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PROPERTY-TYPE DIVERSIFICATION STRATEGIES AND THEIR PERFORMANCE IMPLICATIONS ON SOUT H AFRICAN R EAL ESTATE INVESTMENT TR USTS

RESEARCH REPORT

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445399

A research report submitted to the University of the Witwatersrand, Faculty of Engineering and the Built Environment, School of Construction Economics and Management in partial fulfilment of the requirements for a Master of Science degree in Building.

March 2018

DECLARATION

I declare that this report is my own work submitted in partial fulfilment of the requirements of the degree of Master of Science in Building at the School of Construction Economics and Management in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.



……..

Thatahatšo Bantseke

29 March 2018

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ABSTRACT

Background - Extensive research that examines the performance implications of regional and property-type diversification has been undertaken in Asia, United States of America and the United Kingdom. Research on South African real estate investment trusts' (SAREITs) diversification strategies is insufficient. The South listed property market is ranked amongst the largest sectors on the JSE with 35 *SA REITs* listed on the JSE, which represent a *market capitalisation* of over ZAR435 billion which is 6% of the JSE All Share Index market value. The size of this sector emphasizes the importance it within the South African economy. This study is of significance to the academic fraternity as well as local and international investors and asset managers who are interested in participating in the South African REITs market

Purpose -The study investigates the effects of property-type diversification on SAREITs performance through literature review which explores the key variables in the diversification and performance relationship to create an understanding of the REITs sector. Correlation and multiple regression analysis is undertaken utilizing secondary data from Published Annual Financial Statements, MSCI South Africa and INET BFA Databases. The REITS analyzed have the majority of their underlying property assets located within South Africa and have been listed on the JSE for the 2014 to 2017 financial years.

Findings - The findings from the literature review highlight that property type diversification strategies although playing a paramount role in portfolio formation of REITs and performance, the returns of companies are also influenced by other moderating factors such as property specific, organizational and industry characteristics. Regressions between return variables with the property types and degree of diversification of REITs, show both positive and negative relationship but these associations were found to be statistically insignificant. The hypothesis is not fully supported by the statistical data analysis and entails that other non-systemic risk factors such as "firm leverage policies"; "management style"; "net asset values"; "size of REITs stock" and "property location" need to be analysed in conjunction with in order to yield more robust results.

Limitations - The study focused on SAREITS with the majority of their underlying property assets located within South Africa and listed on the JSE for the 2014 to 2017 financial years. Complete regional data on the listed REITs was lacking which restricted the study to an analysis of property type strategies. Utilisation of secondary data restricted the research to a single set of data and this impacts on the findings as some of the data is incomplete. Further studies in this area could include regional-type diversification strategies analysis over a longer observation period.

1. Introduction and Research Problem

1.1 Background

The introduction of the Real Estate Investment Trust Act of 1960 in the United States of America, which set the modern day structure of the Real Estates Investments Trusts (REITs), was the first catalyst for the outstanding US$1.7 trillion market capitalisation growth within this industry (EYGM Limited, 2016). In the last 10 years there has been a large increase in the number of countries introducing the REITs model in their listed asset markets, with South Africa having introduced its model in May 2013 (EYGM Limited, 2016 and Ntuli & Akinsomi, 2016).

This study endeavours to undertake an analysis on the performance implications of property-type diversification and aims to add to the existing body of knowledge in this research area. The intension is to increase knowledge and awareness of the benefits of diversification strategies within South African REITs to existing and potential investors and operators within this specialised market sector.

1.2 Problem Statement and Research Questions

Geltner (2007) states that the real estate market is considered as a well-functioning market which however, lacks efficiency on information as compared to the financial markets mainly the stock and foreign exchange market. Capozza & Lee (1995) further observe that due to the rapid growth of the global REITs industry research that provides information on performance indicators such as expense ratios, leverage, total asset turnover and returns of different property types is lagging.

In addition to information inefficiencies, trends in the real estate industry after the 2008 global recession have seen investors looking for better yields and this put pressure on the market to become efficient in its investment strategies. A study by Katz & Gupta (2014) reveals the importance of engaging various diversification strategies on investment within UK-REITs and this has proven to be positive and reduce risk on returns on investments within these REITs.

Anderson, Benefield & Hurst (2015) and Benefield, Anderson & Zumpano (2009) in their research identify a significant positive correlation between property-type diversification and real estate returns. On the contrary Eichholtz *et al*. (2000) cited in Benefield, Anderson & Zumpano (2009), and Chen & Peiser (1999) find that specialized REITs outperform property-type diversified REITs when real returns are compared against expected returns. Ping & Jalil (2006) on the contrary does not discover any significant influence of property types on REITs performance.

It is important to resolve these conflicting findings or find ways to explain the reasons behind such differences and this will enable the research fraternity build theories with external validity. This study will replicate the studies done by Ping & Jalil (2006) and Anderson, Benefield & Hurst (2015) especially that these studies although very similar; yielded conflicting outcomes and this research will contribute towards them by bringing into light the elements that contribute to these differences.

Research that examines the performance implications of property-type diversification has been carried out in Asia, United Kingdom (UK) and United States of America (US). This research area, although ranking amongst the top five research areas in real estate publications, has not grown beyond eight percent in terms of amount of featured articles since the 1980s (Winson-Geideman & Evangelopoulos, 2013). Research on South African real estate investment trusts' (SAREITs) is also insufficient and a search on related work has yielded published works by Akinsomi, Pahad, Nape & Margolis (2015), Ntuli & Akinsomi (2016), Olaleye (2011) and Newell & Webb (1998). The lack of REITs focused research material within South Africa and in-depth empirical studies on the effects of property types on REITs performance prompts the need for this study. This research adds-on to the work by Ntuli & Akinsomi (2016) and Olaleye (2011) through highlight the effect of different property types on REITs performance and consequently within a mixed asset portfolio. Akinsomi *et al.* (2015) looked into the barrier to entry into the African real estate market by SAREITs. This research will add on to their research as it clarifies the effects of different property types on performances especially that this strategy is one of the major diversification strategies identified in their research.

It is therefore against this background that there is a need for further empirical studies which seek to ascertain the characteristics of property-types and how they impact on performance.

Furthermore, it is another aim of this research study to deliver a systematic analysis of the impact of the different property-type diversification strategies on performance in the South African real estate industry. As earlier alluded, hopefully the study will be of significance to the academic fraternity as well as local or international investors and asset managers who are participating or having an interested in the South African REITs market.

The research project will answer the following two main research questions:

i) What are the critical dependent and independent variables within the property-type diversification and real estate performance relationship? and
ii) How does property type diversification impact on real estate portfolio performance?

By answering the above research questions the study will be able draw conclusions, make comparisons with similar studies and come up with emerging trends and suggestions for further studies in property-type diversification.

1.3 Research Hypotheses

A literature analysis of Benefield, Anderson & Zumpano (2009) and Ping & Jalil (2016) into the impact of property and regional type diversification on REITs performance aided the construction of the following hypotheses:

Hypotheses:

H_0: Property-type diversification does not enhance REITS performance in terms of expected return, dividend yield, return on equity and return on total assets variables.
H_1: Property-type diversification enhances REITS performance in terms of expected return, dividend yield, return on equity and return on total assets variables.

1.4 Aim of Study

The study intends to investigate the effects of property-type diversification on SAREITs performance as reflected by the expected return, dividend yield, return on equity and return on total assets yields of the SAREITS by applying correlation and multiple regression analysis. It analyses SAREITS with the majority of their underlying property assets located within South Africa and listed on the JSE for the 2014 to 2017 financial years.

1.5 Research Objectives

The four main objective of this study are:

i) To create an understanding of the global SAREITs sector and its diversification strategies;
ii) To explore the key variables in the diversification and performance relationship of SAREITs;
iii) To examine the trend of the performance of the SAREITs over the period of 2014 to 2017 financial years in relation to retail, commercial/office, industrial, residential and special property types;
iv) To compare the trends emerging based on the expected return, dividend yield, return on equity and return on total assets return variables of the SAREITs; and

The first two objectives of the study will be achieved through an in-depth literature review of related research studies locally and internationally. Objective iii) and iv) will be achieved through primary research utilising statistical analysis methods of secondary data.

1.6 Research Structure

The structure of research report is as per Table 1 below:

TABLE 1: Research Structure

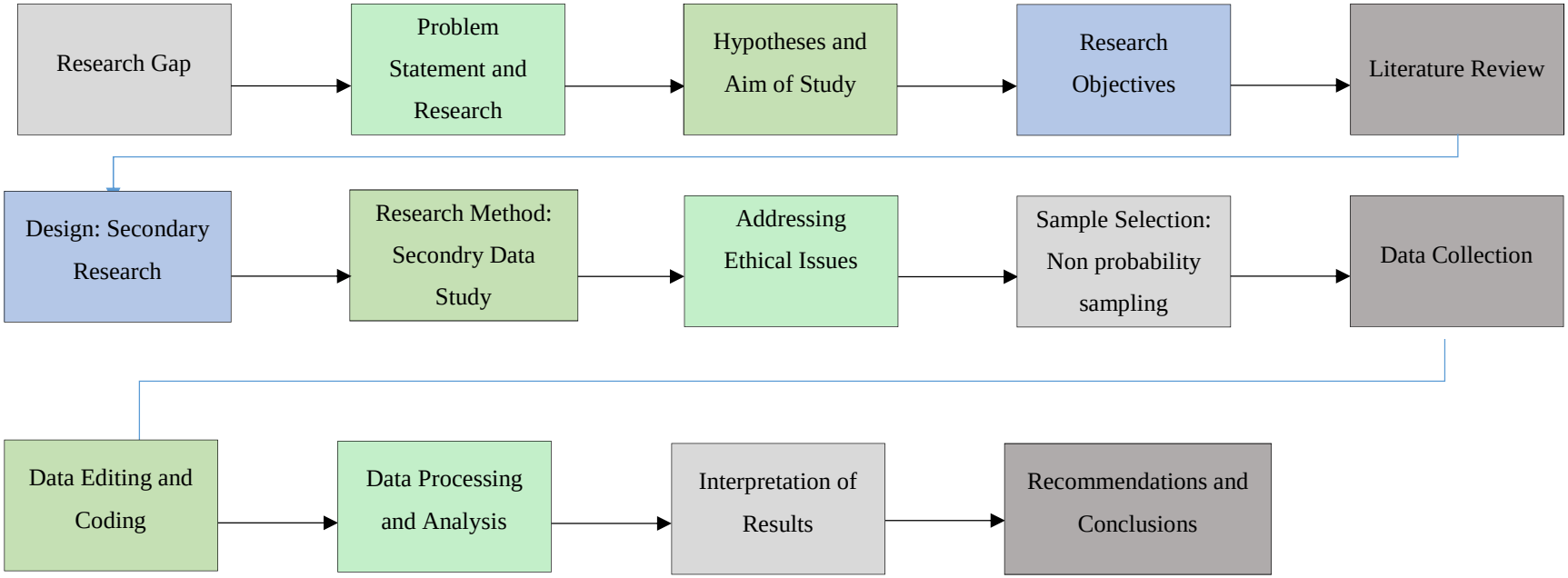
Chapter	Details
Chapter 1: Introduction and Research Objectives	This chapter includes comprises the introduction to the report, which includes the problem statement, research objectives, hypotheses and structure;
Chapter 2: Literature Review	An in-depth literature review of existing studies examines the main theories underpinning the study;
Chapter 3: Research Methodology	Methodological philosophy, strategies and methodological choices that are be applied in the study;
Chapter 4: Data Selection, Coding and Analysis	Secondary data selection and coding will be done followed by statistical analysis using multiple regression analysis to test the effectiveness of property type diversification strategies on real estate performance;
Chapter 5: Analysis of Findings	Analysis of empirical research findings; and
Chapter 6: Recommendations and Conclusions	Conclusion and recommendations for further research.

