Project Appraisal Practices of South African Equity Real Estate Investment Trust.

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DECLARATION

I hereby declare that this thesis was composed by myself, and that the work presented herein is my own, except where explicitly acknowledged within the text. This work has not been submitted for any other degree or professional qualification except as expressly stated.

29 February 2024

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Vukani Lawrence Majozi (signature) Date

ABSTRACT

Project appraisal is the process of assessing the viability of a project or proposal, whether it can add value in shareholder wealth or not. This study aims to understand and investigate the project appraisal practices used in the South African Equity Real Estate Investment Trust.

A survey was conducted to collect data from Financial Managers and Investment Managers to analyses and answer the research question. The survey was sent out to all the 23 South African Equity Real Estate Investment Trust listed on the Johannesburg Stock Exchange (JSE) with a respond rate of 65.21%. In South African Equity Real Estate Investment Trusts, project appraisal predominantly relies on Net Present Value (NPV) and Internal Rate of Return (IRR) for evaluating investment viability. The Weighted Average Cost of Capital (WACC) is extensively used for determining the cost of capital, highlighting its critical role in financial assessments. Additionally, decision-makers frequently employ scenario and sensitivity analyses to rigorously assess project risks, ensuring a comprehensive understanding of potential impacts on investment outcomes.

This study will assist the finance and property studies academics to better understand the project appraisal process and techniques that are commonly used within the property sector, specifically the Equity Real Estate Investment Trust. This will ensure that theories are revisited and are in line with current theories. With these results, we hope that the property industry will receive them well and find them useful to know how their peers are undertaking project appraisals and use that information to improve their own practices.

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DEDICATION

To my late Parents

Makhosazane MaKhuboni Majozi

&

Bongani Simon Majozi

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1. INTRODUCTION

1.1. Background

Real Estate Investment Trusts (REITs) are companies that own income-generating properties; this is achieved by buying and earning from these properties. Originating in the USA in 1960, REITs can be equity or mortgage types, with some being hybrid (NAREIT, 2020). They can focus on various properties like commercial spaces, homes, or healthcare facilities. In South Africa, REITs replaced older investment methods and must follow specific rules, including distributing a minimum of 75% of their earnings. This means they often need to raise capital for new projects, making careful appraisal crucial (Johannesburg Stock Exchange, 2013). Project appraisal is vital for REITs as it helps in making informed decisions on property acquisitions, developments, and renovations to maximize returns for investors and maintain competitiveness in the real estate market. Ultimately, investors want to invest in a low risk vehicle that offers high returns (Acaravci, et al., 2018).

Project appraisal is a process to evaluate a project's worth, especially its potential to increase shareholder wealth. According to Ma'aji and Barnett (2019) project appraisal refers to the process of evaluating, analyzing, and selecting long-term investment projects that involve significant cash outflows. This process involves determining which projects or assets to invest in to maximize the value of the firm to its shareholders over time (Michelon, et al., 2020). The typical steps in the capital budgeting process involve generating investment ideas, analyzing investment proposals, planning the capital budget, and monitoring and post-auditing investment outcomes (Mota & Moreira, 2023).

Effective project appraisal practice contributes to financial performance by allocating resources efficiently, enhancing strategic planning, and ensuring sustainable growth and profitability (AlKulaib, et al., 2016). Financial managers prioritize project appraisal to ensure effective resource allocation, maximize shareholder value, and support strategic decision-making. Failure to follow proper project appraisal practices can lead to poor investment decisions, reduced profitability, inefficient resource allocation, missed growth opportunities, and potential financial distress for the company (Michelon, et al., 2020). As part of REITs operation, looking for new project to invest in is part of their day to day activity and it is important to do a prudent analysis of the of those project as they have long-term influence on the shareholders wealth.

1.2. Research gap

Project appraisal is important especially within the Equity Real Estate Investment Trust (REIT) sector in South Africa, remains a critical yet underexplored area in academic research. While the importance of REITs in the property industry is undisputable, there is a noticeable lack of comprehensive studies that research into the details of their project appraisal techniques. This gap is particularly evident in the South African context, where REITs have not only replaced traditional investment methods but also operate under specific regulatory frameworks. The degrees of how these entities navigate the challenges of project appraisal, given their obligation to distribute a significant portion of their earnings, are not well documented. This presents a missed opportunity for academia and industry, as understanding these processes can offer valuable insights into the

decision-making dynamics of such influential market players. Olawale et al. (2016) analyzed the impact of investment appraisal techniques on the profitability of small manufacturing firms, highlighting the importance of project appraisal. Similarly, Gilbert (2003) investigated capital investment decision evaluation in South African manufacturing firms. Maroyi and van der Poll (2012) conducted a comprehensive survey on capital budgeting techniques used by South African mining companies, emphasizing the significance of project appraisal across various sectors. However, there remains a notable research gap in the comprehensive study of project appraisal techniques within South African Equity REITs.

Furthermore, the decision-making frameworks of both listed and unlisted property funds, in relation to project appraisals, remain an area ripe for investigation. While there some understanding of the practices of prominent listed companies, the methodologies employed by their unlisted counterparts are largely shrouded in ambiguity. The potential influence of established listed companies on the appraisal processes of both fund types is an avenue that hasn't been thoroughly explored, Umair (2015) emphasized the varied use of financial tools based on corporate size practices (Umair, 2015). Given the significant financial implications tied to these appraisals and their direct impact on shareholder wealth, there is a pressing need for research that bridges this knowledge gap. Such a study would not only enhance academic understanding but also provide a roadmap for industry best practices (Mota & Moreira, 2023).

1.3. Objectives of the study

This research primarily investigates the project appraisal methods used by South African Equity Real Estate Investment Trusts (REITs) and their effects on investment choices. The study aims to:

(1) To identify and compare the specific project appraisal practices employed by South African Equity Real Estate Investment Trusts with global financial management standards.

(2) To investigate the predominant project appraisal practices adopted by South African Equity Real Estate Investment Trusts and analyze the impact of decision-makers' educational background, professional experience, and expertise on the adoption and application of these practices.

(3) To examine the methods and strategies utilized by South African Equity Real Estate Investment Trusts for determining the cost of capital in real estate investment projects.

(4) To explore the extent to which non-financial factors such as company reputation, social impact, environmental considerations, and government regulations are integrated into the project appraisal and decision-making processes of South African Equity Real Estate Investment Trusts.

This research aims to bridge the identified gap by thoroughly investigating the project appraisal methods employed by South African Equity Real Estate Investment Trusts (REITs) and their impact on investment decisions. By identifying and comparing these practices with global financial management standards, the study will provide a benchmark for the effectiveness and efficiency of local methodologies. Additionally, analyzing the influence of decision-makers' educational background, professional experience, and expertise on the adoption and application of these

practices will offer insights into the human factors affecting project appraisals. Examining the strategies used to determine the cost of capital will shed light on the financial attention and precision in REIT investment decisions. Furthermore, exploring the integration of non-financial factors such as company reputation, social impact, environmental considerations, and government regulations will highlight the comprehensiveness and multidimensionality of the appraisal process. Together, these objectives will provide a holistic understanding of project appraisal techniques in South African Equity REITs, addressing the existing research gap and contributing to improved investment decision-making in the sector.

1.4. Research questions

(1) What are the specific project appraisal practices employed in South African, compare to global standards and best practices in financial management?

(2) Which project appraisal practices does the South African Equity Real Estate Investment Trust predominantly adopt? How does the educational background, professional experience, and expertise of decision-makers within South African Equity Real Estate Investment Trusts influence the selection and utilization of project appraisal practices?

(3) What methods and strategies do South African Equity Real Estate Investment Trusts commonly used to determine the cost of capital for their real estate investment projects, and how do these methods influence their decision-making processes?

(4) To what extent do non-financial factors such as company reputation, social impact, environmental considerations, and government regulations influence the decision-making process of South African Equity Real Estate Investment Trusts when appraising and selecting real estate investment projects for funding?

To answer the research questions, we'll approach them in two parts. First, we'll explore the existing literature to answer the initial question regarding the specific project appraisal practices employed in South Africa compared to global standards and best practices in financial management. This will provide a solid foundation of understanding and context. Then, for second questions to forth question, which focus on the practices of South African Equity Real Estate Investment Trusts (REITs), will use the survey questionnaire to answer those question.

1.5. Contribution of the study

The proposed study on project appraisal practices within South African Equity Real Estate Investment Trusts (REITs) is poised to make several significant contributions to both academic research and industry practices. Here are some of the key contributions this study is likely to offer:

1.5.1. Filling the Academic Research Gap

The study addresses a notable gap in academic literature by focusing on the project appraisal practices of South African Equity REITs, an area that has been underexplored despite its importance in the real estate investment sector. By delving into the specific methodologies and decision-making frameworks used by these entities, the research will enrich the body of knowledge

on financial management within the context of South African real estate investment, providing a foundation for future studies (Chatterjee, et al., 2003; Egbide, et al., 2013). The findings can influence curriculum design in academic institutions and inform scholars on differences in financial management practices.

1.5.2. Insights into South Africa project appraisal practice vs. Global Practices

By comparing the project appraisal practices employed in South Africa with global standards and best practices in financial management, the study will offer valuable insights into the localization of financial management strategies. This comparison will highlight the unique challenges and opportunities faced by South African REITs, contributing to a deeper understanding of how global practices are adapted to fit local market conditions and regulatory environments. Practically, this knowledge can guide South African REITs in aligning their strategies with international best practices while addressing local peculiarities, potentially enhancing their competitiveness and investment appeal (Ishtiaq, et al., 2017).

1.5.3. Impact of Decision-Maker Characteristics

Exploring how the educational background, professional experience, and expertise of decision-makers within South African Equity REITs influence the selection and utilization of project appraisal practices will shed light on the human element in financial decision-making. This aspect of the study could lead to recommendations for enhancing decision-making processes, such as the development of training programs or the adoption (Michelon, et al., 2020). By identifying the characteristics that lead to more effective appraisal practices, the study can inform recruitment and development strategies within REITs, ensuring that the right skills and knowledge are prioritized in decision-making roles. This, in turn, can improve the overall efficacy and reliability of project appraisals, leading to better investment outcomes.

1.6. Significance of the study

The project appraisal process holds significance in the South African Equity Real Estate Investment Trust sector, given the substantial financial commitments these projects entail. Once a project is approved, reversing such decisions can lead to severe financial consequences, binding the company to honor agreements for the stipulated durations (Mota & Moreira, 2023; Lunkes, et al., 2015). For financial managers, the overarching aim is to increase shareholder wealth. The techniques and considerations employed in project appraisal not only influence the company's future cash flows but also shape its profitability trajectory and long-term strategic direction. Given the potential implications on shareholder value and the broader organizational strategy, it becomes imperative for financial managers to exercise meticulous diligence when appraising investment projects (Geltner, et al., 2014; Ahmad, 2013; Al-Mutairi, et al., 2018). A REIT might adopt advanced financial modeling techniques, such as Monte Carlo simulations or real options analysis. These techniques can better capture the uncertainty and variability in future cash flows compared to traditional methods like discounted cash flow (DCF) analysis. For instance, if the study finds that Monte Carlo simulations provide a more accurate forecast of potential project returns, a REIT could integrate this approach into its standard project appraisal process. This could lead to more precise risk assessments and better-informed investment decisions.

This investigation aspires to fill the existing void in scholarly knowledge, especially for those investigating into finance and property disciplines, by investigating the predominant project appraisal methods in the Equity Real Estate Investment Trust arena. By presenting an in-depth breakdown of these methods, the research hopes to be a foundation for academic activities, enriching comprehension of the distinctions of project appraisal in real estate (Mota & Moreira, 2023). Moreover, the insights collected from this research can serve as a measure for the property sector, enabling REITs to measure their projects appraisal techniques against industry norms. Such revelations can push firms to modify their approaches, ensuring they stay ahead of the curve and in line with top-tier industry practices (Bond, et al., 2019).

A crucial aspect of this research is its potential to influence decision-making blueprints in both the publicly traded and private property fund sectors. By exploring the strategies employed by listed companies in their project evaluations, the study provides critical knowledge that can direct both public and private entities in refining their project appraisal methods. Additionally, grasping the level of proficiency and expertise appointed by these listed public firms can set a standard for private funds, encouraging them to improve on skill development and talent acquisition (Acaravci, et al., 2018). This research will benefit both scholars, listed and unlisted property companies alike. It will assist scholars in shaping the curriculum in line with industry expectations and norms, while also aiding listed and unlisted companies in understanding the project practices of larger firms (Andor, et al., 2019). The study might identify specific project appraisal methods that top-performing REITs use, such as stress testing and scenario analysis. A REIT could then benchmark its own practices against these industry leaders and implement similar methods. For instance, if the study finds that successful REITs frequently use scenario analysis to anticipate various market conditions and market shifts, such as those experienced during the recent COVID-19 pandemic, a REIT could adopt this approach to better prepare for economic downturns or shifts in market demand, leading to more resilient investment strategies.

2. LITERATURE REVIEW

2.1. Project Appraisal practice and Real Estate Investment Trust Background

Project appraisal serves as a vital tool for Real Estate Investment Trusts (REITs) to thoroughly assess the inherent risks associated with potential real estate ventures, thereby empowering them to make well-informed decisions aimed at mitigating risks and fostering successful project outcomes (Dabara & Ogunba, 2019). This process of project evaluation facilitates REITs in scrutinizing the financial viability and anticipated returns of prospective investment endeavors, thereby facilitating the efficient allocation of resources towards projects that resonate with their financial objectives and strategic directives. Moreover, project evaluation enables REITs to harmonize their investment choices with overarching strategic goals and long-term growth aspirations, ensuring that each investment initiative contributes meaningfully to the overall prosperity of the organization. Through meticulous project evaluations, REITs can also ensure adherence to pertinent regulatory frameworks and industry guidelines governing real estate investments, thereby safeguarding the interests of both investors and stakeholders (Bae, et al., 2023).

2.1.1. Real Estate Investment Trust background

The Real Estate Investment Trust, known as REIT's, originated in the United States of America in 1960. Congress created it through legislation called the Real Estate Investment Trust Act, which authorized a real estate ownership structure with tax treatment similar to that of mutual funds, a pass-through entity that distributes most of its earnings and capital gains (Geltner, et al., 2014). There are two types of REITs: equity REITs and mortgage REITs. The Equity REIT owns and manages commercial properties; their main source of income is from rentals, as they act as big property owners. Mortgage REITs invest in housing loans or mortgage-backed securities and hold the properties as collateral in case one defaults. Their main source of income is the interest paid on mortgage loans. Some Real Estate Investment Trusts (REITs) opt to generate revenue from both mortgage loan interest and property rentals; these are referred to as hybrid REITs since they combine both mortgage interest and equity. (Leong, et al., 2014).

