

**The development of sustainability debt capital markets in South Africa:
an analysis through Rogers's Diffusion of Innovation theory**

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Abstract

South Africa is a signatory to the global initiatives that are aimed at addressing climate change and has committed to transitioning the economy away from a dependence on fossil fuels. The United Nations sustainable development goals have inspired innovation in financial markets. The research was undertaken to understand the current state of financial innovation and the factors that catalyse its diffusion in the context of South African financial markets. The chosen research methodology was qualitative for a deductive analysis approach, and semi-structured interviews were conducted with a non-probability sample of relevant industry professionals. The results are representative of a cross-sectional time horizon. The debt and loan capital markets of South Africa have created two new financing mechanisms that are aimed at giving effect to the country's nationally determined contribution. The research reveals that the infrastructure to support the development and diffusion of sustainability debt capital market instruments is in the early stages of development and is driven at the governmental level in collaboration with industry stakeholders. Commercial banks dominate the nascent sustainability social system through significant resource advantages, access to data and information and distribution networks.

Keywords: innovation, diffusion, sustainable development goals, sustainability instruments, debt capital markets

Declaration

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

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Chapter 1: Introduction to the research problem

The research intends to answer business-related questions posed in light of the developing sustainability debt capital market in South Africa. The development of sustainability markets is influenced through the initiatives of the United Nations Sustainable Development Goals (SDGs), where economically active entities are encouraged to take necessary steps to reduce carbon emissions by 2030 (United Nations, 2015).

South Africa is a member state of the United Nations (UN) and is a signatory to the Paris Agreement on climate change. Countries that are signatories to the Agreement are obliged to take the necessary steps to combat global climate change (Dimitrov, 2016). This research is designed to supply some answers to the question 'Why is there a relatively low adoption and diffusion rate of sustainability debt capital market instruments amongst South African institutions and financial markets practitioners?'

South Africa is in a leadership position within and amongst the Southern African region countries (Amusan & Olutola, 2016). Further, Amusan and Olutola (2016) suggest that there is a need for regional cooperation that should result in a harmonised and bespoke policy development and implementation. To this end, the Johannesburg Stock Exchange (JSE) has established a dedicated segment for sustainability instruments, aimed at promoting Green Bond issuances in the country and subregion (Marbuah, 2020).

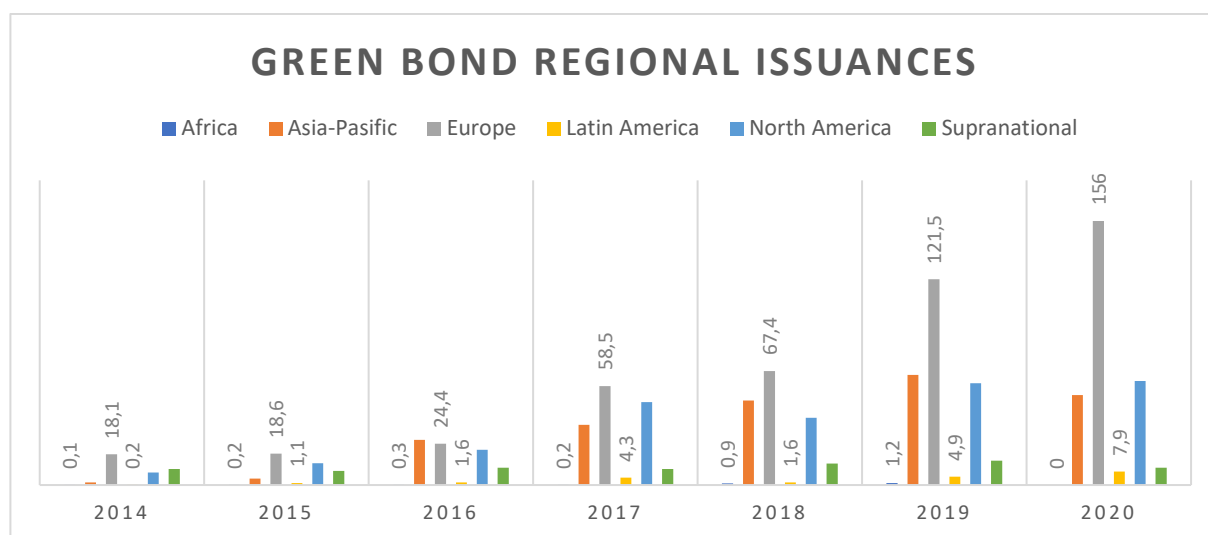
The global financial services industry has conceptualised the usage of sustainability bonds as an instrument of corporate finance. Sustainability bonds are financial products that have been influenced by the United Nations (UN) Sustainable Development Goals (Le Blanc, 2015). Sustainability bonds are similar to vanilla bonds, although with a distinguishing characteristic based primarily on the use of proceeds that are targeted towards financing low-carbon emitting projects (Maltais & Nykvist, 2020).

However, the issuance volumes of Green Bonds differ significantly across regions as reflected in statistics showing that developed economies have recorded a substantially higher volume of issuances when compared to both developing economies and

supranational entities (Climate Bonds Initiative, 2021). The recommendations contained within the Sustainable Development Goals have to be funded and the size of funding is expected to be between USD 5.0 and 7.0 trillion (Lagoarde-Segot, 2020).

Data available as of the end of 2020 highlights that the Africa region has issued the lowest volume of Green Bonds, second only to the Latin American region. The European region has issued the highest cumulative volume, while the African region has issued the lowest cumulative volume since 2014 (Climate Bonds Initiative, 2021).

Graph 1: Green Bond Issuance by Region (Per year, US Dollar Billions)



Source: Climate Bonds Initiative

To illustrate the comparative significance, Table 1 below illustrates that the African region has consistently managed to issue less than 0.52% of total global Green Bond issuance from 2014 to 2020.

Table 1: African Region Cumulative Green Bond Instrument Issuance

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------------|-------|-------|-------|-------|-------|-------|-------|
| Africa | 0,27% | 0,45% | 0,36% | 0,13% | 0,52% | 0,45% | 0,00% |

Source: Climate Bonds Initiative

The UN SDG goal number nine (9) emphasises that “once the acute phase of the COVID-19 crisis is over, governments will need investments in infrastructure more than ever to accelerate economic recovery, create jobs, reduce poverty, and stimulate productive investments that support the development of sustainable economic infrastructure in tune with climate-related projects needed to adapt and respond to climate change” (United Nations, 2020).

The World Bank predicts that developing economies have an investment requirement amounting to approximately 4.5% of Gross Domestic Product (GDP) to achieve infrastructure-related SDGs (Lu, 2020). For South Africa in particular, climate-friendly infrastructure project investment requirements of USD 588 billion are envisaged by 2030. To meet this need, the Government of South Africa plans to leverage the global appetite for Green, Social and Sustainable bonds to help fund its infrastructure programme. According to the National Infrastructure Development Plan (2021), an estimated amount of R6.224 trillion will be required between 2016 and 2040 to achieve the South African commitments related to SDG infrastructure and the National Development Plan of 2030.

As a contribution to scientific knowledge, the research is expected to find and illuminate some of the requisite action “needed by policymakers, financial actors, and public and private investors in order to upscale Sustainable Development Goals financial flows in response to sustainable demands” (Lagoarde-Segot, 2020). This action is especially pertinent within the context of developing market economies like South Africa.

South Africa has developed a national infrastructure plan that prioritises the development of both economic and social infrastructure, which includes energy, water, freight transportation and digital communication (Department of Public Works and Infrastructure, 2021). The national infrastructure plan envisages the utilisation of blended project-financing structures that incorporate “green innovative funding” (Department of Public Works and Infrastructure, 2021, p. 4).

The national infrastructure plan makes recommendations for energy to be produced sustainably by transitioning away from energy generation using fossil fuels and undertakes to support relevant stakeholders in transitioning through this process. The

same measure of support is recommended in respect of the freight transportation sector by attracting sustainable private funding. The plan undertakes to support water infrastructure by using private sector funding to deliver water projects sustainably. The delivery of digital communication infrastructure will also be designed to maximise private and public sector collaborations (Department of Public Works and Infrastructure, 2021). The undertones of the national infrastructure plan also incorporate inclusively the environmental, social and governance (ESG) imperatives of the UN sustainable development goals.

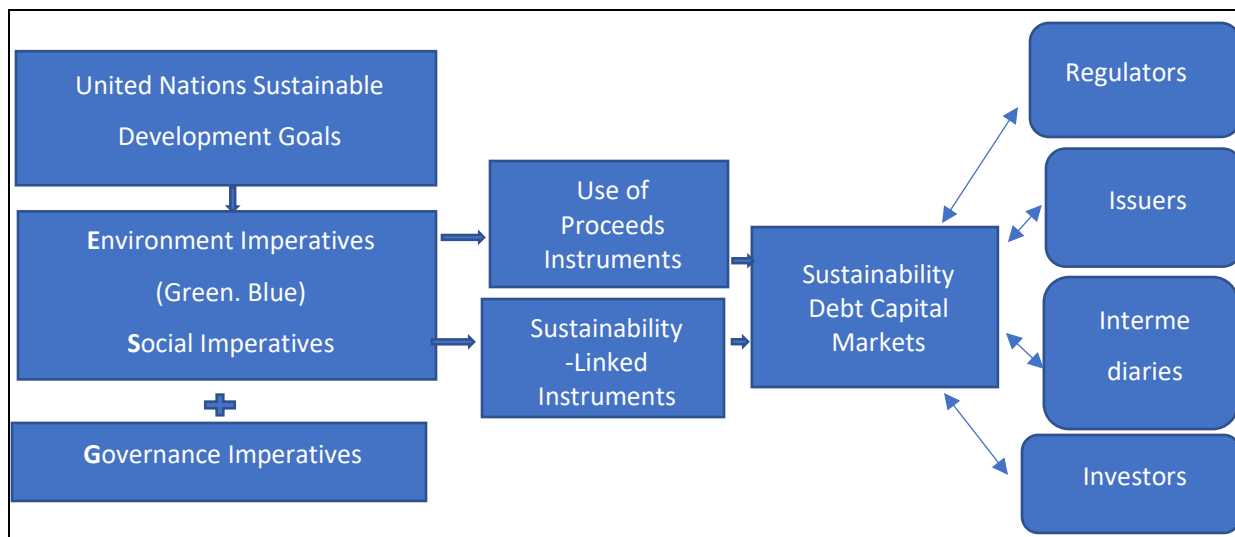
The South African strategy involves funding the infrastructural endeavour through its balance sheet and public-private sector partnerships (PPPs). The PPPs are expected to cover approximately one-third of the amount that needs to be invested until 2050. Notably, the PPPs are earmarked for specific economic infrastructure, while consideration is also given, in some circumstances, for social infrastructure (Department of Public Works and Infrastructure, 2021). Therefore, the ideals of the national infrastructure plan need to be complemented by a robust financial market that will cater to the funding requirements in respect of at least the envisaged magnitude of economic infrastructure.

With consideration to the size of funding requirements to meet the targets envisaged by the Sustainable Development Goals (SDGs) and the importance for the financial services industry to respond proactively thereto, there is an economic justification to research some of the causes and reasons behind the differential adoption and diffusion of sustainability debt capital market instruments. This is especially pertinent where statistics reveal that developed markets issued approximately 80% of green bond volumes in 2020, while developing markets accounted for only 16% (Climate Bonds Initiative, 2021).

The former Governor of the Bank of England and then Chairperson of the G20 financial stability committee, Mark Carney (2015), is referenced by Sartzetakis (2020) where Carney highlighted the importance of a coordinated response by market participants in developing and implementing the necessary means to finance a responsible and just transition away from fossil fuels and towards low-carbon economies. Carney (2015) is further referenced as emphasising that this coordination is an essential element in strengthening the resilience of the global financial system (Sartzetakis, 2020)

The international financial markets have responded by introducing innovative financial instruments that are designed to galvanise and catalyse resources towards SDG-aligned infrastructural development.

Figure 1: Sustainability Debt Capital Market Value Chain



Source: Researchers' Depiction

Sustainability debt instruments are a subset of debt instruments in general which in turn are a subset of the broader category of financial instruments. The UN sustainable development goals inform on environmental, social and governance imperatives and the financial markets have in turn developed sustainability instruments which are essentially by definition instruments that inculcate a combination of both environmental and social imperatives in their construct.

The research intends to explore with the users of financial instruments, and more specifically users of debt instruments, their perceptions concerning the elements influencing the development and adoption of sustainability debt capital market instruments.

The analysis, therefore, deals with soft issues that go beyond legal structures and financial models that define sustainability debt instruments. There is a business case to be made for the analysis based on the need for a suitably developed capital market from which to mobilise, allocate and access financial resources for infrastructural investment.

Chapter 2: Literature review

2.1 Diffusion of Innovation Theory

The research was conducted concerning Everett Rogers's Diffusion of Innovation theory as an organising framework. The work of Rogers (2003) was referenced by Lundbland (2003) as being the seminal research that informs the development of the Diffusion of Innovation theory. Rogers's theory focused mainly on innovation diffusion amongst individuals as opposed to the diffusion of innovation within and across organisations. Our study analysed the diffusion of financial innovation across individual industry professionals.

