce resource extraction and carbon emissions while very little research was found regarding benefits for service organisations such as the financial services. Table 9 and Table 10 summarises the findings from the interviews and highlights the themes that were mentioned most frequently. These results will be discussed in chapter six and compared with the findings from the literature review that was presented in chapter two.

Table 9 - Advantages theme frequency table

Rank	Advantages	Number of times the theme is mentioned	Cumulative frequency %
1	Value creation	19	23%
2	Sustainability	17	44%
3	Cost saving	9	55%
4	Improved community	8	63%
5	Flexibility	6	71%
6	Brand image	6	78%
7	Product Innovation	5	84%
8	Education	5	90%
9	Productivity	4	95%
10	Job creation	4	100%
Grand Total		**83**	

As can be seen from the above frequency tables, the first eight ranked themes stayed the same regardless of the way the frequency was measured while only the last two themes, namely job creation and productivity, swapped around. There were, however, much fewer advantages mentioned by the interviewees compared to the other research questions, potentially due to the drastic change in mindset and business models that is required for the circular economy as well as the current barriers that exist for the implementation of these principles in South Africa.

Table 10 - Advantage theme per strata frequency table

Rank	Advantage	Strata			Total (13 interviewees)
		Expert (4 interviewees)	Financial Services (5 interviewees)	Supplier (4 interviewees)	
1	Value creation	3	2	3	8
2	Sustainability	3	3	2	8
3	Cost saving	1	2	3	6
4	Improved community	0	3	2	5
5	Flexibility	0	2	1	3
6	Brand image	0	2	1	3
7	Product Innovation	0	3	0	3
8	Education	0	3	0	3
9	Job creation	2	1	0	3
10	Productivity	1	1	0	2

The highest ranked theme, namely value creation, was mentioned equally frequently by the supplier and expert representatives but only two of the five financial services representatives mentioned value creation as a potential advantage of the circular economy although it can be argued that cost savings can also indirectly lead to value creation for them. The one supplier mentioned “Look for ourselves, obviously if we re-use stuff that's been paid for, and they pay for it again, its good revenue for a business. That's what I explained to you, the rental of the evergreens, that you get that rental. It's been really good for us, it's really profitable” when asked about the product as a service or rental model while another supplier was of the opinion that “the benefit is that you can reach a whole lot of markets that you can't reach with new product. High-cost new product …The only benefit would be reaching markets that you can't reach with new products because of the cost. That would really be the only benefit”. The supplier also said that it helps them reach other retailers as “leasing on these [makes sense] because obviously for a retailer it's a big outlay per till. Whereas if he just leases it, and in that lease can be the entire process, you know, the least amount will cover your, and for 5 cents on a R100, it covers your insurance from the till point until it’s in the Bank. So covers your whole process including your equipment”. A third supplier representative said that “there's a lot of opportunity in terms of volume so we removed, I think in the past year, we removed about, probably about 500 to 600 devices from site, that's end of life. So there is quite a circulation between new equipment going in and old equipment coming out which is at end of life and we are, so we have quite a warehouse currently just with old equipment and I can go and show you, there is a huge warehouse standing outside just with old equipment that's ready for recycling where we don't have a solution for”.

One expert saw the benefit of the circular or green economy as "… it is potentially a whole new economic sector; there's a potential to create new jobs, there a potential to create new businesses. And I mean, just yesterday, we are doing a project at the moment around unlocking potential job opportunities in the paper and packaging sector, and it's not just about the direct jobs. You know, for every one direct job in recycling you can probably produce about, by developed country standards, you can produce one and a half indirect jobs and you can produce close to two induced jobs. Now, we suspect that in South Africa, in fact those figures might be higher, because our minimum wage is so low, so in fact we might be able to have a more labour intensive green economy than what you might find in developed countries so our multiplier effect from direct to indirect and induced jobs might in effect be a lot higher".

Another expert was of the opinion that waste buy-back centres can generate a lot of value "in terms of value, monetary value, you know what's our problem, we should be having, they call it buyback centres. I don't know if you know about that concept, it's a concept where you have a centre in a township or in town or in, especially in a community where waste management services of the municipality cannot reach. You need to have a buyback centre where I can go, with my 20 plastic bags and my 400 bottles and, you know, and I go there and they buy that from me. For a small amount, and the centre then keeps it there until it is such a volume that whoever buys this stuff, it makes it worthwhile for them to come and collect the bulk. It's not worthwhile for Mrs Mashego to take her 200 kgs of glass, to transport it to Console that is 400 kilometres away, but it is for her, economically viable to take it to a buy-back centre that is only a kilometre away, she can walk, she can take it. And that's the challenge, that's why I said, you know, the buyback centre for example in Bushbuckridge, which is a very rural community it works excellently. You will find little ones, during school holidays they will pick up whatever they can, to just go to the buyback centre and they get paid R20 for a whole day's work but it's R20 pocket money that they didn't have and, but as soon as there's no place that this little child can immediately get R10 or R20 for what they brought they are not going to pick up the waste". This illustrates that a buy-back centre can reduce waste that goes to a landfill, it can improve the community as there will be less trash on the streets, it can aid in economic activity as people will receive an income from their household waste and the recycled waste will reduce the requirement of extracting new raw materials when it gets recycled. This example also illustrates the systems thinking approach that is required when attempting to implement the circular economy.

A financial services representative looked at a more holistic approach to value creation through sustainable initiatives by saying “what's rather happening is how, again it's more sustainability within how we, through our core business offering. And that’s, again, the stuff that I'm doing through SEE which is what you gonna, see, in November, so which is social, environmental and economic, that’s what it stands for. And you know through, it's all about how you position things, so how we've shown why it's important to understand our social environmental impact is you can actually perform your business better. So we've got a model that we've produced which is called the true earnings model which we've shown, that's why I've been a social butterfly at the moment. I've been around from Home Loans to affordable housing to agriculture to renewable energy investments, coal, oil whatever from a PBB and CIB perspective and it's looking at, well, do we actually understand what the social environmental impact or earnings are or non-earnings are for all these things because it might help us, like I did with the agricultural example earlier, by understanding that well, that's how we will make a better decision in terms of do we keep that farmer and just give him a payment holiday and take a short hit now but for long-term gain”. Another financial services interviewee also looked at the bigger picture of their sustainability initiatives when she stated that “the tourism sector, we did a pilot, where the B & B's signed up for like water meters, solar power and, you know, long-term you not only like, uplifting the small business owner but you are also being kinder to the environment in terms of water management, energy management, all those good things”. She also mentioned that helping the client save money through these green initiatives, you actually make those customers better customers as they can repay their loans and will likely be more loyal as you were there for them when they needed financing.

The sustainability theme mainly relates to the environmental benefits and was mentioned mostly by the expert representatives, possibly due to the focus that it has in their respective roles but this theme was also one of the most dominant themes for financial services representatives and to a lesser extent for the suppliers to financial services organisations. A financial services representative focussed on the benefits of green initiatives that lead to a reduction in carbon footprint and mentioned “we've gotta prove our carbon footprint which will show that, hopefully, we will be within the stated regulation” while a supplier focused on the reduction of their products that might have ended up in a landfill were is not for their process where off-cuts are collected which “… is basically trying to keep the green concept going and to try and help so that things doesn't get thrown in the landfill that can get melted down into nothing. So definitely, from an environmental point of view, it is helping the environment a lot”.

Interestingly, the cost savings theme stood out for the suppliers but was less frequently mentioned in the case of financial services organisations while only one of the experts mentioned it as a potential advantage. A financial services expert said that re-using equipment or furniture makes sense and you have to look at “what can you afford, so if you give a branch a fully depreciated item, it makes sense because you don't attack their income statement” which is useful for the rural branches that do not necessarily make sufficient income to warrant a revamp and she also mentioned “if you try to throw away, so you can't throw away your ceiling tiles just anywhere. Some municipalities, you're not allowed to dump quite a few thing which means you have to transport it back, which means there is an additional cost even if you didn't want to re-use it, there’s additional cost for that”. Another financial services representative also commented on their cost savings they achieved through the re-use of furniture and mentioned that “we pulled out two Gen seven tellers in Richards Bay because that branch didn't need two tellers and we put them into a branch on the outskirts of Pietermaritzburg and just clipped on the fronts and we had Gen eights and it was cheaper than buying two new Gen eights”. The one expert commented on their own office revamp where “most of our furniture was a lot cheaper because it was second-hand so there's a cost saving for us and we got quite a, I would say, unique, funky style out of it”. They had actually re-upholstered and painted their second-hand furniture themselves as part of a team building exercise which also uplifted the staff morale while benefitting the environment as the donated furniture didn’t go to landfill and they also didn’t have to purchase brand new furniture.

A Supplier noted that “the customer will definitely benefit because they can use the product much longer and just by refurbishing it you, so… Let's just look at a product quickly, so on the top, you've got the counter and the rest of the mechanism is a safe or a heat seal or, its basic parts, so your real expensive part is the note counter at the top. If you can just replace that motor or that basic, the counter-part, which is probably the most expensive part but you've then got a new product because the safe, what can happen to the safe? Nothing, the lock can perhaps jam, and you replace the lock, so you can actually make a product last much longer by just replacing one or two parts and then re-installing it as long as the device is still valid and there's not newer technology and better technology available” and when they remanufacture spare parts “it saved us an absolute fortune”. Another supplier stated that their initiative where they connect companies that produce plastic products, with the contractors that install their vinyl flooring products possibly contributes to the plastic manufacturers as “the only people that's probably eventually going to gain from it would be the people that go and

fetch it to put it into their process to make something that can be sold and maybe that's where they are quite prepared to go and fetch because it does add to their production process". This essentially means that the plastic manufacturer only needs to pay for the transport of the vinyl off-cuts to their factory but then they get raw materials for free, saving them costs and also potentially the trouble of importing difficult to obtain raw materials.

When it comes to the theme of improved community, it was one of the important themes from a financial services perspective, but less so for the suppliers as only two of the interviewees mentioned community improvement. None of the experts mentioned community improvement specifically, although it can be argued that the job creation theme which the experts did mention will also indirectly result in community improvement as more people will have a form of income which will stimulate the local economy and indirectly lead to a better local community. One of the financial services representatives focused on "how many happy hearts did we leave behind, how many opportunities did we create for a local guy to assist with a paint job? If you use some of the local labour, you can't, I mean there's special skills that's required but there are things that the guys can assist with which means you put in some training for the local guys which means they can go somewhere else and paint, for example" which was reaffirmed by another financial representative that said "it's not always about giving, giving, giving, it's about actually teaching someone". She also mentioned "you get, not just your clients being passionate, but your staff, you know, to have that consistency between, the employer, employee, your supplier, everybody, and everybody working for a common purpose, and that common purpose would be at the end of the day to always give back to the communities" which also indicates the level of collaboration required to drive these initiatives as well as the need for a common goal.

Another financial services representative felt that "it's also showing your staff, who are working in those environments, to do the same kind of thing in their environments at home. To circulate your waste, to use low or energy efficient lighting, things like that, so I think long term it will assist communities". Yet another financial services representative looked at "transformation is a massive thing that we look at, you know because we are also looking at what's the social environment that we operate in, and in South Africa, obviously, transformation is a huge thing. And so that's where things like enterprise development in our procurement chain is very big and we are trying to make sure that we are empowering suppliers that are in the transformation space or are, you know, black owned or whatever" as well as the banks impact in "affordable homes, to

the agricultural sector and trying to keep farms in business, you know, to enterprise development, to know you, you are getting involved in so much that your impact is so much higher". A supplier revealed that they offset their carbon emissions from their technicians that have to drive around a lot through tree planting initiatives and mentioned that "the community gets really, really involved and it's very good for the company because the regional managers go out with their teams and they plant the trees with the community, so you plant, every time we do about 1100 trees, at any given time" while another supplier felt that by re-using their products through donations they could be "helping people, helping children's homes, helping charities. That could be more of a focus, helping society with that, to move that type of product".

The next two themes namely flexibility and brand image were mentioned equally frequently by both the financial services and supplier representatives while none of the experts deemed those as potential advantages. One of the financial services providers mentioned that they re-use furniture and "are building mobile offices that you just plug in, that's got everything already there on wheels, that just lock down and we've already started recycling… Part of that is to make sure that where you go into rural areas, where you have month end pension days, where you have volumes coming in, that you can effectively open your banking hall or make it bigger so that people can go in, which is a different, I think, type of donation, because the biggest donation you can give someone is time...". One of the suppliers also highlighted the flexibility and the ability to remain current with technology if you make use of their rental model when he said that "in my environment, I predominantly rent [equipment] ... If I look at the model where I sell vs rent, I do probably about 60 - 70%, is rental, based on rental and it works fine. So we do off-balance rental for customers, and, but as I said the majority is based on rental because the, in essence of the change in the technology. So you do get the customer that just wants to purchase a device and he will sweat the device for 10 to 12 years till it's after end of life to recover his investment. Other customers look at the focus of as to say three to four years from now there's new technology and I want to stay, I want to rather then upgrade to new technology. So our focus is really, because technology in our environment is evolving so quickly, there's, it's because of the changes of technologies customers traditionally would like to stick to a four or five, maybe a five-year agreement with the understanding that they can upgrade to new technology after that agreement".