This research report firstly outlines the research problem, objectives and structure of the study. The aim of the chapter is to give a background and motivation for the study and introduce the reader to concepts such as real estate investment trusts, diversification, risk and return. The literature review chapter examines the main research theories underpinning it, since it is through the review of the various theories that key theoretical foundations are laid. Key terms such as real estate investments, portfolio diversification, income, risk and return and how they are interlinked are expounded upon in order to gain understanding of the various variables. In the Research Methodology section, research philosophies, strategies and data analysis methods used by the researchers in this area are scrutinised in order to determine the most appropriate methods and tools to apply in this research. Key ethical concerns are also discussed in this

chapter and how these concerns are addressed by the author. Chapter 3 to 5 of the report selects and codes the identified secondary data, undertakes an empirical analysis of the data and findings are discussed and compared with other studies in order to draw conclusions.

Figure 1 shows the methodologic flow that is followed in the study.

FIGURE 1: Flow diagram of elements of methodological choice



Adopted from Saunders, Lewis & Thornhill (2012)

1.7 Limitations of study

The following are the limitations of the study:

i) SAREITS with the majority of underlying property assets located within South Africa and have been listed on the JSE for the 2014 to 2017 financial years;
ii) Complete regional data on the listed SAREITs portfolios is lacking which restricted the study to an analysis of property type strategies;
iii) The research period was limited to 1 year which had an impact reduced the depth of study due to time constraints;
iv) Utilisation of secondary data restricted the research to a single set of data and this impacted on the findings as the data is incomplete; and
v) Data on SAREITS performance is available only from May 2013 to date, which limits the analysis to an observation period of only four years.

1.8 Importance of the study

This research area although ranking amongst the top five research areas in real estate publications has not grown beyond the eight percent in terms of amount of featured articles since the 1980s (Winson-Geideman & Evangelopoulos, 2013). In a South African study by Ntuli & Akinsomi (2016) that analyses the initial performance of SAREITs, their findings indicate that these companies are the second best performing risk-adjusted asset and a return-enhancer, when included in a mixed-asset portfolio.

The property market is said to be ranked amongst the largest sectors on the JSE with a total of 38 REITs listed on the JSE, which represent a *market capitalisation* of over ZAR435 billion (INET BFA Company Information, 2018). The sheer size of this market emphasizes the importance of this sector within the South African economy. According to FTSE Russell's research, the sector comprises 6% of total market capitalisation of the JSE as shown on **Table 2**.

The conclusions of the studies and market facts further emphasize the importance of the SAREITs sector within the listed asset market.

TABLE 2: JSE All Share Index Sector Composition

Rank	Sector Code	Sector Name	Net Market Cap (ZARmill)	Weight %
1	1700	Basic Resources	1 372 456.00	19.18%
2	5500	Media	1 288 875.00	18.02%
3	3700	Personal & Household Goods	752 317.00	10.52%
4	8300	Banks	710 686.00	9.93%
5	5300	Retail	542 144.00	7.58%
6	***8600***	***Real Estate***	***435 743.00***	***6.09%***
7	8500	Insurance	421 253.00	5.89%
8	2700	Industrial Goods & Services	316 357.00	4.42%
9	6500	Telecommunications	311 612.00	4.36%
10	1300	Chemicals	276 439.00	3.86%
11	8700	Financial Services	266 506.00	3.73%
12	4500	Health Care	221 816.00	3.10%
13	3500	Food & Beverage	153 345.00	2.14%
14	5700	Travel & Leisure	36 474.00	0.51%
15	2300	Construction & Materials	25 107.00	0.35%
16	9500	Technology	12 869.00	0.18%
17	0500	Oil & Gas	6 046.00	0.08%
18	3300	Automobiles & Parts	3 955.00	0.06%
			7 154 000.00	**100.00%**

Compile by Author from FTSE Russell (2018)

2. Literature Review

2.1 Introduction

This section places focus on the review of literature related to the research study. It follows that this forms the base upon which the study intends to reach its findings. The review of literature fulfils the first two objective which seek to firstly explore the key variables in the diversification and performance relationship.

The main research theories underpinning this study are critiqued and key terms such as diversification, risk and return are scrutinised to give meaning and links to the study.

Finally, inferences are made from the findings of the related literature in order to give answers to some of our research questions.

2.2 A Case for Real Estate Investment

The slowdown of global economic growth in 2008 has left investors the challenge to seek alternative investment vehicles which will shield them against excessive losses experienced with traditional assets, such as equities and bonds. Real estate has offered this alternative due to its ability to hedge against inflation, increase overall returns and alleviate portfolio risk. The case for the inclusion of real estate in a mixed asset portfolio has been extensively researched with Olaleye (2011) concluding that this asset class, besides having low correlation with complementary asset classes, it also has the ability to yield returns equivalent to stocks and bonds. He further supports this assertion by stating prior research by Grauer & Hakansson (1995), Byrne & Lee (2000), Seiler *et al.* (1999), Chandrashekarah (1999), Bigge & Langemeier (2004), Adair, A., McGreal, S. & Webb, J. (2006), Amidu & Aluko (2006) and Olaleye, Aluko & Oloyede (2008).

Case & Wachter (2011) basing their research on the Gordon growth model, come to a finding that real estate, due to its inflation hedging qualities is able to achieve favourable returns supposing that future rent growth and discount rates are positively correlated with expected and actual inflation rates.

2.2.1 South African Real Estate Investment Trusts

REITs account for an outstanding US$1.7 trillion market capitalisation growth since their inception in 1960 in the United States of America (EYGM Limited, 2016). According to Rehring (2012), real estate is characterised by high transaction costs, long marketing period risks and ability to predict its returns. Findings from this research affirm the supposition that in order to maximise the positive and minimise the negative effects of the REITs features; an investor needs to have a more medium to long term outlook when investing in this asset class. Rehring (2012) concludes that real estate, although muddled by high transaction costs and lack of information efficiency, as an investment vehicle it is able achieve above expected returns given its associated risks.

Prior to the start of the real estate investment trusts structure in South Africa, in May 2013, the publicly traded investment vehicles in existence had been property unit trusts (PUTs) and the property loan stock companies (PLSs). PUTs are trusts that hold a portfolio of investment grade properties whilst PLSs legally differ from the PUTs, in that they are companies (instead of being trusts).

Due to these structures being governed by with an inconsistent regulatory environment, the industry was compelled to come up with a structure that would offer a standardised base to regulate property investment vehicles and this led to the birth of the SAREIT regime (Accountancy South Africa, 2014). The introduction of the REIT structure in South Africa in May, 2013 was primarily aimed at addressing the regulation issues of these entities. PUTs and PLs were allowed to convert to the REIT model and were required to comply with the following JSE Listings Requirements for REITs:

- The listing entity needed to own property valued in excess of R300 million;
- The entity needed to keep its debt below 60 per cent of its gross asset value;
- The REIT should earn 75 per cent of its income from rental or investment income either from direct or indirect property ownership;
- The REIT should monitor risk through a risk committee specifically tasked to perform that task;

- The REIT should not invest in financial instruments that are not in the ordinary course of its business; and
- The REIT is required to distribute at least 75 per cent of its taxable profits available for distribution to its investors each year.

The above regulations, without compromising "transparency and governance", are mainly aimed at safeguarding investor protection and guaranteeing cautious management practices within these entities.

Table 3 lists the 33 identifies SAREITs with the majority of their underlying assets based in South Africa. From the table the following characteristics of the 33 SAREITs are listed below:

i) The selected population has a total market capitalization of R373billon; this figure compared to the rest of the REITs sector on the JSE indicates that these REITs represent over 85% of the total market capitalization of the real estate investments trusts listed on the JSE.
ii) Of the 33 SAREITs identified over 55.86% of the market capitalization is attributed to the four companies, Growthpoint, Redefine, Hyprop and Resilient;
iii) The balance of the market, 44.14%, is shared amongst the remaining 29 companies;
iv) The majority of the SAREITs are diversified by property types and geographically with most of the properties located in the major metropolitan areas of South Africa, .i.e. Johannesburg, Pretoria, Cape Town, Durban and Port Elizabeth.

TABLE 3: South African REITs Market Capitalisation

	Name	Market Cap (ZAR)(billion)	Market Cap (USD)(billion)	Sector Properties	Number of Properties	% of Market owned
1	Growthpoint Properties	89.93	7.5	R,C,I, Res	529	24.13%
2	Redefine Properties	65.19	5.4	R,C,I, Sp	312	17.49%
3	Hyprop Investments	27.88	2.3	R	12	7.48%
4	Resilient REIT	25.21	2.1	R	16	6.76%
5	Fortress REIT A	19.54	1.6	R,C,I, Res	48	5.24%
6	Vukile Property Fund	16.71	1.4	R	47	4.48%
7	Fortress REIT B	16.40	1.4	R,C,I, Res	49	4.40%
8	Investec Property Fund	12.80	1.1	R,C,I	122	3.43%
9	SA Corp Real Estate	12.27	1.0	R,C,I, Res	179	3.29%
10	Emira Property Fund	8.35	0.7	R,C,I	-	2.24%
11	Equites Property Fund	8.09	0.7	I	52	2.17%
12	Arrow Head Properties	7.47	0.6	R,C,I	154	2.00%
13	Liberty Two Degrees	7.22	0.6	R,C,I	11	1.94%
14	Hospitality Prop Fund	6.65	0.6	Sp	15	1.78%
15	Rebosis Property Fund B	6.27	0.5	R,C,I	13	1.68%
16	Accelerate Prop Fund	5.54	0.5	R,C,I	61	1.49%
17	Octodec Investments	5.33	0.4	R,C,I	-	1.43%
18	Delta Property Fund	4.31	0.4	C	20	1.16%
19	Stor-age Property REIT	3.84	0.3	Sp	66	1.03%
20	Indluplace Properties	3.31	0.3	RES	125	0.89%
21	Gemgrow Properties B	3.04	0.3	R,C,I	4	0.82%
22	Dipula Income Fund B	2.45	0.2	R,C,I	87	0.66%
23	Texton Property Fund	2.43	0.2	R,C,I	43	0.65%
24	Dipula Income Fund A	2.19	0.2	R,C,I	87	0.59%
25	Safari Investments RSA	2.14	0.2	R	19	0.57%
26	Fairvest Prop Holdings	1.81	0.2	R	41	0.49%
27	Spear REIT	1.60	0.1	R,C,I, Sp	31	0.43%
28	Rebosis Property Fund A	1.57	0.1	R,C,I	6	0.42%
29	Oasis Crescent Pro Fund	1.24	0.1	R,C,I	-	0.33%
30	Newpark REIT	0.60	0.1	C	2	0.16%
31	Gemgrow Properties A	0.47	0.0	R,C,I	17	0.13%
32	Orion Real Estate	0.41	0.0	R,C,I, Res	3	0.11%
33	Transcend Res Pro Fund	0.40	0.0	RES	13	0.11%

(R=Retail C=Commercial I=Industrial RES=Residential Sp=Specialised) Adopted from Ntuli & Akinsomi (2016): Compile from INET BFA Database and Share Data Online Reports (Retrieved March 2018)

2.3 Diversification, risk and return

2.3.1 Real Estate Returns

The total return of an investment comprises of two parts: the income return and capital growth. Income return or dividend payout is the net cashflow paid out to an investor during a financial period determined by the organisation. This return is calculated by dividing the cash paid out by the market value of the investment or asset. Capital growth on the other hand is determined by dividing the change in the market value of the investment during the financial period by the market value at the beginning of period (Geltner, 2007 as cited by Nyström & Lind, 2012)

In real estate, both the income return and the capital growth are linked but not limited to the value and size of property, the rental rates that can be charged and the stability of cashflows generated. In order to maximise the expected value or return of an investment investors therefor must choose REITs that aim to minimise the risks. (Lizieri & Ward, 2000 as cited in Giannotti & Mattarocci, 2008). Real estate is also subjected to various systemic and non-systemic risks which portfolio managers need to take into account when selecting the type and location of properties within their portfolios. Giannotti & Mattarocci (2008) indicate in **Table 4** the different types of risks that need to be managed in real estate.