Diffusion as a concept is acceptable at a global level and encompasses new ideas, products and services (Lundbland, 2003). The research drew from the description given by Lundbland (2003) that members of a social system communicate an innovation through defined and established channels for the diffusion of innovation to occur. The communication process leads to knowledge, followed by the presence of persuasion factors, then a decision whether or not to adopt a new product, the implementation stage and, lastly, confirmation of the adoption. Wejnert (2002) also referenced Rogers in describing the diffusion of innovation as a process involving stakeholders within a social system through established communication channels and influence.

The Diffusion of Innovation theory applies to multiple disciplines that include education, health care, management, information technology and organisational development (Lundbland, 2003). The work of Rogers is also acknowledged as having had an influential impact within the fields of economic development and management (McGrath & Zell, 2001).

Three distinct theory streams explain innovation diffusion, namely classical diffusion theory, institutional diffusion theory, and cognitive-institutional diffusion theory (Bui, 2015). Rogers's theory falls within the classical diffusion theory category (Bui, 2015).

Classical diffusion theory relates the prominence of interpersonal engagements between and with members or opinion leaders within the social system. Information and benefits of the innovation are relayed through formal and informal channels of engagement. Individual adopters are perceived to have rational decision-making capabilities to assess the value proposition to themselves or their organisations. Also of prominence is the catalytic role of opinion leaders, change agents and innovation champions (Bui, 2015).

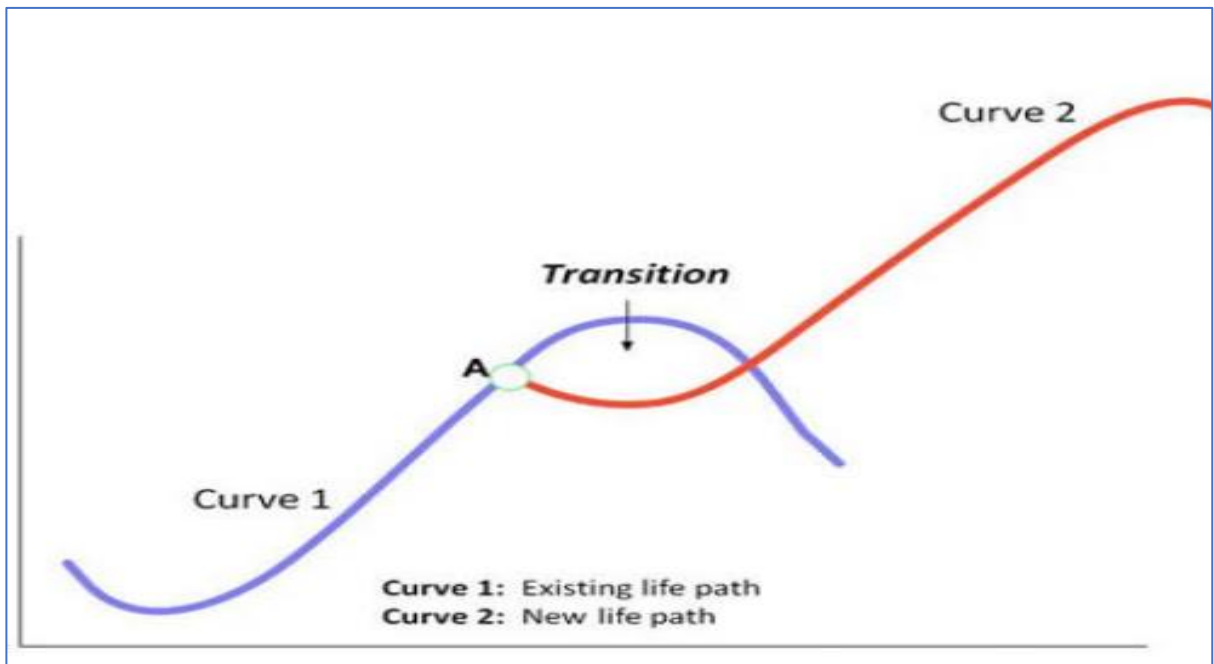
Institutional diffusion theory highlights the adaptive behaviour of organisations based on their interaction with the environment or business. Organisations are influenced, pressured, or coerced to adopt innovation through the necessity to follow regulation, competition, areas of mutual interests or obligations (Bui, 2015).

Cognitive-institutional diffusion theory complements institutional diffusion theory by emphasising the influence of collective organisational actions at the “population and community levels”. The collective actions are brought about through shared information and the commonality of understanding the context for decision-making processes.

Rogers’s classic theory presented four elements that influence the rate of innovation diffusion: (i) innovation characteristics, (ii) communication, (iii) time, and (iv) social system (Lundbland, 2003). Rogers’s framework also presented five stages through which the process of adoption occurs: knowledge, persuasion, decision, implementation and confirmation (MacVaugh & Schiavone, 2010).

Cumulative decisions over time regarding the adoption of innovation can be graphically represented by the Sigmoid-curve (Dearing & Cox 2018). However, regarding the diffusion of policy or strategy innovation, this phenomenon may not be replicated (Dearing & Cox, 2018).

Graph 2: Illustrated Sigmoid Curve



Source: Sigmoid Curve | Business change cycle | Stages of business growth (coachingwithnlp.co)

Graph 2 serves to illustrate that the relationship between the pace of typical adoption (on the y-axis) relative to the passage of time (on the x-axis). Initially, the rate tends to be slow but then accelerates towards a point of maturity at the inflexion point. The innovation can then transition into a modified and improved form, from where a new path life can commence.

2.2 Innovation theory

Schumpeter (1934) is credited for the initiation of the concept of innovation and described it as a first introduction of a new process, product, system or method (Quintane, Casselman, Reiche, & Nylund, 2011). The basic description of innovation here suggested that innovation follows a logical sequence starting with a process and ending with an outcome (Quintaine et al. 2011).

Innovation is distinct from invention (Marques, 2014) and suggests the introduction into a system of something new which is then adopted by members of the system, while invention only produces something new without it necessarily being adopted by the

members of a system (Marques, 2014). Innovation is described by Redmond (2013) as being characterised by novelty and visionary breakthroughs.

The definition of innovation as a process further suggests that there must be a set of underlying activities that constitute the process (Quintaine et al., 2011). These activities constitute two main activities: ideation and implementation, where the ideation and implementation activities stem from a strategic decision-making process that anticipates diffusion or commercialisation of the innovation (Quintaine et al. 2011). Diffusion reflects the proliferation or spread of innovation and leads to acceptance by a target market (Redmond 2013).

The definition of innovation as an outcome suggests that a key characteristic is in its novelty (Quintaine et al., 2011). However, key to this perspective is the subjectivity of the individual or organisation observing the innovation (Quintaine et al., 2011), and that this subjectivity is similarly reflected through the fundamental knowledge base of an individual or an organisation.

Therefore, innovation characteristics reflect how radical and significant the innovation is and whether it is something ground-breaking and new, from the perspective of the adopter. Channels of communication reflect the extent to which and the ease with which adopters access and receive relevant information about the innovation. The time dynamic depicts the propensity of adopter inclination, including the structures and individuals involved in the adoption process. The social system incorporates the key stakeholder influences within the adopting community or population and includes opinion leaders, change agents, and innovation champions (Lundbland, 2003).

The factor that influences *knowledge* is awareness and the active pursuit of exposing a community or population to the innovation or idea. The awareness process needs to achieve the conviction of the function of the new idea in terms of how and why the innovation is a value-add to current products, processes or ideas (Rogers, 2003).

The *persuasion* process begins to form attitudes towards innovation, and this can be positive or negative attitudes, but that will help to determine what the *decision* is in the

early stages of adoption (Rogers, 2003). Here, the adopters begin to form an opinion as to whether to start adopting the innovation or not. Adopters may subsequently choose to *implement* the innovation by making the change towards a new product or by effecting a process adjustment (Rogers, 2003). The confirmation stage manifests in the reinforcement of a change decision (Rogers, 2003). The reinforcement for change decision to adopt is ultimately influenced by the knowledge that the innovation exists, what it does, how to use it and how it works (Rogers, 2003).

Within the organisational context, Wisdom, Chor, Hoagwood and Horwitz (2014) presented two broad descriptive categories, drawn from 20 literature reviews: i) theories addressing the innovation adoption process, and (ii) theories that present innovation adoption in the context of implementation, diffusion, dissemination and sustainability.

However, there appear to be variations in the definition of innovation across different disciplines and this situation highlights the need to find a universal construct (Baregheh, Rowley, & Sambrook, 2009). Since the concept of innovation applies to many disciplines, the situation that arises is that “each of these different disciplines proposes definitions for innovation that align with the dominant paradigm of the discipline” and subjects itself to “a fragmented and ambiguous definition of innovation (Baregheh, Rowley, & Sambrook, 2009, p. 1324)

Baregheh et al. (2009) suggest that key attributes—type, nature, means, stage and aim—are necessary for the qualification to innovation. Damanpour (1991) is referenced by Quintaine et. al. (2011), who presented three key categories that define innovation. These are (i) technical versus administrative, (ii) product versus process, and (iii) radical versus incremental.

The preceding definitions of innovation are based on linear relationships between factors that define innovation as a developmental transition from a process towards a resultant outcome. This is a flawed approach (Greenacre, Gross, & Speirs, 2012). More recent literature has migrated towards understanding innovation as a dynamic and complex system that involves interrelated and interconnected factors. Greenacre, Gross, and Speirs (2012) define this phenomenon as a Systems Innovation. This definition serves to

adequately consolidate and unify the differing contexts of innovation prevalent amongst different disciplines (Greenacre, Gross, & Speirs, 2012).

2.3 Financial innovation

There was a predominant focus in the literature on the diffusion of *technology* innovation within and across these various disciplines, compared to literature that covered the diffusion of financial instrument innovation.

Financial innovation is distinguishable from product and service innovation (Redmond, 2013). Frame and White (2004) described financial innovation based on the functioning of the financial system. They reference Morton (1992) who described the financial system as an enabler for the allocation and distribution of financial resources from savers to deficit entities, and with consideration for risk and cost. Financial innovation introduces a new element to the financial system, for example, new products or new services, which improve the wants and needs of savers and deficit entities, while also reducing both risk and costs (Frame & White, 2004).

Arthur (2017, p.50) presented an extended definition of financial innovation as “a process, carried out by any institution, which involves the creation, promotion and adoption of new (including both incremental and radical) products, platforms, processes or enabling technologies that produce new ways or changes to the way a financial activity is carried out”. The description suggests that non-financial organisations can play an important part in the initiation and adoption and diffusion of financial innovation.

Qamruzzaman and Wei (2018) define financial innovation in the context of economic development by highlighting the impact of broad innovation on economic growth. Financial innovation is an essential element of economic activity by enhancing the systems that optimise the allocation and distribution of scarce resources (Qamruzzaman & Wei, 2018).

Additionally, Janicko (2015) references Merton (1992) in identifying and highlighting that the key roles and functions attributable to financial innovation are primarily to direct and allocate pooled resources towards risk and cost-adjusted economic activities. This

innovation is a result of market competition driven primarily by financial market organisations and institutions, and only subsequently is the innovation diffused through the rest of the economy (Janicko, 2015).

Alamad (2017) references Boyd and Smith (1998) in suggesting that financial innovation exhibits cyclical characteristics that are linked to a particular sectoral development in an economy. For example, the advent of the development of green economies has led to the innovation of unique financing instruments.

The dominant conversation around innovation and financial innovation in particular centres around the theory founded by Schumpeter regarding the importance of innovation as a factor influencing economic growth, its impact on corporate profitability and survival, and general financial sustainability (Alamad, 2017). Financial innovation as a proxy for financial development occurs at a bank-specific or market-specific level, or both (Qamruzzaman & Wei, 2018).

2.4 Regulation and financial strategy

However, there are arguments that financial innovations can be detrimental to society. The financial crisis of 2007 to 2009 is used as an example of financial instrument innovation that negatively and severely impacted social welfare and global economic potential (Mullineux, 2010). There is a consensus that innovation in finance has both positive and negative consequences. Most of the literature has not provided an in-depth analysis of the negative effects, leading to the general assumption that such innovation is good for economies and society.

Arthur (2017) argues that there is a limited understanding of the governance role in financial innovation. Blach (2020) identified the prevailing uncertainty concerning tax and accounting regulations, the complexity of innovative financial structures, and transaction costs as major factors that can lead to the creation of mainly exogenous barriers to financial innovation (Blach, 2020).

2.5 Diffusion of financial innovation

Tufano (1989) and Cavanna (1992) are credited by Arthur and Khraisha (2018) for providing the background research on financial innovation diffusion. The researchers determine that financial innovation diffusion occurred through a process of imitation within a social system that is driven by a profit motive. They further allude to the potential for financial innovation to be propelled even faster, especially in the financial securities markets. They present the inability to secure a patent on a financial product as further inducement for faster diffusion.

There are differing country-specific conditions that influence the diffusion of financial innovations (Su & Si, 2015). Countries that have relatively more liberal economic policies experience higher levels of innovation (Su & Si, 2015). Also, economic cycles that manifest in strong financial markets lead to intermediaries, like commercial banks, rapidly adopting innovation while regulators often take a reactionary approach to financial innovation (Forrer & Forrer, 2015).

Tufano (2003) identified factors that might give rise to the proliferation of financial innovation and highlights particularly the need to address incomplete markets, lowering the cost of capital, responding to regulatory requirements, and changes in economic conditions.

There are benefits to financial innovation diffusion that include the promotion of liquidity to the market when there is a large group of participants who have accepted the added value of the innovation, especially where there is a widespread and common understanding of the taxonomy (Khraisha & Arthur, 2018).