Regarding the productivity improvements, one financial services representative mentioned that their newly designed floor "it makes you want to work in that on that

floor and be creative so the collaboration spaces that we set up with funky furniture, but that is furniture that's got the ergonomic principles towards it obviously and keeping in line with the green, you know, recycled material looking at predominantly South African based products stuff like that". They are also interested in the effect that plants within the office have "we are actually sitting with, wanting to sit with HR to understand when we moved out the plants for example in 2011, I think it was, what was our sick rate, all of that, the turn-around". An expert mentioned that "currently in our office, we don't pay for any electricity because we've got PV on the top of the roof and it covers all of our power that we need to use. So that helps quite a lot. And another thing that specifically, in the interiors, motivates people to do it, is they say you save more if you can improve your productivity with your staff with 1% and they say indoor spaces with more daylight, with views, with fresh air, can increase the productivity that, each of them is got like a certain percentage, but if you can improve your percentage of productivity of your staff with 1% because your salaries are so high compared to your energy bill you save money at a far better gross than saving the money on a net zero energy bill if that makes sense because I think 91% is paid on salaries, 1% on energy and the other percents, I don't know on exactly what but ya".

In terms of brand image, one financial services representative said that "I need a community smile which then will come back to say no, I actually heard about those guys, they came and they helped us" while another financial services representative felt that "we are ready the leading African Bank, I think it just takes it one step further". An expert was of the opinion that "in the beginning, it was very marketing focused, so good publicity or a branding ... Most of our offices only did it because they could get a good, how would you say, advertisement out of it and say well we sustainable so it was still just to have a tag rather than doing the right thing" when asked about the reason for companies trying to get their green building certification. A financial services organisation commented on the required alignment between the values of the organisation and their actions by stating that "I think Nedbank has been known in the market for being the green bank, you know, the tree huggers, that you know that do all things green and whatever".

This section highlighted the potential advantages that can be derived when circular economic principles are implemented in financial services organisations. The following section will explore the enablers required in order to implement more circular economic principles within the financial services sector in South Africa.

5.7. Results for research question 2: Enablers

Research question 2: Which enablers are needed in order to implement the circular economic principles in financial services and are these enablers the same or different to the current known enablers?

Based on the above-mentioned results, which found that there are numerous potential advantages to the implementation of circular economic principles not only for the financial services organisations but also for the suppliers, society and the environment, it made this next research question very important. This question aims to determine which enablers are required for the implementation of circular economic principles in financial services organisations in South Africa. The enablers that were found in this study are discussed in chapter six and compared to the enablers found in the literature which was presented in chapter two. Previous literature had identified a number of enablers that are required to assist with the implementation of the circular economy, but these findings were mainly focussed on manufacturing or industrial types of businesses and did not consider services organisations such as the financial services. As such, this question aims to establish whether these same enablers are also applicable to financial services organisations, or whether there are different or additional enablers to the implementation of the circular economy in these businesses.

Table 11 and Table 12 summarises the findings from this research based on the interviews that were conducted. In total, 21 different themes were identified and the only consistency between rankings of the two frequency tables was the very first theme namely collaboration. The rest of the themes rankings change quite drastically between the tables making it hard to determine which the most important enablers are.

Half of the enablers were ranked the same across the two frequency tables while the other half were ranked differently. The themes where their rankings remained the same across the tables were Collaboration (1), Design (3), Cost saving (6), Measurement (10), Incentives (12), Certification (13), Awareness (15), Recognition (18), Local Manufacturing (19), Autonomy (20) and Donation (21).

Table 11 - Enabler theme frequency table

Rank	Enablers	Number of times the theme is mentioned	Cumulative frequency %
1	Collaboration	17	13%
2	Regulation	14	23%
3	Design	9	30%
4	Vision	9	37%
5	Education and skills	8	43%
6	Cost saving	8	49%
7	Opportunities	8	54%
8	Leadership	8	60%
9	Systems thinking	7	66%
10	Measurement	7	71%
11	Passion	5	75%
12	Incentives	5	78%
13	Certification	4	81%
14	Sufficient resources	4	84%
15	Awareness	4	87%
16	Customer focus	4	90%
17	Perseverance	4	93%
18	Recognition	3	96%
19	Autonomy	2	97%
20	Donation	2	99%
21	Local Manufacturing	2	100%
Grand Total		**134**	

Table 12 - Enabler theme per strata frequency table

Rank	Enablers	Strata			Total (13 interviewees)
		Expert (4 interviewees)	Financial Services (5 interviewees)	Supplier (4 interviewees)	
1	Collaboration	2	3	3	8
2	Opportunities	2	2	3	7
3	Design	1	3	3	7
4	Leadership	1	5	1	7
5	Regulation	3	2	1	6
6	Cost saving	1	3	1	5
7	Systems thinking	2	3	0	5
8	Vision	1	3	0	4
9	Education and skills	2	1	1	4
10	Measurement	1	2	1	4
11	Perseverance	1	2	1	4
12	Incentives	3	1	0	4
13	Certification	2	1	0	3
14	Customer focus	0	0	3	3
15	Awareness	2	1	0	3
16	Passion	0	2	0	2
17	Sufficient resources	2	0	0	2
18	Recognition	2	0	0	2
19	Local Manufacturing	0	0	2	2
20	Autonomy	0	1	1	2
21	Donation	0	1	1	2

In terms of collaboration, only half of the experts mentioned this as a requirement while 60% of the financial services representatives and 75% of the suppliers mentioned the need for collaboration in order to drive the circular economy. The concept was also mentioned 17 times by the various respondents during the interviews. The one financial services representative mentioned that the contractors that fit out their branches for them will “when one does a site and they need something they will talk to one another and say don't you have a 1980 teller counter with the following wood because the one that we currently revamping has been knocked in or whatever, broken, and then they actually, between one another, can swap it out” which indicates level of teamwork that exists between contractors, people who will normally see each other as competition. This is also illustrated by the statement from the same financial services representative that “this is truly a long-term partnership that we are trying to develop between all of us” and they enable this collaboration through “informal coffees” where they discuss innovative ways to solve challenges, re-use branch furniture and equipment and also do community projects.

A different financial services representative said that “the bank was then when I left in 2015, they were starting to look at, how does Nedbank become that conduit between the demand and supply? How do we, number one, fund small business, you know, as suppliers and how do we then lend money to the consumers that demand these kinds of products so that we can bring the two together and somehow, you know, create value, for even the bank, because we are a business we need to create value for everyone concerned” while a third financial services representative mentioned that it’s “that whole networking thing, so if I'm passionate about” sustainability and giving back to the community we should involve more people in these initiatives as “too often we have these charity events and it's just staff members we don't include our customers and I think to get them involved in that there is the best thing”.

One of the supplier representatives from a company that are part of a larger company said that “they allow you to do your own thing, so we're a little small family business if I can call it that, with a big brother that can help us finance and help us make big decisions … you know things like that”. They also use to collaborate a lot more with the financial services companies that they supply products to but this has changed as illustrated by this statement: “How they strategized with us and listened and understood, it feels like they are fighting a losing battle at the stage, so it's sad”. Another supplier mentioned that they experience a lack of collaboration as they come across “stumbling blocks like with the POS integrators because we've got to integrate

our software into the point of sales software. They know with SafePay, that you don't need as many tills, your more efficient, you know, it's not a case of here you are bringing change and you are unpacking bags and filling your till drawer and if someone wants to go to the toilet they've got to make sure they balance if someone else is going to take over, there's none of that because SafePay understands what floats you require and keeps it and if you are changing cashiers, one logs off and the next one logs on there's none of this time-consuming stuff, so you become more efficient. So if you had 7 tills you only need 5, which means your POS suppliers lose licences for two POS devices because they charge licence fees per month per till, so there's a bit of a blockage there when you have to integrate your software" to help companies become more efficient, reducing the number of devices they require, integrating with the cash in transit companies systems which allows them to reduce their carbon emissions as they can optimise their routes based on the information supplied by the software.

This quote from a financial services representative illustrates just how important a vision, collaboration and the ability to persuade others are in order to achieve the goal of making the country better and more sustainable: "There's only one thing that makes a difference, if you cannot persuade people that you are in a partnership to make the country better, and I think that is why one of the initial eight decided not to be part of it, because it's difficult to explain to someone from a first world how important this is, so but if the partnership is not formed and the common goal is not understood, it doesn't matter what regulations you put in place, what KPI's you put in place, how you over measure or under measure, you have to find the person in that group that's got the same passion to deliver this for the country." Another financial services representative mentioned that "you separate the waste in terms of what you can't recycle what goes to landfill but some of the recycle items would be glass, aluminium, steel, furniture, which could be donated or de-assembled and parts of it re-used things like that" which highlights re-use through donation and recycling initiatives.

When asked whether they have a product as a service or rental model, one supplier said that "so it depends, Standard Bank rent from us rent, rent our devices, in some divisions, some divisions outright purchase. So anything that they want to do, we do a leasing, a rental, an outright purchase we even put sometimes stuff like for … we're going to do a 4 month pilot period to help him see the process and understand whether it's a proof of concept with FNB we did a proof of concept for nearly for two years to get the lessons learned so we positioned the devices there at our cost and see that we can understand if it's beneficial for the bank or not. So we are really flexible, whatever

works for the customer we try and accommodate." Another supplier representative mentioned that their sales agents go through rigorous competency tests prior to being appointed as the company is interested in "your needs based selling is what they looking for. Because we are not a product selling company, you know, like a supermarket it's all based on needs and what the client wants and being able to supply them with what they want and what they need for their and being able to do an analysis of that". A third supplier mentioned that "we are ready working on the KPIs for 2000 and 17 and going back to where we used to be where every single person's KPI, their main, first top two KPIs, will be linked to customer". All of these statements indicate a high level of customer centricity from the supplier's point of view.

When asked about the enablers, a number of interviewees mentioned hard work and leadership as illustrated by the following statement from a financial services representative: "Hard work support from the executive which was a proposed mandate and a mandate agreed then". A supplier also indicated that perseverance is required when she stated "a lot of hard work and driving by the key parties. So it would be the CEO of this company, together with, obviously higher management, together with the company that they've got to come on board with the initiative, together with the buy-in from the flooring contractors who are installing the product that would follow through on what they say which is when you cut you off cuts give us a call, this is the number, or whatever you have to do. So I think a lot of it is driving via the various people and following through that it is happening, checking up on them to make sure that, ok you have this big job, we've just delivered X amount, do you have any material that we can collect, that sort of thing. So it's a lot of following up and driving from the key parties involved". An expert, with a lot of international experience mentioned that "South African in general has a wonderful, wonderful entrepreneurial tradition and spirit and people work darn hard, especially, I would say in Jo'burg, you know, it really, people work hard here. I've worked all over the world and they work hard in Johannesburg, they really do, you know, they work long hours, they give it their all so there is an enormous amount of energy here that you wouldn't have, let's say in Copenhagen"

Regulations helps raise awareness as illustrated by this financial services representative's comment on the "Waste Management Act that's also coming out with some new stuff, water regulations, water restrictions so those kind of things, I think, are starting to raise [the level of awareness]" and he also mentioned "there's a few regulations coming out, right, so there's the carbon tax so that's raising the awareness of how you've got to manage this kind of stuff well".

One bank uses modularly designed mobile offices to give them flexibility and agility. The representative mentioned that “we are building mobile offices that you just plug in that’s got everything already there, on wheels, that lock down and we've already started recycling. We've got nice videos to show how we, over 8 hours, 4 hours, actually reorganise the whole bank except for the fixed portions where your tellers and treasury areas are the rest has been we re-organised completely”.

This section presented the findings for the research question that aimed to determine the enablers required to implement the circular economy as it was found that companies could derive benefits from implementing these principles. The next section uncovers the barriers that exist or that can hamper the implementation of circular economic principles in financial services organisations in South Africa.

5.8. Results for research question 3: Barriers

Research question 3: What barriers are currently preventing circular economic principles from being implemented in the financial services industry in South Africa, and are these the same as the current known barriers identified in the literature?

It was important to understand the barriers to the implementation of circular economic principles in the South African financial services industry as this will allow one to try and come up with solutions in order to overcome these identified barriers. Once again, frequency tables were created based on the themes that emerged from the 13 interviews that were conducted with the three different strata. Table 13 and Table 14 summarises these findings. In total, 18 themes were identified and it was found that 10 of the 18 themes were ranked the same across the two frequency tables while 8 themes were ranked in different positions depending on the way the frequency was measured. The themes that were ranked the same across the tables were Cost (2), Business model (4), Lack of resources (5), Complexity (6), Lack of collaboration (11), Changing environment (12), Lack of incentives (15), Risk (16), Low growth Economy (17) and lastly Lack of innovation (18).

Interestingly, this time the highest ranked theme was not the same between the two tables. In the table that measures the frequency at which the theme was mentioned during the interviews, inadequate design was listed as the biggest barrier while in the table that measures how many of each stratum mentioned the theme, lack of skills was

deemed the biggest barrier and these themes actually swapped around in the two tables.