Research on REITs by Akinsomi *et al.* (2015) highlight that when South African investors consider regional diversification in other African countries, property rights instead of expected returns, taxation, market size and market liquidity were found most critical investment criteria. This is contradictory to Ping & Jalil (2016) and may due to the Africa's real estate market still being at its developing stage and operating within untested legislative environments.

TABLE 4: Risk Categories

Risk category	Score	Main significant factors
Tenant risk	A	Tenant's revenue
	B	Tenant's juridical status
	C	Tenant's financial liquidity
	D	
Endogenous risk	A	Estate type and characteristics
	B	Estate fungibility
	C	Potential market replacement
	D	Maintenance costs
Exogenous risk	A	Local area characteristics
	B	Facilities for tenant / owner
	C	Potential use of adjacent areas
	D	
Financial risk	According to borrowing percentage	Loan characteristics
		Financial leverage
		Investment inflow characteristics

Source: Giannotti & Mattarocci (2008)

2.3.2 Systemic and Non-systemic Risk

The notion of diversifiable (non-systemic) and non- diversifiable (systemic risk) emanates from the *"1964 William Sharpe's Capital Asset Pricing Model"* which was further explored by John Lintner in 1965. The model constructed the market equilibrium theory of asset price under conditions of risk and clarified the relationship between the price of an asset as represented by its expected return and the various systemic risks which are associated to it (Ben-Horim & Levy, 1980).

Non-systemic risks such as asset-specific factors; business; financial and liquidity risk are the types of risk which can be eliminated by diversifying an investment portfolio or putting in place other risk mitigating measures. Systemic risk on the other hand deals with unpredictable economic conditions, which include business cycles, inflation rate, interest rates and exchange rates (Rodrigues, 2009). Systemic risk cannot be diversified away and it requires an investor to price in the costs of such risks within the financial model.

In monetary language, risk is a standard deviation from the mean considered and categorized as past or expected deviation and in real estate, it is characterized by the qualities of singular assets which include but are not limited to location, size or quality and are unique to each asset (Cheng & Liang, 2000). Cheng & Liang, 2000 conclude that Modern Portfolio Theory (MPT)

based portfolios prove to be more efficient than naively formed portfolios if the strategy implementation period is identical to the observation period. In theory, qualified and experienced investors can reduce non-systemic risk through the way they structure their portfolios. This is further emphasized by Byrne & Lee (2000) who list two necessities of any diversification strategy as that in each market section, the return patterns should be homogenous and negatively correlated.

2.3.3 Capital Pricing and the Modern Portfolio Theory

The capital pricing and the modern portfolio theories provide a framework to define, measure and explain the relationship between expected asset return and risk. The Capital Asset Pricing Model (CAPM) was independently developed based on Markowitz's work by Sharpe (1964), Lintner (1965) and Mosin (1966). The model is used to value investments by establishing the relationship between risk and return, and the development of the model played a critical role in building the foundation of the Modern Portfolio Theory (MPT) (Fama and French, 2004).

Stephen Ross in 1976 improved upon the CAPM model by developing the Asset Pricing Model (APT) that takes into account the effects of systemic risk factors and has become a substitute for the CAPM (Roll and Ross, 1984). Although both models affirm the linear relation between assets' expected returns and the risks associated with them, the CAPM as a single factor model only incorporates the expected market return less the risk-free premium and the beta/risk of an asset or portfolio. The APT incorporates multiple non-systemic and systemic risk factors, although not specific in the model (Chan, Hendershott & Sanders, 1990). Stephen Ross expressed the required return of an asset in the formula below.

$$E(ri) = rf + \beta i1 * RP1 + \beta i2 * RP2 + \ldots + \beta kn * RPn,$$

Where: *rf* = the risk-free rate of return,
β = the sensitivity of the asset or portfolio in relation to the specified factor (*i1, i2, i3*, etc) and *RP* = the risk premium of the specified factor

Source: Lee (2014)

2.3.4 Assumptions underlying the CAPM

Although the CAPM has been the most widely used model to assess the financial performance of managed portfolios and a tool to estimate the cost of capital of firms or investments, researchers such as Gruber (2003) and Fama & French (2004) identified the following shortcoming in the assumptions of the model.

1. The model assumes that there are no transaction costs involved and an attempt to include these costs in the model complicates it. This assumption unfortunately is unrealistic especially in real estate transactions where some of these costs are unavoidable, significant and often legislated for these type of assets. In case of SAREITs transfer duties levied on change of ownership can cost up to 13% of the property value.
2. The model further assumes that investors are able to exercise both call or put options on an investment, irrespective of their financial resources. This assumption can hold true for large institutional investors but not so for smaller, financially restricted investors as in the case of SAREITs where 29 out of 33 of them are medium and small capitalization companies.
3. The third assumption of the model is that there are no income tax effects on dividends and capital gains and this assumption only holds true for tax-exempt funds. South African company income tax is at 28% of taxable profits whilst dividends are taxed at a rate of 20%.
4. The fourth assumption is that capital markets are perfectly competitive and an individual's or institution's buying and selling of a stock cannot affect its price. While individual actions cannot change asset prices, the combined actions of investors can have a noticeable influence.
5. The fifth critical assumption is that investors are rational and risk-averse and will make their investment decisions solely based on the mean and variance of their expected return. This assumption is contrary to real life situations where investor decisions can be irrational and risky, which is evident in the global 2008 property price crash which led to huge losses in real estate investments.
6. The sixth assumption is that the borrowing and lending of any amount of funds desired at a rate of interest equal to the risk-free interest rate. The assumption does not hold

true in the real world as borrowers are offered different rates of interest based on their risk profile.

7. The final critical assumption assumes the homogeneity of investors and information available to them to make investment decision. The assumption fails to recognise that in an imperfect world access to information, ability to correctly interpret the information and transparency are not the same to all investors and some will be more informed than others.

The research Because of the assumptions listed above it therefor becomes imperative to focus the attention of the review on how the real estate sector is affected by the different risk and environmental factors which impact on its performance.

Merton (1973) expanded upon Sharpe (1964) early work by developing an intertemporal capital asset pricing model which introduced further assumptions to the model in order to simplify an organisation's debt structure. These three assumptions are that

1. An organisation has a basic capital structure consisting of either debt or equity;
2. The interest payable on the debt is equal to the zero coupon bound with no periodic income payments with returns paid to the bondholder only at maturity and
3. An organisation cannot pay out dividends on equity invested or issue new debt until the maturity of its current debt.

The introduction of these additional assumptions allowed the model not only to facilitate the valuation of various asset classes, but also address the need to choose a variety of financial instruments by an organisation (Wang, 2009).

2.3.5 Risk and Return in Real Estate

Different types of properties: being commercial, retail, industrial, residential or specialised, bring along a particular or asset specific risk factors within a diversified property portfolio. These risk factors are categorised by Adair & Hutchinson (2005) as follows:

i) Market transparency risk- this type of risk is associated with the timing, quantity and quality of information available to an investor in order to assess an investment opportunity which might lead to mispricing of assets;

ii) Investment quality risk- changes in factors such as rental growth, lease periods, unexpected maintenance costs and liquidity issues tend to impact on the quality of an investment;
iii) Covenant strength risk- the risk is associated to the tenant's ability to pay the rent;
iv) Depreciation and obsolescence risk- real estate asset depreciate and become obsolete due to advancement in technology, business practise and tenant requirements. These factors place a risk on an investment especially if they have not been correctly priced in a financial model.

According Holman & West (2013) as cited in Lee (2014), within a diversified portfolio, in order to have assets with higher percentage contributions to risk (PCR) these assets need to have similarly higher rates of return. They go on to express the required return of an asset in the formula below.

$$RRi = (PCRi * Rp)/Wi$$

Where Rp = return of the portfolio

$PCRi * Rp$ = Contribution to return of investment/asset i

Wi = weight of the investment/asset in the portfolio

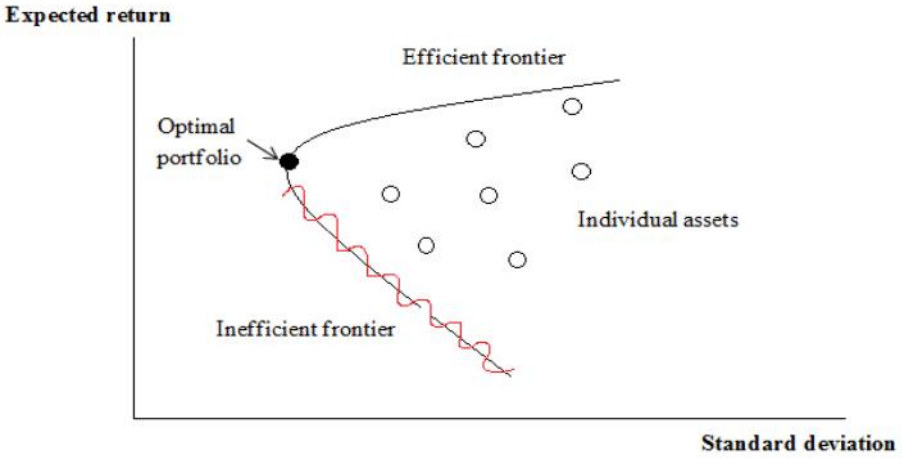
Source: Lee (2014)

Lee (2014) concludes that assets with higher PCRs need to have similarly higher rates of return which can be compared to the actual returns of order to determine whether the asset's PCR is acceptable to the investor. Looking into how the listed property market operates, according to Bakri (2014), it varies with the effect of globalisation and specific location factors being transparency and efficiency. As a result of the two factors above, risks in different markets are dependent on specific market conditions in cases where a region has varied laws and regulations applying to the real estate markets. Based on Markowitz's (1952) work, many investors tend to diversify their investments by investing across different regions in different property types in real estate to protect themselves from such kinds of risk. The impression is that in case of non-systemic risk in a region or property type, other owned complementary properties will buffer the impact of the declines.

Markowitz (1952) is regarded as the first to deliberate on the risk reduction theory when he established a concept currently called the Modern Portfolio Theory (MPT). A portfolio contains many assets, if these are combined and their correlation is not perfect, the portfolio's

standard deviation will be below the average of its assets. Markowitz introduced "the efficient frontier" which represented a set of optimal portfolios that offered the maximum expected return given a predetermined level of risk as represented by the standard deviation. **Figure 2** is graphical representation of the frontier.

FIGURE 2: The Efficient Frontier



Source: Nyström & Lind (2012)

Viezer (2000) defines risk reduction, also referred to as diversification as an effort to completely get rid of the non-systemic risk. This is done to achieve minimal instabilities in returns which are not market related. It follows from Mueller & Laposa (1995) that prime diversification is attained at a given risk level, portfolios that give the optimal proceeds are formed. This also means the minimal risk per specified turnover level. Such characterized portfolios lie on the efficient frontier (Cheng & Liang, 2000).