Frame and White (2004) argue for the necessity of empirical academic studies aimed at understanding the speed or rate at which financial innovation is spread across a population, community or industry. This can be done by answering questions around the nature and characteristics of early adopters and the conditions precedent to rapid adoption rates.

Khraisha and Arthur (2018) also suggest that there are gaps in the academic literature on the diffusion of financial instrument innovation. This study aims to partially fill this gap. The gap exists in the face of financial innovation being necessary to build human civilisation and achieve society's goals (Shiller 2013, with reference especially to the ideals of the global sustainable development goals in general and South Africa's nationally determined contributions (NDCs) in particular.

In summary, the review of literature affirms a consistent thread in terms of the description of innovation. The literature emphasises uniqueness, newness, radical and incremental characteristics as key qualifying criteria for innovation. The concept of innovation highlights its tendency to spread amongst individuals and organisations dynamically and systematically. The analysis concludes that much of the research literature has not focused adequately on the adoption and spread of the financial innovation across a population, community or industry.

Based on the definition by Frame and White (2004) regarding the function of financial diffusion as an enabler of the allocation and distribution of financial resources from savers to deficit entities, the outcome of financial diffusion can be used as a proxy for describing the development of financial markets. Svirydzienka (2016) references Levin (2005) in that financial development includes the pooling and allocation of savings towards productive investments. The definitions present comparable and acceptable similarities based on these financial functions' ability to influence saving and investment decisions and the efficiency with which funds are allocated.

This research aims to outline the current state of diffusion of sustainability debt instruments in South Africa. The research draws primarily from Rogers's theory in terms of the basic elements defining the foundation for the diffusion of innovation.

Chapter 3: Research propositions

The research proposition centres around Rogers's Diffusion of Innovation theory. The definition of diffusion reflects a process through which a new idea, product, or process is spread within and amongst members of a social system. In the research, the process of diffusion within financial markets can be compared to the process of financial market development. As per the definitions provided in Chapter 2, regarding Frame and White (2004) and where Svirydzienka (2016) references Levin (2005), the function of financial diffusion as an enabler of the allocation and distribution of financial resources from savers to deficit entities is comparable with financial market development based on the influence on savings and investment decisions and the efficiency with which funds are allocated. In this case, the research focuses on the market development of debt capital market instruments that have a sustainability bias. The term that will be used to define these instruments in the research is "sustainability instruments".

The research proposes to use the concept of diffusion as a proxy for the process of financial market development. Financial market development is a process that enhances the depth and liquidity of a particular financial instrument and through which market participants can allocate resources towards investible assets on a risk-adjusted basis (Bank for International Settlements, 2020). The diffusion of sustainability instruments is expected to result in enhanced depth and liquidity, including an efficient allocation of resources by investors into sustainability asset classes.

The research proposes that sustainability debt capital market instruments feature the characteristics of innovation. While the concept of sustainability instruments is not new from a global perspective, the research proposes that the instruments are unique and new to the South African market.

The research uses Rogers's theory as the framework of analysis and in formulating the research propositions. The diffusion of sustainability instruments depends on the innovation features, a social system, communication channels, and time:

- 1) Sustainability instruments can be categorised as being innovative instruments. They offer a new and distinct way in which users create value and find comparative advantage in using the instruments.
- 2) There needs to be a well-defined social system of participants who function as opinion leaders, change agents and innovation champions. The social system facilitates the adoption processes, including providing case studies that test the applicability and observability of the innovation.
- 3) The diffusion and development process is affected through established communication channels for the efficient dissemination and sharing of information. The communication channels include platforms that are used to source and store relevant market data.
- 4) The rate and pace of diffusion and development depend on the timeframes underscoring the extent to which organisational leaderships and other authoritative stakeholders are inclined to accept the innovation. The timeframe concept reflects the stages of acceptance—innovators, early adopters, early majority or laggards.

To evaluate the propositions, the research gathered data from market participants in the form of semi-structured interviews. Their beliefs concerning the propositions were expected to illuminate the extent to which sustainability debt capital market instruments satisfy the definition of innovation and its diffusion as outlined by the basic elements contained in Rogers's theory. The proposition highlights innovation, diffusion and sustainability of debt capital market instruments.

On the other hand, if sustainability instruments do not meet the definition of innovation, then which aspects of innovation are lacking? Additionally, the research investigates how market participants perceive the lack of innovation characteristics to impact the rate and pace of adaption and diffusion within the South African debt capital markets.

The objective is to understand sustainability instruments by sourcing information through engaging with users of financial instruments, specifically bonds, and sustainability debt instruments in particular. The information sourced will be used to evaluate the overall proposition that sustainability debt instruments are a financial innovation whose adaption and diffusion can be explained concerning the Innovation Diffusion theory. The research

output is expected to add to the body of scientific knowledge about the development, proliferation and sustainability of investments into low-carbon emission infrastructure.

The region defined as “developing” has had a relatively low level of Green Bond issuances (Climate Bonds Initiative, 2021). This statistic raises the following questions: Why are the issuance levels at the current levels? What are the main adoption challenges in the South African sustainability bond market? Which fundamentals need to be in place for a higher rate of adaption and diffusion to take place?

Chapter 4: Research methodology

4.1 Research Design

The research design was exploratory in that it looked to gain new insights about the circumstances prevalent to the state of adoption and diffusion of sustainability instruments within the bond markets in South Africa. The exploratory nature of the research also stemmed from a need to understand the perceptions prevalent amongst financial sector participants as to the innovativeness of sustainability instruments and factors that affect their adoption and diffusion in South Africa. Hence, there was a strong emphasis on extracting information based on opinions, points of view, perspectives, and behavioural inclinations, amongst others, which lent itself to qualitative research methods (Avgousti, 2013).

The research intended to extract more information about subject groups with which the researcher were familiar, and of which there was had a certain level of understanding. The researcher was a financial services professional who had accumulated knowledge of the operations of debt capital markets (bonds and loans) both locally and internationally—a situation that created a higher level of proximity compared to quantitative methods (Queiros, Farai, & Almeida, 2017).

4.2 Philosophy

The interpretivist paradigm was proper for this research because it intended to source information based on human-factor interpretations and perceptions of the observable phenomenon. The information and data were collected from a select group of defined respondents, and the data was not intended to be used as an inference to a general population (Alharahsheh & Pius, 2020).

4.3 Approach selected

Through a deductive approach, the research intended to document observations regarding the phenomenon described in the problem statement, and from which the

research intended to discern themes and trends within the observations. The process outcome was a theorisation of the patterns observed and these are presented in the form of a proposition (Alharahsheh & Pius, 2020).

4.4 Methodological choice

The research was designed as a qualitative research method to gain a higher quality of understanding of the context of the problem. The research was not undertaken through the analysis of numerical data but rather to “produce in-depth and illustrative information” in respect of an identified problem (Queiros, Farai, & Almeida, 2017, p. 370).

4.5 Strategy

Data collection took place through semi-structured interviews. The interviews were expected to be easy to conduct, compared between respondents and to be replicated (Queiros, Farai, & Almeida, 2017). Hence, the study depended on sourcing primary data directly from respondents.

4.6 Time horizon

The research was conducted to cover a certain point in time, i.e., by referencing a cross-sectional time horizon. The research presented a proposition that reflected a phenomenon at a point in time. Hence, the research aimed to answer the question: What is the situation or status now?

4.7 Sampling technique

The research applied non-probability purposive sampling techniques. This sampling technique was proper given the commonality of characteristics within our chosen group of respondents (Taherdoost, 2016). The characteristics were deliberately predetermined in an attempt to reflect the greater population.

4.8 Population

The population from which the sample was derived included potential issuers of sustainability instruments. The research aimed to gather data from two groups of participants:

- a) potential and actual issuers of sustainability instruments; and
- b) investment professionals who would have been investors in sustainability instruments.

The sample was taken from industry professionals who featured common characteristics that primarily included:

- financial market-related qualifications;
- corporate, project and infrastructure finance professionals;
- investment management, insurance and savings industry experience; and
- exposure to domestic and international debt capital markets.

4.9 Units of analysis

The research looked to analyse information gathered from the responses of a group of participants who were active professionals within the financial services sector in general, and also who were participants in the bond markets in particular. The analysis was based on a study of common themes and trends that were expected to develop from a systematic process of semi-structured interviews with a group of industry professionals. The focus of the study was on data collected from interviews and from which data research found trends and themes that were used to interpret the behaviour of the debt markets, with particular respect to sustainability instruments. Hence, the units analysed were the sustainability instruments.

4.10 Units of observation

The data was gathered and drawn from the semi-structured interview process and was expected to reveal beliefs about the behaviour of sustainability instruments themselves. The interview process was expected to generate particular and clear themes and trends. This interactive process defined the researcher perspective as an interviewer witnessing and documenting interviewee perceptions. Hence, the units of observation were the industry professionals who were active participants and transactors within the South African debt capital markets.

4.11 Sampling method and size

The method for selecting a sample and its size was guided by non-probability purposive sampling techniques. The research was conducted where there was no complete list of all industry professionals, and the research process could not, therefore, assign a probability on any particular individual being selected (Saunders & Lewis, 2018).

Based on the criteria defined in point 4.8, the individuals identified for the sample were deduced to be the best source of data. Hence, the chosen sample showed elements of homogeneity and which sample produced minimal variations in responses (Saunders & Lewis, 2018).

Because the researcher applied best judgement in selecting a sample that would be best suited to address the research proposition and problem statement, the nature of the research approach was considered purposive (Saunders & Lewis, 2018). The research process also anticipated a snowballing effect where participants were expected to make recommendations and suggestions as to other industry professionals that might be able to provide more insights.

The concept of saturation was applied in determining the minimum acceptable sample size. Specifically, the research design anticipated achieving three categories of saturation, namely data saturation, coding saturation and theoretical saturation. The respective saturation points were expected to enhance the quality of the overall research (Fusch &

Nessand, 2015). The research was deemed to have reached data saturation where no new data about the phenomenon under investigation was heard during the interviews (Morse, 1995). Coding saturation was achieved when the number of codes allocated to each progressive interview decreased noticeably. Theoretical saturation was achieved when there was a minimal and insignificant deviation of perceptions and opinions centred on the consolidated themes.

Within the identified sample size, the research process anticipated that a saturation point would be reached through formulating interviews that were in-depth, rich in quality, repetitive and replicable. The research process expected to get to the point where an added interview would not yield further themes, data, and coding opportunities (Fusch & Nessand, 2015). As per the research work undertaken by Guest et al., (2006), there was a predetermined expectation that the research interview process would reach saturation within the first 12 interviews.

4.12 Data collection process

The data capturing and documentation process followed a series of semi-structured interviews and complemented this process by sourcing data from relevant industry documents. The semi-structured interviews were relatively less formal and less structured, which allowed for more of a discussion platform. Interview questions were designed around the problem statement and to help guide the discussion.

Questions were predetermined and posed in an open-ended format in order not to limit the scope or breadth of the interview discussion. The process allowed the research to fully gauge each respondent's experiences, opinions, feelings, beliefs and knowledge. The interviews were recorded on an electronic device from where the voice data was transcribed into text data. Only aggregated data was used. Individual names and identities were not reflected in the research report.

4.13 Data analysis approach

The study followed a phenomenological approach, and the aim was to be able to place sustainability instruments in their proper context amongst prevailing financial instruments through the experience of industry experts and practitioners. The approach allowed for the extraction and depiction of common themes that were used to support or disprove the research proposition (Khan, 2014).

Transcribed data was analysed through coding, which involved finding, categorising, classifying and labelling primary themes and patterns in the data. The research process employed the qualitative data analysis software, ATLAS.ti, for in-depth thematic analysis of the transcribed data (Saunders & Lewis, 2018).

An analysis of the data was used to evaluate the research proposition that the adaption and diffusion of innovative financial instruments, using sustainability instruments as the units of analysis, can be modelled on the Diffusion of Innovation theory as defined by Rogers (2003).

4.14 Quality controls

The research applied key principles used to gauge quality—credibility, transferability, dependability and confirmability. These criteria were used to control for quality in respect of qualitative research methods (Saunders & Lewis, 2018).

The research aimed to achieve credibility by ensuring that the research process had applied all rational and sound decision-making processes that are universally accepted in scientific research. For transferability and dependability to occur, the same set of variables were considered to enable testing under different conditions, while applying the same logical processes and reaching the same conclusions and outcomes.

The research process made efforts to find and exclude any potential biases or errors that would have emanated from the researcher or the interviewees to achieve neutrality and

conformability. The data collected was stored on a memory stick. All necessary precautions were effected to ensure the accessibility of the data for not less than ten years.

The research process enhanced the quality criteria by obtaining data from other sources through triangulation. Over and above the interviewees, the research aimed to access publicly available data through webinars and from fledgling industry organisations such as:

- i. Climate Bond Initiative;
- ii. Global Green Bond Partnership;
- iii. Global Climate Action Summit;
- iv. Sustainability Awareness Bonds;
- v. Climate Awareness Bonds;
- vi. Global Sustainable Investor Alliance;
- vii. Bonds and Loans Africa Conference;
- viii. Green Bonds Principles;
- ix. International Capital Markets Association; and
- x. The Green Bond Council.