All of the supplier representatives deemed inadequate design as a barrier while 60% of the financial services representatives found it to be a barrier. Only one of the experts specifically mentioned inadequate design as a barrier. One of the suppliers mentioned that a change in the notes series in South Africa caused a lot of problems for them as their devices were designed with just a one-sided sensor and to retrofit them with a double-sided sensor would have been too costly which resulted in them having to replace these devices before their actual end-of-life. “Some of our problems were that our new Mandela note was poor in comparison to the previous one, so our old technology could not detect, because on the old notes the background on each note was different where now, the new notes, Mandela's face is on them, so if you, if the note go through like this and the Mandela is at the bottom, if the other side, it depends if you've got a one-sided sensor, so we had to, with the new series do a double-sided sensor so that you can read the note on both sides so the older technology that had a one-sided sensor was a mess because of the notes not because of the device. We could have used the device longer if the notes were better”.

Table 13 - Barrier theme frequency table

Rank	Barrier	Number of times the theme is mentioned	Cumulative frequency %
1	Inadequate Design	16	12%
2	Cost	15	23%
3	Lack of skills	14	34%
4	Business model	11	42%
5	Lack of resources	10	50%
6	Complexity	9	57%
7	Bureaucratic system	9	64%
8	Inequality	9	70%
9	Inefficient measurement	6	75%
10	Restrictive regulation	6	80%
11	Lack of collaboration	6	84%
12	Changing environment	5	88%
13	Corruption and crime	5	91%
14	Lack of perseverance	4	94%
15	Lack of incentives	3	96%
16	Risk	2	98%
17	Low growth Economy	2	99%
18	Lack of innovation	1	100%
Grand Total		**133**	

Another big design issue that was mentioned by a number of suppliers was the design of a safe. Safes are very heavy and this increases the transportation cost along with the associated carbon emissions. These factors make the remanufacturing and refurbishment of safes less desirable although this is still done to some extent in South Africa. “One of the problems, if you understand our environment, our equipment are a lot of the time big safes and its electronics combined with mechanical components and then for instances a safe. So it is sometimes difficult to recycle the safe, so for instance, a safe, looking at a safe you can take the door off, and you can, the door you can really send or sell as scrap metal. But the safe itself, there is inside the safe, is you have concrete, and you can't really re-use or re-sell the safe with the concrete on the inside”. This barrier material makes it very difficult for old safes to be recycled as the concrete between the metal sheets damages the scrap dealer’s concrete crushers and this resulted in “damaged or outdated [safes, once] … they scrap them” to be disposed of “for years and years there wasn't a problem because you had so many empty mine shafts, and the mines, that's all they wanted, so you would dump your old safes down the mine shafts”. Even though the current safe design is a known problem when it comes to the end-of-life, making it more modular is not really an option because “if you do that the criminal will figure that out too, so you've gotta be so careful when you change anything that the criminal doesn't find your weak point”. These design issues are very specific to the type of product used within the financial services industry and it is linked to the criminal element in South Africa.

In addition to the criminal element, corruption was also mentioned by some of the experts as a major stumbling block. This is powerfully illustrated by this statement “The fact of the matter is that, when you have corruption, it throws everything else out the window. So it throws quality, it throws efficiency; it throws everything out the window. Because when you have corruption, you have two problems, right, you end up paying too much for what you're buying, right so don't, your money literally doesn't stretch that far, your budgets. And secondly is that you often end up, maybe getting the wrong person for the job, right. So the quality levels, so you build a school but it's crap, and it falls apart and it doesn't have proper sanitation because the guy who did the job should have never done that job. So they have, there has been studies done by like United Nations and so on, that corruption is the most destructive thing for any economy to grow. Nothing beats corruption. Anything you can have earth shattering I don't know, corruption because it stops everything it stops any kind of progress”. A supplier also mentioned that contractors try and change the specifications as set out by the architects and “then there is corruption because they say well you know what, if we go

with this one, I'll give you five grand because he's getting 20 grand and you getting 5 grand so everyone's happy".

Table 14 - Barrier theme per strata frequency table

Rank	Barrier	Strata			Total (13 interviewees)
		Expert (4 interviewees)	Financial Services (5 interviewees)	Supplier (4 interviewees)	
1	Lack of skills	4	3	3	10
2	Cost	3	4	2	9
3	Inadequate Design	1	3	4	8
4	Business model	3	1	4	8
5	Lack of resources	3	0	2	5
6	Complexity	2	2	1	5
7	Restrictive regulation	3	1	1	5
8	Bureaucratic system	0	4	0	4
9	Inequality	3	1	0	4
10	Inefficient measurement	1	3	0	4
11	Lack of collaboration	1	2	1	4
12	Changing environment	0	2	1	3
13	Lack of perseverance	1	1	1	3
14	Corruption and crime	2	0	1	2
15	Lack of incentives	2	0	0	2
16	Risk	0	2	0	2
17	Low growth Economy	2	0	0	2
18	Lack of innovation	1	0	0	1

All of the experts that were interviewed deemed the lack of skills in South Africa as a major stumbling block while 75% of suppliers and 60% of financial services representatives deemed this as a problem when it comes to implementing circular economic principles. There are a lot of factors relating to the financial services industry as well as the context of the country such as limited local manufacturing, inequality of income, skills and literacy, lack of environmental law enforcement, restrictive regulation, corruption and crime as well as a lack of resources that makes the implementation of circular economic principles particularly challenging in South Africa and in this industry.

A financial services expert said "It takes time to go through the documentation, to skill the vendor. Skilling the Vendors like pulling teeth hay, takes quite a, quite a lot of effort" while another financial services representative also had concerns with the suppliers' skill level when she said that "the ability of a supplier, and the requirements from the banks and also assuming that the supply would know, you know, about the risks we face". One of the suppliers also highlighted the skills requirement "you need expertise

and somebody to advise you where's opportunities. Maybe the other challenge that you need to understand is that the equipment is very very heavy, so a safe can weigh up to 1 ton for instance, so average between 150 kilograms up to, well, up to a ton" when the recycling of safes was discussed.

It was also found that short-term measurements influence long term goals and this financial expert highlights how important alignment is as "the business objectives within the different clusters were not aligned to, you know, the fair share 2030 project. So what happened, and I think it just, it was implemented just before I left. Each of the business units, like I was in Home Loans, and we go a target to lend, 3 billion rand in loans to Green developments over the next 3 years" but the short-term measurements hampered this goal.

5.9. Conclusion

The results from the processed data obtained from the 13 interviews with three different strata have been presented in this chapter. Six or seven interview questions, depending on the specific strata, with additional prompts, were used during the interview process to extract information from the interviewees in order to answer the research questions that was formulated in chapter three. The data indicate that there are a number of advantages, enablers and barriers to the implementation of the circular economy within South African financial services organisations and that some of these principles are already implemented in these companies. The next chapter discusses the results presented in this chapter and compares these findings with the information obtained through a comprehensive literature review.

6. CHAPTER 6: DISCUSSION OF RESULTS

6.1. Introduction

A discussion of the research findings obtained from analysing the gathered data, along with the current literature is presented in this chapter. The findings from this study are related and juxtaposed to the concepts found in the literature presented in chapter two and is structured similarly to the research questions presented in chapter three. The sub-question relating to the current landscape will be discussed prior to discussing the principle research questions. This chapter links back to all preceding chapters and also contains potential concerns as a result of relying on the data obtained from the 13 individuals, representing three different strata which were interviewed for this particular study. The findings of this study add to an enhanced understanding of the advantages of implementing circular economic principles within services industries, particularly financial services, which is an area that hasn't previously been explored. In addition, the study also aids with understanding the barriers and enablers to the implementation of circular economic principles.

6.2. Discussion of sub-question 1: Landscape

What circular economic principles, if any, are currently employed in the financial services industry in South Africa?

The aim of this specific sub-question was to understand the current landscape, as perceived by the participants, in terms of the circular economic principles already employed within financial services organisations in South Africa. This question was required as one would be able to determine advantages that have resulted from implementing circular economic principles in the event that any of those principles had been implemented.

The study found that there are a few circular economic principles already employed in the financial services organisations such as the re-use of furniture, equipment and even construction materials like ceiling tiles. There is also a relatively large focus on recycling initiatives through operational and construction waste management processes that have been implemented, partly due to the influence of the Green Building Council of South Africa as well as certain regulations that have been imposed by the government of South Africa. The study also found that South Africa is a highly regulated country, but the law enforcement is poor.

Many of the suppliers of equipment to the financial services organisations are importers and distributors with very limited local manufacturing taking place in South Africa. Most of the previous research had been done in countries like China, where a great deal of local manufacturing takes place (Lieder & Rashid, 2016). Countries such as the United States of America and China have developed eco-industrial parks in order to aid local manufacturing based on circular economic principles and China has gone even further than that; they have created laws driven by and based on the circular economy (Li & Yu, 2011; Yijun & Ying, 2011; Yong, 2007; Yuan et al., 2006; Zhijun & Nailing, 2007; Zhou, 2006).

6.2.1. Conclusive findings for sub-question 1: Landscape

This research found that there is a fair amount of regulation with regard to waste management and energy reduction in South Africa. It was also found that financial services organisations already re-use furniture and other equipment with some instances of remanufacturing and refurbishment of equipment and furniture which has benefitted these organisations. The financial services organisations, as well as one expert mentioned that some new furniture contracts include take-back schemes wherein the supplier of the furniture has to commit to fetch their products at its end-of-life or when it is no longer required, and they have to commit to re-using a portion of the old material to produce new furniture items. With the establishment of the Green Building Council of South Africa, certification, mainly in the green building space have increased dramatically from one certified building in 2009 to 206 certified green star buildings in 2016.

Recycling initiatives in the South African financial services organisations are in place in the form of operational waste management processes. In the event that they try to achieve a green star rating for a construction project, they also have stringent construction waste management practices, and this is also applied to projects where they might not be aiming for green star certification. Unfortunately, it was found that there is very limited “product as a service” models in place (Stahel & Clift, 2016), models which would probably have provided these organisations, their suppliers and the country with the most benefits.

6.3. Discussion of research question 1: Advantages

Are there any potential advantages that the implementation of circular economic principles can provide financial services organisations when they apply it to their businesses?

This was the principle research question of this study and aimed to understand potential advantages that financial services organisations can derive from the implementation of circular economic principles. Results obtained from the interviews with financial services representatives, sustainability experts and suppliers indicate that there are potential advantages that these organisations, their suppliers, society and the environment can gain in the event that circular economic principles are implemented. The advantages derived from implementing the circular economy that was found in prior studies was mainly focused on manufacturing firms while this study focused on services organisations. It was found that there are a number of overlapping advantages between the results from this study and previous research that had been conducted, but additional benefits were also uncovered. Table 15 provides a summary of the advantages that were found through the interviews and subsequent data analysis compared to the advantages that were found in existing literature which was presented in chapter two of this document.

Table 15 - Advantages of the circular economy found in this research compared to literature

Rank	Advantages and times mentioned	Literature reference	Advantage identified in literature
1	Value creation (19)	Clift and Druckman (2015) Ghisellini et al. (2016) Mathews and Tan (2011)	Product as service business model can generate more profit. Competitive advantage.
2	Sustainability (17)	Andersen (2007) Clift and Druckman (2015)	Reduction in waste to landfill and extraction of raw material.
3	Cost saving (9)	Andersen (2007) Drabe and Herstatt (2016)	Invest in reduction measures to avoid additional taxes. Save costs through cheaper materials and simplified designs.
4	Improved community (7)	N/A	
5	Flexibility (6)	Andersen (2007)	Flexibility for individualised solutions.
6	Brand image (6)	N/A	
7	Product Innovation (5)	Andersen (2007) Drabe and Herstatt (2016)	Continuously innovate. Radically different products due to the end of life considerations.
8	Education (5)	N/A	
9	Productivity (4)	N/A	
10	Job creation (4)	Andersen (2007) Clift and Druckman (2015) Ghisellini et al. (2016)	More labour and less environment.

6.3.1. Conclusive findings for research question 1: Advantages

From Table 15 it can be seen that this study identified four additional advantages that were not specifically included in the previous literature that was discussed in chapter two. These were an improved community, which is particularly relevant considering the unequal society that South Africa has and brand image which indicates that some companies are pursuing sustainability more as a marketing campaign as opposed to doing the right thing for the environment and society while others are focused on their impact. Another additional advantage is education through skills development and awareness that is created when companies implement circular economic principles and employ local people to do the remanufacturing of products.

The last additional advantage that was found relates to productivity. Through the implementation of cradle-to-cradle concepts where the toxicity of the materials used in the furniture and fit-out of branches are limited, or preferably eliminated, the staff works in a healthier environment. When you add ergonomic equipment, buildings with more natural light which reduces the requirement for artificial light and also electricity, natural plants which improve air quality in buildings, you could experience an increase in productivity from your staff as there will most likely be less absenteeism due to illnesses. This increase in productivity can be more valuable to an organisation than the cost savings due to a reduction in energy consumption.

6.4. Discussion of research question 2: Enablers

Which enablers are needed in order to implement the circular economic principles in financial services and are these enablers the same or different to the current known enablers?

This research question aimed to determine whether the enablers to the implementation of circular economic principles in services organisations are the same as the known enablers for manufacturing firms. It was found that there are a number of similar enablers required, but that there are also some newly identified enablers specifically for the South African financial services context to assist with the implementation of the circular economy. The enablers that were found through the interviews and subsequent data analysis is summarised and presented in Table 16 along with a comparison to the enablers that were found in existing literature as presented in chapter two of this document.