REITs can either specialize in one property asset class or have a diversified portfolio with different property asset classes; some can specialize by geographic location and some by property type. Diversified REITs usually own a variety of property classes. The common asset classes are commercial, residential, health care, and self-storage (Brueggeman & Fisher, 2011). Commercial REITs include retail centers, shopping malls, offices, industrial parks, and hotels. Residential REITs own multifamily apartments, manufactured home communities, and student housing. Lodging, known as resorts REITS primarily own hotels, motels, and resorts (Leong, et al., 2014). Health Care owns hospitals and related health care facilities that are leased back to private health care providers who operate such facilities. Self-storage REITs specialize in the ownership of self-storage facilities. Lastly, specialty REITs specialize in different property classes, such as theaters, timberland prisons, golf courses, and network towers (Brueggeman & Fisher, 2011).

Before the introduction of Real Estate Investment Trusts (REITs) in South Africa, the property investment landscape was primarily dominated by two listed property investment vehicles: the

Property Unit Trust (PUT) and the Property Loan Stock (PLS). According to the Association of Property Unit Trusts and the Property Loan Stock Association of South Africa, significant differences characterized these two vehicles. A notable distinction was in the taxation of profits from asset sales; PLS entities were obligated to pay capital gains tax on these profits, while PUTs were exempt, provided they distributed the profits to their shareholders (Bekwa, 2006). Additionally, investment options varied between the two, with PUTs being barred from investing in other listed companies, a restriction that did not apply to PLSs. The gearing limits also differed, with PLSs limited by the stipulations in the company's articles, whereas PUTs had a cap set at 30% of the value of their underlying assets. Furthermore, the regulatory framework for each was distinct, with PLSs regulated under the Companies Act and PUTs under the Collective Investment Schemes in Property Act. This regulatory and operational framework set the stage for the property investment environment prior to the advent of REITs in the country (Rampersad, 2010).

Currently, there are 23 REITs listed in South Africa. According to the Johannesburg Stock Exchange, a company must meet the following criteria to be listed as a REIT's on the Johannesburg Stock Exchange (Johannesburg Stock Exchange, 2013).

- *Must pay at least 75% of their taxable earnings available for distribution out to investors as dividends, giving investors certainty that net income will be paid out.*
- *Earn their income from property leases, which means that they usually have a relatively stable income stream, which is adjusted upwards annually to keep pace with inflation.*
- *Earn their income from commercial properties with long lease periods, which means that they usually have a relatively stable income stream, which is adjusted upwards annually to keep pace with inflation.*
- *Are required to have a committee to monitor risk.*
- *Investors may face some degree of risk because economic and social situations are unpredictable and may positively or negatively influence rental income and the price of REITs*.

By law, REITs are supposed to distribute at least 75% of their taxable earnings. This limits the amount the REIT's can retain for capital projects. As a result, when a REIT's wants to embark on new projects, they must raise capital from shareholders or the debt capital market. Raising capital can dilute shareholder wealth; hence, REITs require a prudent investment appraisal technique to limit long-term losses for the company.

2.1.2. Project appraisal techniques

The evaluation of investment projects, known as project appraisal, holds significant importance in assessing the viability and potential profitability of long-term assets, thus contributing to the future growth of a company. Project appraisal, a crucial aspect of this process, involves a meticulous examination of investment opportunities to maximize returns while mitigating adverse financial outcomes (Maroyi & van der Poll, 2012). Key steps in the project appraisal process encompass the generation of investment concepts, thorough analysis of proposals, strategic planning of the capital budget, and diligent monitoring of post-audit results (Gilbert, 2003). In essence, project appraisal entails the comprehensive assessment of investment projects to ascertain their profitability, feasibility, and impact on the company's overall value and expansion prospects. This multi-layered process typically involves activities such as scrutinizing investment opportunities, utilizing diverse

capital budgeting techniques, and evaluating the financial feasibility of proposed projects (Ma'aji & Barnett, 2019).

Project appraisal techniques are techniques used in assessing the viability of a project(s). One of the commonly used investment assessment tools is called discounted cash flow (DCF), which considers the time value of money and this is done by forecasting the project future cash flows and discounting to the present value. Theoretically, it has proven to be the most appropriate method, including at several different discount models: net present value (NPV), internal rate of return (IRR), modified internal rate of return (MIRR), and the profitability index (PI) (Graham & Harvey, 2002).

Below will look at the some of these techniques in detailed.

- **Net Present Value (NPV)**

The net present value (NPV) is the difference between the project investment market value and it cost. NPV method is a process of calculating the present value of cash flows (inflows and outflows) of an investment proposal, using the cost of capital as the appropriate discounting rate, and finding out the net profit value, by subtracting the present value of cash outflows from the present value of cash inflows (Hillier, et al., 2021). The equation for the net present value, if all cash outflows are made in the initial year (I) will be:

$$NPV = \left[\frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \cdots \ldots \ldots \ldots + \frac{CF_n}{(1+r)^n}\right] - I = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} - I \quad (1)$$

Where $CF_1, CF_2, CF_3, \ldots., CF_n$ = cash inflows, r = discounted rate or firm is cost of capital, I = initial cost of the investment proposal and n = expected life of the proposed project. It should be noted that the cost of capital, r is the discounted rate is assumed to be known.

Net Present Value (NPV) decision criteria

	Shareholder wealth	Decision
$NPV > 0$	Proposed project investment is expected to increase shareholder wealth	Accept the project.
$NPV = 0$	Proposed project investment is expected not to change shareholder wealth	Management must use non-monetary factors to decide
$NPV < 0$	Proposed project investment is expected to decrease shareholder wealth	Reject the project.

Advantages and Disadvantages

Net Present Value (NPV) serves as a crucial analytical tool in financial decision-making, effectively quantifying the potential profit or loss of an investment by appreciating the time value of money. It enables a straightforward comparison among diverse investment opportunities by evaluating their respective cash flows over time, thereby supporting the selection of the most lucrative option. NPV is particularly beneficial for assessing the economic feasibility of long-term projects through a thorough analysis of all pertinent cash flows, aligning with the objective of maximizing shareholder wealth by incorporating risk assessment through the cost of capital (Agbeye, 2019; Effiom & Edet, 2019; Mota & Moreira, 2023). However, the method's application

is marred by complexities in calculation and interpretation, especially with multiple, extended-period cash flows, and hinges on the precision of cash flow projections. Additionally, NPV's reliance on an accurate discount rate and its inadequacy in considering non-monetary factors, such as strategic benefits or qualitative investment aspects, may limit its comprehensive applicability. These disadvantages highlight the challenges in utilizing NPV for projects involving varying investment scales or when precise cost of capital estimation is difficult, underlining the necessity for accurate forecasting and comprehensive analysis in financial evaluations (Baheti & Thatera, 2022; Ma'aji & Barnett, 2019; Al-Mutairi, et al., 2018).

- **Internal Rate of Return (IRR)**

The internal rate of return (IRR) equates the present value cash inflows with the present value of cash outflows of an investment (Hillier, et al., 2021). It is called internal rate because it depends solely on the outlay and proceeds associated with the project and not any rate determined outside the investment, it could be determined by solving the following equation:

$$I = \frac{A_1}{(1+IRR)^1} + \frac{A_2}{(1+IRR)^2} + \frac{A_3}{(1+IRR)^3} + \ \dots\dots\dots + \frac{A_n}{(1+IRR)^n} = \sum \frac{A_1}{(1+k)^t}; \quad (2)$$

Internal Rate of Return (IRR) decision criteria.

	Shareholder wealth	Decision
$IRR > Cost\ of\ Capital$	Proposed project investment is expected to increase shareholder wealth	Accept the project.
$IRR = Cost\ of\ Capital$	Proposed project investment is expected not to change shareholder wealth	Management must use non-monetary factors to decide
$IRR < Cost\ of\ Capital$	Proposed project investment is expected to decrease shareholder wealth	Reject the project.

Advantages and Disadvantages

The Internal Rate of Return (IRR) method is a valuable tool in investment analysis, sharing the NPV method's appreciation for the time value of money and considering the project's entire cash flow life cycle. It offers a clear indicator of the capital's rate of return, aligning with the firm's goal of maximizing owner wealth without necessitating a pre-calculated cost of capital. This makes it appealing for evaluating investments based on their potential profitability (Andor, et al., 2015; Andor, et al., 2019; Chadha & Sharma, 2019). However, the IRR method is not without its challenges. It can lead to complex computational issues and may produce multiple or even negative rates, complicating decision-making. Furthermore, the assumption that cash inflows are reinvested at the internal rate, rather than the firm's cost of capital as in the NPV method, may not always be the most realistic or appropriate. These nuances highlight the need for careful consideration when using IRR for project evaluation (Ma'aji & Barnett, 2019; Effiom & Edet, 2019; Kim, et al., 2020).

- **Modified Internal Rate of Return (MIRR)**

The modified internal rate of return (MIRR) is a yield on an investment considering a specific rate on the reinvestment of funds. The NPV method assumes that cash inflows from a project are reinvested at the project's cost of capital, whereas the IRR method assumes that cash inflows are reinvested at the project's IRR (Hillier, et al., 2021). These assumptions are built into the mathematics of the methods, but they may not represent the actual opportunities of the company. The modified IRR method is an alternative that considers a specific reinvestment rate for cash inflows from a project.

$$MIRR = \sqrt[N]{\frac{\sum_{t=1}^{N} \frac{Cash\ inflow_t}{(1+i)^{N-t}}}{\sum_{t=1}^{N} \frac{Cash\ outflow_t}{(1+i)^{N}}}} \quad (3)$$

Modified Internal Rate of Return (MIRR) decision criteria

	Shareholder wealth	Decision
$MIRR > Cost\ of\ Capital$	the investment is expected to return more than required	Accept the project.
$MIRR = Cost\ of\ Capital$	the investment is expected to return what is required	Management must use non-monetary factors to decide
$MIRR < Cost\ of\ Capital$	the investment is expected to return less than required	Reject the project.

Advantages and Disadvantages

The Modified Internal Rate of Return (MIRR) offers a nuanced approach to evaluating investments, addressing several limitations associated with the traditional Internal Rate of Return (IRR). Key advantages include its consideration of the cost of capital, effectively resolving the issues of multiple IRRs by providing a single, more accurate reflection of an investment's profitability. MIRR also accounts for both reinvestment and financing, offering a more realistic representation of real-world investment scenarios (Maroyi & van der Poll, 2012; Michelon, et al., 2020). Despite these strengths, MIRR is not without its challenges. The method's complexity can deter users, and the determination of an appropriate reinvestment rate introduces subjectivity, potentially affecting the outcome. Moreover, MIRR's sensitivity to the timing of cash flows emphasizes the need for accurate cash flow projections, underscoring its precision yet vulnerability to forecasting errors (Ma'aji & Barnett, 2019; Agbeye, 2019).

- **Profitability Index (PI)**

It is the ratio of the present value of future cash benefits, at the required rate of return to the initial cash outflow of the investment. It may be gross or net, net being simply gross minus one (Hillier, et al., 2021). The formula to calculate profitability index (PI) or benefit cost (BC) ratio is as follows.

$$PI = \frac{PV\ cash\ inflows}{PV\ cash\ outflows} = \frac{\sum_{t=1}^{N} \frac{Cash\ inflow_t}{(1+i)^{N}}}{\sum_{t=1}^{N} \frac{Cash\ outflow_t}{(1+i)^{N}}} \quad (4)$$

Probability Index (PI) decision criteria

	Shareholder wealth	Decision
$PI > 1.0$	the investment is expected to increase shareholder wealth	Accept the project.
$PI = 1.0$	the investment is expected not to change shareholder wealth	Management must use non-monetary factors to decide
$PI < 1.0$	the investment is expected to decrease shareholder wealth	Reject the project.

Advantages and Disadvantages

The Probability Index serves as a crucial tool in decision-making processes by offering a quantitative analysis of the likelihood of success or failure across various scenarios, thereby facilitating more informed choices. It effectively quantifies the risk associated with different decisions, enabling organizations to prioritize projects or actions based on their potential for success and ensuring optimal allocation of resources. This method also provides an objective framework for comparing disparate projects or scenarios, significantly minimizing decision-making biases and supporting strategic planning efforts by allowing entities to anticipate and prepare for multiple potential futures (AlKulaib, et al., 2016; Al-Mutairi, et al., 2018; Chadha & Sharma, 2019). However, the utility of the Probability Index is not without limitations. Its accuracy hinges on the quality and reliability of the data inputs, making it susceptible to inaccuracies if the underlying data is flawed. The process of calculating and interpreting the Probability Index demands a comprehensive understanding of probability and statistics, which can introduce complexity. Additionally, there's a risk of oversimplification, as it might neglect qualitative aspects of decision-making by focusing solely on probabilities. This approach can also create a misleading sense of precision regarding future events, overlooking the inherent uncertainties involved in forecasting. Moreover, crafting a detailed Probability Index for intricate scenarios requires a considerable investment of time and expertise, making it a resource-intensive endeavor (Ma'aji & Barnett, 2019; Kengatharan, 2016; Kim, et al., 2020; Mota & Moreira, 2023).

- **Accounting Rate of Return (ARR)**

The Accounting rate of return (ARR) method uses accounting information, as revealed by financial statements, to measure the profit abilities of the investment proposals. The accounting rate of return is found out by dividing the average income after taxes by the average investment (Hillier, et al., 2021).

$$ARR = \frac{Average\ income}{Average\ Investment} \tag{5}$$

Accounting Rate of Return (ARR) decision criteria

	Shareholder wealth	Decision
$ARR >$ Required Rtae of return	the investment is expected to increase shareholder wealth	Accept the project.
$ARR =$ Required Rtae of return	the investment is expected not to change shareholder wealth	Management must consider other options
$ARR <$ Required Rtae of return	the investment is expected to decrease shareholder wealth	Reject the project.

Advantages and Disadvantages

The Accounting Rate of Return (ARR) method presents a straightforward approach to evaluating investment projects, boasting simplicity in its understanding and application, alongside the convenience of utilizing readily available accounting data for calculations. It encompasses the entire income stream, providing a holistic view of a project's financial performance. However, the ARR method has notable limitations. Primarily, it relies on accounting profits rather than actual cash flows, potentially distorting the true financial viability of projects (AlKulaib, et al., 2016; Agbeye, 2019). Furthermore, ARR overlooks the time value of money, treating profits from different periods as equivalent without accounting for their temporal value. This method also falls short in comparing projects of varying durations, as it does not adjust for the differences in project lifespans. Lastly, ARR does not acknowledge the potential for profits to be reinvested, missing out on capturing the compound growth aspect of investment returns. These drawbacks highlight the need for careful consideration when employing ARR for project appraisal, as it may not fully capture the financial intricacies of investment opportunities (Truong, et al., 2008; Umair, 2015).