4.15 Research limitations

The research process was expected to encounter the following limitations:

- a) Interviewees were asked to share their perspectives which approach could have lent to subjective responses. It would have been difficult to assess the objectivity of responses.
- b) The process captured data at a single point in time and could have benefited from a longitudinal time horizon analysis.
- c) Beliefs could have been influenced by the environment in which the respondents work, and the research process would have been limited in assessing the conditions affecting the state of the environment.
- d) Since the sustainability market in South Africa were still in their infancy, there could have been insufficient market data available in terms of depth and scope.

- e) The research also assumed that the chosen sample had the necessary exposure and experience to give an informed opinion on the state of the sustainability bond markets.
- f) The research could have been enhanced by in-person interviews and preferably be conducted at the respondents' places of work.
- g) Since the research was limited to semi-structured interviews, it could also have been enhanced by allowing the respondents to give their responses through a questionnaire.
- h) The process also ran the risk that the responses could perhaps be too rigid and not reveal the necessary depth of detail.

Chapter 5: Results

The deductive analysis process began with an outline of the framework/theory which informs the proposition that the diffusion of innovation in the South African sustainability market can be outlined with reference to Rogers's Diffusion of Innovation theory.

The research process implemented a structured coding technique to organise and analyse the transcribed interview data and more information was gathered through triangulation. The descriptive coding process served to assigning specific labels to data and allowed for summarising in a word or short phrase the basic topic of a passage of qualitative data (Saldana, 2021). The research data was coded at a manifest level to deduce from theory what was contained in the data.

Table 2: Interviewee list, Respondent title and Interview date

| Interviewee | Title / Position | Interview date |
|--------------------|-------------------------------------|-----------------------|
| Respondent 1 | Group Treasurer | 15 September 2021 |
| Respondent 2 | Principal: Debt Capital Markets | 17 September 2021 |
| Respondent 3 | Funding Manager | 20 September 2021 |
| Respondent 4 | Head: Sustainable Finance Solutions | 20 September 2021 |
| Respondent 5 | Group Treasury Manager | 23 September 2021 |
| Respondent 6 | General Manager: Treasury | 30 September 2021 |
| Respondent 7 | Co-Head: ESG & Sustainable Finance | 01 October 2021 |
| Respondent 8 | Portfolio Manager | 07 October 2021 |
| Respondent 9 | Senior Credit Research Analyst | 11 October 2021 |

The data collection process was completed after nine semi-structured interviews were conducted. There was an exhaustive attempt to gather data from as wide a range as possible of industry participants. The targeted number for the non-probabilistic sample was 12 individuals to reach a point of saturation. However, a tangible point of saturation was reached after the eighth interview.

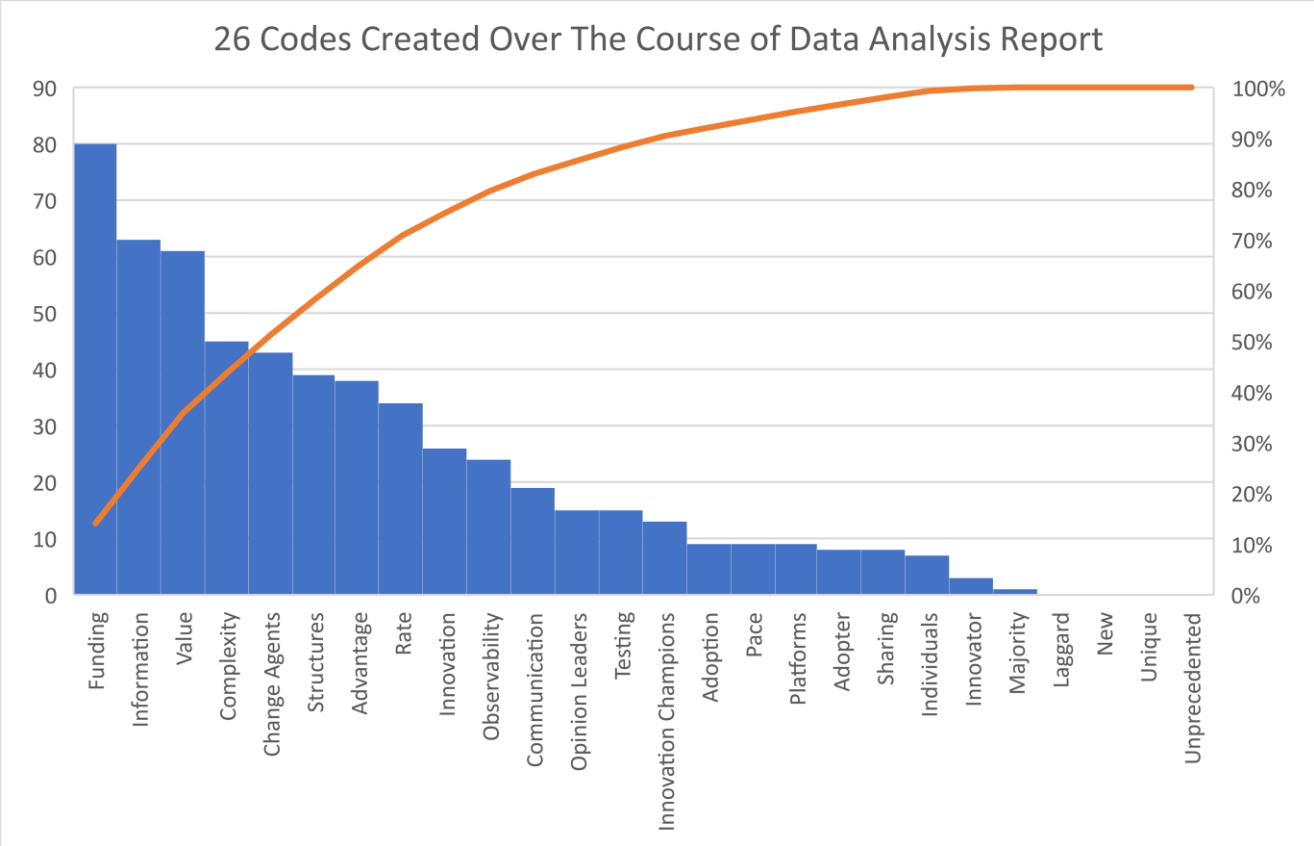
Table 3: Consolidated themes

| Theme | Number of times mentioned | Participants |
|---|----------------------------------|---------------------|
| | | |
| Importance to funding strategies | 9 | 9 |
| Importance of data and information | 9 | 9 |
| Stakeholders in the social system | 6 | 9 |
| Value and comparative advantages | 8 | 9 |
| Levels of complexity | 9 | 9 |
| Change agents and structures | 6 | 9 |
| Characteristics of innovativeness | 7 | 9 |
| Rate of adoption, observability and testing | 7 | 9 |
| State of RSA debt capital markets | 9 | 9 |

The themes reflect similarities and/or variations across codes. For example, the importance of funding relates to the role of internal corporate structures and change agents in facilitating the acceptance of sustainability aligned financing strategies. Other codes bearing similarity to funding include observability, which describes the extent to which industry professionals can witness first-hand market transactions from which they can reference and test their transition plans and experiences in the process of adoption.

Similarly, for example, the theme describing the importance of data and information shares similarities with communication, sharing, and platforms. The interlinkages highlight Rogers's assertion that innovation diffusion should occur through established communication networks and channels that facilitate the sharing of market intelligence that is sourced from common and reliable platforms. Further details on the themes are provided in Chapter 6: Analysis of results.

Graph 3: Code report:



Source: Researcher generated with Atlas.ti 9.0

The code report serves to illustrate the descending rank of codes according to their prominence in the data collection process (Guest, Bunce, & Johnson, 2006). Each code is referenced to the overall discussions about the critical elements that industry professionals perceive to be the most important consideration in respect of the diffusion of sustainability debt instruments in South Africa.

For example, the importance of the ability to incorporate sustainability debt instruments into corporate funding policies and strategies received the highest number of references amongst the interviewees. Ranked second, was the ease with which there was access to the most relevant and value-adding data and information for strategic long-term decision-making purposes. Further detail is provided in Chapter 6.

Table 4: Axial codes to codes

| Axial codes/categories | Codes |
|-------------------------------|--|
| Innovation characteristics | Value (3) Advantage (7) Innovation (9) |
| Social system | Funding (1) Change agents (5) Observability (11) Opinion leaders (12) Testing (13) Adoption (15) Innovation champions (14) |
| Communication Channels | Information (2) Communication (11) Sharing (19) Platforms (17) |
| Time Dynamic | Complexity (4) Structures (6) Rate (8) Innovator (21) Individuals (20) Adopter (18) Majority (22) Pace (16) |

The open coding process produced 26 codes. These are ranked according to the number of times they were mentioned during the interviewing sessions. The codes have been aggregated and condensed into broader axial categories that are aligned to the theoretical framework.

Table 5: Data verification

| Category | Application |
|-----------------|--|
| Credibility | The research was conducted through an academically authentic process. A substantial review of methodology literature was reviewed in the selection process for the type of research conducted. Credibility in the research is achieved by having secured an industry sample of professionals who are knowledgeable and have the necessary skills in the field of finance and on the topic of sustainability. |
| Dependability | The research outcomes achieve trustworthiness and reliability since the majority of the data was collected from primary sources, and which sources have first-hand experience in structuring and implementing sustainability transactions. |
| Transferability | The research relates to issues that are currently pertinent in the global context. The research propositions can be replicated in other countries that share similar characteristics with South Africa. |
| Confirmability | The research outcomes can be replicated by other researchers. This is possible if the status quo remains the same as at the time of research. However, this is unlikely because the dynamics of the sustainability markets are in development and experience changes daily. |

Chapter 6: Discussion of results

The results are presented by focusing on the emergent themes generated during the interview processes. The South African debt markets have responded to the SDG aligned initiatives by introducing two distinct financial instruments that are designed to galvanise and catalyse resources towards SDG-aligned infrastructural development.

- a. Use-of-proceeds instruments: the frameworks defining this category of instruments are intended to be specific with regards to the ultimate targeted employment of resources.
- b. Sustainability-linked instruments: the frameworks defining this category of instruments are intended to provide issuers with a mechanism to attain and report on predefined and predetermined sustainability targets over time.

6.1 Instruments are integral to funding strategies

It is reasonable to conclude from the repetitive comments made by all nine respondents that the overarching importance of sustainability debt instruments is in the ability to provide and secure the necessary amount of resources that align with corporate funding strategies. The respondents also highlight that the ability to fund projects is enhanced by the robustness of the financial markets' social systems that make up diverse stakeholders like investment managers, banks, development finance institutions, multilaterals, international financial institutions and other intermediaries. The sustainability stakeholders are a representation of the ecosystem defined by Wejnert (2002). There is consensus amongst the respondents that sustainability debt instruments have been generally accepted as suitable funding instruments, and that borrowing policies have been developed to accommodate ESG initiatives. Respondent 2 notes that "if you look at the projects that we do, and especially on the energy front, basically most of the projects that we get into have, in one form or the other, are basically ESG". Respondent 2 further confirms that "ESG financing for us is totally into our corporate strategy".

All respondents expressed the expectation that sustainability instruments had the potential to become the standard form of debt funding in the medium to long term. For

example, Respondent 1 is quoted as saying: "... and I think in the long term that is where we are going. I think we will get there where it will be like a normal funding instrument". Additionally, Respondent 3 supports the sentiment: "... the current format in which they are getting money will completely change into this new asset class we are talking about, ESG". Critical requirements in consideration of funding strategy execution are: (i) the ability to have independent risk assessments undertaken by a rating agency, (ii) the ability to raise funds in substantial volume, and (iii) the potential for instrument tradability in the secondary markets.

The prevailing situation falls short of any reliable ratings, by established rating agencies, on sustainability instruments. The current market cannot be described as providing adequate liquidity that would enhance price discovery for sustainable instruments. The issue of scale also affects investors as much as it affects issuers because of the need to have a diversified pool of resources and adequate risk sharing. Respondent 3 said the following: "... the problem is this whole game, this whole ESG game, is a massive capital game".

There is a general preference for the sustainability-linked instruments based on the less cumbersome requirement to identify and report on key performance indicators, as opposed to the instruments that require a detailed assessment of the ultimate use of proceeds. The requirements to declare the use of proceeds and report on key performance indicators are perceived to be an added administrative cost of raising funds. This is highlighted by respondent 3 who lamented that "... the very first thing you are going to get asked is 'What are you going to use it for?' and then you spend 90% of your time explaining that".

Issuers especially look to raise funding in the most cost-efficient manner. The consensus is that there are no pricing advantages to be gained from issuing sustainability instruments. Respondent 3 for example stressed the point: "... no, it has no pricing benefits, don't even think about ESG if you thought there is a price benefit. They (the market) still price the risk of the issuer". Hence, risk assessments are based primarily on the strength of the issuer's balance sheet. There is no separation of the risk characteristics

of the project to be funded from the balance sheet of the issuer. This is because the funding itself, especially in respect of sustainability-linked instruments, is not ringfenced.

Issuers sell conventional debt instruments through a standardised documentation platform that can either be a domestic or a global medium-term note programme. Sustainability issuances are also issued through medium-term note programmes, a situation that further highlights the reliance of an issuer's balance sheet to price risk and return on sustainability instruments.