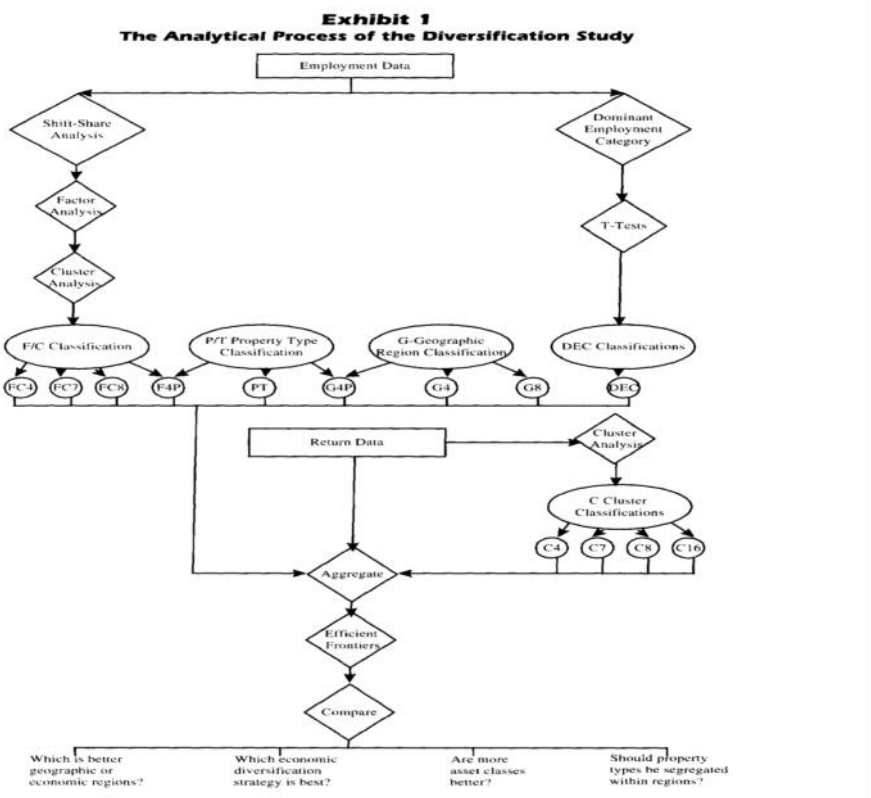
2.4 Diversification Strategies and Theoretical Framework in Real Estate

2.4.1 Diversification Strategies in Real Estate

Akinsomi *et al.* (2015) describe diversification as *"the means by which investors minimise their exposure to firm-specific risk and systematic risk as well as moderating the short-term effects of individual asset class performance on portfolio value"*. Since the aim of diversification is to have asset portfolios with the uppermost return at a given risk level; it becomes important to analyse risk reduction strategies in the real estate segment due to the industry's unique

composition and operating models. Viezer (2000) analytic process of determining the main risk reduction strategies in the real estate industry identifies property, geographic region, economic region and asset class (Class A, Class B and Class C buildings) diversification strategies. This analysis was done utilising a process that ensured that all strategies tested had access to similar property data, a single testing period was utilised for all strategies and strategies with similar asset class characteristics were compared to each other in order to separate strategy impact from influence of other factors.

FIGURE 3: The Analytic Process of the Diversification Study



Source: Viezer (2000)

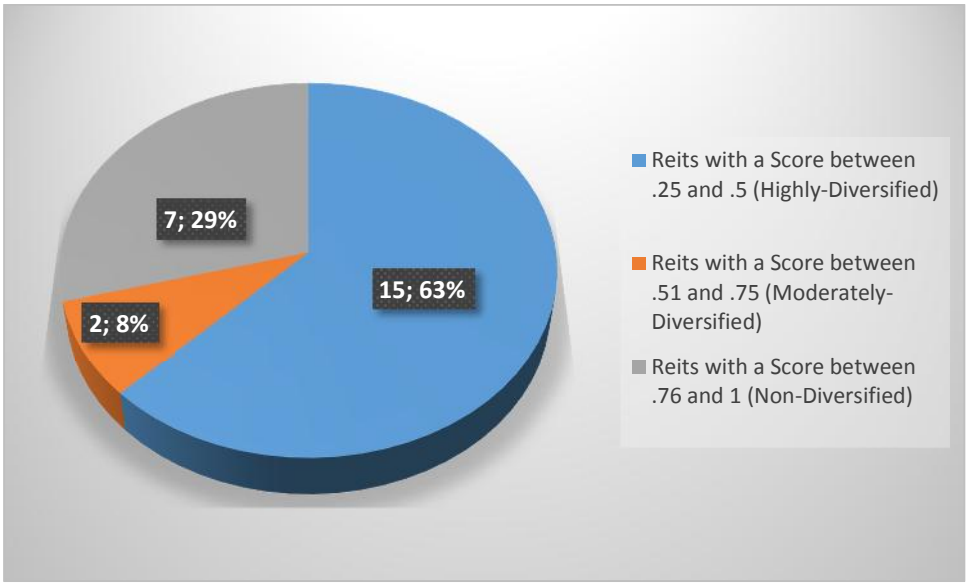
Findings by Viezer (2000) found property type diversification to have significant impact on returns in comparison to the other three strategies, i.e., geographic region, economic region and asset class. Furthermore, the MPT constructed property-geographic diversification strategy was found to be superior and provided portfolio managers with a diversification strategy that is not only easy to implement but also efficient as confirmed by Olaleye, Aluko & Oloyede (2008) findings. The researchers found that investors can benefit from property-type diversification strategies but only if such portfolios are efficiently put together using

constant correlation models. Their findings further highlighted that naively constructed portfolios did not yield risk reduction benefits in the Nigerian real estate market.

The author has categorized the SAREITS in accordance with Ambrose & Linneman (1998) method of employing the percentage of the REITs' portfolio investment in each property type. A REIT with less than 75% of its portfolio invested in one particular property type is categorised as “Diversified”. On the other hand a REIT which has 75% or more of its portfolio invested in a particular property type, is categorised as “PurePlay/Non-Diversified”.
This method yield a sample of 10 REITs being categorized as “Specialized” and 23 REITs being categorized as “Diversified”.

The following table and chart summarize the REITs diversification categories calculated using the Herfindahl-Hirschman index (HHI) developed by economists Orris C. Herfindahl and Albert O. Hirschman (Herfindahl, 1950).

FIGURE 4: SAREITs Diversification (HHI Scoring)



Compiled by Author from Share Data Online Reports (2018)

TABLE 5: SAREITS Diversification Categories

	Name	Type of REIT D= Diversified P=Pureplay/Non-Diversified	Sector Properties
1	Growthpoint Properties	D	R,C,I, Res
2	Dipula Income Fund A	D	R,C,I
3	Dipula Income Fund B	D	R,C,I
4	SA Corp Real Estate	D	R,C,I, Res
5	Emira Property Fund	D	R,C,I
6	Fortress REIT A Ltd	D	R,C,I, Res
7	Fortress REIT B Ltd	D	R,C,I, Res
8	Gemgrow Properties A	D	R,C,I
9	Gemgrow Properties B	D	R,C,I
10	Investec Property Fund	D	R,C,I
11	Liberty Two Degrees	D	R,C,I
12	Newpark REIT	D	R,C,I
13	Orion Real Este	D	R,C,I, Res
14	Rebosis Property Fund A	D	R,C,I
15	Rebosis Property Fund B	D	R,C,I
16	Redefine Properties Ltd	D	R,C,I, Sp
17	Spear REIT	D	R,C,I, Sp
18	Texton Property Fund	D	R,C,I
19	Arrow Head Properties	D	R,C,I
20	Delta Property Fund	P	C
21	Equites Property Fund	P	I
22	Indluplace Properties	P	RES
23	Transcend Res. Prop Fund	P	RES
24	Accelerate Property Fund	D	R,C,I
25	Fairvest Prop Holdings	P	R
26	Hyprop Investments Ltd	P	R
27	Oasis Crescent Prop Fund	D	R,C,I
28	Octodec Investments	D	R,C,I
29	Resilient REIT Ltd	P	R
30	Safari Investments RSA	P	R
31	Vukile Property Fund	D	R,C,I,Sp,Res
32	Hospitality Property Fund	P	Sp
33	Stor-age Property REIT	P	Sp
R=Retail C=Commercial I=Industrial RES=Residential Sp=Specialised			

Compiled by Author from Share Data Online Reports (2018)

2.4.2 Direct and Indirect Real Estate Investment

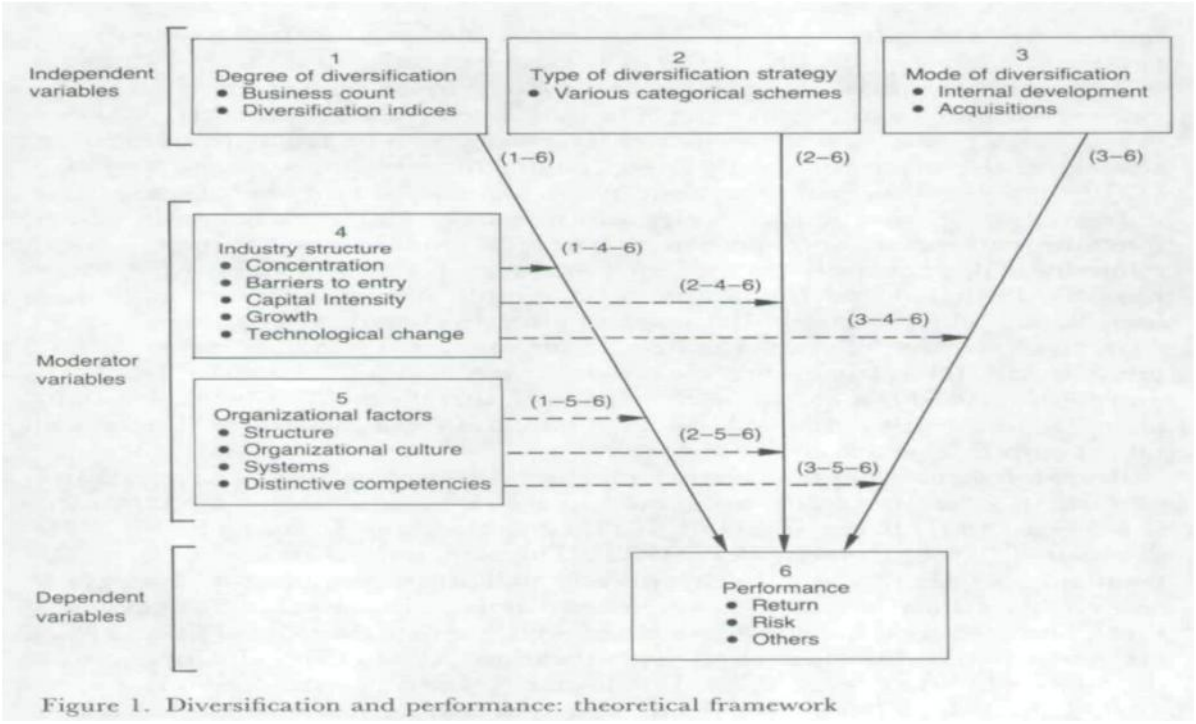
When looking at investment into property markets, an investor is faced with a decision whether to make a direct or indirect investment. A direct investment in real estates is when a property either residential or commercial is bought for generating revenue or for imminent trade whilst indirectly is through managed funds. Direct investment is further explored by Nelson (2006) as the utmost preferred approach to add exposure to portfolios by both individuals and institutions in spite of its popularity and high profile. He further on also discuss the pros and cons of direct versus indirect real estate investing. It is noteworthy that the risk-return dynamics of real estate markets is another major factor in assets markets and also in fiscal activities. In such instance, the term 'Investment' implicates the client as a passive investor principally concerned about the possible income from proprietorship of the real asset as an investment, compared to the gains from direct operation, use, or occupancy of the property (Bakri, 2014). Since valuations, risk, and uncertainty in returns are an integral part of the property investment process, Adair & Hutchison (2005) state that they are therefore these risks also need to be managed.

Ping & Jalil (2016) state that the most dominant underlying factor that could have an impact in real estate investment should be the earning rate. As such, they further note that profit on investment could be defined as returns on the original investment while returns in general would include income returns and capital growth.