Table 16 - Enablers of the circular economy found in this research compared to literature

Rank	Enablers and times mentioned	Literature reference	Enablers identified in literature
1	Collaboration (17)	Andersen (2007) Corder et al. (2014) European Commission (2011) Kuah (2002) Mathews and Tan (2011) Roos (2014) Zhijun and Nailing (2007)	Require collaboration between companies, research institutions and universities. Clustering. Eco-industrial parks. The company cannot achieve circularity on its own.
2	Regulation (14)	Li and Yu (2011) European Commission (2011) Yijun and Ying (2011) Yong (2007) Yuan et al. (2006) Zhijun and Nailing (2007) Zhou (2006)	Need regulation that promotes eco-innovation and improved standards. Circular economic laws.
3	Design (9)	Benyus (1997) Clift and Druckman (2015) Matan and Newman (2015)	Need improved designs that consider the end-of-life of the product. Look to nature for product design. Need innovation to achieve green urbanism.
4	Vision (9)	Drabe and Herstatt (2016)	Company's philosophy should fit with the cradle-to-cradle concept.
5	Education and skills (8)	European Commission (2011)	Grow excellence in the science base.
6	Cost saving (8)	Crainer (2013)	The circular economy could lead to cost savings.
7	Opportunities (8)	Boughzala and De Vreede (2015) Seebode et al. (2012) Weidinger et al. (2014)	Collaboration can lead to competitive advantage. Greening the economy can create new growth opportunities. Co-creation can lead to breakthrough innovations.
8	Leadership (8)	European Commission (2011) Hamel (2009) Roos (2014)	Need industrial leadership. Leaders should enable and encourage innovation and collaboration. Need transformational leaders.
9	Systems thinking (7)	Andersen (2007) Clift and Druckman (2015) Cole (2012) Corder et al. (2014) Galbreath et al. (2014) Kuah (2002) Lieder and Rashid (2016) Shafiq et al. (2014) Sigler (1999)	Interdisciplinary collaboration. Humans are just one element of the bigger eco-system. Complementary clusters can drive economic growth, profitability and innovation. Supply chain system can provide a competitive advantage.
10	Measurement (7)	Clift and Druckman (2015) Ghisellini et al. (2016)	Change tax laws to encourage re-using and remanufacturing of products.
11	Passion (5)	Hanson-Rasmussen et al. (2014)	Millennials want to work for sustainable firms.
12	Incentives (5)	European Commission (2011)	Need incentives to drive eco-innovation.
13	Certification (4)	McDonough and Braungart (2002)	Cradle to cradle certified products.
14	Sufficient resources (4)	European Commission (2011)	Need access to materials, external information and knowledge as well as technology.
15	Awareness (4)	Clift and Druckman (2015)	Consumers option out of product ownership and adopting product as a

			service model.
16	Customer focus (4)	n/a	n/a
17	Perseverance (4)	n/a	n/a
18	Recognition (3)	n/a	n/a
19	Autonomy (2)	n/a	n/a
20	Donation (2)	n/a	n/a
21	Local Manufacturing (2)	Galbreath et al. (2014) Kuah (2002) Lieder and Rashid (2016)	Clusters where local manufacturing takes place. The one companies waste can be an input for another company.

As can be seen in Table 16, the majority of enablers for the circular economy were similar to the enablers found in the current literature. The newly identified themes, which were also not frequently mentioned during the interviews and thus ranked quite low, include customer focus, perseverance, recognition, autonomy and donations.

All of the suppliers mentioned that they are very customer centric, to the extent that they will adjust their business model to suit the customer. The one company called it “needs based sales” that they apply when analysing the customers’ requirements in order to advise them of the best possible solutions for their specific needs. The other suppliers will structure the deal in such a way that it suits the customer. If a customer would want to lease a product from them, then they will structure the deal as such in comparison to when the customer wants to purchase the product outright even though a rental type of model would be the most profitable for the suppliers and provide the most flexibility for the financial services organisation.

The perseverance theme came through strongly in that a number of respondents quoted “hard work” when asked what helps to get these green, sustainability or circular economy principles from being implemented. A number of interviewees also mentioned that recognition and some extent of autonomy are important to drive these principles as the bureaucratic system was frequently mentioned as a barrier.

In South Africa, due to the level of inequality in the country, some of the respondents mentioned that when they revamp branches, instead of them re-using furniture or equipment themselves, they donate this to the local community. This practice creates a number of benefits for the organisation and the local community. The company reduces their cost as it is sometimes more costly to transport the old furniture and equipment back to a central warehouse or to dump it responsibly due to the waste act. They also create goodwill in the community that can potentially translate into sales. Also, through the upliftment of the local community, they indirectly create a more stable operating environment for themselves.

6.4.1. Conclusive findings for research question 2: Enablers

This study found that the most important enablers to drive the implementation of the circular economy in financial services organisation within South Africa are similar to the enablers required for manufacturing firms which have been the focus of most prior research. The theme that came through the strongest was collaboration as no company can be circular on their own, they need the entire eco-system to achieve the optimal levels of circularity and for that, collaboration is vital (Boughzala & de Vreede, 2015).

Due to a lot of the limiting factors in the current landscape and neo-classical business models, such as externalities not being priced correctly (Andersen, 2007; Lovins et al., 1999), uncertain market demand and the risk relating to return on investment into eco-innovations, it was found that the correct regulation is important to drive the right behaviours. The study found that South Africa has very good regulations, although some deem the regulation as becoming restrictive and the enforcement of the regulation is still largely lacking.

Modular design, and designing products with their end-of-life in mind (Crainer, 2013; Drabe & Herstatt, 2016; McDonough & Braungart, 2002) are very important for the circular economy but this is quite difficult for the financial services industry when it comes to their security products such as safes due to the criminal element in South Africa. Scientific research will be required to determine a solution do deal with safes that have reached their end-of-life as the old solution of dumping these into old mine shafts is not environmentally friendly or sustainable due to the loss of material from the system.

6.5. Discussion of research question 3: Barriers

What barriers are currently preventing circular economic principles from being implemented in the financial services industry in South Africa, and are these the same as the current known barriers identified in the literature?

This research question aimed to understand whether the barriers to the implementation of the circular economy are the same for services organisations as for manufacturing firms as most of the prior research had focussed on the latter. It was found that there are a number of similar barriers between the different industries when it comes to the implementation of circular economic principles, but that there are also some newly

identified barriers that relate specifically to the financial services industry as found in the context of South Africa. Table 17 summarises and is contrasts the findings with the literature that was presented in chapter two.

Table 17 - Barriers of the circular economy found in this research compared to literature

Rank	Barrier and times mentioned	Literature reference	Barriers identified in literature
1	Inadequate Design (16)	Bakker et al. (2014) Benyus (1997)	Need to design in order to extend product life. Current designs are not ideal, nature has a lot of great designs and systems that we should copy.
2	Cost (15)	Andersen (2007) European Commission (2011) Rosenau-Tornow et al. (2009)	The cost of raw, virgin materials hampers or encourage circular economy depending on whether they are more or less expensive than recycled materials. Lack of external funding.
3	Lack of skills (14)	Drabe and Herstatt (2016)	Need to have skills to identify toxic materials.
4	Business model (11)	Bakker et al. (2014) Bechtel et al. (2013) Hawken et al. (1999d) Roos (2014)	Change in mind-set. Need to rethink neo-classical economic system and linear economy.
5	Lack of resources (10)	European Commission (2011) Roos (2014)	Limited access to knowledge, information, qualified personnel and technology. Lack of technology.
6	Complexity (9)	Andersen (2007)	Interdisciplinary nature of the circular economy makes it very complex.
7	Bureaucratic system (9)	European Commission (2011)	Existing regulations is limiting.
8	Inequality (9)	n/a	n/a
9	Inefficient measurement (6)	Andersen (2007) European Commission (2011) Hawken et al. (1999d) Lovins et al. (1999)	Need an accurate measure for externalities. Tax system rewards companies when being wasteful. Failure of market prices of externalities.
10	Restrictive regulation (6)	European Commission (2011) Roos (2014)	Regulation not providing incentives for eco-innovation. Complex regulation and difference between international regulations.
11	Lack of collaboration (6)	European Commission (2011)	Lack of collaboration.
12	Changing environment (5)	European Commission (2011)	Climate change.
13	Corruption and crime (4)	n/a	n/a
14	Lack of perseverance (4)	n/a	n/a
15	Lack of incentives (3)	Roos (2014)	Need a proper business case to justify circular economy.
16	Risk (2)	European Commission (2011)	Market risk, uncertain market demand, uncertain return on investment for eco-innovation.
17	Low growth Economy (2)	European Commission (2011)	Economic and financial crises.
18	Lack of innovation (1)	Matan and Newman (2015) Seebode et al. (2012)	Without innovation, green urbanism would not be possible. Innovation is required.

It can be seen from Table 17 that the majority of barriers identified in this research has been identified in previous research. The three additional themes that were identified by analysing the data obtained from 13 interviews are inequality, corruption and crime and lastly lack of perseverance which are in a sense related themes. The first two relate strongly to the context in which the research was conducted as South Africa has a very high Gini coefficient, reaffirming the level of inequality that exists within the country. This level of inequality also impacts the education and skill level of the people living in South Africa, and this reduces the local manufacturing capabilities of companies that require certain skills in order to produce specialised equipment. The inequality has also led to high levels of crime due to the difference in living conditions between the haves versus the have nots and it has also created an environment for corruption to thrive. Due to the level of corruption, leaders striving for more environmentally responsible business practices can be persuaded otherwise by corrupt individuals.

6.5.1. Conclusive findings for research question 3: Barriers

The inadequate design of products was the theme that was the most frequently mentioned as a barrier during the interviews. The nature of the financial services industry, as well as the crime levels in South Africa, restrict the level of modularity that can be used in the design of security equipment like safes as the criminals would very quickly use that to their own advantage. As such, the end-of-life of safes is not considered when designing these products at all, the focus is on keeping criminals from gaining access to the content of the safe. This has resulted in a big problem with an oversupply of old safes that cannot be easily recycled due to the barrier material used within the walls of the safe. Often times these old safes also don't adhere to the latest required standards which limit the re-use of these safes.

Another highly ranked barrier was the cost element which in this instance relates to the transport costs involved in moving heavy equipment in order to get it to a factory where it can get remanufactured. South Africa is a fairly large country with limited local manufacturing and transport is mainly done via the road network, not via the railway network. Also, due to the limited current costs related to the environmental impact when producing new equipment, and the lack of local skills to manufacture or remanufacture specialised equipment, companies find it cheaper at times to purchase a new product, than to remanufacture an old product which might have outdated technology.

The fourth highest ranked barrier to the circular economy found in this study relates to the current business models that are used by companies in South Africa. Most of the suppliers sell their products and equipment to financial services organisations due to the current linear economy mindset and the fact that financial services organisations often have access to cheaper finance than the suppliers of these products. Financial services organisations also prefer to purchase the equipment in order to have the asset on their book as it can be depreciated over time which has an impact on the tax they pay.

6.6. Conclusion

This study obtained data from 13 individuals representing three different strata. Although the sample was quite small, the advantages, enablers and barriers found through a qualitative research methodology, are very similar to these factors found when the current literature was analysed. Due to the context of South Africa, as well as the type of industry analysed, there were some additional themes that emerged which contributes to the current literature as previous studies were focused on manufacturing firms.

7. CHAPTER 7: CONCLUSION

7.1. Introduction

This concluding chapter highlights the principal findings of the research. It combines the results of the research to form a comprehensive set of discoveries along with a model that was adapted from Lieder and Rashid's (2016) model to include the services organisation's requirements. This section includes recommendations to potential stakeholders and it indicates the managerial implications based directly on the findings. The research limitations of this study, due to the methodology followed, are also restated and finally, this chapter provides recommendations for potential future research on the subject matter.

7.2. Principal findings

This study found that financial services organisations already make use of some of the circular economic principles like re-use, recycle and remanufacture, but the product as a service component, which is deemed the most beneficial element of the circular economy (Stahel, 2010), is not utilised much although some of the suppliers are willing to offer such a model.

The research indicated that financial services organisations can gain flexibility when implementing circular economic principles but that value creation along with sustainability was much higher ranked themes. In addition, the implementation of circular economic principles could potentially increase staff productivity through improved working conditions (Lovins et al., 1999) which would benefit the organisations more due to the high costs related to staff within services organisations. In order to achieve circular economy, there are a number of enablers required. This study identified five additional enablers namely customer focus, perseverance, recognition, autonomy and donations, that were not explicitly mentioned in the literature review, but the main enablers remained the same for the financial services organisations as for manufacturing firms. Collaboration (Boughzala & de Vreede, 2015), regulation and design (Bakker et al., 2014) were found to be the three key enablers that came out in this study.

It was found that there are a number of barriers to the implementation of the circular economy, especially in financial institutions within South Africa which will have to be overcome if more of these principles are to be employed in this industry. These barriers

relate to both the context of the country as well as the financial services industry. The country is in some instances still a developing country with an unequal society as well as diverse geographical locations, for example, some metro cities are very well developed and westernised while small towns or other areas are still very rural in nature. The financial services industry also creates difficulties with regard to the practicality of implementing circular economic principles due to the nature of the equipment that these institutions make use of as well as the security risk brought about by the cash environment and criminal elements that exist within the South African context.