Medium-term note programmes are designed in the form of legal frameworks. The language around these frameworks is largely standardised across domestic and international debt markets. However, in the context of sustainability frameworks (Appendix A), the detail additionally includes the following key elements drawn from the International Capital Market Association (ICMA):

- a) Green Bond Principles (GBP)
- b) Social Bond Principles (SBP)
- c) Sustainability Bond Guidelines (SBG)

The general sustainability framework covers four key pillars: (i) definition and use of proceeds; (ii) process for selection and evaluation of projects; (iii) management of proceeds; and (iv) impact reporting. Respective frameworks are expected to be evaluated by Second Party Opinion agencies, whose function is to give effect to the credibility, impact and alignment with the four key pillars of the GBP, SBP and SBG.

The introduction of sustainability instruments has made it necessary to develop a new market taxonomy; that is, the process of naming, classifying and categorising the various elements of sustainability frameworks and instruments. In the South African experience, this process has been slow and has led to the creation of non-standardised frameworks, originating on a case-by-case basis.

The development of local sustainability frameworks relies predominately on the taxonomy that has been developed by the European Union (EU). Issuers, investors and

intermediaries use the EU taxonomy as a reference point, however, the process of adoption and amending it to South Africa-specific conditionalities has been slow. Respondent 9 pinpoints one of the macro-issues: "... if we agree on common frameworks and common sources of what impact for a sector is in South Africa, and not just use the international benchmarks, create the local nuance, then you will get the investor and the issuer on the same page where it matters". The reason that was highlighted concerns the necessity to accumulate enough case studies to evaluate the applicability of the taxonomy to South African conditions. Respondent 3 is quoted as saying: "... green taxonomy was very European based ... we took it and tried to amend it for our purpose. And I think we have not done even 10% of the work ..."

It is reasonable to conclude from the interviews that the quantum of funds with sustainability mandates has grown to the extent that observed subscription volumes either match or exceed those of conventional bond auctions. Respondent 2 notes that "... because of the increased awareness of environmental sustainability and the social perspective, they do offer advantages if you are an issuer because you are more likely to get money from investors and basically there is a lot of money looking for these assets". Respondent 5 also affirms the phenomenon: "... we are seeing especially proceeds instruments, where the proceeds are being used for renewable energy ... there is a big appetite for these types of instruments". Hence, it is reasonable to expect that any identifiable price advantages may only accrue from the amount of demand that a particular project can attract. Therefore, any downward price pressures are primarily an outcome influenced by significant pools of funding that are chasing a few sustainability assets or projects. Therefore, pricing sustainability instruments is influenced by economic forces of supply and demand, where excess supply drives the prices down, with no particular preference for the type of instrument.

A further challenge relates to the alignment of expectations between sustainability investors and issuers of debt instruments. Investors seem to prefer strict adherence to SDG deliverables and standards, while issuers are limited to the extent to which their respective corporate strategies and policies are designed to meet shareholder compacts. A question in this regard that was posed by respondent 3: "Can I actually live with these standards, given my own mandate and strategy? That is a big challenge."

The South African sustainability markets are dominated by investment banks. The banks are credited for their dominance as the key holders and suppliers of capital. The investment managers are predominantly focused on long-term conventional government debt instruments, while it is the banking sector that currently plays a key role in funding sustainability projects. However, the banking sector exclusively funds projects through short-term loan facilities. This situation creates a mismatch between the need for funding sustainability projects that have a long-term lifespan versus the availability of resources that are currently short term—that is, an asset to liability mismatch scenario in the design of funding strategies. Respondent 4 said the following: “I think it is easier to raise, to borrow money from banks than to borrow money from institutional investors. It is more of a depth thing.”

The perceived inclination of the banking sector to allocate resources towards projects that maximise shareholder returns highlights the markets’ differing priorities concerning environmental, social, and governance imperatives. The profit maximisation motive suggests that the dominating sources of funding will be allocated to commercially viable projects that are bankable. This leaves the balance of socially oriented projects being potentially underfunded and reliant on concessional facilities from development finance institutions or the government fiscus.

Quintaine et al. (2011) suggest that the process of diffusion and adoption features two underlying activities: ideation and implementation. These activities stem from a strategic decision-making process that anticipates the commercialisation of innovation. Hence, the dominance of banks is understandable in the context of strategic decisions based on profit maximisation.

Additionally, Janicko (2015) highlights the role of financial market organisations as key functionaries in directing and allocating resources towards risk and cost-adjusted economic activities. The dominance of banks derives, by this definition, from the competitive advantages accruing due to resource endowment, including the symmetry of knowledge and information networks.

It is the opinion of the interviewees that the government of South Africa has a leading role to play in affecting the country's infrastructure needs. These infrastructures are grouped into three categories:

- a) Social infrastructure: This is infrastructure that demonstrates social returns higher than the cost of borrowing, depends on the fiscus for funding, and has minimal scope for private sector investment.
- b) Commercially viable infrastructure: Commercial projects create revenue streams that enable private sector investment and do not need funding by the government, but some financial support may be necessary.
- c) Blended finance infrastructure: These projects are usually partially economically viable having both social and economic impacts. The projects would need some form of fiscal financial support to attract private sector investment through a blended finance solution utilising public-private partnerships.

The presentation of the different categories of infrastructure seeks to highlight the variation in the quantum of resources that are estimated to be required for infrastructural deployment. The South African combined planned infrastructure portfolio is estimated to amount to ZAR 2.3 trillion. The funding gap, which accounts for blended and commercial projects, is estimated to be ZAR 506 billion (Infrastructure and Investment Office, the Presidency, 2021). Hence, only 25% of the budgeted amounts is expected to be sourced from the private sustainability debt markets for commercially viable and blended projects, while 75% is earmarked to come from public funds for socially-oriented initiatives.

The sustainability-linked instruments that are expected to catalyse the development of the market incorporate both environmental and social SDG imperatives. Hence, the issues of "scale" and "size" are a concern that is raised in respect of efficient traction that can generate market liquidity, tradability, investor diversity and pricing. As of 12 October 2021, only a total of ZAR 10.4 billion of green/sustainability-linked bonds had been placed in the local bond market. Respondent 3 commented: "So you are sitting with an optimisation problem. Actually, that is what you are trying to map here, is an optimisation problem."

6.2 Stakeholders in the social system

The key stakeholders in the social systems from the South African perspective are:

- a) the banking sector, including development finance institutions;
- b) investment managers;
- c) asset consultant's, trustees and principal officers;
- d) intermediaries;
- e) government; and
- f) issuers.

The adoption of sustainability instruments is seen as being driven by issuers and the banking sector more than investors. It was suggested that the other important stakeholders within the sustainable social systems who can have a greater impact on the development of funding opportunities, and the sustainability debt markets themselves, include asset consultants, investment trustees, and principal officers (Figure 2).

Figure 2: Mapping the sustainability social system



Source: Researchers' depiction

The roles of investment managers (investors), asset consultants, trustees and principal officers are interrelated. Essentially, investment managers do not have absolute discretion in the application of resources. The critical role of fiduciaries—asset consultants, trustees and principal officers—was highlighted concerning the ultimate allocation and disbursement of resources based on specific investment management mandates that govern them.

The precise issue is mainly the extent to which sustainability assets form part of the investible asset-class universe that determines portfolio risk and return criteria. The opinion from an asset management respondent was that sustainability assets have not been broadly introduced or incorporated into the investable universe by fiduciaries. In developing investment mandates, the overall view of fiduciaries in terms of maximising asset returns is from a global perspective. Hence, there are no country-specific considerations when making ESG investment decisions. This global perspective is supported by Lundblad (2003) who attests that the diffusion of, for example, financial instrument products, can present as a global phenomenon.

There is a perceived and real issue in respect of the government's capacity and willingness to make the transition to meet net-zero targets or carbon neutrality. The country's high negative exposure to hydrocarbons makes the trajectory steep. High negative exposure to hydrocarbons is a partial consequence of:

- a) limited institutional capacity to transition away from hydrocarbons;
- b) dependence on foreign currency receipts;
- c) high debt levels and the impact on debt serviceability;
- d) low-income levels and the impact on transition resilience and tolerance; and
- e) the highly disruptive nature of the net-zero and carbon-neutral transition.

There is a need for holistic short- to long-term policy initiatives that support the practicality and implementation ability of sustainably financing for environmental and social issues. The government authorities have a responsibility and a leadership role to play in:

- a) planning;
- b) the design of regulations and legislation;
- c) facilitating and guiding the standardisation of taxonomies and frameworks;
- d) promoting uniformly understood best practices; and
- e) creating harmonisation and global convergence.

The importance of standardisation and harmonisation of frameworks and taxonomies is highlighted by the role of other stakeholders, who essentially function as intermediaries, who are considered to be change agents, opinion leaders and innovation champions, and are credited with actively engaging in the development of the market. These include the following organisations:

- a) Carbon Trust,
- b) International Capital Markets Association,
- c) Loan Market Association,
- d) New Business Initiative, and
- e) National Treasury.

The multitude of stakeholders within the sustainability markets closely reflects the definition provided by Greenacre, Gross and Spiers (2012) in that the process of innovation diffusion does not necessarily follow a linear projection, from one entity or actor to another, but rather comprises dynamic and complex systems that involve interrelated and interconnected factors and entities.

6.3 Importance of data and information

There is an overall perception that the availability of data and information about sustainability markets is relatively scarce. The available information is described as not providing adequate detail for decision making purposes. For instance, Respondent 1 laments that "... if I want to issue a green bond from step 1 to the last step, what would be required—I don't think that information is readily available". Respondent 5 also emphasises the deficiency of information by pointing out that "... the principles are agreed, but how to implement those principles on a tangible, practical basis is what is being

developed and is developed as we speak”. Respondent 7 also supplements the phenomenon with the following point of view: “... I don’t think there is a clear set of rules yet in terms of what is a minimum level of information that needs to be furnished, but those parts are necessary to be able to ascertain if the sustainability objectives make sense or not.”

The dominance of the banking sector also appears to influence the concentration of data and information amongst the top five banks in South Africa. International development finance institutions also facilitate the channelling of information from developed sustainability markets. Informal discussion panels and conferences exist amongst industry participants as well, and these are mostly arranged by the banking sector.

The general information and data infrastructure on sustainability instruments is still being developed. There are “small pockets” of data and information that participants can access through online sources, but this presents a problem of reliability, consistency, and accuracy. Most of the data and information that is available is drawn from international sources, but also this information is not necessarily retrieved from common sources.

Data and information on sustainability assets are especially important when considering the risk of what is termed “Greenwashing”; that is, the practice of labelling some assets incorrectly to qualify them as sustainability assets. This information is provided by “second-party opinion providers”, who are independent for-profit organisations. Respondent 3 commented on this issue: “... the point is that with second-party opinions is that do you think that private companies suddenly can drive the clean world environment? They can’t, they can’t drive the clean environment”.

Data and information management also occurs through the development of taxonomy—the South African Green Taxonomy document—which “... has not been tried and tested in our local context, and most of its content has been borrowed out of Europe. So, we do not have any track record of implementation in the South African context”. In effect, the perception is that international reference points cannot necessarily be translated to South Africa.

Adapting European standards for sustainability taxonomy appears to have a cause for confusion as to its practicality for the South African conditions. This is predominantly the case where a framework is being developed for a funding structure that is negotiated on a bilateral basis. However, for listed sustainability instruments, the Johannesburg Stock Exchange, which acts as a regulator and intermediary, facilitates to some extent the standardisation of terminology through the compulsory listing requirements. Statistics South Africa is also credited with being a reliable and consistent source of sustainability data and information, but this is limited to energy projects.

As to the available data and information, there are also issues of interpretation. The respondents' perception was that there was no consistent and common interpretation or understanding of the salient elements. Because the industry is amending foreign material into localised conditions, there are evident translation risks. Hence, the banking sector has become the primary source of advice in respect of the development of taxonomy and contractual frameworks. The banking sector themselves reference their sources from for-profit international information platforms like Bloomberg and Reuters. Hence, the dissemination and receipt of informational data are based on relationships and trust, without the benefit of independent third-party verification.

The frameworks define different categories of sustainability labels that include green bonds, sustainable bonds, social bonds, and sustainability-linked bonds. Each category is defined in terms of its unique taxonomy. However, their distinguishing factor is in the use of proceeds, except sustainability-linked instruments which need to only identify and meet specific predetermined targets, for example, SDG targets. However, in the South African context, there are no well-defined net-zero or carbon-neutrality goals, especially targets that tie in with the developing taxonomy. This is compared to the EU situation where there are legally binding targets to net-zero and there is a well-defined taxonomy around targets and goals.

6.4 Value and comparative advantages

The overall assessment of the value and comparative advantage of sustainability instruments over convention instruments rests on the ability to have distinguishable

matrices that reflect price, volume, liquidity and tradability. There are no identifiable or tangible advantages based on price, liquidity and tradability.

Value is realised predominantly from the quantum of funds that are made available for sustainability assets emanating from the increased awareness of environmental, social and governance imperatives aligned with the sustainable development goals. As one respondent commented: "... it is more of a depth of capital conversation than a pricing of capital conversation".

The depth of capital does not necessarily translate into liquidity because the South African sustainability market is still relatively small, and where there is tight liquidity, the pricing measurement of instruments can be inaccurate and not truly reflect macroeconomic fundamentals.

The process of risk measurement involving the credit-rating agencies utilises a balance sheet approach. The risk of a potential default is measured on the strength of an issuer's balance sheet in the case of both use-of-proceeds bonds and sustainability-linked bonds. Hence, the pricing of the bonds is viewed as not being reflective of the true risk characteristics of a particular sustainability asset or project. The rating agency frameworks for assessing sustainability risk is still under development in the South African context.