- **Payback Period (PP)**

The payback period is the duration required for an investment to recoup its initial cost. In other words, it represents the timeframe for an investment to reach a point where the accumulated returns equal or surpass the initial investment, commonly known as the breakeven point (Hillier, et al., 2021).

$$Payback\ Period\ (PP) = Full\ Years\ until\ recovery + \frac{Unrecovered\ amount}{Cashflow\ in\ recovery} \quad (6)$$

Payback Period decision criteria

	Shareholder wealth	Decision
PP < Target Payback Period	Project is expected to recover its initial investment within the desired timeframe, indicating quicker returns and potentially increasing shareholder wealth	Accept the project.
PP = Target Payback Period	Project is expected to recoup its initial investment within the timeframe deemed acceptable by the company. Management may need to consider other factors beyond the Payback Period in making the decision	Management must consider other options
PP > Target Payback Period	Project is expected to take longer to recoup its initial investment, potentially tying up capital for an extended period and decreasing shareholder wealth	Reject the project.

Advantages and Disadvantages

The Payback Period method is favored for its simplicity and ease of use, offering a straightforward approach to evaluating investment projects by measuring the time it takes for an investment to recoup its initial outlay. This method is particularly appreciated for its capacity to adjust for the uncertainty of future cash flows, inherently promoting a bias toward projects that enhance liquidity due to its focus on recovering the initial investment quickly (Hall, 2000; Lunkes, et al., 2015). However, the Payback Period comes with significant limitations. It neglects the time value of money, treating cash inflows received at different times as having the same value, thereby

oversimplifying the comparison between different investment opportunities. Additionally, it disregards any cash flows that occur beyond a predetermined cutoff date, potentially overlooking the full profitability of an investment. This method also exhibits a bias against long-term projects, which may offer substantial returns beyond the cutoff period but require a longer timeframe to pay back the initial investment. These drawbacks underscore the need for a more nuanced approach when relying on the Payback Period for investment decisions, as it may not fully capture the long-term value and profitability of projects (Hall & Millard, 2010; Chadha & Sharma, 2019; Baheti & Thatera, 2022).

Real Option

Real options in project appraisal represent a sophisticated analytical framework that extends traditional investment evaluation methods by incorporating the flexibility to make future decisions in response to changes in the market or project environment. Unlike static evaluation methods such as Net Present Value (NPV) or Internal Rate of Return (IRR), which assume a fixed strategy throughout the project's life, real options recognize that managers can adapt their strategies in response to unforeseen developments, thereby adding value to the project (Andor, et al., 2019; Singh, et al., 2021).

Advantages and Disadvantages

Real options offer a nuanced approach to project appraisal, providing significant advantages by allowing decision-makers to adapt strategies in response to market fluctuations, thereby enhancing the overall value of projects. This method excels in managing uncertainty and risk through its recognition of the potential for future adjustments, while also placing a high value on the strategic implications of investment decisions, such as growth opportunities and competitive positioning. Furthermore, real options introduce a dynamic element to the valuation process, more accurately mirroring the complexities of real-world business scenarios (Bond, et al., 2019; Brueggeman & Fisher, 2011). However, the approach is not without its challenges; it is marked by its mathematical and conceptual complexity, necessitating sophisticated financial and statistical expertise. Additionally, real options analysis requires comprehensive data on market volatility and risks, which can be difficult to procure with precision. The subjective nature of valuing these options, particularly when forecasting future market conditions and strategic benefits, introduces further complications. Moreover, the detailed and data-intensive nature of real options analysis renders it a more costly and time-consuming methodology compared to more traditional project appraisal techniques, making it imperative to weigh these factors carefully when considering its application (Bond, et al., 2019; Firer, et al., 2002).

2.1.3. Technique(s) to determining acceptable rate of return for an investment

The determination of an acceptable rate of return for an investment is a critical aspect of financial management and project appraisal, intricately linked to the concepts and methodologies outlined, such as NPV, IRR, MIRR, ARR, Payback Period, and Real Options. Each of these methods, while unique in their approach, essentially seeks to evaluate the viability and profitability of investment projects against certain benchmarks, primarily the cost of capital (Bennouna, et al., 2010; Batra & Verma, 2017). The cost of capital, a foundational pillar in these evaluations, represents the hurdle rate investments must exceed to be deemed worthwhile. It encapsulates the expectations of return from both debt and equity holders, factored into the Weighted Average Cost of Capital (WACC),

Debt Cost, and Cost of Equity, including calculations through the Capital Asset Pricing Model (CAPM) (Dayananda, et al., 2002; Barjaktarovic, et al., 2016; Li, 2019).

WACC stands out as a critical determinant in the appraisal process, offering a consolidated view of the cost of raising funds from both debt and equity sources. It serves as the discount rate in NPV calculations and a comparative benchmark for IRR and MIRR, highlighting its central role in determining project acceptability (Hillier, et al., 2021). This benchmark reflects the minimum return required on projects, considering the risk profile and capital structure of the company, thereby guiding investment decisions, risk assessment, and strategic financial planning. The computation of WACC incorporates the cost of equity, calculated through CAPM, which adjusts for the systematic risk relative to the broader market, and the cost of debt, reflecting the direct financial charges a company faces when borrowing (Ma'aji & Barnett, 2019).

Despite its comprehensive insight, the application of WACC is nuanced, requiring careful consideration of market conditions, capital structure dynamics, and risk assessments. Its role in evaluating investment projects is pivotal, as it directly influences decisions on project acceptance, financing strategies, and ultimately, the strategic direction of the company in pursuit of maximizing shareholder value. The interplay between WACC, CAPM, and other financial metrics underscores the complex landscape of corporate finance, where accurate, informed decision-making is paramount to navigating investment risks and opportunities effectively (Firer, et al., 2002).

- **Weighted Average Capital Cost – WACC**

The cost of capital is an essential determinant in the calculation of discounted cash flow (DCF). It is recommended for corporations to use the weighted average of capital, which incorporates both the market value of debt and the market value of stock. The weighted average cost of capital (WACC) is the minimum rate of return necessary for an investment proposal to be considered viable, given that it carries the same level of risk as the company's existing assets (Lunkes, et al., 2015). WACC is one of the main factors that affect the profitability of the project and WACC is represents the average rate of return a company is expected to pay to all its security holders to finance its assets (Baheti & Thatera, 2022). The Weighted Average Capital Cost is calculated as follows;

$$WACC = \left(\frac{E}{V} \times K_e\right) + \left(\frac{D}{V} \times K_d\right) \times (1 - T)$$

Where: E = Market value of equity, D = Market value of debt, V = Total market value of equity and debt, K_e = Cost of equity, K_d = Cost of deb and T = Corporate tax rate

The Weighted Average Cost of Capital (WACC) serves as a comprehensive metric that merges the various costs of capital, including both debt and equity, to present a unified view of the financial burden a company bears to secure funding. Its pivotal role in guiding investment decisions is underscored by its function as a benchmark; projects yielding returns above the WACC signal value creation, thereby informing strategic project selection and capital distribution. Central to valuation methodologies like the Discounted Cash Flow (DCF) analysis, WACC assists in pinpointing the present value of future cash flows, facilitating the optimization of capital structure to reduce financing costs.

- **Debt Cost**

Debt cost refers to the cost a company incurs from borrowing funds through debt instruments. The cost of debt is often calculated as the yield to maturity (YTM) on the company's existing debt, or by considering the interest rate, the company pays on its debt (Ma'aji & Barnett, 2019). In the context of Real Estate Investment Trusts (REITs), the cost of debt refers to the effective interest rate that REITs pay on their borrowed capital, which is integral to project appraisal practices. This rate is adjusted for the tax shield on interest expenses, making it a vital metric for evaluating the financial viability and risk of real estate investments, as it directly impacts the cash flow and profitability of projects within the REIT portfolio (Bae, et al., 2023; Geltner, et al., 2014).

- **Capital Asset Pricing Model - CAPM**

CAPM is a model used to determine the expected return on an investment based on its risk, typically compared to the overall market return. The cost of equity represents the rate of return that an investor requires from an investment in equity shares to compensate for the risk of owning those shares. It is the expected return on equity capital that shareholders expect to receive from the company (Bodie, et al., 2018). Below are some of the Method used to calculate the cost of Equity?

Capital Asset Pricing Model (CAPM) - The CAPM calculates the cost of equity based on the risk-free rate, the market risk premium, and the beta coefficient of the stock. The formula is $K_e = R_f + \beta \times (R_m - R_f)$

Where: K_e = Expected return on equity, R_f = Risk-free rate, R_m = Expected market return and β = Beta coefficient representing the asset's sensitivity to market movements

- **Arbitrary rate (Random Rate)**

The term "Random Rate" is not a standard financial term. If you mean the discount rate used to evaluate uncertain or risky projects, it could refer to the rate of return required by investors to compensate for the uncertainty or risk associated with the investment. This rate is usually subjective and depends on the perception of risk by investors (Elton, et al., 2014).

2.1.4. Technique(s) used to perform investment's risk analysis

This study will also look at methods and models to appraise projects under uncertainties. Decision theory rules and criteria may be applied when alternative scenarios for uncertain environmental and company conditions are included in a model. Risk-Adjusted Analysis methods used to adjust the data to incorporate the risks involved (Elton, et al., 2014). Sensitivity analysis aims to investigate the relationships between the various data and the target values of an investment appraisal and, if possible, the profitability of alternatives as well. Risk analysis entails the representation of uncertain input measures as probability distributions. The decision-tree method uses a dynamic model that includes several scenarios, their probabilities of occurring and the subsequent decisions that are contingent upon their occurrence. A real option enables the investor to carry out a particular action without obligation. A company will exercise the option only if it expects to receive an economic advantage from doing so and will reject it otherwise (Götze, et al., 2015).

Scenario Analysis assesses potential future events by exploring alternative possible outcomes (Arnold & Hatzopoulos, 2020). It's useful for understanding the range of possible impacts on investment decisions, enabling better preparedness for various future conditions. The Sensitivity Analysis help to examines how changes in input variables affect the outcome of a model or decision (Graham & Harvey, 2002). This analysis is crucial for identifying the variables that significantly influence project outcomes, helping prioritize risk management efforts. Simulation Analysis involves using mathematical models to predict the behavior of a system under different scenarios. This method is beneficial for assessing a wide range of outcomes and their probabilities, providing a comprehensive view of potential risks and opportunities (Ryan & Ryan, 2002).

Decision Tree Analysis represents decisions and their possible outcomes in a tree-like structure. It's valuable for visualizing and comparing different courses of action, facilitating clearer decision-making by outlining potential risks and rewards (Brounen, et al., 2004). Risk-adjusted Analysis is used to adjust the outcomes of investments to account for the level of risk involved. This approach allows for a more meaningful comparison between investments, highlighting the trade-offs between risk and return (Dedi & Orsag, 2007). Monte Carlo Simulation is used to perform risk analysis by modeling a range of outcomes based on probability distributions for uncertain factors. It is useful for quantifying the likelihood of different outcomes, enhancing the decision-making process by providing a detailed risk assessment (Truong, et al., 2008). Risk Analysis focuses on identifying and assessing how project outcomes might change due to risk events. This method is essential for developing strategies to mitigate or manage risks, improving the overall decision-making and success rate of projects (Hall & Millard, 2010).

2.1.5. Non-financial factors

In the context of Real Estate Investment Trusts (REITs) in South Africa, non-financial factors play a pivotal role in guiding investment decisions and strategy formulation. These factors, encompassing environmental, social, and governance (ESG) considerations, significantly influence the sustainable growth, stakeholder trust, and long-term viability of REITs, reflecting a holistic approach to value creation beyond mere financial metrics (SAREIT, 2013). Projects perceived as socially questionable can significantly tarnish an organization's reputation, leading to a loss of customer trust, investor confidence, and stakeholder support, ultimately impacting the bottom line and long-term viability (Bekwa, 2006). Similarly, changes in employee numbers can have profound social impacts; while increasing employment opportunities can boost local economies and social stability, downsizing can cause financial hardship and social unrest, highlighting the importance of considering workforce changes' social implications. Additionally, the environmental consequences of projects ranging from pollution and habitat destruction to initiatives promoting conservation and renewable energy carry significant weight in terms of regulatory scrutiny, legal liabilities, reputational impact, and alignment with sustainability goals (Li, 2019).

Governmental attitudes toward projects also play a critical role, where positive support can ease implementation and mitigate risks, whereas negative attitudes can introduce regulatory hurdles and project uncertainty (Olawale, et al., 2016). Post-audit practices further emphasize the importance of evaluating the effectiveness, efficiency, and overall impact of capital projects post-completion. Such audits are vital for ascertaining investment success, adherence to budget and timelines, and guiding future decisions in long-term capital planning. This comprehensive approach underscores the necessity of addressing social, environmental, and political factors alongside rigorous post-

project evaluations to ensure responsible stewardship and project success (Srithongrung, et al., 2019).

2.1.6. Post-Audit

Post-audits often entail the examination and assessment of significant capital projects once they have been completed, in order to evaluate their effectiveness, efficiency, and overall impact. Post-audits ascertain the success of investments, the realization of planned benefits, and adherence to budget and timeframe constraints. In addition, post-audits assess the effectiveness of capital projects to guide future decision-making regarding comparable investments in the process of long-term capital planning (Srithongrung, et al., 2019; Hall & Millard, 2010).

2.2 Empirical evidence

Over the years, there have been an increase on studies on project appraisal and capital budgeting.

2.2.1. Overview of REIT Industry in South Africa

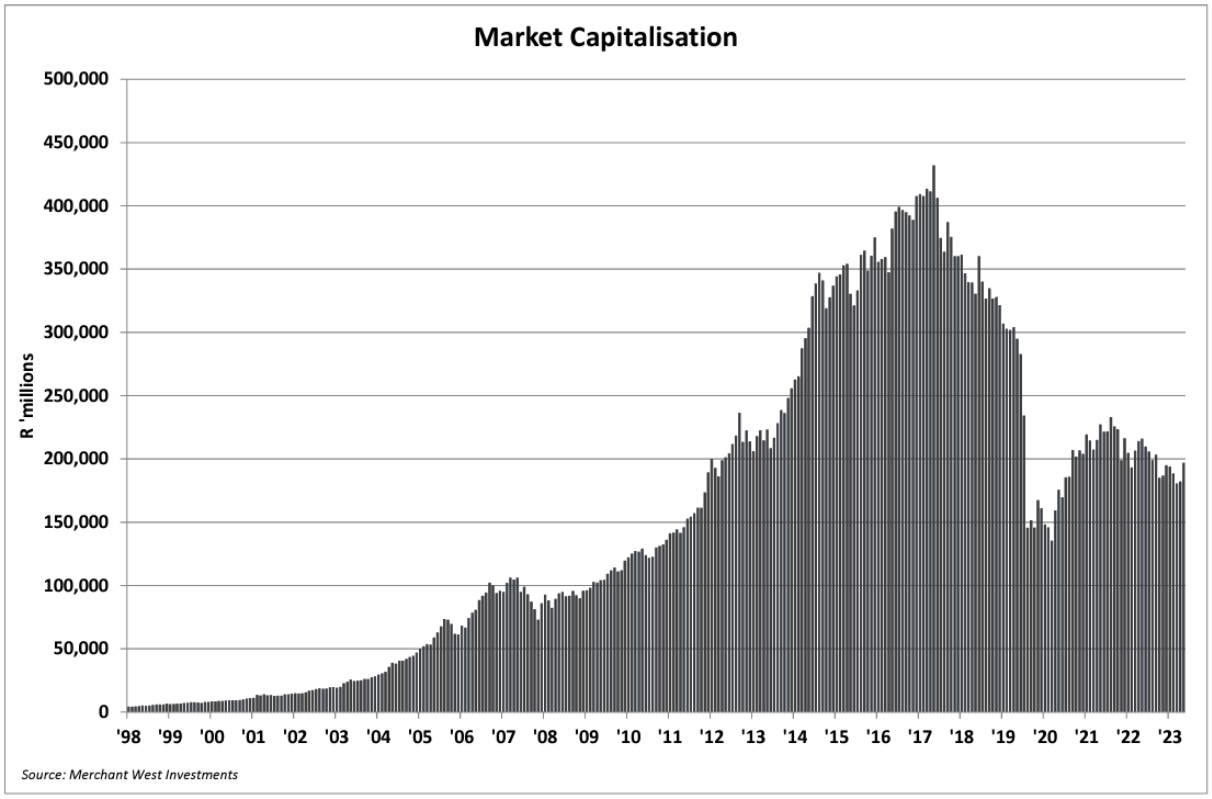

Figure 1: Market Capitalisation: The bar chart displays the SAREIT trend of Market Capitalisation over a span of 26 years, from 1998 to 2023.