Figure 8 – A comprehensive circular economy framework adapted by the author from Lieder and Rashid (2016) to include services organisations

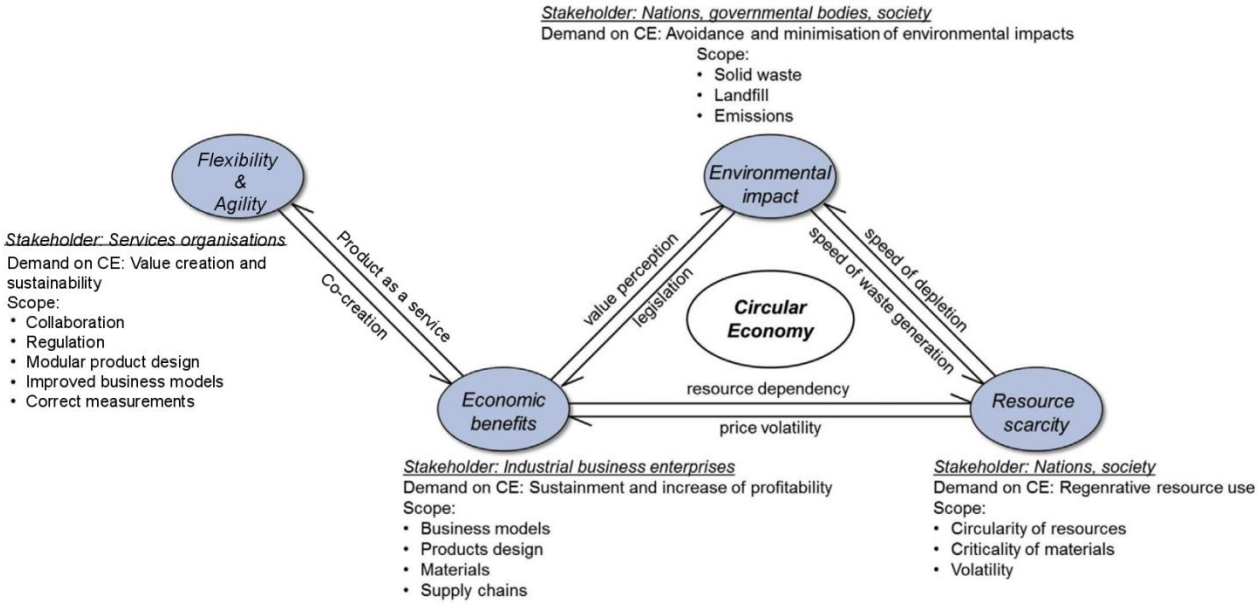


Figure 8 provides a comprehensive circular economy framework based on the findings from this research which has been added to a model proposed by Lieder and Rashid (2016). This model expands on the current literature as very little research has been conducted on circular economy applications within services industries like financial services organisations.

It can be seen from the model that services organisations want to achieve value creation and sustainability by implementing circular economic principles but that is reliant on collaboration (Boughzala & de Vreede, 2015), regulation, and modular product design (Drabe & Herstatt, 2016) , a rethink of the current linear business

models (Roos, 2014) as well as a change in the current tax systems and measurement of negative externalities related to natural resources (Andersen, 2007; Clift & Druckman, 2015; Ghisellini et al., 2016; Lovins et al., 1999). These organisations should make use of products as services models, which the service providers understand as rental models, and also co-create custom solutions with their suppliers to achieve the most flexibility and agility to remain competitive in the current economic climate.

7.3. Implications for management

Management of financial services organisations, as well as the management of suppliers, should drive collaboration between themselves in order to implement more circular economic principles such as the product as a service model. These models will provide both organisations with benefits and it will also provide benefits to the environment and the local communities in which they operate. If suppliers can start doing more local manufacturing, it will create a platform for more circular economic principles and this will also have a positive effect on the economy through value and job creation.

7.4. Research limitations restated

The first limitation of this study is that it has been done as an exploratory study and further research will be required to confirm the findings of the research (Shafiq et al., 2014). A pragmatic research philosophy has been employed in that the sampling method used was purposive, convenience and snowball sampling (Saunders & Lewis, 2012) which could cause the sample to be non-representative. The face-to-face or telephonic interviews required more engagement than if the research were based on publicly available data and this engagement most likely reduced the objectivity and independence of the researcher (Easterby-Smith, Thorpe, & Jackson, 2015) but it has probably also lead to greater insights than what would have been obtained from secondary sources or surveys where the researcher would not have been able to ask for more insights from the respondents. The researcher attempted a process called bracketing, an important process within phenomenological studies, whereby the researcher had to set aside preconceived ideas to enable her to understand the potential advantages as well as the barriers and enablers to the circular economy in financial services organisations from the interviewee's perspective (Nieswiadomy, 2011) without which a lot of personal biases would have been introduced.

Due to the interpretivist nature of qualitative research, several interpretations of the problem could have been developed (Creswell, 2007) and the small sample size, which consisted of 13 individuals representing three different strata, limited the researcher to infer the research findings to the universe (Yin, 2009). Potentially, the identified interviewees could have represented an additional limitation on this research as they might not have been representative of the universe. Representatives from four of the five large retail financial services organisation were interviewed and as such, the sample did not represent the entire financial services landscape within South Africa.

The chosen context of this study, namely the financial services organisations within South Africa has added additional limiting factors to this research both from a sector point of view but also from a geographical point of view (Shafiq et al., 2014). Future research could consider focusing on a larger geographical area or analysing financial services organisations in countries with a high proportion of local manufacturing, and/or it could consider covering a wider variety of services organisations. Lastly, as the researcher has not done academic research and as such was inexperienced with qualitative research, which has added another major limitation to this study.

7.5. Suggestions for future research

The circular economy could have a major impact on the current linear, consumption driven economy which poses challenges to financial institutions as they are not currently focused on funding remanufactured products and the goal of the circular economy is to reduce consumption and thus new sales. Future research on the required changes to financial institutions' business models to cater for the circular economy is required.

The findings are focussed on the financial services sector, and there are a number of barriers that could be specific to this industry. Future research, to determine whether the circular economy could provide another service related companies with potential advantages is required.

Some of the findings relate to the challenges of safely disposing of, or recycling the specialised equipment used in the financial services organisations and further research into this field would be very valuable. It was found that there is a large amount of old, outdated safes that are very difficult to recycle due to the current designs of the safes. The barrier material used in the walls of the safes make them very heavy to transport

and it also makes recycling near impossible with current concrete crusher equipment used by scrap metal dealers.

7.6. Conclusion

This research aimed to understand whether financial services organisations could derive any potential advantages in the event that they implement circular economic principles in their businesses and the research found that they could derive some direct as well as indirect benefits. In order to answer the stated research question, it was deemed necessary to understand what circular economic principles, if any, are currently employed in the financial services industry in South Africa and it was found that there are some forms of circular economic principles that have been implemented. These include re-using furniture and equipment, reduction in emissions through improved energy management and energy efficient equipment, refurbishing of safes, furniture and other capital intensive equipment as well as recycling through operational and construction waste management processes and systems. It was found that very few financial services organisations are making use of leasing models, or as Stahel and Clift (2016) would refer to it, products as a service, the element of the circular economy which could provide the financial services organisations, their suppliers, the economy, society and the environment with the most advantages.

As it was found that financial services organisations could derive benefits from implementing circular economic principles, the research also aimed to establish the barriers preventing and enablers required to encourage financial services organisations to implement these principles in South Africa. It was found that these barriers and enablers are similar to those experienced by manufacturing firms but the study found five additional enablers and three additional barriers that were not found in the current literature.

Finally, a model was created to cater for services organisations by adapting a model proposed by Lieder and Rashid (2016). This contributes to the current literature which has mainly focused on manufacturing organisations.

8. REFERENCE LIST

Accenture. (2016). Global Fintech Investment Growth Continues in 2016 Driven by Europe and Asia , Accenture Study Finds. Retrieved August 18, 2016, from https://newsroom.accenture.com/news/global-fintech-investment-growth-continues-in-2016-driven-by-europe-and-asia-accenture-study-finds.htm

Andersen, M. S. (2007). An introductory note on the environmental economics of the circular economy. *Sustainability Science*, 133–140. doi: 10.1007/s11625-006-0013-6

Bakker, C., Wang, F., Huisman, J., & Den Hollander, M. (2014). Products that go round: exploring product life extension through design. *Journal of Cleaner Production*, *69*, 10–16. doi: 10.1016/j.jclepro.2014.01.028

Bechtel, N., Bojko, R., & Völkel, R. (2013). *Be in the Loop: Circular Economy & Strategic Sustainable Development*. Blekinge Institute of Technology.

Benyus, J. M. (2002). *Biomimicry : innovation inspired by nature*. HarperCollins Publishers.

Betts, N. (2015). Sustainable economic development as a cluster strategy. *Economic Development Journal*, *14*(1), 45–50.

Bisseker, C. (2014). SA economy trapped in low growth. Retrieved August 24, 2016, from http://www.financialmail.co.za/coverstory/2014/06/12/sa-economy-trapped-in-low-growth

Borel-Saladin, J. M., & Turok, I. N. (2013). The green economy: Incremental change or transformation? *Environmental Policy and Governance*, *23*(4), 209–220. doi: 10.1002/eet.1614

Boughzala, I., & de Vreede, G.-J. (2015). Evaluating Team Collaboration Quality: The Development and Field Application of a Collaboration Maturity Model. *Journal of Management Information Systems*, *32*(3), 129–157. doi: 10.1080/07421222.2015.1095042

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Brundtland, G. H., Khalid, M., Agnelli, S., Al-Athel, S., Chidzero, B., Fadika, L., … Others, A. (1987). *Our Common Future: Report of the World Commission on Environment and Development* (Vol. 4). Oslo. Retrieved from http://www.un-documents.net/our-common-future.pdf

Carrillo-Hermosilla, J., del Río, P., & Könnölä, T. (2010). Diversity of eco-innovations: Reflections from selected case studies. *Journal of Cleaner Production*, *18*, 1073–1083. doi: 10.1016/j.jclepro.2010.02.014

Clift, R., & Druckman, A. (2015). *Taking Stock of Industrial Ecology*. doi: 10.1007/978-3-319-20571-7

Cole, R. J. (2012). Transitioning from green to regenerative design. *Building Research & Information*, *40*(1), 39–53.

Competition Commission Enquiry Panel. (2008). *Banking Enquiry: Report to the Competition Commissioner*.

Corder, G., Golev, A., Fyfe, J., & King, S. (2014). The Status of Industrial Ecology in Australia: Barriers and Enablers. *Resources*, *3*(2), 340–361. doi: 10.3390/resources3020340

Crainer, S. (2013). Squaring the circle. *Business Strategy Review*, *24*(4), 13–19. doi: 10.1111/j.1467-8616.2013.00988.x

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd Edition). Sage Publications.

Creswell, J. W. (2013). *Research design* (4th Edition). Sage Publications.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, *39*(3).

Culiberg, B. (2014). Towards an understanding of consumer recycling from an ethical perspective. *International Journal of Consumer Studies*, *38*, 90–97. doi: 10.1111/ijcs.12068

Davidow, W. H., & Malone, M. S. (2014). What Happens to Society When Robots Replace Workers ? *Harvard Business Review*, *December*.

Dawson, A. J. (2006). A messy business: qualitative research and ethical review. *Clinical Ethics*, *1*(2), 114–116. doi: 10.1258/147775006777254551

Dietz, M., Khanna, S., Olanrewaju, T., & Rajgopal, K. (2016). Cutting through the noise around financial technology. Retrieved April 23, 2016, from http://www.mckinsey.com/industries/financial-services/our-insights/cutting-through-the-noise-around-financial-technology

Drabe, V., & Herstatt, C. (2016). Why and how companies implement Circular Economy concepts – the case of Cradle to Cradle innovations. In *R&D Management Conference 2016: From Science to Society: Innovation and Value Creation*.

Dworkin, S. L. (2012). Sample size policy for qualitative studies using in-depth interviews. *Archives of Sexual Behavior*, *41*(6), 1319–1320. doi: 10.1007/s10508-012-0016-6

Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2015). Chapter 4 Designing management and business research. In *Management and Business Research (*5th Edition, pp. 66–106). Sage Publications.

Eaton, D. (2013). Technology and Innovation for a Green Economy. *Review of European, Comparative & International Environmental Law*, *22*(1), 62–67. doi: 10.1111/reel.12020

Economy, S. A., Rate, I., Forecasts, E., Economists, L., Africa, S., Congress, A. N., … Alliance, D. (2016). South Africa Economic Outlook. Retrieved September 1, 2016, from http://www.focus-economics.com/countries/south-africa

European Academies Science Advisory Council. (2015). Circular economy: a commentary from the perspectives of the natural and social sciences, (April), 1–18.