2.4.3 Theoretical Framework

The conceptual framework for the study is based upon the diversification-performance relationship as set out by Datta, Rajagopalan & Rasheed (1991) in a framework which is composed of independent, moderator and dependent variables. Dependent variables are identified as the extent of diversification, the type of diversification strategies and the methods used in implementing these strategies. Moderator variables are mainly industry and organisational factors which include competitors and entry barriers, capital intensity, technology, organisational structure, culture, systems and core competencies. Finally, the authors identify risk, return and other measures of performance as dependent variables in the diversification-performance relationship.

FIGURE 5: Theoretical Framework



Source: Datta *et al.* (1991)

2.4.4 Property-type diversification and its impact on performance of REITs

Jalil & Ali (2015) discovered that the factors influencing the performance of Malaysian-REITs include the type of its underlying property, for instance, according to Danielsen & Harrison, (2007), if a REIT focuses on only a single types of property as compared to the one with several types of property in its property portfolio, it will enjoy large liquidity. Byrne & Lee (2000) also suggest that REITs systemic risk is affected by the property type in the investment. It is important to note that REITs stock is hybrid in nature and its primary profit is made from the rental of underlying property which depends on the value of the property type, hence the significance of the quality of the assets to its profits (Chan, Erickson & Wang, 2003; Hui, Yiu & Yau, 2007 and Newell, 2012). Ping & Jalil (2016) also argue that either pure-played or diversified strategy in REITs lead to profits and decline of risk. REITs' performance differs also due to the region in which it's located, and its capacity to afford diversification prospects for investors (Newell & Yen Keng, 2003) and is linked to rental revenue (Olanrele, Said & Daud, 2015) and both consequently influence the REITs market share price.

Property type and location of property owned are the key elements to assess the performance

of REITs as noted by Jalil & Ali (2015). A study conducted on office buildings by the authors, indicated that demand side variables can be used to explain office rental rates charged. In addition, the study of Kim & Jang (2012) revealed that hotel REIT in comparison with other REIT property sectors has higher market risk and underperformed office, industrial and diversified REITs sector in terms of portfolio or individual stock. According to the study, the performance of the hotel REITs is affected by factors that include rate of room occupancy, excess of lodging properties in property market and hotel financing policy.

Benjamin, Zietz & Sirmans (2003) suggest that tangible features of property, factors of the local market and region have an influence on the value of industrial property. Also, Capozza & Lee (1995) in their study state that higher rentals are set in retail REITs higher values by the stock market, on the other hand, lower rentals for warehouse REITs depend on local property market factors. Different arguments have taken center stage in relation to property portfolio concentration: either pure-play or diversified property portfolio. It would appear that REITs' pure play property portfolios are beneficial than diversified portfolios as the latter appear to be uncertain as a result of low collateral value of assets (Morri & Cristanziani, 2009). Property type diversification strategies although playing a paramount role in portfolio formation of REITs are not the only influencing factor that determines the performance of REITs. Moderating factors such as property specific, organizational and industry characteristics also influence the type of strategies that a REITs would embark upon in order to maximize its income and capital growth. Extensive research into these factors is also still needed. Research into REITs performance in terms of property diversification strategies has been undertaken extensively in the U.S and U.K, little has been done in South Africa. This will be relevant, definitely to equity investors, both in South Africa or abroad who have an interest in getting into the South African REITs market.

Most of the studies have been empirical and analyzed secondary data from the various stock market indices and this data has been tested thoroughly for robustness in the reports and proven to be the most effective research data sources in this area of research. Studies by Benjamin *et al.* (2003) and Jalil & Ali (2015) indicate a lack of literature review studies in this area of research and indicate another possible gap that can be explored.

2.5 Summary of the literature review

This literature review highlighted the explored characteristics of the real estate sector, and in particular, real estate investments trusts in South Africa. Diversification, risk and return were explained and how these variables are interlinked. The section that expounded on systematic and non-systematic risk gave clarity into what types of risk factors that real estate firms are exposed to and how these risks can be mitigated by spreading capital to a number of different assets hence reducing the negatives that could affect realization of expected returns.

The review further explores the capital pricing and the modern portfolio theories which provide a framework to define, measure and explain the relationship between expected asset return and risk. Different diversification strategies implemented within the real estate industry, and how decisions into whether REITs invest in directly or indirectly in real estate are analysed and the review puts forward the theoretical background which will give guidance to the statistical data analysis chapters of this study. Finally a critique of various research reports findings into the effects of property type diversification on REITs performance is undertaken in order to add on the foundations for the empirical analysis in the forthcoming chapter.

3. Research Methodology

3.1 Introduction

The importance of data in research cannot be overemphasized with Saunders, Lewis & Thornhill (2012) focusing on the importance of undertaking extensive data analysis prior to formulating research strategies and questions. The exercise of exploring existing literature and data will either take a deductive approach where the researcher is able to identify theories and ideas that they can test using either qualitative or quantitative data and this approach is known as deductive research. Another approach is the inductive process where the researcher will collect data and analyze it in order to develop theories.

Deductive studies involve the formation of an initial theoretical framework and research strategy in order to test a theoretical supposition whilst inductive studies involve the collection and analysis of data in order to develop a theory (Saunders, Lewis & Thornhill 2012). This study will undertake a deductive approach as there are already extensive theoretical background with regards to diversification strategies in real estate and it will endeavor to test the effectiveness of property and regional type diversification strategies on real estate performance. The following subsections look into strategies and methodological choices underpinning the study.

3.2 Research Strategy

As the general objective of the study is to identify patterns and cause and effect relationships utilizing quantitative data analysis methods positivism is the most appropriate research philosophy for this study. Saunders, Lewis & Thornhill (2012) explain that positivism philosophy ensures that data is only gathered on observable and factual phenomenon which allows the researcher to identify cause and effect relationships which can be generalized. Within this philosophy research is undertaken objectively, independent of the researcher's influence on the nature and substance of the data collected. A deductive research approach will be followed which will involve an in-depth literature review (qualitative analysis) and an empirical analysis of secondary data utilizing with descriptive and inferential statistical methods (quantitative analysis).

The study will undertake a systemic analysis of the impact of the different property-type diversification strategies on performance of real estate investment trusts and the hypotheses will be tested within the South African context.

3.3 Methodological Choice

This study will have a longitudinal research design with a quantitative strategy. Yilmaz (2013) defines a quantitative study as a one that seeks to numerically describe occurrences and analyse data acquired through mathematical and statistical methods.

A longitudinal study is observational with no interference by the researchers with studied population or sample and observations are undertaken over a period of time. In this study the returns of the JSE listed REITs and property types will be analysed over a period from 2014 to 2017. This type of study will enable the researcher to detect changes in the trend for REITs performance variables in relation to the property types.

Quantitative research is seen as a logical method that follows an objectivist epistemology. The measurement and analysis of cause and effect relationships is central to the method and the researcher and subjects being studied operate within a framework which is independent of their influence and hence makes the method objective. Yilmaz (2013) further notes that quantitative studies unlike qualitative studies enable the researcher to come up with broad findings which can be applied to other similar research settings.
Qualitative studies on the other hand enables the research to reflect the personal experiences of the researcher and participants during the research process, which can be both in terms of data collection and analysis. Therefor due to the qualitative method inability to provide the researcher the ability to collect and analyze data expediently and numerically, describe occurrences and analyse data acquired through mathematical and statistical methods, this method will not be utilised for this research.

Empirical quantitative studies by Adair & Hutchinson (2005), Benefield, Anderson & Zumpano (2009), Byrne & Lee (2000), Capozza & Lee (1995), Benjamin, Zietz & Sirmans (2003) and Jalil & Ali (2015) are amongst the majority in comparison to qualitative studies leading to this method having been thoroughly tested within this research area. These reports use secondary data in order to analyze the various REITs performance indicators such as:

- Annual, quarterly and monthly total returns, income returns, and appreciation (capital) returns;
- Risk-adjusted performance measure ratios such the return on equity and return on total assets; and
- Risk-adjusted returns: Volatility was determined by calculating the annualized standard deviation and calculating the reward-to-risk ratios, Sharpe ratios and asset betas.

These reports correlate with Zietz, Sirmans & Friday (2003) findings that the most commonly primary research methods used to analyze REITs performance, risk and diversification are empirical studies that utilize statistical analysis tools such as descriptive statistics, regression analysis, time series regression, correlation statistics analysis, multi factor and Sharpe models. Most of the authors reviewed have used the same methods and data analysis tools and stock market indices and reports were the commonly used their data sources.

Ping and & Jalil (2016) highlight that REITs market, although similar to the stock market in terms of its measures of performance which are risk and return, it is unique in terms of its assets and regulatory environment. They further construe that the legislative requirement to distribute the majority of distributable profits to investors (75% in the case with SAREITs) makes the dividend payout an equally important measure of performance. This study adopts the empirical research methods by these researchers into the effects of property type diversification on Malaysian REITs' performance as measured by the expect return and dividend yield. In addition an analysis of the different property types on income returns, capital growth and total returns as done in studies by Benefield, Anderson & Zumpano (2009) and Anderson, Benefield & Hurst (2015). Similarly the study will utilise the multiple regression analysis (MPA) to describe the relationships between the dependent and independent variables and utilise correlation analysis to test the strength of such relationships.

3.4 Data Collection, Sources and Analysis

3.4.1 Data Collection and Sources

This research utilizes secondary data, mainly due to time constraints in the ability to collect primary data. Additionally, similar studies done have successfully utilized this type of data analysis.

The quantitative research strategy employs secondary research technique using data from the following sources:

- MSCI South Africa Annual Property Index which tracks performance of retail, office and industrial properties;
- INET BFA Expert which is a financial reporting database of South Africa which offers vital information on international listed and unlisted companies;
- Published annual financial statements and company reports of the REITs and
- ShareData Online a subsidiary of The Profile Group a financial stock market data and investor information online portal.

3.4.2 Analysis of longitudinal secondary data

The statistical analysis endeavors to undertake the following tests in order to achieve the objectives of the study:

- To examine the trend of the performance of the SAREITS over the period of 2014 to 2017 financial years in relation to retail, commercial/office, industrial, residential and special property types. This examination enables the study to determine if a relationship does exist between these variables;
- To make a comparison of the trends as indicated by the expected return, dividend yield, return on equity and return on total assets performance measures. The comparison enables the study to identify the various diversification strategies being adopted by SAREITs.
- Finally, from the results of the analysis, the study draws conclusions; make comparisons with similar studies and come up with emerging future trends and suggestions for further studies in property-type diversification strategies.

3.4.3 Data Analysis Methods

3.4.3.1 Diversification Score Calculation

The diversification scores of the REITs were calculated using the Herfindhal (1950) Index. The formula for the index is as follows:

$$Degree\text{-}of\text{-}Diversification = \Sigma\, Sp^2$$

where Sp = The proportion of property-type p a REIT is invested in.

Source: Anderson, Benefield & Hurst (2015)

An index equal to 1 is a REIT is invested in only one property type and the index will reduce to a minimum of 0.20 if the REIT is invested in all property types equally. Capozza and Lee (1995) used this index to measure the effects of firm diversification on its net asset value. Capozza & Seguine (1999) and most recently Danielsen & Harrison (2007) used the same index to measure diversification effects on liquidity and firm value. I submit that this measure of diversification has been tested in similar studied and is a good fit for this study.

3.4.3.2 Returns Calculations

To compute the expected return (Y_1), an average of the daily returns was calculated for the five REIT types based on the following equation;

$$R_j = \frac{(P_{j,t} - P_{j,t-1}) + D_{j,t}}{P_{j,t-1}}$$

Where:

R_j = Return for stock j

$P_{j,t}$ = Stock price for stock j at the present time

$P_{j,t-1}$ = Stock price for stock j at the previous day

$D_{j,t}$ = Current dividend for stock j

Further, the dividend yield which looks at the relationship between annual dividends with the current share price, was calculated using the following formula in cases where this data was not available in the INET BFA database;

$$\text{Dividend Yield} = \frac{A \quad D}{C \quad Sha \quad P \quad ce}$$

A five-year average was calculated for the different REIT types. The annual dividend comprised of an interim and a final dividend. All the companies under research to a large extent followed the two payments method. The annual market value for the thirty-three companies was extracted from INET BFA and Sharenet.com.