The SARETs have shown significant growth over time. Figure 1 is the evidence of this growth, overall trend depicted by the bars suggests a long-term growth in market capitalisation from 1998 until a peak around 2018. This growth appears relatively steady and gradual without significant short-term fluctuations, indicating a stable increase in value over these two decades. The peak in

market capitalisation occurs around 2018, where the value nearly reaches 500,000 million. This suggests a period of significant economic growth or an accumulation of market value at that time. After 2019, there is a sharp decline in market capitalisation, followed by high volatility, which was the result of COVID-19. The bars show sharp rises and falls in value, suggesting a period of economic instability.

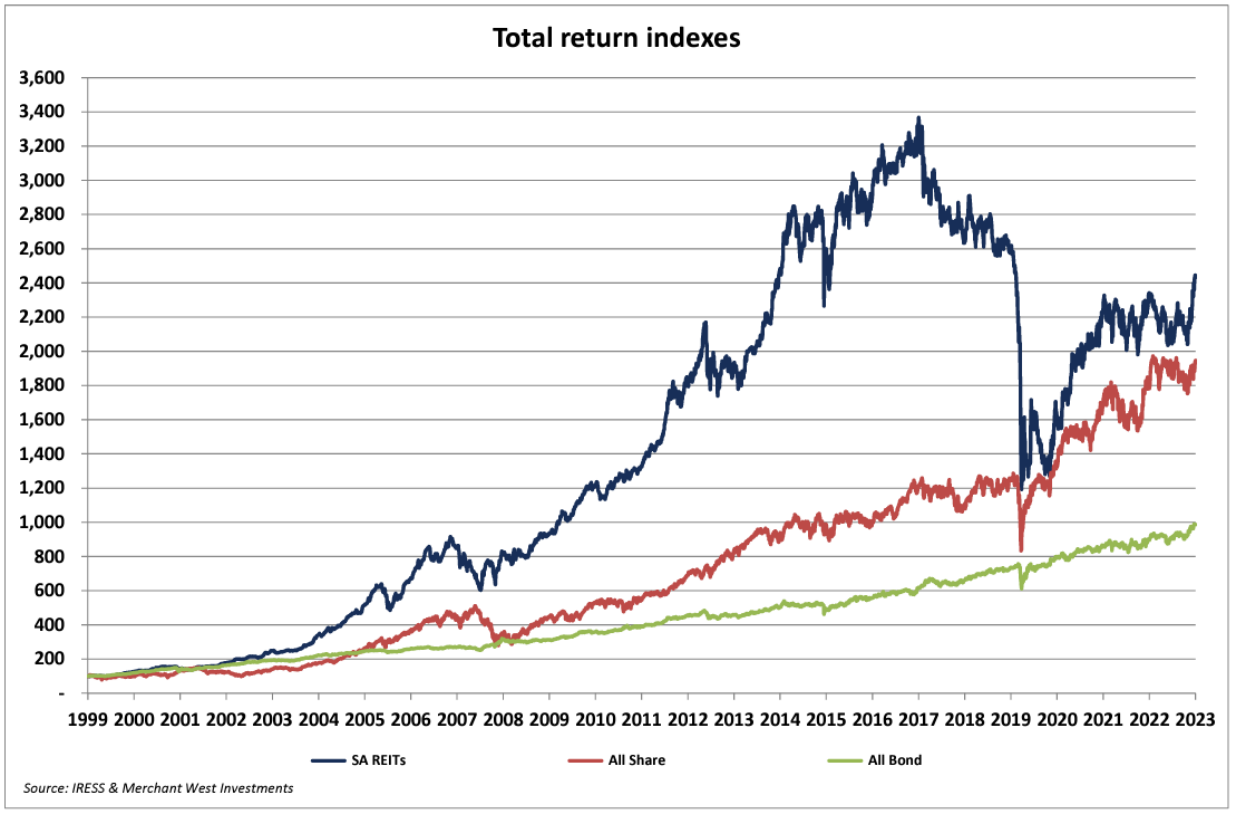

Figure 2: Total Return Indexes line chart tracking the performance of three different investment indices from 1999 to 2023

South African Real Estate Investment Trusts (SA REITs) exhibit a gradual rise in value over the span of 24 years. The gentle slope suggests that real estate investments in the South African market yield stable but modest returns. This indicates a market that experiences fewer abrupt changes compared to stocks. Similarly, bonds also demonstrate a gradual increase in returns over the same period. The gentle slope implies steady but modest returns from all bonds in the South African market. This reflects a market that is generally stable with fewer significant fluctuations compared to stocks. On the contrary, the All Share index shows high volatility in comparison to bonds but is more stable when compared to SA REITs. There is a noticeable difference in volatility between SA REITs and bonds.

2.2.2. International studies on project appraisal

Recent studies across various global markets have illuminated the intricate dynamics between theoretical principles and practical applications within the realm of project appraisal. The findings

on the study conducted by Korent and Visnjic (2023) on Theory-Practice gap in Capital budgeting suggest that while companies employ a variety of capital budgeting methods, there is room for improvement in aligning practices with theoretical principles, particularly in promoting the broader adoption of NPV and IRR methods (Korent & Visnjic, 2023). Kim et al. (2020) surveyed CFOs of major Korean firms to investigate capital budgeting practices in Korea, comparing them against those of US and European firms as well as best practices recommended by leading firms and financial advisors. The findings indicated that Korean firms exhibited capital budgeting practices on par with or even stronger than those in developed markets, with a majority employing best practices techniques such as Net Present Value (NPV), Internal Rate of Return (IRR). Additionally, the study revealed that factors such as company size, leverage, CEO age, and education influenced capital budgeting practices, while chaebol affiliation correlated with somewhat stronger practices (Kim, et al., 2020).

In their study titled "The theory-practice gap in capital budgeting: Evidence from the United Kingdom," Arnold & Hatzopoulos (2020) investigated the existence of a theory-practice gap in capital budgeting practices among companies in the UK. With an impressive response rate of 49%, the authors analyzed the sample to discern prevalent methods used in capital budgeting. Their results revealed a significant utilization of basic capital budgeting tools, with Net Present Value (NPV) being the most commonly employed method, utilized by 84% of the surveyed companies. Additionally, Internal Rate of Return (IRR) and Accounting Rate of Return (ARR) were also frequently utilized, with adoption rates of 83% each. These findings suggest a notable alignment between theoretical principles and practical applications in capital budgeting among companies in the UK (Arnold & Hatzopoulos, 2020).

Chadha & Sharma (2019) conducted a study titled "Capital budgeting practices: a survey in the selected Indian manufacturing firms" with the aim of investigating prevalent capital budgeting practices in selected Indian manufacturing firms. The study also sought to determine the factors influencing the ascertainment of cost of capital and shed light on issues leading to the neglect of scientific evaluation techniques in project appraisal. Using a survey method, the study revealed that the payback period method and Net Present Value (NPV) method were the two most popular techniques of capital budgeting in the Indian manufacturing sector. Despite this, non-discounting techniques held greater overall weightage compared to discounting methods. This study provides valuable insights into the capital budgeting practices of Indian manufacturing firms, offering useful information for investors interested in the Make in India program. It also addresses the neglect of capital budgeting techniques, highlighting its significance as the first study of its kind in this context (Chadha & Sharma, 2019).

A study was conducted to investigate various aspects of capital budgeting techniques adopted by Kuwaiti non-financial companies listed on the Kuwait Stock Exchange (KSE). This study was conducted using a questionnaire from Chief Executive Officers (CEOs), Chief Financial Officers (CFOs) and other managers of manufacturing, service and real estate companies listed on the KSE. The result unveiled that net present value and profitability index are the most frequently used capital budgeting techniques and the choice of the technique is determined by the nature of the project under assessment, and the academic and professional capabilities of corporate staff (Al-Mutairi, et al., 2018). Mubashar & Tariq (2019) investigated capital budgeting decision-making practices among non-financial corporations listed on the Pakistan Stock Exchange. With a

response rate of 35%, the study analyzed 70 out of 200 usable responses. The results indicated a comprehensive utilization of various capital budgeting techniques among Pakistani firms. Notably, all respondents consistently employed Internal Rate of Return (IRR), Profitability Index (PI), and Net Present Value (NPV), with adoption rates reaching 100%. Additionally, other techniques such as Hurdle Rate, Payback Period (PBP), and Discounted Payback Period (DPBP) were widely utilized, albeit to varying degrees. These findings underscore the diverse range of evaluation techniques employed in capital budgeting decision-making among Pakistani corporations (Mubashar & Tariq, 2019).

Batra & Verma (2017) examined capital budgeting practices in Indian companies listed on the Bombay Stock Exchange from various industries. With a response rate of 16%, the authors analyzed 77 out of 469 responses. Their findings revealed a prevalent use of techniques such as Payback Period (PBP), Internal Rate of Return (IRR), and Net Present Value (NPV), with adoption rates exceeding 65%. Additionally, other methods such as Discounted Payback Period, Profitability Index (PI), and Average Accounting Rate of Return (ARR) were also commonly employed, indicating a diverse range of evaluation techniques being utilized in India (Batra & Verma, 2017). De Souza & Lunkes (2016) investigated capital budgeting practices among large Brazilian companies from ten different industries. With a response rate of 11%, the authors analyzed 51 out of 463 usable responses. Their findings revealed a strong preference for techniques such as Payback Period (PBP), Net Present Value (NPV), and Internal Rate of Return (IRR), with adoption rates exceeding 80%. Additionally, other methods such as Profitability Index (PI), Real Options (RO), and Modified Internal Rate of Return (MIRR) were also commonly utilized, indicating a diverse range of evaluation techniques being employed in Brazil (De Souza & Lunkes, 2016).

Barjaktarovic et al. (2016) conducted an analysis of capital budgeting practices in Serbia, analyzing 65 out of 392 responses from companies across different industries, resulting in a response rate of 17%. Their findings indicated a prevalent use of techniques such as Payback Period (PBP), Profitability Index (PI), and Net Present Value (NPV), with adoption rates exceeding 50%. Additionally, Internal Rate of Return (IRR) and Average Accounting Rate of Return (ARR) were also utilized, albeit to a lesser extent. These results suggest a mixed adoption of traditional and advanced techniques within the Serbian business context (Barjaktarovic, et al., 2016). Nurullah & Kengatharan (2015) explored capital budgeting practices among manufacturing and trading companies listed on the Colombo Stock Exchange in Sri Lanka. With a response rate of 80%, the authors analyzed 32 out of 40 usable responses. Their findings revealed a high utilization of techniques such as Net Present Value (NPV), Payback Period (PBP), and Internal Rate of Return (IRR), with adoption rates exceeding 90%. Additionally, other methods such as Discounted Payback Period (DPB), Profitability Index (PI), and Modified Internal Rate of Return (MIRR) were also commonly employed, indicating a diverse range of evaluation techniques being utilized in Sri Lanka.

Andor et al. (2015) conducted a survey of Central and Eastern European firms, including countries like Bulgaria, Croatia, and Poland, to explore their capital budgeting practices. With a response rate of 0.5%, the authors analyzed 333 out of 70000 responses. Their findings highlighted a preference for the Payback Period (PBP) and Average Accounting Rate of Return (ARR) methods, with adoption rates of 66% and 60%, respectively. Surprisingly, only 61% of the firms conducting

formal capital budgeting analyses utilized Discounted Cash Flow (DCF)-based techniques such as NPV and IRR. These results underscore the prevalence of traditional methods and the limited adoption of sophisticated techniques among Central and Eastern European firms (Andor, et al., 2015). de Andrés et al. (2015) investigated capital budgeting practices in Spain, analyzing 140 out of 2000 usable responses from non-financial corporations, resulting in a response rate of 7%. Their findings revealed a high prevalence of techniques such as Payback Period (PBP), Internal Rate of Return (IRR), and Net Present Value (NPV), with adoption rates exceeding 95%. These results indicate a strong reliance on traditional capital budgeting methods among Spanish firms (de Andrés, et al., 2015).

Rossi (2015) examined capital budgeting practices in Europe across countries such as Italy, France, and Spain. With a response rate of 39%, the author successfully conducted 43 out of 110 interviews with companies from the service sector, retail, and manufacturing. The findings highlighted a preference for the Payback Period (PBP) method, followed by Net Present Value (NPV) and Internal Rate of Return (IRR). These results suggest a diverse landscape of capital budgeting practices across different European countries and industries (Rossi, 2015). Lam & Oshodi (2014) investigated the capital budgeting evaluation practices of contractors in the Hong Kong construction industry in their study. With a response rate of 32%, the authors analyzed 68 out of 213 usable responses. Their findings indicated a predominant use of investment appraisal techniques such as Payback Period (PBP) and Average Accounting Rate of Return (AARR), with adoption rates ranging from 73.5% to 83.4%. Additionally, Net Present Value (NPV) and Internal Rate of Return (IRR) were also commonly used, particularly among large companies. These results suggest a mixed adoption of traditional and advanced techniques within the construction sector in Hong Kong (Lam & Oshodi, 2014).