European Commission. (2011). *Communication from the Commission to the European Parliament, the Council, the European economic and social committee and the Committee of the regions on "Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP)." Policy*. Brussels. Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0899&from=EN

European Commission. (2014). *Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains*. *Report*. Retrieved from http://bookshop.europa.eu/en/scoping-study-to-identify-potential-circular-economy-actions-priority-sectors-material-flows-and-value-chains-pbKH0114775/

Finegold, M. A., Holland, B. M., & Lingham, T. (2002). Appreciative inquiry and public dialogue: An approach to community change. *Public Organization Review*, *252*, 235–252. doi: 10.1023/A:1020292413486

Fisher, P. (2016). It's time for financial institutions to get serious on climate risk. Retrieved September 15, 2016, from http://www.eco-business.com/opinion/its-time-for-financial-institutions-to-get-serious-on-climate-risk/?utm_medium=email&utm_campaign=Sep 14 newsletter&utm_content=Sep 14 newsletter+Version+A+CID_5ed55a4a1ac82c57f7c3027ffd2f18b1&utm_source=Campaign Monito

Frosch, R. a., & Gallopoulos, N. E. (1989). Strategies for Manufacturing. *Scientific American*, *261*(3), 144–152. doi: 10.1038/scientificamerican0989-144

Galbreath, J., Charles, D., & Klass, D. (2014). Knowledge and the Climate Change Issue: An Exploratory Study of Cluster and Extra-Cluster Effects. *Journal of Business Ethics*, *125*(1), 11–25. doi: 10.1007/s10551-013-1901-1

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, *114*, 11–32. doi: 10.1016/j.jclepro.2015.09.007

Godfrey, L. (2014). Greening waste management. In *The sustainable infrastructure handbook*.

Golafshani, N. (2003). Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report*, *8*(4), 597–606.

Gunderson, R. (2014). Social barriers to biophilia : Merging structural and ideational explanations for environmental degradation. *The Social Science Journal*, *51*(4), 681–685. doi: 10.1016/j.soscij.2014.06.002

Halme, M., Lindeman, S., & Linna, P. (2012). Innovation for Inclusive Business: Intrapreneurial Bricolage in Multinational Corporations. *Journal of Management Studies*, *49*(4), 743–784. doi: 10.1111/j.1467-6486.2012.01045.x

Hamel, G. (2009). Moon Shots for Management. *Harvard Business Review*, (February).

Han, L., Li, B., Song, T., & Tong, L. (2006). Circular-economy models of animal husbandry industry in jilin province. *Chinese Geographical Science*, *16*(2), 148–153.

Hanson-rasmussen, N., Lauver, K., & Lester, S. (2014). Business Student Perceptions of Environmental Sustainability : Examining the Job Search Implications. *Journal of Managerial Issues*, *XXVI*(2), 174–193.

Hawken, P., Lovins, A., & Lovins, H. (1999a). Chapter 01: The Next Industrial Revolution. In *Natural Capitalism* (pp. 1–21). Little, Brown and company.

Hawken, P., Lovins, A., & Lovins, H. (1999b). Chapter 05: Building Blocks. In *Natural Capitalism* (pp. 82–110). Little, Brown and company.

Hawken, P., Lovins, A., & Lovins, H. (1999c). Chapter 07: Muda , Service , and Flow. In *Natural Capitalism* (pp. 125–143). Little, Brown and company.

Hawken, P., Lovins, A., & Lovins, H. (1999d). Chapter 08: Capital Gains. In *Natural Capitalism* (pp. 144–169). Little, Brown and company.

Hawken, P., Lovins, A., & Lovins, H. (1999e). Chapter 13: Making Markets Work. In *Natural Capitalism* (pp. 260–284). Little, Brown and company.

Hobson, K. (2015). Closing the loop or squaring the circle? Locating generative spaces for the circular economy. *Progress in Human Geography*, *40*(1). doi: 10.1177/0309132514566342

Hofstee, E. (2011). Constructing a good dissertation. EPE.

Hoornweg, D., & Bhada-tata, P. (2012). *What a waste: A global review of solid waste management. The World Bank, Urban Development Series Knowledge Papers*. Retrieved from http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1334852610766/What_a_Waste2012_Final.pdf

Kemp, R. (2011). Ten themes for eco-innovation policies in Europe. *Surveys and Perspectives Integrating Environment and Society*, (4.2), 1–19. Retrieved September 1, 2016, from http://sapiens.revues.org/1169

Koonce, B. L. (2016). The Wild , Distributed World : Get Ready for Radical Infrastructure Changes , from Blockchains to the Interplanetary File System. *Intellectual Property & Technology Law Journal*, *28*(10), 3–5.

Kopnina, H. (2014). Consumption, waste and (un)sustainable development: reflections on the Dutch holiday of Queen's day. *Environment Systems & Decisions*, *34*(2), 312–322. doi: 10.1007/s10669-013-9467-0

KPMG. (2016). *Meet EVA*. Retrieved October 26, 2016, from https://www.finextra.com/finextra-downloads/newsdocs/meet-eva-1.pdf

Kuah, A. T. H. (2002). Cluster Theory and Practice: Advantages for the Small Business Locating in a Vibrant Cluster. *Journal of Research in Marketing and Entrepreneurship*, *4*(3), 206–228. doi: 10.1108/14715200280001472

Lamb, M., & Sutherland, M. (2010). The components of career capital for knowledge workers in the global economy. *The International Journal of Human Resource Management*, *21*(3), 295–312. doi: 10.1080/09585190903546839

Li, J., & Yu, K. (2011). A study on legislative and policy tools for promoting the circular economic model for waste management in China, 103–112. doi: 10.1007/s10163-011-0010-4

Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: a comprehensive review in context of manufacturing industry. *Journal of Cleaner Production*, *115*, 36–51. doi: 10.1016/j.jclepro.2015.12.042

Lovins, A. B., Lovins, L. H., & Hawken, P. (1999). A Road Map for Natural Capitalism. *Harvard Business Review*, *May-June*.

Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS Quarterly*, *39*(1), 155–175.

Marshall, B., Cardon, P., Poddar, A., & Fontenot, R. (2013). Does Sample Size Matter in Qualitative Research ?: a Review of Qualitative Interviews in Is Research. *Journal of Computer Information Systems*, *54*(1), 11–22.

Martin, C. J. (2016). The sharing economy: A pathway to sustainability or a nightmarish form of neoliberal capitalism? *Ecological Economics*, *121*, 149–159. doi: 10.1016/j.ecolecon.2015.11.027

Mason, M. (2010). Sample Size and Saturation in PhD Studies Using Qualitative Interviews. *Forum: Qualitative Social Reseach (Sozialforschung)*, *11*(3), 1–13. Retrieved August 5, 2016, from http://www.qualitative-research.net/index.php/fqs/article/view/1428

Matan, A., & Newman, P. (2015). Green urbanism in the Indian Ocean region. *Journal of the Indian Ocean Region*, *11*(1), 60–73. doi: 10.1080/19480881.2015.1017228

Mathews, J. A., & Tan, H. (2011). Progress toward a circular economy in China: The drivers (and inhibitors) of eco-industrial initiative. *Journal of Industrial Ecology*, *15*(3), 435–457. doi: 10.1111/j.1530-9290.2011.00332.x

Matus, K. J. M., Xiao, X., & Zimmerman, J. B. (2012). Green chemistry and green engineering in China: drivers , policies and barriers to innovation. *Journal of Cleaner Production*, *32*, 193–203. doi: 10.1016/j.jclepro.2012.03.033

Maynard, J. (2016). Numbers don't lie – SA moving backwards under Zuma's leadership. Retrieved September 3, 2016, from http://www.fin24.com/BizNews/numbers-dont-lie-sa-moving-backwards-under-zumas-leadership-20160902-3

McDonough, W., & Braungart, M. (2002). *Cradle to cradle: remaking the way we make things*. New York: North Point Press.

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens III, W. W. (1972). *The limits to growth*. Universe Books.

Myers, M. D. (2013). *Qualitative Research in Business and Management (2nd Edition)*. Sage Publications.

National Planning Commission. (2011). *National Development Plan*.

Nieswiadomy, R. (2011). Qualitative Research Designs. *Foundations of Nursing Research*, 171–184. doi: 10.4135/9781483329659.n5

O'Reilly III, C. A., & Tushman, M. L. (2011). Organizational Ambidexterity in Action: How managers explore and exploit. *California Management Review*, *53*(4).

Pawlyn, M. (2013). Push the limits of 3D Printing. *Nature*, *494*(February), 172–175.

Persson, O. (2015). *What Is Circular Economy ? − The Discourse of Circular Economy in the Swedish Public Sector*. Uppsala Universitet.

Pollard, S., Charnley, F., & Webster, K. (2016). The circular economy – a reappraisal of the " stuff " we love. *Geography*, *101*(Spring), 17–28.

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review*, (February), 63–77.

Preston, F. (2012). A Global Redesign? Shaping the Circular Economy. *Energy, Environment and Resource Governance*, (March), 1–20.

Ramzy, N. S. (2015). Sustainable spaces with psychological connotation: Historical architecture as reference book for biomimetic models with biophilic qualities. *International Journal of Architectural Research*, *9*(2), 248–267.

Rogers, K., & Hudson, B. (2011). The Triple Bottom Line: The Synergies of Transformative Perceptions and Practices for Sustainability. *OD Practitioner*, *43*(4), 3–9.

Roos, G. (2014). Business Model Innovation to Create and Capture Resource Value in Future Circular Material Chains. *Resources*, *3*(1), 248–274. doi: 10.3390/resources3010248

Rosenau-Tornow, D., Buchholz, P., Riemann, A., & Wagner, M. (2009). Assessing the long-term supply risks for mineral raw materials — a combined evaluation of past and future trends. *Resources Policy*, *34*(4), 161–175. doi: 10.1016/j.resourpol.2009.07.001

Rus, H. A. (2012). Environmental depletion , governance , and conflict. *Southern Economic Journal*, *78*(April 2010), 1305–1332.

Saunders, M., & Lewis, P. (2012). *Doing Research in Business and Management*. England: Pearson.

Schiederig, T., Tietze, F., & Herstatt, C. (2012). Green Innovation in Technology and Innovation Management – an Exploratory literature Review. *R&D Management*, *42*(2), 180–192. doi: 10.1111/j.1467-9310.2011.00672.x

Schneider, L. A., Shaul, M., & Lascelles, C. K. (2016). Regulatory Priorities for FinTech Firms--and Investors--in the Coming Year. *Journal Of Taxation & Regulation Of Financial Institutions*, *29*(4), 5–15.

Seebode, D., Jeanrenaud, S., & Bessant, J. (2012). Managing innovation for sustainability. *R and D Management*, *42*(3), 195–206. doi: 10.1111/j.1467-9310.2012.00678.x

Sehlabi, R., & McKay, T. M. (2016). Municipalities, commercial composting and sustainable development, the case of Johannesburg, South Africa. *Environmental Economics*, *7*(1).

Shadymanova, J., Wahlen, S., & Horst, H. Van Der. (2014). “Nobody cares about the environment”: Kyrgyz’ perspectives on enhancing environmental sustainable consumption practices when facing limited sustainability awareness. *International Journal of Consumer Studies*, *38*, 678–683. doi: 10.1111/ijcs.12140

Shafiq, A., Klassen, R. D., & Johnson, P. F. (2014). Socially Responsible Practices: An Exploratory Study on Scale Development using Stakeholder Theory. *Decision Sciences*, *45*(4), 683–716.

Sigler, J. (1999). Systems Thinking : Organizational and Social Systems. *Futurics*, *23*(1&2), 39–66.

Sikdar, S. K. (2014). An E-Conversation with Prof . Roland Clift. *Clean Techn Environ Policy*, *16*(3), 3–6. doi: 10.1007/s10098-013-0702-7

Silverman, S., & Solmon, M. (1998). The Unit of Analysis in Field Research : Issues and Approaches to Design and Data Analysis. *Journal of Teaching in Physical Education*, *17*, 270–284.

Simatele, M. (2015). Market Structure and competition in the South African banking sector. *Procedia Economics and Finance*, *30*(15), 825–835. doi: 10.1016/S2212-5671(15)01332-5

Simbanegavi, W., Greenberg, J., & Gwatidzo, T. (2012). Testing for competition in the South African banking sector. *Munich Personal RePEc Archive*. Retrieved from https://mpra.ub.uni-muenchen.de/43627/

Staff Writer. (2016). IMF cuts SA's economic growth outlook to lowest on record. Retrieved August 16, 2016, from http://www.bdlive.co.za/economy/2016/01/19/imf-cuts-sas-economic-growth-outlook-to-lowest-on-record

Stahel, W. R. (1984). The Product-Life Factor. In *An Inquiry Into the Nature of Sustainable Societies: The Role of the Private Sector* (pp. 72–96).

Stahel, W. R. (2010). The Performance Economy. In *The Performance Economy* (pp. 1–12).

Stahel, W. R., & Clift, R. (2016). Chapter 7: Stocks and Flows in the Performance Economy. *Taking Stock of Industrial Ecology* (1st Edition, pp. 137–158). Springer International Publishing. doi: 10.1007/978-3-319-20571-7

Standard Bank. (2016). *Standard Bank Group Annual integrated report 2015*. *Standard Bank*. Retrieved from http://annualreport2015.standardbank.com/pdf/Standard-Bank-Group-Annual-Integrated-Full-Report-2015.pdf

StatsSA. (2015). *Statistical Release - National & Provincial Labour Market: Youth*. Retrieved from http://beta2.statssa.gov.za/publications/P02114.2/P02114.22014.pdf

StatsSA. (2016). *Statistical release Quarterly Labour Force Survey*. *Quarterly Labour Force Survey* (Vol. PO211). Retrieved from http://www.statssa.gov.za/publications/P0211/P02114thQuarter2015.pdf

Stermer, I. (2016). *SA banks Great costs*. Renaissance Capital.