3.4.3.3 Multiple Regression Analysis

This study follows the Multiple Regression Analysis (MRA) to test the relationship between expected return, dividend yield, return on equity and return on total assets of South African REIT companies with their property type values between the periods of 2013 to 2017. The same method was employed by Ping & Jalil (2016) and also by Anderson, Benefield & Hurst (2015) in their studies. The population of the study is comprised of twenty two diversified REITS, one industrial, two residential, five retail, one commercial and two specialised. The MRA is in essence a correlation coefficient test between the dependent and independent variables. A sample of 24 REITs are analysed over an observation period of 4 years.

The dependent and independent variables of ***Analysis 1*** are represented by the MRA equations as follows:

$$y_1 = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots + b_6x_6$$
$$y_2 = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots + b_6x_6$$
$$y_3 = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots + b_6x_6$$
$$y_4 = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots + b_6x_6$$

Where: y_1 = expected return, y_2 = dividend yield, y_3 = return on equity, y_4 = return on assets a= constant, b= coefficients of the variables, x_1 = diversified property, x_2 = commercial property, x_3 = industrial property, x_4= residential property, x_5= retail property and x_6= specialised property.

The dependent and independent variables of ***Analysis 2*** are represented by the MRA equations as follows:

$$y_1 = a + b_1 x_1$$
$$y_2 = a + b_1 x_1$$
$$y_3 = a + b_1 x_1$$
$$y_4 = a + b_1 x_1$$

Where: y_1 = expected returns, y_2 = dividend yield, y_3 = return on equity and y_4 = return on total assets a= constant, b= coefficients of the variables, x_1 = diversification score

Secondary data analysis involved the re-analysis of already collected raw or aggregated data and the data was edited and coded. Multiple regressions are employed to test the influenced of all property types and the degree of diversification on expected return, dividend yield, return on equity and return on total assets. The results of the analysis are shown in the next chapter.

3.5 Research ethical considerations

Leedy & Ormrod, 2009 give the following four main categories of ethical considerations in research. These guiding principles were followed in this research paper:

i) *Protection from Harm*: Since our research entailed the use of secondary data it did not involve the direct participation of neither human, protected plants nor animals.

ii) *Informed Consent*: The secondary data utilised has been sourced from publicly available database.

iii) *Right to Privacy*: The research project has been undertaken within the University of the Witwatersrand's Ethics Rules and Regulations.

iv) *Honest in Reporting of Findings*: The utilisation of secondary data can have disadvantages such as data collected for different purposes, difficulty to obtain, unsuitable aggregation and poor quality. These issues can lead to wrong and misleading findings (Saunders, Lewis & Thornhill, 2012). The research project was undertaken with the use of tried and tested INET BFA databases and integrity and honesty was maintained throughout the reporting of findings.

3.6 Data Specification

3.6.1 Dependent Variables

The dependent variables used ***Analysis 2 and 3*** of the study were the expected return (y_1), the dividend yield (y_2), return on equity (y_3) and return on assets (y_4). They are as specified below:

TABLE 6: Dependent Variables_Analysis 2 and 3	
Variable	**Description**
Expected Return	This variable is calculated by the formula: $E(R) = (\frac{P_1 - P_0}{P_0}) * 100$ (3) Where, E(R) = Quarterly Expected Return P_1 = Daily price of REIT stock at the end of the quarter P_0 =Daily price of REIT stock at the beginning of the quarter
Dividend Yield	This variable is calculated by the formula: $DY = \frac{\text{Annual Dividend Distribution}}{\text{Stock Price}}$ (4) Where, DY = Dividend Yield
Return on Equity	This variable is obtained from INET BFA Database and calculated by the formula: Profit After Taxation Total Owners Interest * 100
Return on Total Assets	This variable is obtained from INET BFA Database and calculated by the formula: Profit Before Interest And Tax (EBIT) - Total Profit of Extraordinary Nature Total Assets * 100

Source: Ping and & Jalil (2016)

3.6.2 Independent Variables

The independent variables for ***Analysis 2*** are; commercial property (x_1), industrial property (x_2), residential property (x_3), retail property (x_4) and specialised property (x_5) and they are as follows:

TABLE 7: Independent Variables_Analysis 2	
Variable	**Description**
Residential Property	Value of Residential property owned
Retail Property	Value of Retail property owned
Office/Commercial Property	Value of Office/Commercial property owned
Industrial Property	Value of industrial property owned
Specialised /Other Property	Value of Specialised REITs property owned

Compiled by Author from INET BFA and & Share Data Online Reports (2018)

The independent variables for ***Analysis 3*** are; retail property (x_1), commercial property (x_2), industrial property (x_3), and they are as follows:

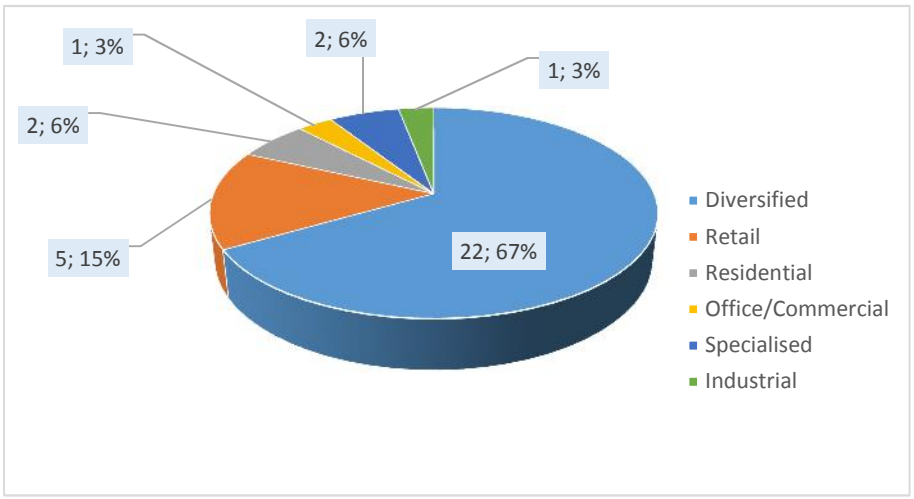
TABLE 8: Independent Variables_Analysis 3	
Variable	**Description of Variables**
Diversification Score	Herfindahl scores of SAREITs

Compiled by Author from INET BFA & Share Data Online Reports (2018)

3.6.3 Summary Statistics of Population and Variables

Figure 6 and Table 9 below gives the proportions and names of the companies, their names and properties types invested in.

FIGURE 6 : Proportions of Listed SAREITS



Compiled by Author from INET BFA & Share Data Online Reports (2018)

TABLE 9: SAREITS Population

REITS Name	Property Invested
Indluplace, Transcend	Residential
Equites	Industrial Properties
Fairvest; Hyprop; Resilient; Safari; Vukile	Retail Properties
Delta Property	Commercial/Office
Hospitality; Stor-Age	Specialized Properties (Hospitality, Storage, etc.)
Oasis; Accelerate; Octodec; Dipula A; Dipula B; Emira; Fortress A; Fortress B; Gemgrow A; Gemgrow B; Growthpoint; Investec; Liberty; Newpark; Orion; Rebosis A; Rebosis B; Redefine; SA Corp; Spear; Texton; Arrow Head	Diversified

Compiled by Author from INET BFA & Share Data Online Reports (2018)

A total of twenty three out of thirty three REITs were analysed in the study as indicated in Table 8 above. Indluplace, Transcend, Stor-Age, Fortress B, Gemgrow B, Liberty Two Degrees, Newpark, Rebosis A and Spear REITs were excluded in the study due to their listing periods in the JSE being less than four financial years, i.e. 2014 to 2017 financial years.

TABLE 10: SAREITS Sample Analysed

REITS Name	Property Invested
Equites	Industrial Properties
Fairvest; Hyprop; Resilient; Safari; Vukile	Retail Properties
Delta Property	Commercial/Office
Hospitality	Specialized Properties (Hospitality)
Oasis; Accelerate; Octodec; Dipula A; Dipula B; Emira; Fortress A; Gemgrow A; Growthpoint; Investec; Orion; Rebosis B; Redefine; SA Corp; Texton; Arrowhead	Diversified

Compiled by Author from INET BFA and Share Data Online Reports (2018)

The summary statistics of the overall model presented in **Table 11** reveal presence of variations in Expected Return (SD = 18.125) versus the arithmetic mean = 6.712, Dividend Yield (SD = 3.785) versus the arithmetic mean = 7.423, Return On Equity (SD = 13.345) versus the arithmetic mean = 13.782 and Return On Assets (SD = 9.645) versus the arithmetic mean = 10.163. There are high level of dispersion in Expected Returns and Dividend Yield indicating an opportunity for investors to earn excessive returns on optimally diversified portfolios.

With regards to Commercial (SD = 22.257) versus the arithmetic mean = 22.257, Industrial (SD = 23.705) versus the arithmetic mean = 23.808, Residential (SD = 4.821) versus arithmetic mean = 1, and Other (SD = 21.293) versus arithmetic mean = 7.691, a high level of dispersion is evident with Specialised/Other and Residential properties indication an opportunity in diversification benefits with these property types within optimally diversified portfolios.

TABLE 11: SAREITs Summary Statistics						
Variable		**Mean**	**Std. Dev.**	**Min**	**Max**	**Observa-tions**
Diversification Score	overall	0.560	0.261	0.263	1.000	N = 96
	between		0.265	0.263	1.000	n = 24
	within		0.000	0.560	0.560	T = 4
Expected Return	overall	6.713	18.126	-61.542	50.555	N = 96
	between		7.763	-9.701	21.990	n = 24
	within		16.437	-45.128	39.164	T = 4
Dividend Yield	overall	7.423	3.785	0.000	17.277	N = 96
	between		2.126	3.324	11.065	n = 24
	within		3.154	-0.190	15.182	T = 4
Return on Equity	overall	13.782	13.346	-13.126	124.578	N = 96
	between		6.528	6.141	41.329	n = 24
	within		11.698	-16.947	97.031	T = 4
Return on Total Assets	overall	10.163	9.645	-10.891	96.568	N = 96
	between		5.107	4.033	31.904	n = 24
	within		8.233	-13.028	74.828	T = 4
Retail Property	overall	43.879	31.355	0.000	100.000	N = 96
	between		31.862	0.000	100.000	n = 24
	within		0.000	43.879	43.879	T = 4
Commercial Property	overall	23.621	22.258	0.000	90.100	N = 96
	between		22.618	0.000	90.100	n = 24
	within		0.000	23.621	23.621	T = 4
Industrial Property	overall	23.808	23.706	0.000	95.000	N = 96
	between		24.089	0.000	95.000	n = 24
	within		0.000	23.808	23.808	T = 4
Residential Property	overall	1.000	4.821	0.000	24.000	N = 96
	between		4.899	0.000	24.000	n = 24
	within		0.000	1.000	1.000	T = 4
Specialised/Other	overall	7.692	21.293	0.000	100.000	N = 96
	between		21.638	0.000	100.000	n = 24
	within		0.000	7.692	7.692	T = 4

N = Number of Observations n = Sample Size T = Observation period

Compiled by Author from INET BFA and Share Data Online Reports (2018)

4. Data Analysis and Research Findings

4.1 Results and Discussion

The study investigated the effects of property-type diversification on SAREITs performance as reflected by its returns and dividend yields by applying correlation and multiple regression analysis and consequently the following analysis either proves or disproves the hypothesis.