Singh et al. (2012) explored capital budgeting decisions among non-financial corporations listed on the Bombay Stock Exchange in India in their study "Capital Budgeting decisions: evidence from India." With a response rate of 19%, the authors analyzed 31 out of 166 usable responses. Their findings revealed a variety of capital expenditure evaluation techniques, with Internal Rate of Return (IRR) being the most commonly utilized method at 78.57%, followed by Payback Period (PBP) and Net Present Value (NPV) at 64.28% and 50.00%, respectively. These results indicate a diverse range of evaluation methods being employed in the Indian context (Singh, et al., 2021). In their study "Improved Capital budgeting decision making: evidence from Canada," Bennouna et al. (2010) examined capital budgeting decision-making processes among companies listed in the Financial Post across various industries in Canada. With a response rate of 18%, the authors analyzed 88 out of 478 usable responses. Their findings highlighted a significant reliance on Discounted Cash Flow (DCF) techniques, with Net Present Value (NPV) being utilized always or usually by 94.2% of the surveyed companies, followed by Internal Rate of Return (IRR) at 87.7%. These results suggest a strong inclination towards sophisticated capital budgeting techniques among Canadian firms (Bennouna, et al., 2010).

Technique(s) to determining acceptable Mustafa & Hindi (2010) focused on capital budgeting practices among companies listed on the Qatar Stock Exchange. They received and utilized 55 out of 170 responses from various industries, resulting in a response rate of 32%. Their findings indicated that the most commonly used investment and project evaluation techniques were NPV, PI, and IRR, with adoption rates ranging from 63.63% to 86.36%. Other techniques such as DPBP,

PBP, ARR, and MIRR were also used, albeit with slightly lower adoption rates (Mustafa & Hindi, 2010). Shinoda (2010) explored capital budgeting management practices among companies listed on the Tokyo Stock Exchange in Japan. They received and utilized 225 out of 2,224 responses from various industries, resulting in a response rate of 10%. Their findings revealed that companies predominantly utilized the Payback Period (PBP) method, followed by NPV, ARR, and IRR. Additionally, other methods such as DPBP, Premium Payback Period (PPP), and Real Options (RO) were also used, albeit to a lesser extent (Shinosa, 2010).

Truong et al. (2008) examined cost-of-capital estimation and capital budgeting practices among businesses in Australia. They received and utilized 87 out of 356 responses from nine businesses, resulting in a response rate of 24%. Their findings indicated that the most commonly used evaluation techniques were NPV, PBP, and IRR, with adoption rates ranging from 80% to 94%. Other techniques such as ARR and Adjusted NPV were also used, albeit less frequently (Truong, et al., 2008). Dedi & Orsag (2007) surveyed capital budgeting practices among Croatian firms, including non-financial corporations and banks. They received and utilized 50 out of 200 responses from non-financial corporations and 9 out of 34 responses from banks, resulting in response rates of 25% and 26%, respectively. Their findings revealed that the most commonly utilized capital budgeting methods included PBP, IRR, NPV, and DPBP, with adoption rates ranging from 65% to 83%. Other methods such as PI, Annuity Method, ARR, and MIRR were also used, albeit to a lesser extent (Dedi & Orsag, 2007).

Brounen et al. (2004) investigated corporate finance practices in Europe, focusing on countries such as Great Britain, France, Germany, and the Netherlands. They received and utilized 313 out of 6,500 responses from various activities, resulting in a response rate of 5%. Their findings revealed variations in capital budgeting techniques across different countries, with the Payback Period (PBP) being the most commonly used method in the UK, the Netherlands, and Germany. Other methods such as IRR, NPV, Accounting Rate of Return (ARR), and Real Options were also used, although with varying adoption rates (Brounen, et al., 2004). In their study titled "Capital budgeting practice of the Fortune 1000: How have things changed?" Ryan & Ryan (2002) examined the capital budgeting practices of the Fortune 1000 companies. With a response rate of 20.5%, the authors analyzed the sample to understand the prevalent methods utilized in capital budgeting. Their findings revealed that the basic capital budgeting tools such as Net Present Value (NPV), followed by Internal Rate of Return (IRR) and Payback Period (PBP), remained prominent among the surveyed companies. This suggests a continued reliance on traditional methods for evaluating investment opportunities within these large corporations (Ryan & Ryan, 2002).

Graham & Harvey (2002) explored corporate finance practices in the USA across various industries. They received and utilized 392 out of 4,400 usable responses, resulting in a response rate of 9%. Their findings indicated that the most commonly used evaluation techniques included IRR, NPV, and PBP, with adoption rates ranging from 56.74% to 75.61%. Other methods such as Earnings Multiple Approach, Discounted Payback Period, and Accounting Rate of Return were also utilized, albeit to a lesser extent (Graham & Harvey, 2002).

Table 1: Overview of studies conducted international on project appraisal practice

Author(s)	**Study Objectives**	**Method Used**	**Most Useful Method**
Korent & Visnjic, 2023	The aim of this paper is to investigate, determine and compare the non-existence of the theory-practice gap of capital budgeting of medium-sized and large companies in Croatia.	Survey questionnaire (respond rate: 5,12%)	NPV, IRR and PBP
Kim et al., 2020	Survey CFOs of major Korean firms on capital budgeting practices	Survey	NPV and IRR
Arnold & Hatzopoulos, 2020	Investigate the theory-practice gap in the UK	Survey (respond rate 32%)	IRR, NPV and PBP
Chadha & Sharma, 2019	Survey on capital budgeting in Indian manufacturing firms	Survey	PBP, NPV
Al-Mutairi, et al., 2018	Investigate capital budgeting in Kuwaiti companies	Questionnaire	NPV, PI
Mubashar & Tariq, 2019	Decision-making practices in Pakistani corporations	Questionnaire (respond rate 35%)	IRR, PI and NPV
Batra & Verma, 2017	Examine practices in Indian companies	Questionnaire (respond rate 16%)	PBP, IRR and NPV
De Souza & Lunkes, 2016	Capital budgeting among large Brazilian companies	Survey (respond rate 11%)	PBP, NPV and IRR
Barjaktarovic, et al., 2016	Capital budgeting practices in Serbia	Survey (respond rate 17%)	PBP, PI and NPV
Nurullah & Kengatharan, 2015	Capital budgeting in Sri Lankan companies	Questionnaire (respond rate 80%)	NPV, PBP, IRR
Andor, et al., 2015	Survey of Central and Eastern European firms	Survey (respond rate 0,5%)	PBP and ARR
de Andrés, et al., 2015	Capital budgeting practices in Spain	Questionnaire (respond rate 7%)	PBP, IRR and NPV
Rossi, 2015	Capital budgeting in Europe (Italy, France, Spain)	Interviews (respond rate 7%)	PBP, NPV and IRR
Lam & Oshodi, 2014	Evaluation practices of contractors in Hong Kong	Survey (respond rate 32%)	PBP and AARR
Singh, et al., 2012	Budgeting decisions in Indian non-financial corporations	Survey (respond rate 19%)	IRR, PBP and NPV
Bennouna, et al., 2010	Decision making in Canadian companies	Survey (respond rate 18%)	NPV and IRR
Mustafa & Hindi, 2010	Practices in Qatar Exchange listed companies	Survey (respond rate 32%)	NPV, PI and IRR
Shinoda, 2010	Management practices in Tokyo Exchange listed companies	Survey (respond rate 10%)	PBP, NPV and ARR
Truong, et al., 2008	Cost-of-capital estimation in Australia	Survey (respond rate 24%)	NPV, PBP and IRR
Dedi & Orsag, 2007	Survey among Croatian firms	Survey (respond rate 26%)	PBP, IRR and NPV
Brounen, et al., 2004	Corporate finance practices in Europe	Survey (respond rate 5%)	PBP, IRR and ARR
Ryan & Ryan, 2002	Fortune 1000 capital budgeting practices	Survey (respond rate 20,5%)	NPV, IRR and PBP
Graham & Harvey, 2002	Corporate finance practices in the USA	Survey (respond rate 9%)	IRR, NPV and PBP

Table 2: Frequency and Percentage of Appraisal Methods Used in 23 international Studies

Appraisal Method used	Frequency	Percentage (%)
Net Present Value (NPV)	20	87,0
Payback Period (PBP)	18	78,3
Internal Rate of Return (IRR)	17	73,9
Accounting Rate of Return (ARR)	5	21,7
Profitability Index (PI)	4	17,4

The global trends in project appraisal techniques reveal a strong preference for certain methodologies over others, indicating a convergence towards best practices that emphasize the value and return on investment of projects. The Net Present Value (NPV) method stands out as the most commonly used technique, appearing in 87% of the reviewed international studies. This prevalence underscores NPV's critical role in assessing the profitability of a project by discounting future cash flows to their present value, offering a clear, quantifiable metric for comparing the viability of different investment opportunities. Similarly, the Internal Rate of Return (IRR) and the Payback Period (PBP) methods are also widely employed, appearing in 73.9% and 78.3% of the studies, respectively. The IRR offers insights into the efficiency of the investment by calculating the interest rate at which the net present value of costs and benefits breaks even, while PBP provides a straightforward measure of the time required to recoup the initial investment, appealing for its simplicity and focus on liquidity.

In contrast, the Profitability Index (PI) and the Accounting Rate of Return (ARR) methods are significantly less utilized in global practices, found in only 17.4% and 21.7% of the studies, respectively. This suggests a lesser emphasis on these techniques within the broader project appraisal discourse. PI, which calculates the ratio of payoff to investment cost, and ARR, which measures the return on investment based on accounting information rather than cash flow, may be seen as offering less comprehensive or less directly relevant metrics for evaluating project viability in comparison to NPV, IRR, and PBP. These trends reflect a global consensus towards favoring methods that provide clear, financially driven metrics for decision-making, highlighting the importance of cash flow analysis and financial return in project appraisal practices.

2.2.3. South Africa and Africa studies on project appraisal

Effiom & Edet (2020) undertook an empirical assessment of the constraints to capital budget implementation in Nigeria. Through a descriptive and analytical methodology, the study distributed a primary survey instrument to 200 respondents in 20 federal ministries, departments, and agencies within two states in the South-south geopolitical zone. Utilizing multiple regression and correlation analyses, the study revealed significant factors hindering effective capital budget implementation, including delays in budget presentation and approval, corruption-related leakages, and inadequate monitoring and evaluation mechanisms. The study recommended measures to strengthen budgetary processes and institutions, emphasizing the need for a defined timeframe for budget presentation and approval within the legal framework (Effiom & Edet, 2019). Paseda (2020) conducted a comprehensive review of capital budgeting techniques, emphasizing the importance of selecting investment projects that maximize shareholder value. The review highlighted an increased prominence of NPV as an evaluation technique, consistent with academic

merit. However, the likelihood of using specific evaluation techniques was found to be linked to firm size, leverage, and CEO characteristics. The study recommended the adoption of real options techniques to facilitate the linkage of financial objectives with corporate strategy in the complex business environment (Paseda, 2020).

Olawale et al. (2016) investigated the impact of investment appraisal techniques on the profitability of small manufacturing firms in South Africa's Nelson Mandela Bay area. Their findings revealed that owners of small manufacturing firms did not use sophisticated investment appraisal techniques when evaluating proposed projects. This lack of sophistication had a negative impact on the profitability of small firms, suggesting a need for improved managerial and financial skills among small manufacturing firm owners (Olawale, et al., 2016). Hall & Sibanda (2016) addressed the gap in research on capital budgeting practices among small listed companies in South Africa. Their study found that small listed companies primarily employed IRR and NPV-based capital budgeting techniques, mirroring practices in larger companies. The use of discounted cash flow techniques had increased over the years, indicating a shift towards more sophisticated evaluation methods among small listed companies (Hall & Sibanda, 2016).

Hall & Mutshutshu (2013) explored the capital budgeting techniques employed by decision-makers in South African state-owned companies (SOCs). Their study found that NPV and IRR were the most commonly used techniques, with WACC emerging as the preferred discount rate. State-owned companies tended to prefer sensitivity analysis for assessing project risk. The study emphasized the importance of NPV as a primary capital budgeting technique and recommended its wider adoption in SOCs (Hall & Mutshutshu, 2013). Maroyi & van der Poll (2012) conducted a survey of capital budgeting techniques used by listed mining companies in South Africa. Their findings indicated that NPV, IRR, and payback period were the most common techniques used to evaluate major projects. The study highlighted the reasons for using these techniques and suggested the need for financial officers to explore other valuable techniques such as discounted payback period, profitability index, and real options to enhance project feasibility assessment (Maroyi & van der Poll, 2012).

Hall & Millard (2010) investigated capital budgeting practices among selected listed South African firms. They received and used 41 out of 67 responses from companies in various industries listed on the Johannesburg Stock Exchange for at least ten years, resulting in a response rate of 61%. Their findings revealed that the most important capital budgeting techniques employed by these companies were Return on Investment (ROI) at 33.3%, followed by Net Present Value (NPV) at 28.6%, and Internal Rate of Return (IRR) at 23.7%. Additionally, Present Value Payback, Accounting Payback, and other methods were utilized, albeit less frequently (Hall & Millard, 2010). Correia (2010) provided a comprehensive review of capital budgeting practices in South Africa over several decades. Despite a significant increase in the use of Discounted Cash Flow (DCF) methods, the Internal Rate of Return (IRR) technique remained the primary method employed, albeit with noted drawbacks. Larger companies tended to favor DCF methods, and there was a growing use of sensitivity analysis and scenario analysis. However, the adoption of sophisticated risk analysis tools was limited, and the process of ranking mutually exclusive projects often deviated from financial theory. The review underscored the importance of aligning capital budgeting practices with finance theory to enhance decision-making effectiveness (Correia, 2010).

Brijlal and Quesada (2009) focused on capital budgeting techniques in businesses across different sizes and sectors in the Western Cape province of South Africa. Their research revealed that the payback period and NPV methods were most commonly used across various business sizes and sectors. Interestingly, a significant percentage of businesses relied on a single technique for capital budgeting decisions, with larger businesses showing a preference for more complicated methods like IRR and NPV. The study also highlighted challenges in different stages of the capital budgeting process and emphasized the importance of considering non-quantitative factors and risk when making investment decisions (Brijlal & Quesada, 2008). Correia & Cramer (2008) surveyed South African listed companies to analyze their corporate finance practices related to cost of capital, capital structure, and capital budgeting decisions. The study found that companies predominantly employed DCF methods like NPV and IRR for project evaluation and CAPM for determining the cost of equity. Most practices aligned with those of US companies, reflecting the relatively developed state of the South African economy. However, gaps in the application of finance theory were identified, including limited use of newer techniques like real options and low target debt-equity ratios (Correia & Cramer, 2008).

Du Toit & Pienaar (2005) reviewed the capital budgeting behavior of large South African firms listed on the JSE Securities Exchange SA. The study found a preference for IRR and NPV in evaluating capital investments, with larger annual capital budgets correlating with the use of specific evaluation methods. Interestingly, when presented with mutually exclusive projects, respondents often chose the project adding the least value, highlighting potential inefficiencies in capital investment decision-making processes (du Toit & Pienaar, 2005). Gilbert (2003) investigated whether managers of South African manufacturing firms make optimal capital investment decisions by adhering to corporate finance theory. The study surveyed capital investment evaluation practices in these firms and found that the majority do not use the Net Present Value (NPV) evaluation technique as prescribed. Instead, many use it alongside other theoretically deficient techniques and fail to adjust for project-specific risk. This departure from optimal decision-making practices raises concerns about the effectiveness of capital investment decisions in South African manufacturing firms (Gilbert, 2003).