From investment manager and investor perspectives, additional disclosers present an opportunity to better evaluate the risk elements of an asset or portfolio of assets. The nature of ESG-related disclosers is advantageous for synthesising future non-financial risks that can also manifest in embedded financial risks. This approach is also consistent with shareholder demands for more balanced reporting of corporate performances through a balanced scorecard.

There is also a public relations dividend that accrues from being identified as an ESG-conscious industry participant, resulting in organisational marketing benefits like reputational enhancements and visibility.

6.5 Levels of complexity

Respondents describe the administrative aspect of pre and post-implementation processes as being considerably more cumbersome when compared to conventional instruments. Respondent 2 alludes to the fact that "... from a structuring perspective, not that complex, but from a reporting and follow up, it is actually very complex". Respondent 4 supplements this observation: "With traditional bonds, you need a facility agent, and you need a rating agent. I think with a green bond you have added complexity, I now need a framework agreement as well, and you need an independent audit so you can measure the progress you are making in terms of your commitment. So, I think it is more complicated."

The frameworks that have to be developed need to contain detailed information on eligible categories of assets, the market consensus on labels and definitions, and an understanding of the emerging taxonomies. Sustainability structures are also complex because they are unlike the typical balance sheet issuances where it is for general purposes. As such, the level of challenges experienced is determined on a relative basis as opposed to an absolute basis. An insight provided by Respondent 7: "I haven't seen a large degree of consistency because sectors are also very different, and you have got to treat each sector differently in terms of what is possible from a sustainability perspective or what are the material issues for each of those sectors."

A distinction is made between use-of proceeds instruments versus sustainability-linked instruments in terms of their respective levels of complexity. From a structuring perspective, use-of-proceeds instruments are considered less complex than sustainability-linked instruments.

For use-of proceeds instruments, the starting point is in the process of alignment with SDG indicators, then these indicators must provide a measurement reference point, followed by continuous reporting on the measurements. These processes require an ability to be able to extract details on actual targeted spending on sustainable assets and build a legal framework for each cluster of projects. These are operationally cumbersome.

Sustainability-linked instruments are considered relatively more complex to structure from a legal term agreement perspective because the market for this instrument is still new and there are as yet undefined market practices. There are currently no clear market standards that have been developed for these kinds of products across the board. However, from an operational perspective, it presents less complexity because it is perceived to be easy to align with how an entity has designed its strategic sustainability implementation plans; that is, it aligns with what they already plan to do. It is easier then if an entity has got systems and structures in place to monitor specific SGD and/or ESG data, to overlay that with what is existing.

The need to exemplify the principle of additionality is an additional complexity issue. Respondent 4 is quoted: "... it is all about ensuring that you can package a product which retains its credibility and integrity and really the principle of additionality, that you are actually moving the dial. You want to be able to say that this is forward-looking, and you are advancing additional outcomes".

Overall, sustainability instruments present more challenges and complexity mainly due to:

- (i) the time and resource requirements for due diligence;
- (ii) strict requirements for reporting over the life of a project;
- (iii) designing new framework agreements; and
- (iv) provisions for independent audits.

So, in general, the levels of complexity result primarily from the aspects of operational support. A respondent is quoted: "... in terms of the administration and the follow-up and making sure that the funds have been used and all requirements from an investor have been ticked. We have got to follow up on all these projects. It is very complex".

6.6 Change agents and structures

In the respondents' opinion, there are only a few active change agents, and the most prominent of these are the JSE, institutional portfolio managers, development finance

institutions and the banking sector. The JSE has been credited for its role as an intermediary and regulator. The exchange has been key in driving a consultative process that led to the partial development of the national taxonomy in the form of listing requirements. The exchange has also established a platform that is dedicated to the listing and trading of sustainability-specific securities.

Respondent 8 notes that some institutional portfolio managers are actively supportive of the market, but the sentiment is that there is still a lot more that these entities can do to make a significant impact. Respondent 5 comments that "... the adoption of green principles and green loans and all this stuff is quite heavily being driven by issuers more than investors". It is also noted that their meaningful participation is dependent on the investment mandate instructions given by asset consultants, trustees, and principal officers. Therefore, it is feasible to get the impression that there are concerns regarding the apparent lack of initiative and enthusiasm by institutional portfolio managers to proactively engage issuers in the developmental phases of sustainability projects.

Development finance institutions are considered to be valuable stakeholders and change agents due to their sizable resource endowment, the ability to provide concessional finance, their international experience, their skills and knowledge transfer capabilities, and their broader focus beyond commercial projects and inclusive of social aspects of sustainability.

The banking sector dominates the market from multiple fronts: the scale of funding capacity, project initiation and development, as mentioned earlier in this document.

6.7 The extent of innovativeness

The dominant sentiment is that the sustainability instruments are often compared to the conventional vanilla-type instruments in terms of risk and return features. Investors and issuers have to make critical judgements concerning the value generated by a sustainability instrument of the same monetary quantum. The immediately observable advantage for an issuer is focused on the reputational aspect of subscribing to the ideals of environmental sustainability and social imperatives.

Respondent 5 describes sustainability bonds as being essentially vanilla bonds with user proceeds and/or with general SGD performance indicators; that is, they remain just a bond with certain obligations. The obligations centre around the requirements to provide more integrated reporting and disclosure. However, elements of innovation are likened to the tools that the industry has created to deal with these obligations. For example, the JSE has conceptualised the establishment of virtual data rooms where a typical bondholder can go into that data room and access information on a widely distributable platform.

Respondents 3 and 4 identified the sustainability instruments as a new asset class that is essentially an extension of fixed-income assets. An example of an innovative asset would be created with absolute distinctive features and functions: for example, the collateralised mortgage bond securities that were a primary cause of the 2007 to 2009 global financial crisis. Such securities are designed through quantitative engineering by investment banks to maximise returns and manage risks, as opposed to sustainability instruments that are redesigned only to cater for environmental, social, and governance initiatives and purposes.

Ultimately, the fundamentals of investment concerning sustainability debt instruments are perceived to not have changed. That is, the bond is still a bond, interest is interest, and risk is risk. Those parts have not changed. Participants are still issuing under the same pricing supplements and then it is complemented by additional disclosures.

The above argument is supported by Frame and White (2004) who suggest that to qualify as financial innovation, there must be an introduction of a new element to the financial system, for example, new products or new services that improve the wants and needs of savers and deficit entities, while also reducing risk and costs. Arthur (2017) also argues that financial innovation must reflect radical and incremental creations that produce new ways or changes to the way a financial activity is carried out.

An argument in support of the innovativeness of sustainability instruments considers the fact that such instruments are forward-looking, and they embed sustainability performance targets into the instrument. The specific requirements in respect of the use of proceeds,

the setting of predetermined key performance indicators and supplementary disclosure requirements introduces an element of innovation. Additionally, there are differentiating aspects in respect of specific industries and project types. However, the fundamental structuring processes are not dissimilar to those of normal conventional bonds.

The differing views expressed concerning the assessment of the extent of innovation are consistent with the definition provided by Quintaine (2011) that, ultimately, assessments are a product of an individual's or organisation's subjectivity and knowledge base. Respondents who were inclined to define sustainability instruments as innovative were professionals within the banking sector, and their perception is assumed to be drawn from their extensive knowledge advantages.

6.8 Rate of adoption, observability and testing

For the general market in South Africa, the rate and pace of adoption of sustainability instruments is still very low. The rates of adoption are different according to whether the instruments are use-of proceeds or sustainability-linked. Proceeds instruments have been adopted slower than sustainability-linked instruments.

Despite the proceeds instruments being perceived as being less "complex", on an all-in cost comparison and over a long-term horizon view, they outweigh sustainability-linked instruments. Respondent 6 said the following: "... for user proceeds, the people that could easily adopt, adopted, and anyone else stayed away because it was too complicated, it just took too much effort and too much time actually".

The relative newness of sustainability-linked instruments means that industry participants leverage off an environment that is not yet strictly regulated, there are no requirements for second-party opinions and fewer internal operational costs.

The rates of adoption are positively correlated to the extent that information about each respective instrument is accessible and observable. This encompasses the levels at which the industry participants are aware of and can structure each framework. For example, a respondent is quoted as saying that "... it just depends on who can bring it (information,

data and structural concepts) here and implement it the fastest, and obviously who has clients and the client relationships that are willing and happy to do it with them”.

Supporting the rate of adoption is the availability of the underlying pipeline of projects and the creation of an environment where projects with ESG characteristics thrive. Additionally, it is about effecting implementation strategies and finding the balance concerning having onboarded qualifying investors and aligning investor expectations with a pool of risk-adjusted projects. There also appears to be a consensus regarding a lack of collaborative effort, through an organised, thorough and diligent process, in the development of projects towards a stage that is ESG bankable.

The development of legal frameworks is still at an early stage resulting in fragmented applications of general templates of what an ESG framework should look like. The legal frameworks that define each portfolio of projects need to be robust and broad enough not to create limitations on which projects could qualify under each framework. The adoption rate factors in the additional administrative costs and timeframes in which to engage with intermediaries, such as the second-party opinion agencies and the legal processes.

Observability is related to the ease with which data and information can be accessed and synthesised. The size of the market affects observability, for example in the form of price discovery. The market can best be described as one that is nascent and there is not enough activity in the market to create a substantial pool of data points that would enable an in-depth analysis of information (Appendix B). Despite the few data points that are available coming from the sustainability bond markets, the sustainability loan markets are even less observable because these are concluded in private over-the-counter platforms. Respondent 2 said the following: “... because these instruments have not been generally adopted by the market, so it is not observable, especially in the Southern African context”.

Here, the concept of testing relates to the inclination of industry participants to learn from the experiences of their peers, both domestic and international, before designing and implementing sustainability-funding strategies. This is especially evident in the design and development of frameworks.

Because the sustainability market has not yet formulated a standardised and harmonised template for frameworks, these frameworks have to be designed on a case-by-case basis due to the existing nuances of differing industries, project profiles, use of proceeds and sustainability indicators.

Chapter 7: Conclusions and recommendations

7.1 Principal conclusions

7.1.1 Alignment with global sustainability imperatives

The South African financial markets have made an undertaking to transition away from fossil fuels and climate-negative economic activities. The transition ideology is encapsulated in an official programme to support the development of clean energy generation in South Africa. There is a common understanding of the visions underlying the United Nation's Global Sustainable Development Goals, the African Union's Agenda 2063, South Africa's National Development Plan, and South Africa's Nationally Determined Contributions. The overall perceptions are that transition is inevitable and that the timing is a function of COP26 directives and country-specific targets. Bui (2015) highlights the importance of the collaboration of key members of the ecosystem in effecting strategic decision making and assessing the value proposition of innovations. The need for and the pursuit of an alignment of global sustainability imperatives finds acceptance within cognitive-institutional diffusion theory by exemplifying the role of collective organisational actions that are brought about through shared information and commonality of understanding the context of decision-making processes (Bui, 2015).

South Africa, like most of the African continent, is endowed with fossil fuels and the economy is fossil fuel dependent, with the largest emitters being state-owned companies. In the African continent context, the transition processes have been driven by an emphasis that places environmental and social sustainability issues as being the most important. While climate change issues are easily observable and sometimes quantifiable, however, there are transition risks based on the relatively low levels of energy consumption, emissions and use of fossil fuels, as compared with the developed global economies. For example, Africa accounts for less than 3% of global emissions and accounts for approximately 3.5% of global energy consumption, while coal accounts for only 20% of energy generation.

7.1.2 Innovativeness of sustainability instruments

The features of debt markets catering for sustainability bonds are not dissimilar to conventional debt markets. The market participants in their majority consider sustainability instruments as being a new asset class, rather than being an innovative financial instrument. Factors in support of this position are the underlying units of measurement: price, volume, tenor, and risk. The lack of qualifying criteria for sustainability instruments as innovations is reflected by Redmond (2013), who indicated that innovative instruments should exhibit radical and ground-breaking characteristics in the perspective of the adopters.

The research's theoretical framework based on Rogers's Diffusion of Innovation theory (Rogers, 2003) uses the criteria of relative advantage and value to assess innovativeness. The research outcome is that no tangible advantages or value are accruing out of the use of sustainability instruments, except for volume. The definition of volume in the context of debt markets talks to the quantum of funds that are attracted and are available for investment.

The conclusion drawn from respondents is that sustainability debt instruments do not necessarily offer better pricing advantages but rather offer investor diversification and volume. Market participants value pricing advantages the most and, data generated by prevailing market activity suggests that any pricing advantages are a result of demand pressures emanating from an increased interest in sustainability assets by the investment community.

In terms of value, the new asset class presents more cost disadvantages due to the additional operational and administrative processes that are prescriptive. Costs unique to use-of-proceeds instruments are associated with the requirement for a detailed breakdown of the assets intended for funding, impact assessment reporting, certification criteria of qualifying projects and continuous reporting. For sustainability-linked instruments, there are additional transaction risks based on the underachievement of predefined key performance indicators. For both instrument types, the structuring

processes have to be supported by legal frameworks which are currently not formulated or applied consistently across the industry.