4.1.1 Results of *Analysis 1*

The following analysis looks into the evolution of property type diversification strategies in the top ten highly diversifies SAREITs (Herfindahl Index Scores of less than 0.5). **Table 12** indicates a general trend towards property type diversification with eight out of ten of the SAREITs becoming more diversified over the observation period. This observation is consistent with Anderson, Benefield & Hurst (2015) findings that although there was a reduction in the number of diversified REITs during the research period, the concentration indices of the remaining REITs indicates a move towards more diversification. The analysis shows a total increase in retail property holdings from 40% to 44% and a reduction in office/commercial and industrial property holdings from 36% to 32% and 20% to 13% respectively. The drop in commercial and industrial property holdings could be attributed to the country been experiencing a tough economic climate in the last ten years following the global financial crisis that originated in 2007/8 (South African Reserve Bank, 2013).

An interesting trend within this sector is the increase in portfolio holdings in residential and other/specialized properties from 3% to 4% and 0% to 8% respectively. This trend towards nonconventional property types is supported by recent JSE listings of specialized REITs such as Indluplace Properties (Residential Properties) and Stor-Age Property REIT (Self-Storage Properties) in the year 2015 and Transcend Property Fund (Residential Properties) in 2016 (INET BFA and Share Data Online Reports, 2018). The trends on these results are in line with summary statistics which indicate evidence of diversification opportunities on residential and specialized property types.

On the contrary Growthpoint concentration increased due to the REIT reducing its properties in industrial and increasing offices and retail holdings whilst Arrowhead reduced their properties assets in offices and industrial and increased them in retail. The main property types invested in by the SAREITs are retail (42%), office/commercial (34%), industrial (17%) and other: specialized and residential (7%).

TABLE 12: Evolution of Property Type Diversification of SAREITs

Name	Market Cap	Year	Office	Retail	Industrial	Resid-ential	Other	Div Score	Portfolio Total
GROWTHPOINT	89.93	Period 1	42	35	23	0	0	0.35	100
		Period 2	45.2	38.4	16.4	0	0	0.38	100
REEFINE	65.19	Period 1	64	20	16	0	0	0.48	100
		Period 2	38	40	14	2	6	0.33	100
FORTRESS	35.94	Period 1	13	51	36	0	0	0.41	100
		Period 2	11.7	36	13	0	39	0.31	100
INVESTEC	12.8	Period 1	57	34	9	0	0	0.45	100
		Period 2	38	40	22	0	0	0.35	100
SACORP	12.27	Period 1	19	11	70	0	0	0.54	100
		Period 2	6	43	29	0	22	0.32	100
EMIRA	8.35	Period 1	50	34	16	0	0	0.39	100
		Period 2	41	44	15	0	0	0.38	100
ARROWHEAD	7.47	Period 1	43	38	19	0	0	0.37	100
		Period 2	38	54	8	0	0	0.44	100
REBOSIS	7.84	Period 1	40	60	0	0	0	0.52	100
		Period 2	52	47	1	0	0	0.49	100
ACCELERATE	5.54	Period 1	13	81	2	0	4	0.68	100
		Period 2	28	56	6	0	10	0.41	100
OCTODEC	5.33	Period 1	22	39	8	31	0	0.21	100
		Period 2	22	37	8	33	0	0.19	100
	Total Period 1		36	40	20	3	0		100
	Total Period 2		32	44	13	4	8		100

Compiled by Author from Published Company Financial Statements (2018)

4.1.2 Results of *Analysis 2*

4.1.2.1 Pairwise Correlations of Returns and Property Types

The expected return (capital growth) as Damodaran (2016) asserts, is the rate equity investors need to earn to be compensated for the risk they have taken in investing in the equity of the firm. Coupled with the dividend yield (income return), these two measures are regarded as important indicators used by shareholders and potential investors to determine the overall performance of a company and to make a decision as to whether to or not to invest in the property type in a specific region.

The following **Tables 13 and 14**, give the correlation of expect returns and dividend yields against the different property types owned by the REITs.

TABLE 13: Correlation: Expected Return with Property Types

	Expected Return	Retail	Comme-rcial	Industrial	Residen-tial	Other
Expected Return	1					
Retail	.164	1				
Commercial	-.177*	-.516**	1			
Industrial	.111	-.535**	-.061	1		
Residential	-.073	-.086	.051	-.069	1	
Other	-.162	-.318**	-.230*	-.246**	-.076	1

*. Correlation is significant at the 0.05 level **. Correlation is significant at the 0.01 level

Results presented in **Table 13** reveal that expected return had positive correlations with retail and industrial property types. Inversely, expected return had negative correlations with commercial, specialised/0ther and residential property types. Expected Return has a significant negative correlation with commercial property type.

Ping and Jalil (2016) explains similar results by describing the characteristics of the tenants of these properties and stating them as a potential reason for them. For instance, they state that the

stable returns to the industrial properties were due to the tenants who had a good reputation and a famous brand. These strong property fundamentals tend to assist in the insulation of the REIT from the week economic climate hence the stable and more positive returns. The same applies to the commercial properties which target reputable tenants like the government and other blue chip companies. They mitigate their leasing risk by long-term leases and low vacancies due to tenant profile.

TABLE 14: Correlation: Dividend Yield with Property Types

	Dividend_Yield	Retail	Comm-ercial	Indus-trial	Residen-tial	Specialised/Other
Dividend_Yield	1					
Retail	-.012	1				
Commercial	.323**	-.516**	1			
Industrial	-.139	-.535**	-.061	1		
Residential	.032	-.086	.051	-.069	1	
Other	-.173*	-.318**	-.230*	-.246**	-.076	1

*. Correlation is significant at the 0.05 level **. Correlation is significant at the 0.01 level

Table 14 results demonstrate that Dividend Yield had a substantially positive and significant correlation with commercial property (corr = 0.323) comparative to the rest of the property types. On the contrary, Dividend Yield had negative and significant correlations with Specialised/Other property types (corr = -0.173) followed by industrial property and retail property type.

The results are contradictory to those of the studies by Ping and Jalil (2016) who results depicted a positive correlation value only for the commercial lot while all the other property types had a negative correlation. The results suggest that an increase in the commercial property type within a portfolio has positive effects on dividend yields which is in contrast with what SAREITs are actually doing indicated in ***Analysis 1*** (reduction in commercial property holdings). One of the reasons for this could be that these REITs are simply getting rid of their non-performing commercial properties.

Although the correlations of dividend yields are insignificant with regards to residential property ***Analysis 1*** indicates a rise in residential property holdings of diversified SAREITs

from 3 to 4%. Residential REITs listings on the JSE of Indluplace Properties and Transcend Property Fund in 2015 and 2016 respectively show a keen interest in this property type by SAREITs (INET BFA and Share Data Online Reports, 2018).

4.1.2.2 Regression Estimates

This section provides regression estimates for Expected Return, Dividend Yield, Return on Equity and Return on Assets models. Results were analysed at 5% level of significance. The independent variables property types whose impacts were tested on each of the above-mentioned dependent variables are Retail property, Commercial property, Industrial property and Specialised/Other properties. The Residential property type was omitted from the estimation process due to collinearity.

TABLE 15: MRA: Expected Return Model[1]

Source	SS	df	MS		Number of obs = 96
					F (4, 91) = 2.05
Model	2577.44	4	644.36		Prob > F = 0.094
Residual	28634.96	91	314.66		R-squared = 0.082
					Adj R-squared = 0.042
Total	31212.40	95	328.55		Root MSE = 17.73

Expected Return	Coeff.	Std. Err.	t	P > | t |	[95% Conf.	Interval]
Retail	0.281	0.380	0.74	0.461	-0.473	1.037
Commercial	0.103	0.391	0.26	0.792	-0.674	0.881
Industrial	0.312	0.381	0.82	0.415	-0.445	1.071
Other	0.104	0.383	0.27	0.786	-0.656	0.865
_cons	-16.342	37.648	-0.43	0.665	-91.126	58.441

1. Residential omitted because of collinearity

Results on the Analysis of Variance (ANOVA) section show that from the total sum of square of 31212.40, about 2577.44 was accounted for by the model, and 28634.96 remained unexplained. From the 95 total degrees of freedom, 4 were consumed by the model while 91 were left for the residual. Regression estimates show that all property types, namely Retail,

Commercial, Industrial, and Other properties had positive but statistically insignificant impacts on Expected Return during the sample period 2014 to 2017.

Though statistically insignificant, the property types that had the highest impacts on Expected Return were Industrial property (coeff = 0.312; t-statistic = 0.82), and Retail property (coeff = 0.281; t-statistic = 0.74). The computed F(4, 91) statistic (=2.05; Prob > F = 0.094) could not reject the null hypothesis that all model coefficients excluding the constant are equal to zero. With a constant of -16.34, the computed Adjusted R-squared, about 4.2% overall variation in the expected return was explained by retail, commercial, industrial and specialised property types during the sample period 2014 to 2017.

TABLE 16: MRA: Dividend Yield model[1]

Source	SS	df	MS		Number of obs = 96
					F (4, 91) = 3.64
Model	187.837	4	46.959		Prob > F = 0.008
Residual	1173.215	91	12.892		R-squared = 0.138
					Adj R-squared = 0.100
Total	1361.052	95	14.326		Root MSE = 3.590

Dividend Yield	Coeff.	Std. Err.	t	P > l t l	[95% Conf.	Interval]
Retail	0.003	0.076	0.04	0.968	-0.149	0.155
Commercial	0.050	0.079	0.64	0.524	-0.106	0.208
Industrial	-0.022	0.077	-0.29	0.774	-0.175	0.131
Other	-0.023	0.077	-0.30	0.765	-0.177	0.130
_cons	6.798	7.620	0.89	0.375	-8.338	21.936

1. Residential omitted because of collinearity

The results on the Analysis of Variance (ANOVA) in **Table 16** show that from the total sum of square of 1361.05, about 187.83 was explained by the model, while 1173.21 remained unexplained. From the 95 total degrees of freedom, 4 were consumed by the model while 91 were left for the residual. Regression estimates show that all property types had statistically insignificant impacts on dividend yield. Retail and commercial properties had positive impacts while Industrial properties and specialised/other properties had negative impacts on dividend yield during the period 2014 to 2017.

Although statistically insignificant, the property types that had the relatively highest impacts on dividend yield were commercial property (coeff = 0.050; t-statistic = 0.64), specialised properties (coeff = -0.023; t-statistic = -0.30) and industrial property (coeff = -0.022; t-statistic = -0.29). The computed F(4, 91) statistic (=3.64; Prob > F = 0.008) rejected the null hypothesis that all model coefficients excluding the constant are equal to zero. With a constant of 6.79, the adjusted R^2 show that about 10% overall variation in the dividend yield was explained by retail, commercial, industrial and specialised property types during the sample period of 2014 to 2017.

The results entail that there are other factors that are not discussed here that contribute to the 91.74% and 86.2% to the influence on expected yield and dividend yield respectively on the SAREITs. The results concur with those of Ping and Jalil (2016) whose R^2 values with both expected returns and dividend yield were also low. They attributed this to the possibility of the REITs financial performance being influenced by many other factors. According to Jalil & Ali (2015) and Ong, Teh, Soh, & Yan (2012), these factors include financing policy; management style; net asset value; size of REITs stock and property location. These sentiments were also shared by Kim & Jang (2012) and Onanrele *et al.* (2014) who asserted net asset value; size; gearing/leverage and cashflows as some of the financial factors that had influenced the REITs' dividend yield and expected returns. The low R^2 for both dependent variables may also a result of economic pressures affecting companies in South Africa.

The correlations between the independent variables and return on assets and return on equity are shown in **Table 17 and 18**.