Table 3: Overview of studies conducted in South Africa on project appraisal practice

Author(s)	**Study Objectives**	**Method Used**	**Most Useful Method**
Paseda, 2020	Review of capital budgeting techniques	Comprehensive review	NPV
Olawale et al., 2016	Impact of investment appraisal techniques on small manufacturing firms' profitability	Findings	Lack of sophisticated techniques
Hall & Sibanda, 2016	Capital budgeting practices among small listed companies in South Africa	Study	IRR, NPV
Hall & Mutshutshu, 2013	Capital budgeting techniques in South African SOCs	Study	NPV, IRR
Maroyi & van der Poll, 2012	Survey of capital budgeting techniques by South African mining companies	Survey	NPV, IRR, Payback period
Hall & Millard, 2010	Capital budgeting practices in South African firms	Survey	ROI, NPV, IRR
Correia, 2010	Review of capital budgeting practices in South Africa	Comprehensive review	IRR
Brijlal & Quesada, 2009	Capital budgeting techniques in Western Cape businesses	Research	Payback period, NPV
Correia & Cramer, 2008	Survey on corporate finance practices in South Africa	Survey	NPV, IRR
Du Toit & Pienaar, 2005	Capital budgeting behavior of South African firms	Review	IRR, NPV
Gilbert, 2003	Evaluation of capital investment decisions in South African manufacturing firms	Survey	Non-optimal decision-making practices

Table 4: Frequency and Percentage of Appraisal Methods Used in 11 South African Studies

Appraisal Method used	Frequency	Percentage (%)
Net Present Value (NPV)	8	72,7
Internal Rate of Return (IRR)	7	63,6
Payback Period	2	18,2
Return on Investment (ROI)	1	9,1

In South Africa, the project appraisal practices exhibit a strong inclination towards traditional and widely recognized methodologies. The findings reveal that Net Present Value (NPV) and Internal Rate of Return (IRR) are the predominant techniques used, with NPV being employed in 72.7% and IRR in 63.6% of the cases. This aligns with the global emphasis on these methods, confirming their importance in the financial assessment of projects. NPV, in particular, is valued for its capacity to gauge a project's worth in today's terms by considering the time value of money, making it a central tool for comparison across potential investments. The IRR similarly provides a critical measure of a project's efficiency by identifying the break-even rate of return. However, the usage of other methods like the Payback Period and Return on Investment (ROI) is less common, at 18.2% and 9.1% respectively. The limited adoption of a diverse range of appraisal tools suggests a potential area for development in South African practices, particularly when considering the observations regarding the lack of sophisticated techniques and suboptimal decision-making practices in the region.

In addressing the research question on the specific project appraisal practices employed in South Africa in comparison to global standards and best practices in financial management, it's evident that both the South African context and international norms heavily rely on the Net Present Value (NPV) and Internal Rate of Return (IRR) as fundamental tools for evaluating the financial viability of projects. In South Africa, NPV is used in 72.7% of the studies, slightly lower than the global usage rate of 87%. Similarly, IRR is employed in 63.6% of South African studies compared to 73.9% internationally. This parallel underscores the critical role these methods play in assessing projects by accounting for the time value of money and profitability relative to costs, aligning with best practices in financial analysis worldwide.

However, the comparison reveals a significant divergence in the application of the Payback Period (PBP) and Return on Investment (ROI). Globally, PBP is utilized in 78.3% of the studies, indicating a pronounced concern for liquidity and the swift recovery of investment costs, a perspective that is less emphasized in South Africa, where PBP is used in only 18.2% of the cases. This considerable difference suggests a strategic shift in South African practices towards prioritizing long-term financial sustainability and intrinsic project value over immediate financial returns, possibly reflecting a deeper commitment to sustainable growth and profitability. The ROI, scarcely used in South Africa at 9.1%, further highlights this strategic orientation away from short-term financial metrics.

Through this lens, the distinction landscape of project appraisal practices becomes apparent. While foundational methods like NPV and IRR form the bedrock of financial analysis in both South Africa and globally, the stark contrast in the application of PBP and ROI between the two regions emphasizes a regional variation in financial strategy. South Africa's lesser emphasis on short-term financial recovery metrics compared to the global preference reflects a distinct approach to

financial management, aiming to align investment decisions more closely with long-term profitability and value creation. This comparison not only sheds light on the specific practices within South Africa but also positions them within the broader context of global financial management standards, illustrating the dynamic interplay between regional preferences and universal best practices.

2.2.4. Technique(s) used to perform investment's risk analysis

Several studies have explored the gap between theory and practice in capital budgeting, focusing particularly on risk analysis methods employed in major project assessment. Arnold & Hatzopoulos (2020) investigated the United Kingdom context, revealing a range of techniques used for risk assessment, including sensitivity analysis, scenario analysis, raising the required rate of return, and subjective assessment, among others (Arnold & Hatzopoulos, 2020). Similarly, Graham & Harvey (2001) highlighted the incorporation of real options and sensitivity analysis as prevalent risk analysis methods in corporate finance, while Ryan & Ryan (2002) found that sensitivity analysis and scenario analysis were commonly used among Fortune 1000 companies, supplemented by techniques like incremental IRR and simulation (Graham & Harvey, 2002) (Ryan & Ryan, 2002). Moreover, Brounen et al. (2004) provided insights into European countries such as the UK, Netherlands, Germany, and France, showing variations in risk analysis methods, with some commonalities such as sensitivity analysis and the incorporation of real options into investment project evaluation. These studies collectively underscore the importance of understanding the practical application of risk analysis methods in capital budgeting, illuminating trends and variations across different contexts (Brounen, et al., 2004).

The risk analysis methods employed in capital budgeting practices across different regions. Dedi & Orsag (2007) surveyed Croatian firms, revealing prevalent methods such as sensitivity analysis and simulation, with a significant portion incorporating risk through techniques like scenario analysis and decision tree analysis (Dedi & Orsag, 2007). Truong et al. (2008) examined Australian practices, finding a strong reliance on the minimum required rate of return, accompanied by the use of Value at Risk (VaR) and real options methods (Truong, et al., 2008). In South Africa, Hall & Millard (2010) discovered that sensitivity analysis and adjusting the required rate of return were commonly used techniques for risk analysis in capital budgeting among listed firms (Hall & Millard, 2010). Similarly, Bennouna et al. (2010) investigated Canadian firms, highlighting sensitivity analysis, scenario analysis, and risk-adjusted discount rates as prevalent methods for risk analysis in capital budgeting. These studies collectively emphasize the diversity of risk analysis techniques employed globally and provide insights into the practices of firms in different countries (Bennouna, et al., 2010).

Singh et al. (2012) explored Indian companies, noting a strong reliance on sensitivity analysis, particularly for exclusive risk assessment, alongside marginal rate adjustments and shorter payback periods for riskier projects (Singh, et al., 2021). In Spain, de Andrés et al. (2015) found sensitivity analysis, simulation, and real options as prevalent methods, with high frequencies indicating their significant role in investment decisions (de Andrés, et al., 2015). Similarly, Nurullah & Kengatharan (2015) in Sri Lanka identified sensitivity and scenario analysis as primary techniques, followed by simulation and real options, underscoring their widespread adoption in risk assessment (Nurullah, & Kengatharan, 2015). Barjaktarovic et al. (2016) examined Serbian practices, highlighting sensitivity analysis as a common approach, albeit with a lower frequency compared to other countries (Barjaktarovic, et al., 2016). Further afield, De Souza & Lunkes

(2016) observed Brazilian firms heavily favoring scenario and sensitivity analysis, alongside decision tree and Monte Carlo simulation methods (De Souza & Lunkes, 2016). Lastly, Batra & Verma (2017) surveyed Indian companies, emphasizing the significance of sensitivity and scenario analysis in risk-adjusted capital budgeting techniques. Collectively, these studies provide insights into the diverse risk analysis methods utilized globally, reflecting the nuanced approaches adopted by firms in different economic contexts (Batra & Verma, 2017).

Table 5: Methods used to assess project risk

Author(s)	**Study Objectives**	**Method used**	**Most Useful Method**
Arnold & Hatzopoulos, 2020	Investigate the theory-practice gap in the UK	Survey (respond rate 32%)	Sensitivity analysis, Scenario analysis
Graham & Harvey, 2001	Corporate finance practices in the USA	Survey (respond rate 9%)	Real options, Sensitivity analysis
Ryan & Ryan, 2002	Fortune 1000 capital budgeting practices	Survey (respond rate 20,5%)	Sensitivity analysis, Scenario analysis
Brounen et al., 2004	Corporate finance practices in Europe	Survey (respond rate 5%)	Sensitivity analysis, Real options
Dedi & Orsag, 2007	Survey among Croatian firms	Survey (respond rate 26%)	Sensitivity analysis, Simulation
Hall & Millard, 2010	Capital budgeting practices in South African firms	Capital budgeting practices in South African firms	Sensitivity analysis, Adjusting required rate of return
Bennouna et al., 2010	Decision making in Canadian companies	Survey (respond rate 18%)	Sensitivity analysis, Scenario analysis
Singh et al., 2012	Budgeting decisions in Indian non-financial corporations	Survey (respond rate 19%)	Sensitivity analysis, Shorter payback periods
de Andrés et al., 2015	Capital budgeting practices in Spain	Questionnaire (respond rate 7%)	Sensitivity analysis, Simulation
Nurullah & Kengatharan, 2015	Capital budgeting in Sri Lankan companies	Questionnaire (respond rate 80%)	Sensitivity analysis, Scenario analysis
Barjaktarovic et al., 2016	Capital budgeting practices in Serbia	Survey (respond rate 17%)	Sensitivity analysis
De Souza & Lunkes, 2016	Capital budgeting among large Brazilian companies	Survey (respond rate 11%)	Scenario and sensitivity analysis
Batra & Verma, 2017	Examine practices in Indian companies	Questionnaire (respond rate 16%)	Sensitivity and scenario analysis

The analysis of risk assessment tools as applied within the context of project appraisal demonstrates a strong preference for Sensitivity Analysis, with its usage reported in 92.3% of the cases, indicating its prominence as the go-to methodology for evaluating potential risks. This tool's widespread adoption suggests a favored approach for its ability to test how different values of an independent variable affect a particular dependent variable under a given set of assumptions, providing insights into the robustness of project outcomes against uncertainties (Firer, et al., 2002).

Scenario Analysis also enjoys significant usage at 53.8%, reflecting its utility in exploring the impacts of different future states of the world on project performance. Conversely, more complex or specialized tools such as Simulation Analysis, Real Options, and Adjusting Required Rate of Return are less commonly employed, with frequencies of 15.4%, 7.7%, and 7.7% respectively. This could imply a preference for straightforward and less computationally intensive techniques in everyday risk appraisal practice, or possibly a lack of familiarity or resource allocation for more sophisticated analyses in the assessed sample.

3. RESEARCH METHODOLOGY AND DATA

3.1. Methodology

This section of the study explains the methods that will be used in collecting and analyzing the data. Research design and methodology, target population, data collection instruments, data collection procedure and data analysis and presentation will be covered.

3.1.1. Research design and methodology

In line with the existing literature, this survey targets the following personnel who are the decision makers: Investment Manager, Risk Manager, Portfolio Manager, Financial Manager or Financial Director, Chief Investment Officer (CIO) and Chief Financial Officer (CFO) (Graham & Harvey, 2002; Maroyi & van der Poll, 2012; Mota & Moreira, 2023). The survey will be sent out to all the 23 companies that form part of SAREIT and who are listed on the Johannesburg Stock Exchange (JSE). Primary data will be collected by means of a questionnaire to achieve the research objectives of this study. It will take approximately 5 – 10 minutes to compete the questionnaire. The questionnaire uses multiple-choice questions and will be divided into three sections:

- Section I: Investment decision-maker profile (this will give us the profile of whoever is responsible for project appraisals in the studied companies)
- Section II: General information about the company and lastly
- Section III: Project appraisal techniques used in practice.

The designed survey is methodically structured to investigate into the details of project appraisal practices within South African Equity Real Estate Investment Trusts (REITs), offering a understanding that aligns with specific research questions aimed at comparing these practices to global standards and identifying the prevailing methodologies among these entities. For the investigation into the specific project appraisal practices employed in South Africa and their alignment or deviation from global financial management standards (Research Question 1.4.1), the survey's third section on project appraisal techniques serves as a pivotal source of primary data. The responses will give local practices, which will be compared against global benchmarks drawn from existing literature, will highlight both congruencies and unique approaches, potentially identifying areas ripe for innovation or enhancement.

The inquiry into which project appraisal practices are predominantly adopted by South African Equity REITs and the impact of decision-makers' educational background, professional experience, and expertise on these practices (Research Question 1.4.2) is directly supported by the survey's initial section. Investment decision-maker profile will help answer research by providing insights into the educational background, experience, and expertise of the individuals responsible for project appraisals in South African Equity Real Estate Investment Trusts (REITs). Understanding the profile of decision-makers will shed light on how their characteristics influence the selection and adoption of project appraisal practices (Ishtiaq, et al., 2017; Maroyi & van der Poll, 2012; Kim, et al., 2020).

Regarding the methods and strategies utilized by South African Equity REITs to determine the cost of capital for real estate investment projects and their influence on decision-making processes (Research Question 1.4.3), the survey poses targeted questions (Questions 11 and 12) to dissect the approaches to calculating the cost of capital, including equity costs. Analyzing these responses

will offer insights into the prevalent practices and how they align with or diverge from theoretical models, thereby elucidating their impact on investment decisions (Korent & Visnjic, 2023; Arnold & Hatzopoulos, 2020; Hall & Sibanda, 2016; Ryan & Ryan, 2002).

Lastly, the extent to which non-financial factors—such as company reputation, social impact, environmental considerations, and governmental regulations—affect the decision-making processes of South African Equity REITs when appraising and selecting projects for funding (Research Question 1.4.4) is probed in the latter part of the survey (Question 14). This section aims to quantify the influence of these factors, providing a comprehensive overview of the holistic approach to project appraisal that encompasses both financial and sustainable investment criteria. By examining the methods used in project appraisal and considering the influence of non-financial factors, this section will provide a comprehensive understanding of the decision-making process in South African Equity REITs (Hall, 2000; Graham & Harvey, 2002; Ryan & Ryan, 2002; Brounen, et al., 2004; Truong, et al., 2008; Rossi, 2015; Batra & Verma, 2017; Mubashar & Tariq, 2019; Arnold & Hatzopoulos, 2020; Bae, et al., 2023).