7.1.3 Foundations of the social system

The sustainability ecosystem is made out of both local and international entities and organisations, including the government. Referring to Rogers (2003), an ecosystem is defined by the actions and behaviour of participants within an industry or community who impact the diffusion process. The system involves opinion leaders, change agents and innovation champions. The research reveals that the most influential of these are domiciled outside of South Africa. For instance, Respondent 5 acknowledges that "... where there is a lot of activity happening is through national treasury and that kind of collaborating with the Carbon Trust to develop the SA taxonomy. So, they are trying to (create something) very similar to Europe, to define what are green activities and define all that". Further, respondent 6 credits the international community as being "where your thought leadership and your innovation would lie, is internationally".

The most influential amongst those domiciled in South Africa, and who are described as South African by origin, is the investment banking community ("banks"). Banks have a comparative advantage based on an established tangible and intangible infrastructure network, in financial and human resources, and access to data and information. The dominance of banks heavily influences the type of sustainability projects that can and are funded in South Africa. These projects tend to be more commercially oriented, driven by the underlying profit motive-driven business model of banks, as opposed to socially-oriented infrastructure projects.

Referencing Rogers (2003), the banks play a dominant role in the five stages of diffusion and adoption processes. They are the primary custodians of *knowledge*, and their networks provide them with the platforms to expose the industry to the development of sustainability instruments. The banks also carry the ability to *persuade* the market through their role as key advisors. The stages of decision, implementation and confirmation are also attributable to banks since they are active as investors, intermediaries and issuers in the value chain developing sustainability instruments.

The basic function of sustainability instruments is to provide corporates and other organisations with the ways and means to capitalise on their strategic objectives. Hence, any consideration for the use of sustainability instruments has to primarily be aligned with business objectives or organisational mandates. The process of alignment is perceived to present lesser challenges in instances where an entity has pre-emptively incorporated sustainability principles into its operational and strategic structures. This process requires unconditional support from decision-making structures, for example, shareholders and senior management. The research reveals that the adoption of sustainability principles is broadly accepted in South Africa and that these principles are being integrated into long-term strategic planning.

According to Respondent 4, the sustainability market is in its infancy and the nominal value of listed transactions amounts to only ZAR 10.4 billion—a relatively small quantum relative to the conventional debt market. Respondent 8 alludes to the fact that the investor base of debt capital markets is characterised by what is termed “buy and hold investors”, that is, there is a minimal exchange of instruments in the market. The research reveals that the combination of market size and investor behaviour exacerbates the lack of observability of sustainability instruments in terms of data and information that accurately reflect the instruments’ macro fundamentals. Respondent 8 notes that “... it is quite incredible that that might happen because obviously in the background right, interest rates are changing, economics are changing, so you can actually find the asset valuation versus the economic fundamentals markets at the time may actually be out of sync”.

Hence, without the ability to have clear insight into the valuation aspects of sustainability instruments, it would be reasonable to expect some participants to opt for a wait and see approach before affecting sustainability-adoption strategies. There are concerns around the extent to which there is a misalignment of interests within the ecosystem itself and in terms of a prevailing asymmetry of information prevalent in the sustainability debt markets. For example, some participants find difficulty in distinguishing between environmental, social and governance assets because of the interconnectivity of these issues.

The tendency to benchmark South Africa's sustainability framework against the EU experience is understandable to the extent that it is a more mature market with established common law and law treatments. Therefore, it would be in line with the processes that have been followed already on developing the conventional financial market infrastructure. The research reveals that there is no justification in there being a bespoke Africa-specific set of rules. It makes sense that South Africa strives for some sort of broad, global standard so that it makes it easier to communicate globally because capital is tangible and is global. Any particularity would be expected to emanate from government policy.

The argument above is supported by the definition provided by Arthur and Khraisha (2018) that the rate of financial diffusion occurs through a process of imitation within a social system that is driven by a profit motive. Also, in the South African context, the economic policies are considered to be liberal, and the economy is dominated by the financial services industry. These factors, according to Su and Si (2015) and Forrer and Forrer (2015), manifest in strong financial markets that lead to intermediaries like commercial banks rapidly adopting innovation while regulators often take a reactionary approach to financial innovation.

7.1.4 Data and information-sharing platforms

There are concerns in the market concerning the reliability of ESG data. This stems from the situation where different companies provide measurement matrices that are not consistent. This is the case even with rating agencies where reporting is not consistent on ESG measures. Investors anticipate forward-looking reporting on risks and opportunities, specifically on two kinds of risks:

- a) Transition risk: This relates to the use of carbon pricing as a proxy for transition risk and the future movement thereof, including the financial impact of increased regulations under different scenarios and time horizons. Transition risks also manifest through:

- I. government's reliance on a carbon-driven economy on the fiscus;

- II. contribution of hydrocarbons to government revenue;
- III. contribution to foreign exchange receipts; and
- IV. contribution of carbon-intensive sectors to the economy.

b) Physical risk: This risk is assessed at an asset or product level by measuring possible variations of return on investment.

There is an issue concerning the rating processes and second party opinions in that they are perceived to be subjective. While some industry participants use proprietary measurement instruments that do not rely on third-party providers, for example, artificial intelligence-based models and fundamental qualitative analysis, it is important to have an aggregated measurement and disclosure system. The research reveals that there are no tangible benefits in the current fragmented individualistic measurement approach.

In summary, requirements for the development of sustainability debt markets include:

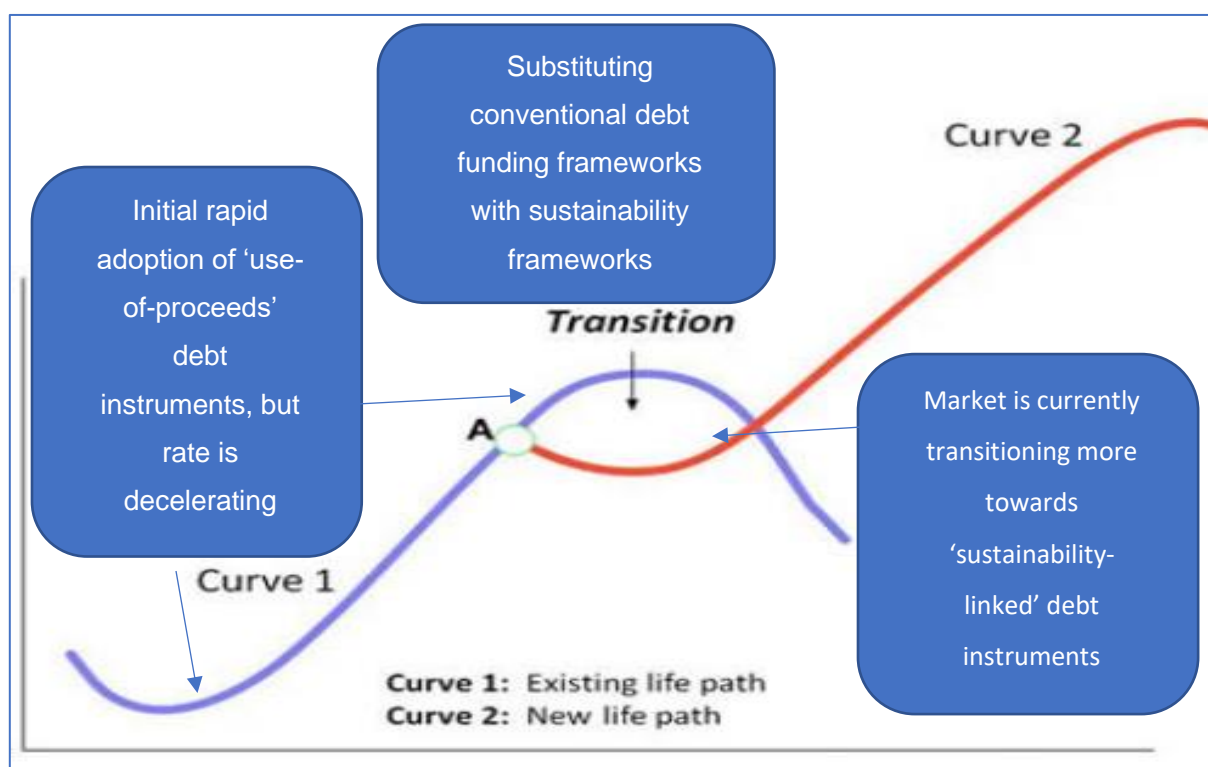
- a) complete development of new taxonomy and frameworks;
- b) engagement with second-party opinion processes;
- c) improving the underlying motivation of investors;
- d) assessment and confirmation of the eligibility of assets and projects;
- e) packaging projects for size, scale and attract-ability;
- f) crowding-in development finance institutions, domestic and international financial institutions, multilateral organisations and other relevant stakeholders;
- g) developing carbon-accounting methodologies;
- h) developing incentive and/or punitive mechanisms;
- i) extending the sustainability debt market to the loan market through commercial banks;
- j) enhancing supply dynamics through corporate strategic funding initiatives; and
- k) developing competent intermediaries within the ecosystem.

In terms of the innovation-decision stages of adoption described by Rogers, the research finds that the South African debt markets have passed the knowledge, persuasion, and

decision stages. In Graph 4 below, the sigmoid curve illustrates the current stages of implementation and confirmation as characterised by:

- (I) the process of integrating sustainability policies into corporate strategic planning;
- (II) substituting conventional debt-funding frameworks with sustainability frameworks; and
- (III) transitioning away from “use-of-proceeds” instruments and developing “sustainability-linked” instruments.

Graph 4: Illustration of the Sigmoid curve for sustainability debt instruments



Source: Adapted from Sigmoid curve | Business change cycle | Stages of business growth (coachingwithnlp.co)

7.2 Theoretical contribution

The research contributes to theories on innovation diffusion in general and financial innovation diffusion in particular. Referencing McGrath and Zell (2001), the development of financial markets through the creation of additional investable asset classes has the potential to impact the fields of economic development and management.

The research does not make any findings regarding the role of sustainability markets in enhancing economic activity. This observation is highlighted in the context of the definition provided by Qamruzzaman and Wei (2018) that positions financial innovation in the context of economic development through the activities that enhance the systems that optimise the allocation and distribution of scarce resources.

Unlike the financial instrument innovations that are cited as being responsible for the financial crisis of 2007 to 2009, the innovation of sustainability financial instruments is perceived to be beneficial for societal welfare and global economic potential.

The sustainability markets need to achieve meaningful increments in size in order to accrue added benefits beyond investor diversification and volume. Price, tenor, and liquidity benefits can be unlocked where a large group of participants have accepted the added value of sustainability instruments, especially where there is a widespread and common understanding of the taxonomy (Khraisha & Arthur, 2018).

The research highlights the gaps that exist in the development process, such as the legal frameworks, accounting treatment, management and dissemination of data and information, quantitative risk assessment methodologies, governance and market concentration.

Overall, the research reveals that sustainability instruments are innovative in terms of responding to the issues, challenges, and needs of the day, including in the way in which it is purpose-led, be it for the specific use of proceeds or linked to measurable targets. The innovation, predominantly, emanates from corporates having a specific need that they are being pushed by shareholders to demonstrate, that they are building a sort of resilience into their businesses, sustainability, and in line with ESG principles or the Paris Agreement. Therefore, it is an innovation in the context of the South African markets through the use of traditional debt instruments to achieve sustainability objectives with different terms and conditions.

7.3 Implications for management and other relevant stakeholders

Sustainability finance is expected to be an important and indispensable feature in the disciplines of organisational development, corporate financial management and the financial markets. The traditional processes and decision-making criteria are being challenged by the advent of a new asset class that has the potential of being a compulsory element in the design and financing mechanisms of corporate strategies.

Any resistance to the adoption of sustainability instruments has the potential to negatively impact an entity's cost of capital. The observable trend is that each entity will be required to, as a routine, maintain and commit to a certain level of ESG credentials, which will be rated in the same way that credit ratings are applied by investors. Hence, entities may have an ESG rating and companies with a lower ESG rating would be expected to pay a premium for their debt and credit facilities; much in the same way a company that has got a low credit rating is expected to pay a premium for debt and credit facilities. The fundamental strategic risk is in being allocated a deficient ESG rating that affects investor perception to the extent that it damages corporate reputation. Hence, companies will be expected to achieve some form of minimum standards soon, and these will need to be integrated into long-term strategic decision-making frameworks.

7.4 Limitations of the research

The research interviews were conducted virtually due to regulated COVID-19 conditions. There were difficulties in accessing individuals for the chosen sample which resulted in the final sample size comprising 9 participants instead of the target of 12. However, the point of saturation was reached after the eighth interview.

The research could have been enhanced with interviews from the extended asset management community which includes:

- a) principal officers of pension funds,
- b) retirement fund consultants,
- c) trustees of medical aids, and

d) other fiduciaries.

7.5 Suggestions for future research

The research contributes to the ongoing discussion around the rate and pace at which financial innovation spreads in the South African environment. The research follows the suggestion by Frame and White (2004) regarding the need for additional empirical studies aimed at increasing the depth and breadth of understanding the conditions precedent to adoption and diffusion rates. Khraisha and Arthur (2018) also note the gaps prevalent in the study of the diffusion of financial innovation

Future research can refine the applicability of Rogers's framework as a basis of analysis for the diffusion of financial innovations, especially in respect of diffusion amongst individuals and organisations in developing economies.