Talyan, V., Dahiya, R. P., & Sreekrishnan, T. R. (2008). State of municipal solid waste management in Delhi, the capital of India. *Waste Management*, *28*(7), 1276–1287. doi: 10.1016/j.wasman.2007.05.017

The Product-Life Institute. (n.d.). Cradle to Cradle. Retrieved April 4, 2016, from http://www.product-life.org/en/cradle-to-cradle

Trading Economics. (2016). South Africa GDP Annual Growth Rate. Retrieved November 4, 2016, from http://www.tradingeconomics.com/south-africa/gdp-growth-annual

Trică, C. L., & Papuc, M. (2013). Green economic growth premise for sustainable development. *Theoretical and Applied Economics*, *XX*(1), 131–140.

Troiano, M. (2014). *Multichannel banking and overcapacity: cost saving opportunity or competitive threat? Scope Ratings*.

Turner, G. M. (2008). A comparison of The Limits to Growth with 30 years of reality. *Global Environmental Change*, *18*(3), 397–411. doi: 10.1016/j.gloenvcha.2008.05.001

United Nations. (2014). *World Urbanization Prospects The 2014 Revision*. New York. Retrieved from http://www.compassion.com/multimedia/world-urbanization-prospects.pdf

University of California TV. (2009). *Cradle to Cradle Design — Creating an Environmentally and Economically Intelligent Future*. Retrieved from http://www.uctv.tv/shows/Cradle-to-Cradle-Design-Creating-an-Environmentally-and-Economically- Intelligent-Future-16539

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences*, *15*(3), 398–405. doi: 10.1111/nhs.12048

Veleva, V., Todorova, S., Lowitt, P., Angus, N., & Neely, D. (2015). Understanding and addressing business needs and sustainability challenges : lessons from Devens eco-industrial park. *Journal of Cleaner Production*, *87*, 375–384. doi: 10.1016/j.jclepro.2014.09.014

Visser, W. (2013). To survive in a volatile world businesses must build in resilience. *The Guardian*, pp. 1–2.

Visser, W. (2015). Sustainable fronteers. Greenleaf Publishing.

Viviers, S., Mitchell, S., & Smit, E. (2015). ESG reporting in SA: where are the gaps? Retrieved August 23, 2016, from http://www.fin24.com/Opinion/ESG-reporting-in-SA-where-are-the-gaps-20150731

Volstad, N. L., & Boks, C. (2012). On the use of Biomimicry as a Useful Tool for the Industrial Designer. *Sustainable Development*, *20*(3), 189–199. doi: 10.1002/sd.1535

Weidinger, C., Fischler, F., & Schmidpeter, R. (2014). *Sustainable Entrepreneurship: Business Success Through Sustainability*. (S. O. Schmidpeter & R. Idowu, Eds.)*Springer*. Springer. doi: 10.1007/978-3-642-38753-1

Wolfson, A., Tavor, D., & Mark, S. (2014). CleanServs: clean services for a more sustainable world. *Sustainability Accounting, Management and Policy Journal*, *5*(4), 405–424. article. doi: 10.1108/SAMPJ-01-2014-0007

Yijun, J., & Ying, H. (2011). Applying Circular Economy Theory in Environmental Impact Assessment. *Energy Procedia*, *11*, 4013–4018.

Yin, R. K. (2009). *Case Study Research: Design and Methods*. (4th Edition). Sage Publications. doi: 10.1097/FCH.0b013e31822dda9e

Yong, R. (2007). The circular economy in China. *Journal of Material Cycles and Waste Management*, *9*(1), 121–129. doi: 10.1007/s10163-007-0183-z

Yu, C., Jong, M. De, & Dijkema, G. P. J. (2014). Process analysis of eco-industrial park development the case of Tianjin china. *Journal of Cleaner Production*, *64*, 464–477. doi: 10.1016/j.jclepro.2013.09.002

Yuan, Z., Bi, J., & Moriguichi, Y. (2006). The Circular Economy: A New Development Strategy in China. *Journal of Industrial Ecology*, *10*(1–2), 4–8. doi: 10.1162/108819806775545321

Zhang, W., Goodale, E., & Chen, J. (2014). How contact with nature affects children's biophilia, biophobia and conservation attitude in China. *Biological Conservation*, *177*, 109–116. doi: 10.1016/j.biocon.2014.06.011

Zhijun, F., & Nailing, Y. (2007). Putting a circular economy into practice in China. *Sustainability Science*, 95–101. doi: 10.1007/s11625-006-0018-1

Zhou, H. (2006). Circular economy in China and recommendations. *Ecological Economy*, *2*(2), 102–114.

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2010). *Business Research Methods* (8th Edition).

9. APPENDICES

9.1. Appendix A – Proposed timeline

Section of research project or time-consuming activity	Target completion date
Bentley International Summer Programme	1 July – 1 August 2016
Ethical Clearance submission	19 September 2016
Interviews completed	7 October 2016
Coding of interview notes done	9 October 2016
Discussion of draft results	11 October 2016
Introduction and conclusion	13 October 2016
First draft of research report	23 October 2016
Abstract draft	27 October 2016
Final draft of research report	30 October 2016
Printing and binding of research report	4 November 2016
Final submission of research report	7 November 2016

9.2. Appendix B - List of interviewees

No.	High-level grouping	Position	Place of employment
1	Content expert	Principal scientist	Council for Scientific and Industrial Research (CSIR)
2	Content expert	Business Development Manager	Green building council of South Africa
3	Content expert	Sustainability expert	Environmental empowerment at the Department of Agriculture
4	Content expert	Sustainable Building Consultant	Solid Green
5	Business practitioner	Client experience manager	FirstRand Bank with insights into Nedbank
6	Business practitioner	Programme Director for Retail Real Estate Infrastructure	ABSA
7	Business practitioner	Senior Manager, Architecture, Regulation and Cost	Standard Bank
8	Business practitioner	Senior Manager, Sustainability	Standard Bank
9	Business practitioner	Manager, MIS, Asset and Liability Management	Standard Bank
10	Supplier	Sales Director	Supplier
11	Supplier	Product Manager	Supplier
12	Supplier	Sales Director, Bank Security and Cash Handling	Supplier
13	Supplier	Sales agent for the entire commercial sector which includes financial services	Supplier

9.3. Appendix C - Consent form for interviews

Gordon Institute of Business Science
University of Pretoria

Informed consent letter

The potential advantages of implementing circular economic principles in financial services organisations in South Africa

I am an MBA student at the Gordon Institute of Business Science (GIBS) and am conducting research on the circular economy. This research aims to understand the potential advantages as well as the barriers and enablers of implementing circular economic principles in the financial services industry. You are kindly requested to participate in an interview to assist with this research.

This interview is expected to last approximately an hour and will be recorded for later verification of interview notes, should you consent to this. The interview will help with the understanding of potential advantages of implementing circular economy principles in South African financial institutions as well as the current and future barriers and enablers.

- ☐ You may record this interview while taking notes
- ☐ You may only take notes during the interview

Your participation is voluntary and you can withdraw at any time without penalty. Please be assured that your personal data will be kept confidential. The contents of the interview will be presented in the aggregate and may be made publicly available, in the form of an MBA thesis, without your name or any other personal details reflected.

If you have any concerns, please contact me or my supervisor. Our details are provided below.

Researcher: Hayley Dill Telephone: 072 611 0354 Email: Hayley.dill7@gmail.com	Research Supervisor: Prof. Johan L Olivier Email: fisheagle@imaginet.co.za

Signature of participant: _____ Date: _____

Signature of researcher: _____ Date: _____

9.4. Appendix D - Interview guide with questions and prompts for semi-structured interviews

The list of questions had been adapted from questionnaires by Persson (2015) and Bechtel et.al (2013) for the South African context as well as the required focus on the financial services industry which is a different perspective and context as to their respective studies (Bechtel et al., 2013; Persson, 2015). Not all the questions were relevant to all the interviewees and this list of questions was substantially reduced and adjusted after the mock interview discussion and some of the first interviews.

The researcher started the interview by providing the interviewee with a very brief overview of the specific aim of this research project to provide them with the relevant context but an attempt was made not to be leading during this overview process. Each interviewee was asked to sign the above, informed consent letter prior to the start of the interview and a request was also made to record the interview to assist with data analysis later in the research process. None of the interviewees objected to the recordings for which the researcher was very grateful as these recordings were very helpful during the data analysis phase of this research.

9.4.1. List of potential interview questions

1. What is your role within the organisation? (Focus on responsibilities, level in the hierarchy)
2. What is your background? (If deemed relevant)
3. How are you involved in the topic of Circular Economy, sustainability, the procurement or supply of equipment to the financial services industry or the building of branches/ ATMs? (If not covered in question 1 & 2)
4. What is your understanding of the Circular Economy or sustainability and its principles?
5. What are circular economic or sustainability principles you aware of that are currently employed in the financial services industry? Which of these also employed in South Africa/ the organisation that you represent? Which of these are specifically used in the branch and ATM networks?
6. Tell me more about these projects (aim, motivation, why, what, what for, whom). What were/ are the desired outcomes for the project? (If there are any)
7. Do you cooperate with specific departments/ suppliers regarding the implementation process of these projects?

8. Did you use any specific tools to implement the approach? If yes, which ones did you use (e.g. cradle-to- cradle, eco-efficiency, product-service systems)?
9. Why did you decide to use the above mentioned circular economy principles?
10. What are the final goal (vision)/ advantages for implementing Circular Economy? How will you know once you have achieved this goal?
11. Why do you think companies decide to use the concept of Circular Economy? What are the main drivers?
12. In your opinion, what are the barriers to implementing the Circular Economy, specifically in financial services organisations?
13. What were the internal barriers you faced when implementing circular economic principles?
14. What were the external barriers you faced when implementing circular economic principles?
15. In your opinion, what are the enablers of implementing the Circular Economy?
16. What were the internal enablers you encountered when implementing circular economic principles?
17. What were the external enablers you encountered when implementing circular economic principles?
18. Do you expect to experience any further barriers/enablers in the future?
19. Among those barriers and enablers that you described, which ones were the most significant barriers/enablers you faced?
20. To what extent can you influence those barriers/ enablers?
21. Can you identify any interrelations between those barriers and enablers? Do they influence each other?
22. Regarding those barriers and enablers, how do you think the Circular Economy approach will develop in the future?
23. Would you say that Circular Economy is an approach that provides organisations with sufficient flexibility for future actions?
24. Did the implementation of the concept provide you with sufficient return on investment (revenue, cost reduction, employee motivation, etc.) or do you expect it in the future?
25. What are the future possibilities/potentials of implementing circular economy in your organisation?
26. Did you increase or decrease jobs when implementing the Circular Economy?
27. What funding models can potentially assist companies to implement the Circular Economy?
28. Would a circular economy create a more sustainable society? Why/ why not?

29. What role do you see public sector having in going towards a more circular society?
30. What government policies can potentially assist companies to implement the Circular Economy?
31. Which actors do you think are needed to implement a circular economy?
32. Does the circular economy require a shift from short term to long term perspective? If so do we need to change the current way the political system works (i.e. election every 4 years)?
33. Do you see companies being the main drivers in a shift to a circular economy or is the public sector equally important in such a process? Why/ why not?
34. Do you think in a circular economy that economic growth is possible?
35. Is there anything else you would like to add or that you think would be important for me to know?
36. Can you name any key references or case studies that have been insightful for you?
37. Can you provide me with any other contacts that I can conduct interviews with regarding this topic?