Surveys are the most suitable method of data collection for this study due to their effectiveness in measuring people's preferences and their ability to collect data remotely, which is more economical in terms of researcher time, effort, and cost compared to methods like experimental and case research. They also offer respondents the convenience of answering at their own pace, making them a preferred choice for many. The survey method stands out as the most appropriate choice for gathering data in this study due to its versatility and efficiency (Saunders, et al., 2009). Surveys offer a comprehensive means of understanding decision-making processes and preferences within South African Equity Real Estate Investment Trusts (REITs), making them invaluable for addressing the research questions at hand. Additionally, the remote nature of survey data collection minimizes logistical challenges and resource demands, allowing researchers to efficiently gather data without significant time, effort, or cost implications (Cooper & Schindler, 2014). Furthermore, the flexibility afforded by surveys enables respondents to participate at their convenience, enhancing the likelihood of higher response rates and ensuring a more comprehensive dataset for analysis. Overall, the survey method emerges as the optimal approach for investigating project appraisal practices and decision-making factors within South African Equity REITs, offering a practical and respondent-friendly means of data collection (Bhattacherjee, 2012). However, surveys have limitations. It can be challenging to determine if respondents are answering truthfully, and quantitative methods primarily yield numerical descriptions without rich detail, failing to explain why decision-makers prefer certain appraisal practices over others. Additionally, surveys often face issues with timeliness and low response rates, and the data gathered is typically rigid, relying on closed questions that limit opportunities for discovery and deeper insights (Bhattacherjee, 2012).

3.1.2. Data Collection

For the purpose of capturing insights specific to the Equity REIT industry, the survey will employ clear and concise language to ensure respondents comprehend questions accurately, minimizing the potential for misinterpretation. Furthermore, the questionnaire will incorporate validation checks and multiple response options to facilitate the comprehensive and accurate collection of data from individuals responsible for project appraisal within the targeted population. This approach aims to streamline the data collection process while ensuring that pertinent information is captured effectively. The survey will be distributed to all 23 South

African Equity Real Estate Investment Trusts listed on the Johannesburg Stock Exchange (JSE), providing a representative sample to analyze and address the research questions effectively (Saunders, et al., 2009).

3.1.3. Data Analysis

The collected data from the survey will be analysed and presented using frequency tables. Frequency tables are statistical summaries that organize data values into categories, showing the frequency or count of occurrences for each category. This method enables researchers to grasp the distribution of a particular variable and identify patterns within the dataset (Saunders, et al., 2009). Frequency tables are utilized in various stages of data analysis, such as exploratory data analysis and hypothesis testing. They offer a concise overview of the dataset, displaying the frequency of each category, aiding in identifying trends, patterns, and outliers in the data. Constructing a frequency table involves categorizing the data into groups or bins, counting the frequency of observations in each category, and displaying the results in a tabular format. The table typically comprises columns representing categories or data intervals and rows showing the frequency counts or percentages within each category (Cooper & Schindler, 2014).

3.1.4. Limitations of the survey method

Some limitations to the study are inherited in the survey as a data collection instrument.

- Difficulties in determining whether respondents are responding truthfully.
- Quantitative research methods produce primarily numerical descriptions, they do not yield rich details, and in this case, it will not explain why decision makers preferred certain appraisal practice to others.
- Lack of control over timeliness, and potentially low response rates.
- Data usually gathered in a rigid manner and therefore does not inspire discovery, because in surveys closed questions are mainly used.

To boost survey response rates, emails were sent to participants highlighting the survey's relevance and featuring engaging subject lines. Follow-up reminders were sent to remind participants to respond on the survey. The survey was designed to be concise, user-friendly, and available in both printed and online formats. Respondents were assured of the confidentiality of their responses, and the survey was timed to avoid busy periods. Survey was conducted between June 2023 and November 2023. All data was collected online and stored on the cloud.

4. EMPIRICAL RESULTS

This section presents a comprehensive analysis of the results obtained from survey conducted in 23 Real Estate Investment Trust companies in South Africa to investigating project appraisal practices, risk analysis methods, and investment decision-making within diverse organizational settings. The compiled data offer valuable insights into the prevalence and utilization of different project appraisal techniques, risk assessment methodologies, and factors influencing investment decisions across different regions and industries. Through an in-depth examination of the findings from the survey, this analysis aims to uncover key trends, patterns, and variations in capital budgeting practices and risk management strategies employed by organizations globally. By delving into the nuances of the results presented in the studies, this section seeks to provide a nuanced understanding of how organizational characteristics, decision-makers' profiles, and external factors shape investment decisions and risk management practices in various contexts.

4.1. Comparative Analysis of Project Appraisal Practices: South Africa versus Global Standards

Sections 2.2.2 and 2.2.3 of the literature review address the research question: 'What are the specific project appraisal practices employed in South Africa compared to global standards and best practices in financial management?' This comparison explains the methodologies adopted within the South African context against the international standard, providing insights into the alignment or divergence in financial analysis practices, below is the summary of the literature findings.

The analysis of project appraisal practices in South Africa compared to global standards reveals a common reliance on Net Present Value (NPV) and Internal Rate of Return (IRR) for evaluating project financial viability, with South Africa showing a slightly lower usage rate (NPV at 72.7%, IRR at 63.6%) compared to global norms (NPV at 87%, IRR at 73.9%). This similarity underscores the universal importance of these methods in financial analysis. However, a significant difference emerges in the use of the Payback Period (PBP) and Return on Investment (ROI), with South Africa employing PBP in only 18.2% of cases and ROI at 9.1%, markedly lower than the global usage of PBP at 78.3%. This gap indicates a strategic focus in South Africa on long-term financial sustainability over immediate returns, suggesting a commitment to sustainable growth and value creation. The divergence in PBP and ROI usage highlights regional financial strategy variations, with South Africa prioritizing long-term profitability, contrasting with a global emphasis on short-term financial recovery. This comparative analysis illuminates the distinct financial management approaches in South Africa within the context of global practices, showcasing the dynamic relationship between regional preferences and international standards.

4.2. Predominant Project Appraisal Practices in South African Equity Real Estate Investment Trusts

Under this heading, the discussion focus on the project appraisal practices most commonly adopted by South African Equity REITs. It would also explore the influence of decision-makers' educational backgrounds, professional experiences, and expertise on the selection and application of these practices.

Table 6: Investment decision-maker profile

		Characteristics	Frequency	Percentage (%)
Investment decision-maker profile	Position	Investment Manager	4	26,7
		Risk Manager	0	0,0
		Portfolio Manager	4	26,7
		Financial Manager	1	6,7
		Chief Investment Officer (CIO)	2	13,3
		Chief Financial Officer (CFO)	1	6,7
		Other (Specify)	3	20,0
	Years Worked for Current Organization	Below a year	1	6,7
		2 - 3 years	3	20,0
		4 - 5 years	6	40,0
		over 6	5	33,3
	Overall experience in project appraisal	Below a year	0	0,0
		2 - 3 years	0	0,0
		4 - 5 years	2	13,3
		6 - 10 years	3	20,0
		over 10 years	10	66,7
	highest level of education	B Com Honours	2	13,3
		Property Studies Honours	2	13,3
		Chartered Accountant (CA)	7	46,7
		Charted Financial Analyst (CFA)	1*	6,7
		Masters of Business Administration (MBA)	0	0,0
		Master's Degree (None-MBA)	3	20,0
		Doctoral Degree	0	0,0
		Other	0	0,0

* Charted Financial Analyst is also a Chartered Accountant (CA)

The position analysis within the organizations surveyed revealed that Investment Managers and Portfolio Managers are the most common roles, each making up 26.7% of respondents, indicating their significant involvement in capital investment decisions. The absence of Risk Managers suggests variability in how organizations manage risk. CIOs and CFOs are less prevalent, at 13.3% and 6.7% respectively, pointing to some top-level engagement in investment decisions, while 'Other' roles account for 20%, reflecting a variety of positions contributing to investment processes.

In tenure and project appraisal experience, most respondents (40%) have been with their current organization for 4 to 5 years, and 33.3% for over 6 years, demonstrating a mix of moderate to long-term organizational experience. A majority (66.7%) possess over 10 years of experience in project appraisal, underscoring the respondents' significant expertise, while 20% have 6 to 10 years of experience, and very few have less than 5 years, showing a skew towards more experienced individuals.

Regarding education, nearly half of the respondents (46.7%) are Chartered Accountants, indicating a strong accounting influence. Master's degrees (non-MBA) are held by 20%, and B Com Honours and Property Studies Honours by 13.3% each, suggesting a substantial representation of advanced academic qualifications. Only one respondent is a Chartered Financial Analyst (CFA), and notably, no MBAs or Doctoral Degrees were reported, highlighting a preference for certain qualifications within the field.

Table 7: General information about the company

	Characteristics	Frequency	Percentage (%)
Year company received REITs Status	2013	6	40,0
	2014	2	13,3
	2015	3	20,0
	2016	3	20,0
	2017	1	6,7
Capital Investment Manual	Yes	7	46,7
	No	8	53,3
Full-Time Staff for Capital Investment Analysis	Yes	9	60,0
	No	6	40,0
Number staff assigned full time capital investment analysis	0	6	40,0
	1	2	13,3
	2	4	26,7
	3	1	6,7
	4	2	13,3

The analysis of the distribution of REIT status acquisition over the years shows a peak in 2013 with 40% of companies surveyed receiving their status, indicating a significant trend or regulatory change that year. A decline followed in 2014, with 13.3% of companies attaining REIT status. The years 2015 and 2016 saw a steady rate with 20% each, suggesting stabilization in the market or regulatory environment. However, there was a drop to 6.7% in 2017, pointing to possible market saturation or a change in the economic landscape. In terms of capital investment practices, there is a nearly even split among companies regarding the presence of a capital investment manual, with 53.3% lacking one. This may reflect differing corporate cultures or confidence in the expertise of personnel. A majority of 60% have full-time staff for capital investment analysis, indicating a recognition of the complexity and importance of this function within these organizations.

The allocation of staff members to capital investment analysis varies, with 40% of companies not assigning any full-time staff, relying instead on their investment committee comprising senior executives and board members. This could suggest a reliance on collective executive experience over individual analysts. Meanwhile, 13.3% have one, 26.7% have two, and smaller percentages have three to four staff members, reflecting different levels of resource commitment to capital investment analysis and possibly varying sizes and investment activity levels of the companies.

Table 8: Methods used for Project Appraisal practice

	Primary Technique	Secondary Technique
Net present value (NPV)	10 (66,7)	3 (20)
Internal rate of return (IRR)	4 (26,7)	11 (73,3)
Profitability index (PI)	1 (6,7)	1 (6,7)
Payback period (PBP)	0 (0)	0 (0)
Discounted payback period (DPBP)	0 (0)	0 (0)
Modified internal rate of return (MIRR)	0 (0)	0 (0)
Accounting rate of return (AR)	0 (0)	0 (0)
Real Option	0 (0)	0 (0)
Other	0 (0)	0 (0)

Net Present Value (NPV) technique emerged as the predominant method, with 66.7% of respondents indicating that they always utilize NPV in their capital budgeting decisions. However, a significant minority (20%) reported almost always using this method, indicating its widespread adoption and importance in evaluating investment projects. Internal Rate of Return (IRR) also emerged as a commonly employed technique, with 73.3% of respondents indicating almost always using it and 26.7% always employing it. This suggests a high reliance on IRR as a primary tool for assessing the profitability of investment projects among the surveyed individuals. Although Profitability Index (PI) is less commonly used compared to NPV and IRR, a small proportion of respondents (6.7%) reported always employing the Profitability Index, with an additional 6.7% indicating almost always usage. While the adoption of PI is lower compared to NPV and IRR, its presence indicates a diverse set of techniques employed in capital budgeting decisions.

Table 9: Frequency of how decision makers uses the project appraisal techniques

	Always (%)	Almost Always (%)	Sometimes (%)	Rarely (%)	Never (%)
Net present value (NPV)	11 (73,3)	3 (20)	1 (6,7)	0 (0)	0 (0)
Internal rate of return (IRR)	13 (86,7)	1 (6,7)	0 (0)	1 (6,7)	0 (0)
Profitability index (PI)	2 (13,3)	2 (13,3)	3 (20)	6 (40)	2 (13,3)
Payback period (PBP)	0 (0)	3 (20)	6 (40)	4 (26,7)	2 (13,3)
Discounted payback period (DPBP)	0 (0)	2 (13,3)	5 (33,3)	6 (40)	2 (13,3)
Modified internal rate of return (MIRR)	0 (0)	1 (6,7)	5 (33,3)	6 (40)	3 (20)
Accounting rate of return (AR)	0 (0)	2 (13,3)	3 (20)	4 (26,7)	6 (40)
Real Option	0 (0)	0 (0)	0 (0)	4 (26,7)	11 (73,3)
Other	0 (0)	0 (0)	0 (0)	0 (0)	15 (100)

Net Present Value (NPV) emerges as the most frequently utilized technique, with 73.3% of respondents indicating that they always use it, and an additional 20% reporting almost always usage. This high adoption rate underscores the significance of NPV in evaluating the profitability of investment projects. Similarly, IRR exhibits a high adoption rate, with 86.7% of respondents indicating always usage and 6.7% reporting almost always usage. This indicates a strong reliance on IRR as a primary tool for assessing project profitability. The adoption of Profitability Index (PI) is less prevalent compared to NPV and IRR, with only 13.3% of respondents reporting always usage and an additional 13.3% reporting almost always usage. However, a sizable proportion of respondents (40%) reported sometimes using this technique, indicating its relevance in certain contexts. Payback Period (PBP) and Discounted Payback Period (DPBP): These techniques are less commonly employed compared to NPV and IRR, with respondents reporting varied usage patterns across different frequency categories. Real Option Analysis interestingly, none of the respondents reported always or almost always using Real Option analysis, indicating its limited adoption in the surveyed population. However, a substantial proportion (73.3%) reported never using this technique, suggesting a notable gap in its application.

4.3. Approaches to Determining Cost of Capital in South African Equity REITs

The methods and strategies used by South African Equity Real Estate Investment Trusts to calculate the cost of capital for real estate investment projects would be examined. Lastly will look at method used to assess risk.

Table 10: Methods used to Determining Cost of Capital in South African Equity REITs

	Frequency	Percentage (%)
Arbitrarily discount rate	6	40,0
Weighted Cost of Capital (WACC)	8	53,3
Cost of Debt	1	6,7
Cost of Equity	0	0,0

40% of respondents reported using an arbitrarily determined discount rate in their capital budgeting analyses. This approach involves selecting a discount rate based on subjective judgment or historical data rather than employing a systematic method for its determination. The moderate adoption of this method suggests a reliance on qualitative assessments or conventional practices in setting discount rates. Weighted Average Cost of Capital (WACC) emerges as the most prevalent approach, with 53.3% of respondents utilizing it in their capital budgeting decisions. WACC represents the average cost of financing a company's assets and is calculated by weighting the cost of equity and the cost of debt by their respective proportions in the capital structure. The widespread adoption of WACC underscores its significance as a comprehensive measure of the required rate of return for investment projects.