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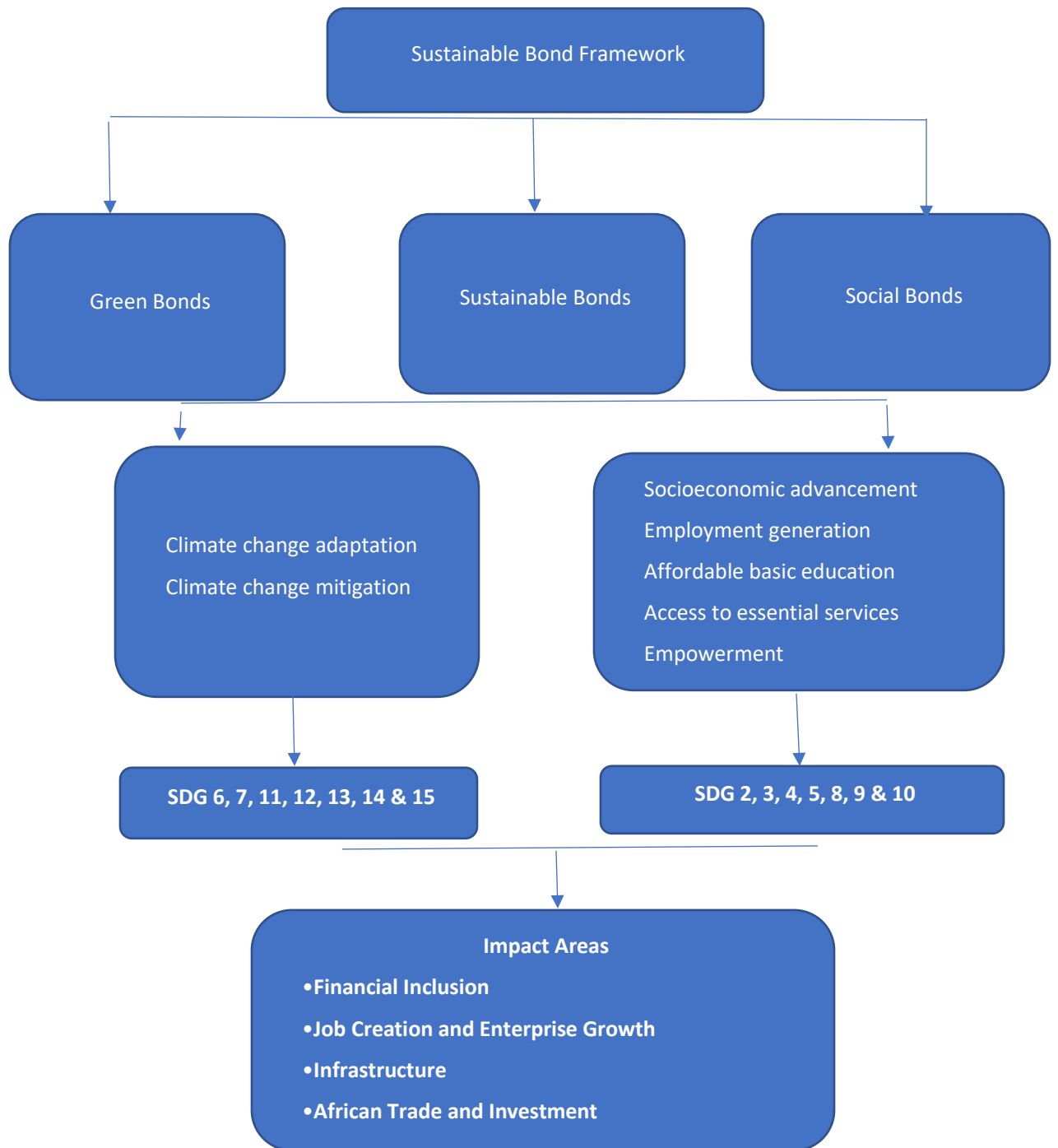
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Appendix A: Sustainability Bond Framework
Adapted from Standard Bank



**Appendix B : Market Size: South Africa Green and Sustainability-linked Bonds.
Issuance in local debt capital markets**

| Issuer | Issue Year | Tenor (Years) | Nominal Size Issued |
|---------------------------------------|-------------------|----------------------|----------------------------|
| City of Johannesburg | 2014 | 10 | 1 458 000 000 |
| City of Cape Town | 2017 | 10 | 1 000 000 000 |
| Growthpoint Properties Limited | 2018 | 5 | 300 000 000 |
| Growthpoint Properties Limited | 2018 | 7 | 240 000 000 |
| Growthpoint Properties Limited | 2018 | 10 | 560 000 000 |
| Nedbank Limited | 2019 | 3 | 616 000 000 |
| Nedbank Limited | 2019 | 5 | 715 000 000 |
| Nedbank Limited | 2019 | 7 | 331 000 000 |
| Nedbank Limited | 2019 | 3 | 495 000 000 |
| Nedbank Limited | 2019 | 5 | 505 000 000 |
| Nedbank Group Limited | 2020 | 5 | 2 000 000 000 |
| Clindeb Investments Limited (Netcare) | 2021 | 2 | 1 000 000 000 |
| Investec Property Fund Limited | 2021 | 3.2 | 800 000 000 |
| Emira Property Fund Limited | 2021 | 3 | 380 000 000 |

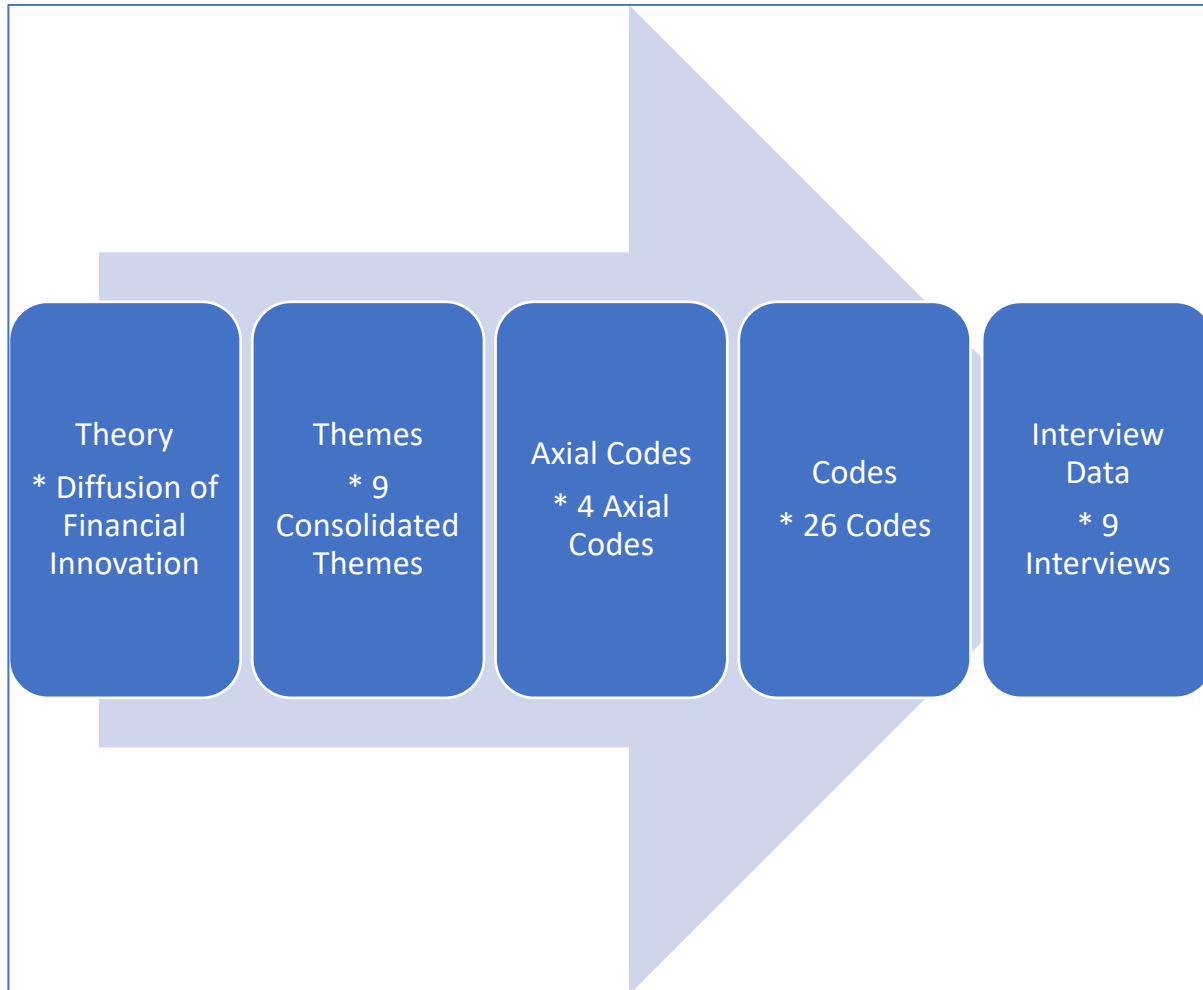
Appendix C: Timescale and resource requirements

| Task | Targeted completion date |
|------------------------|--|
| 1. Literature review | An extensive literature review has been conducted. The research question has been formulated through the literature review process. |
| 2. Interviews Design | Questions for the semi-structured interviews are designed for qualitative primary data collection. Interviews were conducted virtually utilising online platforms like Zoom and Teams. Interview designs were completed by the end of June 2021. |
| 3. Interviews | Interviews were concluded during September and October 2021 and depended on the availability of respondents. |
| 4. Data Analysis | Data analysis and coding will be completed by the end of September 2021. |
| 5. Research draft | The first research draft was completed by 16 October 2021. |
| 6. Research completion | The final research report was completed and submitted on 01 November 2021. |

Appendix D: Consistency matrix

| Proposition | Literature review | Data Collection tool | Analysis |
|--|--|----------------------------------|--|
| <p>Proposition 1 Green bond instruments are a financial innovation</p> | <p>(Marques, 2014) (Redmond, 2013) (Quintane, Casselman, Reiche, & Nylund, 2011) (Baregheh, Rowley, & Sambrook, 2009) (Greenacre, Gross, & Speirs, 2012)</p> | <p>Semi-structured interview</p> | <p>Holistic assessment of industry-specific interpretation of innovation characteristics.</p> |
| <p>Proposition 2 The proliferation of Green bond instruments can be explained concerning Diffusion of Innovation theory</p> | <p>(Lundbland, 2003) Invalid source specified. (Redmond, 2013) (Tufano, 2003) (Dearing & Cox, 2018) (Su & Si, 2015) (Forrer & Forrer, 2015) (Anh Tu, Sarker, & Rasoulinezhad, 2020) (Shiller, 2013)</p> | <p>Semi-structured interview</p> | <p>Assessment of conditions precedent to adaption and diffusion rates throughout the system comprising industry professionals and institutions</p> |

Appendix E: Deductive coding process. Deducing from theory what is contained in the data.



Appendix F: Code list

| Code | Grounded | Density |
|----------------------|-----------------|----------------|
| Adopter | 8 | 0 |
| Adoption | 9 | 0 |
| Advantage | 38 | 0 |
| Change agents | 43 | 1 |
| Communication | 19 | 0 |
| Complexity | 45 | 1 |
| Funding | 80 | 0 |
| Individuals | 7 | 1 |
| Information | 63 | 1 |
| Innovation | 26 | 1 |
| Innovation champions | 13 | 0 |
| Innovator | 3 | 1 |
| Laggard | 0 | 0 |
| Majority | 1 | 1 |
| New | 0 | 1 |
| Observability | 24 | 1 |
| Opinion leaders | 15 | 0 |
| Pace | 9 | 1 |
| Platforms | 9 | 1 |
| Rate | 34 | 1 |
| Sharing | 8 | 1 |
| Structures | 39 | 0 |
| Testing | 15 | 0 |
| Unique | 0 | 0 |
| Unprecedented | 0 | 1 |
| Value | 61 | 0 |

Appendix G: Interview guide

| FOCUS AREA | EXAMPLE OF QUESTIONS / INQUIRIES |
|---|--|
| Individual background and experience | <ul style="list-style-type: none"> • Kindly provide a brief background of your qualifications and experience. |
| Understanding the Industry structure and market characteristics | <ul style="list-style-type: none"> • In your opinion, how would you define the state of the South African debt capital markets? • In terms of depth, liquidity, participants, infrastructure...? |
| Understanding the Financial innovation itself | <ul style="list-style-type: none"> • Does your organisation consider green bonds to be an example of financial innovation? • Do green bonds offer any relative advantages over other instruments for your organisation? • Are green bonds compatible with your overall corporate strategy? • Would you define green bonds as complex instruments? • Do you find it necessary to test and assess green bonds before adopting and implementing? • Is data and information about green bonds easily observable? |
| Understanding the financial markets social system | <ul style="list-style-type: none"> • Who are the opinion leaders? • Who are the change agents? • Who are the innovation champions? |
| Understanding the communication channels and process | <ul style="list-style-type: none"> • To what extent is there a common understanding in respect of information on green bonds? • What are the common sources of information? • Are these sources reliable or offer value? • What platforms offer channels of information sharing? |
| Understanding the "Time" dynamic | <ul style="list-style-type: none"> ➤ Innovation-decision process <ul style="list-style-type: none"> ○ What structures and individuals are involved in the process? ➤ Adopter categories within social system <ul style="list-style-type: none"> ○ How inclined is your organisation to adopt financial innovations? <ul style="list-style-type: none"> ▪ Innovator? ▪ Early adopter? ▪ Early majority? ▪ Late majority? ▪ Laggard? |

Appendix H: Ethical Clearance

Dear Bheka Fakude,

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.

[Ethical Clearance Form](#)

Kind Regards