9.4.2. Interview questions

These were the final questions asked per strata during the interviews after the above list was adjusted based on the mock interview discussion as well as some of the initial interviews:

9.4.2.1 Questions to people working in financial service organisations in the relevant areas of the business:

1. What is your role within the organisation? (Prompts: Likes, dislikes, frustrations) *Intro*
2. Please tell me a little about your academic and work background? *Intro and to get an understanding of the personality and skillset of the interviewee*
3. To your knowledge, what initiatives, projects or regulations does your organisation have with regard to environmental sustainability or green issues? (Prompts: Tell me more, please expand, anything relating to reducing or re-using or recycling?) *Understanding the landscape can prompt for branches and ATMs*
4. In your opinion, that is currently helping to get these initiatives, projects or

regulations implemented? *Enablers*

5. What would you say are hampering the implementation of these initiatives, projects or regulations? *Barriers*
6. If these and other initiatives, projects or regulations can get implemented, what would you say will be the benefits to the organisation, the suppliers, society and the environment? *Potential Advantages*

9.4.2.2 Questions to people working for suppliers that supply products or services to financial service organisations in South Africa:

1. Please tell me about the organisation you work for and your role within the organisation? (Prompts: Likes, dislikes, frustrations) *Intro*
2. Please tell me a little about your academic and work background? (Prompt: how did you get involved with …) *Intro and to get an understanding of the personality and skillset of the interviewee*
3. To your knowledge, what initiatives, projects or regulations does your organisation have with regard to environmental sustainability or green issues? (Prompts: Tell me more, please expand, anything relating to reducing or re-using or recycling?) *Understanding the landscape*
4. Do you have any projects or initiatives that focus on the consumers e.g. financial services organisations, of your products/ equipment? *Understanding the landscape can prompt for branches and ATMs*
5. In your opinion, that is currently helping to get these initiatives, projects or regulations implemented? *Enablers*
6. What would you say are hampering the implementation of these initiatives, projects or regulations? *Barriers*
7. If these and other initiatives, projects or regulations can get implemented, what would you say will be the benefits to your organisation, the consumers of your products, society and the environment? *Potential Advantages*

9.4.2.3 Questions to people deemed experts in the field of sustainability, circular economy, green build or the regulatory environment:

1. Please tell me about the organisation you work for and your role within the organisation? (Prompts: Likes, dislikes, frustrations) *Intro*
2. Please tell me a little about your academic and work background? (Prompt: how did you get involved with …) *Intro and to get an understanding of the personality and skillset of the interviewee*
3. To your knowledge, what initiatives, projects or regulations with regard to environmental sustainability or green issues are currently being addressed in South Africa? (Prompts: Tell me more, please expand, anything relating to reducing or re-using or recycling?) *Understanding the landscape can prompt for financial services*
4. In your opinion, that is currently helping to get these initiatives, projects or regulations implemented? *Enablers*
5. What would you say are hampering the implementation of these initiatives, projects or regulations? *Barriers*
6. If these and other initiatives, projects or regulations can get implemented, what would you say will be the benefits to organisations, suppliers, society and the environment? *Potential Advantages*

9.5. Appendix E – A systems view of the world illustrated through this story. Source: (Sigler, 1999)

"Seconds after leaving a bright yellow wildflower, a butterfly dives into the thick grasses of a colourful mountain meadow in the United States to escape the beak of a swooping swallow. The commotion kicks up grass seeds that stick to the pollen on the butterfly's body. Sensing it is now safe, the butterfly rides a strong breeze as the pollen-soaked grass seeds float off into the open spaces above. Thousands of miles away a bright Sun soaks up the surface water from a quiet ocean into the heavens above. Half the world away, a young zebra defecates on the barren plains of the open Serengeti.

The wind that caught the pollen-soaked grass seeds has carried them into the jet stream along a journey around the world. Falling in and out of different wind currents, the seeds finally land on the Serengeti plain just a few miles from the dung pile left from the zebra a couple of days earlier. At that second, the first raindrop in months hits the plane. Dark clouds have been forming for days over the ocean and moving slowly inland to start the torrential rains for the long monsoon season. The seeds get swept away in the ensuing floods and carried to the banks of the nearby rushing River. Only a large rock laid in its resting place millions of years ago creates a fork in the floodwaters, thus keeping the seeds from getting caught up in the flow of the river. A herd of wildebeest crossing the river from the other side pick up the seeds in their muddy hooves. When the weary wildebeest are finally able to rest from their predators, the mud slowly dries and falls off, only to once again be washed away by a trickling path of water. The seeds end up next to the zebra dung, which has also been washed away miles from where it started, creating a natural fertilizer. The seeds begin to grow, starting a new highly adaptable plant in a land that needs it ever so badly. In just a couple of years, the few seeds have created a new grassy feeding ground for a small herd of rhinos on the verge of extinction. Now the can stay in this land and multiply, (fairly) safe from the poachers and predators who will not discover the secluded area for years to come."

9.7. Appendix F – Draft ethical clearance form

MBA RESEARCH PROJECT INFORMATION	
NAME	HAYLEY DILL
STUDENT NUMBER	22026704
TELEPHONE / CELL PHONE	072 611 0354
E-MAIL OF RESEARCHER	Hayley.dill7@gmail.com
PROPOSED TITLE OF STUDY	The potential advantages of implementing circular economic principles in financial services organisations in South Africa
RESEARCH SUPERVISOR	Prof Johan L Olivier
E-MAIL OF SUPERVISOR	fisheagle@imaginet.co.za
SIGNATURE OF SUPERVISOR	

GIBS distinguishes between FOUR types of data. Please complete the table for ALL the data types that you plan to use.

Type of data	Relevant section of form	Attachments (please mark that they are included)	Initial all those sections that apply to your research
HUMAN: **A.** Pre-existing personal records, e.g. performance reviews	**A**	☐ Methodology section of proposal ☐ Permission letter from organisation to use the data	
B. New data solicited, e.g. interviews or surveys	**B**	✓ Methodology section of proposal ✓ Separate informed consent statement (unless included in the document marked below) ✓ Interview schedule / questionnaire / proprietary test instrument / description of intervention ☐ IF proprietary test instrument, letter of permission (e.g. the MBTI)	**HD**
NON-HUMAN: **C.** Public data, e.g. World Bank or other	**C**	☐ Methodology section of proposal	

databases (no letter needed)			
D. Private/ Organisation-specific non-human data, e.g. financial statements of private companies (letter needed)	**D**	☐ Methodology section of proposal ☐ Permission letter from organisation to use the data	

Complete all sections relevant to your research.
ALL researchers must complete Sections E and F.

A. PRE-EXISTING RECORDS OF HUMAN SUBJECTS

1. Specify the nature of records and how they will be used.

2. Confirm that permission has been obtained to study and report on these records.

☐ I confirm. Remember to attach permission letter(s).

3. Provide the name and job title of the person in the organisation who has authorised the use of the records.

4. How will confidentiality and/or anonymity be assured? (Mark all that apply).

☐ No names will be recorded
☐ No names will be requested
☐ Data will be stored without identifiers
☐ Only aggregated information will be provided
☐ Other. Please specify

B. NEW DATA OBTAINED FROM HUMAN SUBJECTS

5. Please confirm that no inducement is to be offered.

✓ ☐ **I confirm**

6. Mark the applicable box(es) to identify the proposed procedure(s) to be carried out to obtain data.

✓ ☐ **Interview schedule (Attach if applicable)**
☐ Questionnaire (Attach if applicable)
☐ Pre-existing proprietary test instrument, e.g. MBTI (Attach)
IF a pre-existing proprietary test instrument is used, confirm that permission has been obtained to use it.
☐ I confirm
Remember to attach permission letter(s).
☐ Intervention, e.g. training (Describe)

7. Confirm that the data gathering is accompanied by a consent statement.

✓ ☐ **I confirm**

8. Where is the consent statement found?

✓ ☐ **As part of the data gathering document, e.g. in the introduction of the questionnaire.**
✓ ☐ **As a separate document. Remember to attach.**

9. Is there is risk that the researcher is not competent in (one of) the language(s) subjects use to communicate?

☐ Yes, there is a risk
✓ ☐ **No, there is not a risk**

IF yes, how will the subjects' full comprehension of the content of the research, including giving consent, be ensured? Please specify.

10. Do subjects risk possible harm or disadvantage (e.g. financial, legal, social) by participating in the research?

✓ ☐ **No**
☐ Yes.

IF yes, explain what types of risk and what is done to minimise and mitigate those risks.

11. Are there any aspects of the research about which subjects are not to be informed?

✓ ☐ **No**
☐ Yes.

IF yes, explain why, and how subjects will be debriefed.

12. How will confidentiality and/or anonymity be assured?

✓ ☐ **No names will be recorded**
✓ ☐ **No names will be requested**
✓ ☐ **Data will be stored without identifiers**
✓ ☐ **Only aggregated information will be provided**
☐ Other. Please specify

C. PUBLIC NON-HUMAN DATA

13. Specify the nature of records to be used: How they will be selected, sourced and used.

D. PUBLIC DOMAIN / COMPANY-SPECIFIC NON-HUMAN DATA

14. Specify the nature of records (e.g. marketing reports or safety records) and how they will be used.

15. Confirm that permission has been obtained to study and report on these records.

☐ I confirm. Remember to attach permission letter(s).
16. Provide the name and job title of the person in the organisation who has authorised the use of the records.

17. Do companies risk possible harm or disadvantage (e.g. financial, legal, social) by participating in the research?

☐ No
☐ Yes. Explain what types of risk and what is done to minimise and mitigate those risks.

18. How will confidentiality and/or anonymity be assured?

☐ All company-specific details will be removed
☐ Data will be stored without identifiers
☐ Only aggregated information will be provided
☐ Other. Please specify

E. CONFIDENTIALITY

Please select the relevant option
✓ ☐ **Free access, i.e. report not embargoed**
☐ No access for a period of two years
Specify reasons for consideration
☐ No access under any circumstance for an undetermined period.

A letter of permission from the Vice- principal: Research and Postgraduate Studies is attached.

F. TO BE COMPLETED BY ALL RESEARCHERS

19. In what format will the data be stored? Mark all that apply.

✓ ☐ **Physically**
✓ ☐ **Electronically**
☐ Other. Please explain.

20. Confirm that the data will be stored for a minimum period of 10 years.

✓ ☐ **I confirm.**

21. It is a goal of GIBS to make research available as broadly as possible. Mark the boxes below for the medium/media in which you do **NOT** wish results to be made available.

Academic dissemination Popular dissemination

☐ Research report	☐ TV
☐ Scientific article	☐ Radio
☐ Conference paper	☐ Lay article
☐ Book	☐ Podcast
☐ Book	

22. Confirm that the consent obtained is aligned with the extent of dissemination. E.g. consent if you are planning to use the research to launch a consulting career will be more comprehensive than in the case of research that is intended only for a scientific audience.

✓ ☐ **I confirm**

23. IF you wish to describe any other information which may be of value to the committee in reviewing your application, please attach a separate sheet.

G. APPROVALS

The applicant must please ensure that the supervisor has signed the form before submission.

RESEARCHER/APPLICANT:

24. I affirm that all relevant information has been provided and that all statements made are correct.

Name in capital letters: HAYLEY DILL

Signature: _____

9.8. Appendix G – Ethics approval

From: **Ethics, Administrator** Received: **19-Sep-2016**

To: **Miss Dill, Hayley H** - *Gordon Institute of Business Science*

CC: **Olivier, Johan JL** - *Gordon Institute of Business Science*
Ms Theodoridis, Jennifer (Mathebula) - *Gordon Institute of Business Science*

Subject: **GIBS Ethics Notification**

Dear Hayley Dill,

Please see attached letter related to your Ethics Application.

Regards,
Jennifer Mathebula

Attachments:

GIBS - Approval Letter.pdf

Dear Miss Hayley Dill

Protocol Number: **Temp2016-02140**

Title: **The potential advantages of implementing circular economic principles in financial services organisations in South Africa**

Please be advised that your application for Ethical Clearance has been APPROVED.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards,

Adele Bekker

9.9. Appendix H – Consistency Matrix

Title: Advantages, enablers and barriers to the implementation of circular economic principles in South African financial services organisations

RESEARCH QUESTIONS	PROPOSITION	LITERATURE REVIEW	DATA COLLECTION TOOL	ANALYSIS
1. Are there any potential advantages that the implementation of circular economic principles can provide financial services organisations when they apply it to their businesses? **Sub-question:** What circular economic principles, if any, are currently employed in the financial services industry in South Africa?	It is expected that fully utilising CE principles should provide financial services with flexibility in functionality, reduction in large capital expenditure, co-creation of innovative solutions and reduced environmental impact.	Andersen (2007); Clift and Druckman (2015); Drabe and Herstatt (2016); Ghisellini et al. (2016); Mathews and Tan (2011); Roos (2014)	In-depth, semi-structured interviews with interview guide – question 3, 6 or 7 depending on the strata.	Content analysis through a theoretical thematic analysis method using both inductive and deductive methods to code interview notes, reduce and refine codes, then ran the analysis using Microsoft Excel software.
2. Which enablers are needed in order to implement the circular economic principles in financial services and are these enablers the same or different to the current known	It is expected that financial services organisations will require similar enablers with additional ones to manufacturing firms.	Andersen (2007); Bechtel et al. (2013); Clift and Druckman (2015); Cole (2012); Corder et al. (2014); Drabe and Herstatt (2016);	In-depth, semi-structured interviews with interview guide – question 4 or 5 depending on the strata.	Content analysis through a theoretical thematic analysis method using both inductive and deductive methods to code interview notes, reduce and refine codes, then ran the

enablers?		European Commission (2011); Galbreath et al. (2014); Ghisellini et al. (2016); Hanson-Rasmussen et al. (2014); Kuah (2002); Lieder and Rashid (2016); Matan and Newman (2015); Roos (2014); Seebode et al. (2012); Shafiq et al. (2014); Sigler (1999); Veleva et al. (2015); Weidinger et al. (2014);		analysis using Microsoft Excel software.
3. What barriers are currently preventing circular economic principles from being implemented in the financial services industry in South Africa, and are these the same as the current known barriers identified in the literature?	It is expected that financial services will experience the similar barriers to manufacturing firms with a few additional barriers.	Andersen (2007); Bechtel et al. (2013); Corder et al. (2014); European Commission (2011); Ghisellini et al. (2016); Hawken et al. (1999d); Lovins et al. (1999); Matus et al. (2012); Roos (2014);	In-depth, semi-structured interviews with interview guide – question 5 or 6 depending on the strata.	Content analysis through a theoretical thematic analysis method using both inductive and deductive methods to code interview notes, reduce and refine codes, then ran the analysis using Microsoft Excel software.