A smaller proportion of respondents (6.7%) reported using the cost of debt as the discount rate. The cost of debt represents the interest rate a company pays on its debt financing and is typically used to discount cash flows associated with debt-funded projects. While less commonly employed compared to WACC, the use of the cost of debt highlights its relevance in specific contexts, particularly when evaluating debt-financed investments. Interestingly, none of the respondents reported using the cost of equity as the discount rate. The cost of equity represents the return required by equity investors to compensate for the risk associated with holding the company's stock. The absence of its usage suggests a potential oversight or a preference for alternative approaches among the surveyed population.

Table 11: Tools used to assess project risk

	Always (%)	Almost Always (%)	Sometimes (%)	Rarely (%)	Never (%)
Scenario analysis	7 (46,7)	6 (40)	1 (6,7)	1 (6,7)	0 (0)
Sensitivity analysis	7 (46,7)	8 (53,3)	0 (0)	0 (0)	0 (0)
Simulation analysis	2 (13,3)	5 (33,3)	2 (13,3)	5 (33,3)	1 (6,7)
Decision tree analysis	0 (0)	4 (26,7)	2 (13,3)	7 (46,7)	2 (13,3)
Risk-adjusted analysis	0 (0)	3 (20)	4 (26,7)	4 (26,7)	4 (26,7)
Monte Carlo simulation	0 (0)	2 (13,3)	0 (0)	2 (13,3)	11 (73,3)

Scenario Analysis technique is quite commonly used, with 46.7% of respondents reporting that they always use it and an additional 40% reporting almost always. It indicates a high reliance on scenario analysis as a risk assessment tool. Similar to scenario analysis, sensitivity analysis is frequently utilized, with 46.7% of respondents reporting its use always and 53.3% almost always. This suggests a significant reliance on sensitivity analysis to assess project risks. While less commonly used compared to scenario and sensitivity analyses, simulation analysis still sees considerable adoption, with 13.3% of respondents indicating its use always and 33.3% almost always. However, a notable portion reported rarely using it (33.3%), indicating a more varied utilization pattern.

Decision Tree Analysis technique shows a diverse usage pattern, with no respondents reporting always using it. However, 26.7% reported almost always, and 26.7% sometimes. On the contrary, 46.7% reported rarely using decision tree analysis, suggesting a less prevalent adoption. A similar pattern is observed for risk-adjusted analysis, with no respondents reporting always using it. Twenty percent reported sometimes, but an equal proportion (26.7%) reported rarely and never using it, indicating a mixed adoption pattern. Monte Carlo Simulation technique appears to be less commonly used, with no respondents reporting always using it. Thirteen point three percent reported almost always, while 73.3% reported never using it. This suggests a lower overall adoption rate for Monte Carlo simulation compared to other techniques.

Scenario analysis and sensitivity analysis emerge as the most prevalent risk analysis techniques, followed by simulation analysis, albeit with a more varied adoption pattern. Decision tree analysis, risk-adjusted analysis, and Monte Carlo simulation show less consistent usage, with varying degrees of adoption among respondents.

4.4. The Influence of Non-Financial Factors on Project Appraisal in South African Equity REITs

This section will discuss the extent to which non-financial factors, such as company reputation, social and environmental impacts, and government regulations, affect the decision-making processes of South African Equity Real Estate Investment Trusts in the project appraisal and funding selection. Lastly, we will look at post-audits of major capital expenditures and try to find out how significant they are as part of project appraisal.

Table 12: Analysis of Non-Financial Factors on Project Appraisal in South African Equity REITs

	Always (%)	Almost Always (%)	Sometimes (%)	Rarely (%)	Never (%)
Impact on the organisation's reputation if the project is socially questionable	7 (46,7)	8 (53,3)	0 (0)	0 (0)	0 (0)
Social impact of an increase or decrease in employee numbers	7 (46,7)	7 (46,7)	1 (6,7)	0 (0)	0 (0)
The environmental impact of the project	7 (46,7)	7 (46,7)	1 (6,7)	0 (0)	0 (0)
Possible positive or negative governmental political attitudes towards the project	7 (46,7)	7 (46,7)	1 (6,7)	0 (0)	0 (0)

Nearly half of the respondents (46.7%) reported always considering the impact on the organization's reputation if the project is socially questionable, with an additional 53.3% reporting almost always. This indicates a high level of attention paid to maintaining the organization's reputation in project decision-making processes. Similarly, a significant majority of respondents (46.7%) reported always considering the social impact of changes in employee numbers, with another 46.7% reporting almost always. This suggests a strong emphasis on evaluating the social implications of workforce changes during project appraisal.

The environmental impact of projects is also given considerable attention, with 46.7% of respondents indicating that they always consider it, and another 46.7% reporting almost always. This reflects a high level of awareness and concern for environmental considerations in project decision-making. The potential governmental and political attitudes towards the project are consistently considered by respondents, with 46.7% reporting always and another 46.7% almost always. This indicates a proactive approach to assessing the potential regulatory and political landscape surrounding proposed projects.

The data highlights a strong emphasis on considering non-financial factors such as reputation, social impact, environmental implications, and governmental/political attitudes during project appraisal processes. This reflects a comprehensive approach to decision-making that goes beyond purely financial considerations and underscores the importance of broader stakeholder interests in project evaluation and selection.

Table 13: Post-audits of major capital expenditures analysis

	Always (%)	**Almost Always (%)**	**Sometimes (%)**	**Rarely (%)**	**Never (%)**
Post-audits of major capital expenditures	2 (13,3)	11 (73,3)	2 (13,3)	0 (0)	0 (0)

The majority of respondents (73.3%) reported conducting post-audits of major capital expenditures almost always, indicating a strong commitment to evaluating the outcomes of significant investments after their completion. An additional 13.3% reported conducting post-audits always, further emphasizing the importance placed on reviewing the performance and outcomes of capital projects. A smaller proportion of respondents (13.3%) indicated that post-audits are conducted sometimes, suggesting that while not as frequent as "Always" or "Almost Always," there is still a recognition of the value in periodically assessing the success and impact of capital expenditures. Notably, none of the respondents reported conducting post-audits rarely or never, indicating a consistent practice of evaluating major capital expenditures post-implementation. This suggests a proactive approach to performance evaluation and a commitment to accountability and continuous improvement in capital investment decision-making processes. The data underscores the significance of post-audits as a common practice among the surveyed organizations, highlighting their role in ensuring accountability, identifying areas for improvement, and enhancing the effectiveness of capital expenditure decisions.

5. CONCLUSION

The exploration of Project Appraisal Practices within South African Equity Real Estate Investment Trusts (SAREITs), based on a study with a 65.21% response rate from 23 SAREIT members, reveals insightful trends that align with global capital budgeting practices. This research focuses on how SAREITs carefully review and improve their investment appraisal methods, which is important for understanding the industry. The preference for traditional valuation methods such as Net Present Value (NPV) and Internal Rate of Return (IRR) among SAREITs is consistent with findings from various international studies. For instance, Korent & Visnjic (2023) identified NPV, IRR, and Payback Period (PBP) as predominant methods in Croatian companies, a trend echoed in regions as varied as Sri Lanka (Nurullah & Kengatharan, 2015), Korea (Kim et al., 2020), and the UK (Arnold & Hatzopoulos, 2020). These methods are favored for their effectiveness in evaluating the viability and profitability of investment projects, showcasing a global consensus on their utility in managing corporate finance and making investment decisions.

Furthermore, the Weighted Average Cost of Capital (WACC) has been identified as the most utilized tool for determining the cost of capital among SAREITs. The pivotal role of WACC in the appraisal process, serving as the discount rate for NPV calculations and a benchmark for IRR, underscores its significance in guiding investment decisions, financing strategies, and strategic financial planning. This approach is supported by the works of Bennouna et al. (2010) and Batra & Verma (2017), who emphasize the foundational role of WACC in evaluating investment projects. The application of scenario and sensitivity analysis by SAREITs in assessing project risk reflects a sophisticated approach consistent with global practices. Studies such as Arnold & Hatzopoulos (2020) and Graham & Harvey (2001) have highlighted the significant role of these analyses in effective capital budgeting, showcasing their importance across different economic environments.

In addition to financial metrics, the influence of non-financial factors, notably environmental, social, and governance (ESG) considerations, is evident in the investment decision-making process within the REIT sector. These factors significantly impact sustainable growth, stakeholder trust, and long-term investment viability, echoing the holistic approach to value creation discussed by Bekwa (2006) and Li (2019). The practice of conducting post-audits, as reported by a significant majority of respondents, underscores a commitment to evaluating the outcomes of investments post-completion. This practice, emphasizing accountability and continuous improvement, aligns with the findings of Srithongrung et al. (2019) and Hall & Millard (2010), highlighting its role in enhancing the effectiveness of capital expenditure decisions.

In conclusion, the Project Appraisal Practices of South African Equity Real Estate Investment Trusts offer a comprehensive view of the methodologies and considerations underpinning investment decisions in the sector. Integrating traditional financial appraisal techniques with risk assessment methods and non-financial factors, SAREITs demonstrate a strategic and holistic approach to capital budgeting and investment appraisal. This analysis not only contributes to the academic discourse on capital budgeting practices but also provides practical insights for practitioners within the REIT sector and beyond.

6. POLICY RECOMMENDATIONS

The following policy for academic and industry:

- **Implementation of a Structured Investment Policy for REITs:**

Real Estate Investment Trusts (REITs) should establish a formal investment policy that emphasizes the use of sophisticated capital budgeting techniques, such as Net Present Value (NPV) and Internal Rate of Return (IRR). This recommendation is grounded in the observation that these methods are widely accepted and employed by firms across different markets for their effectiveness in aligning investment decisions with shareholder wealth maximization objectives (Korent & Visnjic, 2023; Kim et al., 2020). Additionally, the policy should mandate the employment of full-time professionals dedicated to overseeing project appraisals to ensure consistency and rigor in the evaluation process.

- **Education and Training Emphasis on Predominant Methods and Emerging Techniques:**

Academic institutions should prioritize teaching the predominant methods of capital budgeting, particularly NPV and IRR, due to their widespread use and acceptance among firms in various global markets (Arnold & Hatzopoulos, 2020; Chadha & Sharma, 2019). Furthermore, there should be an emphasis on emerging and sophisticated techniques such as Real Options Analysis and Monte Carlo Simulation, which offer deeper insights into the risk and flexibility associated with investment decisions (Al-Mutairi et al., 2018; Mubashar & Tariq, 2019).

- **Enhanced Focus on Practical Application and Continuous Professional Development:**

Organizations should foster an environment of continuous learning and professional development, encouraging employees to stay abreast of the latest trends and techniques in capital budgeting. This can involve regular training sessions, workshops, and seminars to bridge the theoretical knowledge and its practical application in real-world scenarios (Batra & Verma, 2017; De Souza & Lunkes, 2016).

- **Adoption of Advanced Analytical Tools**:

Firms should invest in advanced analytical tools and software that facilitate the application of sophisticated capital budgeting techniques, aiding in accurate project risk, cash flow, and valuation assessments (Barjaktarovic et al., 2016; Nurullah & Kengatharan, 2015).

- **Encouragement of Research and Development in Capital Budgeting Practices:**

The academic and professional communities should encourage research and development in capital budgeting to innovate new methodologies and refine existing practices, ensuring they evolve to meet the changing dynamics of the global market (Andor et al., 2015; de Andrés et al., 2015).

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Annexure A: Survey: Questionnaire

Section I: Investment decision-maker profile

1. What is your position

Investment Manager
Risk Manager
Portfolio Manager
Financial Manager / Financial Director (FD)
Chief Investment Officer (CIO)
Chief Financial Officer (CFO)
Other (Specify)

2. For how many years have you worked for your current organization?

Below a year
2 - 3 years
4 - 5 years
over 6

3. What is your overall experience in project appraisal?

Below a year
2 - 3 years
4 - 5 years
6 - 10 years
over 10 years

4. What is your highest level of education?

Bachelor of Science
Bachelor of Commerce
B Com Honours or equivalent
Property Studies Honours
Chartered Accountant (CA) or Chartered Public Accounted (CPA)
Charted Financial Analyst (CFA)
Master of Business Administration (MBA)
Master's Degree (Excluding MBA)
Doctoral Degree
Other

Section II: General information about the company

5. Which year did your company receive the REIT's status: _____

6. Does your company possess or capital investment manual (written capital investment guide line)? Yes: ___ or No: ___

7. Is there a member(s) of your staff assigned full time capital investment analysis? Yes: ___ or No: ___ (If Yes, please specify the number of member(s))? _____

Section III: Project appraisal techniques used in practice

8. What is the preferred project appraisal method in your company?

	Primary Technique	**Secondary Technique**
Net present value (NPV)		
Internal rate of return (IRR)		
Profitability index (PI)		
Payback period (PBP)		
Discounted payback period (DPBP)		
Modified internal rate of return (MIRR)		
Accounting rate of return (ARR)		
Real Option		
Other		

9. How frequently does your firm use the following techniques when deciding which projects or acquisitions to pursue?

	Never (0)	**Rarely (1)**	**Sometimes (2)**	**Almost Always (3)**	**Always (4)**
Net present value (NPV)					
Internal rate of return (IRR)					
Profitability index (PI)					
Payback period (PBP)					
Discounted payback period (DPBP)					
Modified internal rate of return (MIRR)					
Accounting rate of return (ARR)					
Real Option					
Other					

10. Which of the following approaches are used in your company to determine minimum acceptable rate of return (Discount rate) to evaluate capital investments/projects (please tick one circle only)?

Weighted Cost of Capital (WACC)
Cost of Debt
Cost of Equity
Arbitrarily discount rate
other

11. How do you determine your firm's cost of equity capital?

	Always (%)	Almost Always (%)	Sometimes (%)	Rarely (%)	Never (%)
Scenario analysis					
Sensitivity analysis					
Simulation analysis					
Decision tree analysis					
Risk-adjusted analysis					
Monte Carlo simulation					

12. Which techniques does your firm use to assess a project's risk?

	Never (0)	Rarely (1)	Sometimes (2)	Almost Always (3)	Always (4)
Scenario analysis					
Sensitivity analysis					
Simulation analysis					
Decision tree analysis					
Risk-adjusted analysis					
Monte Carlo simulation					
Risk analysis					
Others					

13. To what extent do you consider the following non-financial factors when doing project appraisal?

	Never (0)	Rarely (1)	Sometimes (2)	Almost Always (3)	Always (4)
Impact on the organisation's reputation if the project is socially questionable					
Social impact of an increase or decrease in employee numbers					
The environmental impact of the project					
Possible positive or negative governmental political attitudes towards the project					
The strategic consequences of consumption of scarce raw materials					

14. Does your company conduct post-audits of major capital expenditures?

Never (0)	Rarely (1)	Sometimes (2)	Almost Always (3)	Always (4)