TABLE 17: Correlations of Return on Equity and Property Types

	Return_On_ Equity	Retail	Commercial	Industrial	Residential	Specialised/Other
Return_On_ Equity	1					
Retail	-.025	1				
Commercial	-.103	-.516**	1			
Industrial	.185*	-.535**	-.061	1		
Residential	-.009	-.086	.051	-.069	1	
Other	-.059	-.318**	-.230*	-.246**	-.076	1

*. Correlation is significant at the 0.05 level **. Correlation is significant at the 0.01 level

TABLE 18: Pairwise Correlations of Return on Total Assets and Property Types

	Return_On_Assets	Retail	Commer-cial	Industrial	Residential	Other
Return_On_Assets	1					
Retail	.001	1				
Commercial	.259**	-.516**	1			
Industrial	-.186*	-.535**	-.061	1		
Residential	-.002	-.086	.051	-.069	1	
Other	-.065	-.318**	-.230*	-.246**	-.076	1

*. Correlation is significant at the 0.05 level **. Correlation is significant at the 0.01 level

Pairwise correlation results presented in **Table 17** show that return on equity had negative correlations with commercial property, retail property, specialised/other and residential property. Nonetheless, only industrial property type had a positive and significant correlation (corr = 0.185) with return on equity.

The results of the analysis indicate that retail, commercial, residential and specialised property types do not offer diversification benefits in terms of returns to equity if their magnitude is increased within a portfolio. Industrial property on the other hand improved diversification benefits due to its positive correlation. With regards to return on total assets (**Table 18)**; results show a substantially positive and significant correlation with commercial property (corr = 0.259) compared to retail property. On the other hand, return on assets had negative and significant correlations with industrial property (corr = -0.186).

These results are in agreement with an analysis done by Benefield, Anderson & Zumpano (2009) where results indicate an enhanced performance for property-type diversified REITs in comparison to non-diversified REITs. These results though seemed to depend on the prevailing market conditions during the sample period.

Anderson, Benefield & Hurst (2015) further supports these outcomes and found a significantly positive relationship between property-type diversification and return on assets, return on equity, and Tobin's Q. Their findings also find evidence that within diversified REITs there are opportunities for managers to select high performing real estate which gives the REITs the advantage of trading at a premium.

TABLE 19: MRA: Return on Equity model[1]

Source	SS	df	MS		Number of obs = 96
					F (4, 91) = 1.05
Model	745.344	4	186.336		Prob > F = 0.386
Residual	16175.471	91	177.752		R-squared = 0.044
					Adj R-squared = 0.002
Total	16920.81	95	178.113		Root MSE = 13.332

Return on Equity	Coeff.	Std. Err.	t	P > | t |	[95% Conf.	Interval]
Retail	-0.013	0.285	-0.05	0.963	-0.581	0.554
Commercial	-0.074	0.294	-0.25	0.800	-0.659	0.509
Industrial	0.081	0.286	0.28	0.777	-0.488	0.651
Other	-0.038	0.288	-0.13	0.893	-0.611	0.533
_cons	14.487	28.296	0.51	0.610	-41.719	70.694

1. Residential omitted because of collinearity

Computed results from **Table 19** on the Analysis of Variance (ANOVA) section show that from the total sum of square of 16920.81, about 745.34 was explained by the model, while 16175.47 remained unexplained. From the 95 total degrees of freedom, 4 were consumed by the model while 91 were left for the residual. Model regression estimates show that all property types had statistically insignificant impacts on return on equity. Retail property, commercial property and specialise properties had negative impacts on return on equity, while only Industrial property had a positive impact on Return on Equity during the sample period 2014 to 2017.

Even though statistically insignificant, the property types that had the relatively highest impacts on return on equity were industrial property (coeff = 0.081; t-statistic = 0.28) and commercial property (coeff = -0.074; t-statistic = -0.25). The computed F(4, 91) statistic (=1.05; Prob > F = 0.386) could not reject the null hypothesis that all model coefficients excluding the constant are equal to zero. With a constant of 14.48, the computed Adjusted R-squared show that merely 0.2% overall variation in the Return on Equity was explained by retail, commercial, industrial and specialised property types during the sample period 2014 to 2017.

TABLE 20: MRA: Return on Total Assets model[1]

Source	SS	df	MS		Number of obs = 96
					F (4, 91) = 2.53
Model	883.875	4	220.968		Prob > F = 0.045
Residual	7954.478	91	87.411		R-squared = 0.100
					Adj R-squared = 0.060
Total	8838.353	95	93.035		Root MSE = 9.349

Return on Assets	Coeff.	Std. Err.	t	P > | t |	[95% Conf.	Interval]
Retail	0.062	0.200	0.31	0.754	-0.335	0.461
Commercial	0.165	0.206	0.80	0.425	-0.244	0.575
Industrial	-0.013	0.201	-0.07	0.946	-0.413	0.386
Other	0.036	0.202	0.18	0.858	-0.3651	0.437
_cons	3.544	19.842	0.18	0.859	-35.870	42.959

1. Residential omitted because of collinearity

Computed results on the Analysis of Variance (ANOVA), **Table 20**, show that from the total sum of square of 8838.35, approximately 883.87 was explained by the model, while 7954.47 remained unexplained. From the 95 total degrees of freedom, 4 were consumed by the model while 91 were left for the residual. Model regression estimates show that all property types had statistically insignificant impacts on return on assets. Retail property, commercial property and specialised properties had positive impacts on return on assets, while only Industrial property had a negative impact on Return on Assets during the sample period 2014 to 2017.

Though statistically insignificant, the property types that had the relatively highest impacts on Return on Equity were commercial property (coeff = 0.165; t-statistic = 0.80) and retail property (coeff = 0.062; t-statistic = 0.31). The computed F(4, 91) statistic (=2.53; Prob > F = 0.045) could not reject the null hypothesis that all model coefficients excluding the constant are equal to zero. With a constant of 3.54, the computed Adjusted R-squared show that about 6% overall variation in the Return on Assets was explained by Retail, Commercial, Industrial and Other property types during the sample period 2014 to 2017.

Despite the correlations seen in the results, the study reveals that the independent variables in question had low R^2 values with both returns on equity and returns on total assets which leads

to the conclusion that there are other factors that are not discussed here that contribute to the 98% and 94% to the influence on these returns respectively on the REITs. This is evidenced by Benjamin, Zietz & Sirmans (2003) who state that tangible features of property, factors of the local market and region also have an influence on the value of the REIT.

4.1.3 Results of *Analysis 3*

The following analysis looks into the effects of the degree of diversification of REITs as measured by the Herfindhal (1950) Index on the returns. A total of 24 (twenty four) REITs were used for this study and the following **Table 21** gives a summary of the REITs categories in terms of their diversification scores. 63% of the REITs are highly diversified with scores of between .25 and .5, 8% of the REITs are moderately diversifies and 29% of the REITs are non-diversified.

TABLE 21: Sample REITS Diversification Scores

Reits with a Score between .25 and .5 (Highly-Diversified)	15	63%
Reits with a Score between .51 and .75 (Moderately-Diversified)	2	8%
Reits with a Score between .76 and 1 (Non-Diversified)	7	29%
Total REITs Analysed	**24**	

*. Correlation is significant at the 0.05 level **. Correlation is significant at the 0.01 level

TABLE 22: Pairwise Correlations for Diversification Scores versus Returns

	Expected Return	Dividend Yield	Return on Equity	Return on Assets
Diversification score	0.065	-0.134	0.182	0.163

Table 22 correlates the degree of diversification of the REITs with expected return, dividend yield and return on equity and total assets. The results of this analysis indicate that there is a positive correlation between diversification scores and expected returns, return on equity and total assets implying that the more diversified (lower scores) the SAREITs the higher are these indicators and vice versa. A negative correlation emerges when diversification scores are compared with dividend yields indicating that dividend yields drop due to the REIT being more specialised. These results are supported by Capozza and Seguin (1999) conclusions that due to the underlying assets of a diversified REITs being more difficult to evaluate and therefor perceived riskier, investors tend to demand higher returns from these REITs. Their data indicate that portfolio managers have become aware of these demands and need to consider how their project selection decisions impact on the liquidity of the REITs, the rate of return required by investors, and thus shareholders wealth. These results are again supported by Cronqvist, Högfeldt & Nilsson (2001) where their findings find existence of ex ante discounts as investors anticipate extra costs when firms diversify. Although the correlations on this analysis are not significant ***Analysis 1*** shows that SAREITs are still pursuing property type diversification through increasing their retail, residential and specialised property holdings. These strategies although having a potential to improve on REITs' performance, have to be supported by the portfolio manager's ability to choose properties that bring to the portfolio distinctive characteristics that would support the enhancement in performance.

4.1.4 Hypotheses Testing and Implications to SAREITs Market

The hypotheses of this study are as follows:

H_0: Property-type diversification does not enhance REITS performance in terms of expected return, dividend yield, return on equity and return on total assets variables.

H_1: property-type diversification enhances REITS performance in terms of expected return, dividend yield, return on equity and return on total assets variables.

It is important to note that although the R^2 values of SAREITs returns against property types are very low, the results still show that the property type diversification does influence the REITs' performance. The extent of this influence is not significant and could be influence by other firm specific and market factors which were not analysed in this research.

This conclusion is further supported by our analysis into the evolution of property type diversification strategies for the top ten highly diversifies SAREITs which shows that SAREITs are becoming more diversified and these decisions could be also supported by asset, firm and market factors prevailing in these property types.

The results on the expected returns, dividend yield, return on equity and return on total assets variables analysed in the study agree with literature findings by Ping and Jalil (2016), Lee & Stevenson (2005) and Newell & Yen Keng (2003). Although not based in South Africa they assert that property type diversification may offer comparable performance to other diversification strategies. Statistical analysis on annualised returns on the contrary yield contradicting findings and this may be due to using data sets which have been aggregated differently. Comparing the results with Olaleye, Aluko & Oloyede (2008) conclusions that investors can benefit from property-type diversification strategies but only if such portfolios are efficiently assembled using constant correlation models. They found that naively property-type diversified portfolios did not yield risk reduction benefits in the Nigerian real estate market which could be the case with some of the SAREITs analyzed.

The hypothesis (H_1) is therefore not fully supported by the statistical data analysis and entails that other non-systemic risk factors such as firm leverage policy; management style; net asset value; size of REITs stock and property location need to be studied in conjunction with this study in order to yield more robust results. The study is also unable to reject the null hypothesis (H_0) which states that property-type diversification does not enhance REITS performance in terms of expect return, dividend yield, return on equity and return on total assets variables.

5. Conclusion and Recommendations

The study aimed to undertake an analysis on the performance implications of property-type diversification. This aim was achieved through a literature review of the real estate investments trusts sector by examining the characteristics of the sector. The review also explored the relationship between risk and return factors and the diversification strategies evident in the sector. The first two objectives of the study which strived for to explore the key variables in the diversification and performance relationship were achieved through this literature review and key findings by similar studies were highlighted.

The findings from the literature review highlight that property type diversification strategies although playing a paramount role in portfolio formation of REITs and performance, the returns of companies is also influenced by other moderating factors such as property specific characteristics, organizational and industry characteristics.

Most of these studies analysed in the report have been empirical studies that analysed secondary data from the various stock market indices and these data have been tested thoroughly for robustness in these reports and proven to be the most effective research methods and data.

The statistical analysis undertaken examined the trend of the performance of the SAREITS over the period of 2014 to 2017 financial years in relation to retail, commercial/office, industrial, residential and specialized property types. This examination identified patterns in the dependent and independent variables. The results of the analysis showed that the correlation coefficient values of the expected return of the REITs have the highest positive correlation value with retail property at with the highest score followed by industrial property. For dividend yield, the commercial lot had the highest figure followed by residential property. Industrial, retail and other/specialised property types had a negative correlation with the dividend yield. These correlations were although found to be statistically insignificant due to low R^2 values.

Further analysis of the correlation between return on equity and return on total assets with the property types and degree of diversification of REITs, show both positive and negative

correlations but these associations were also found to be statistically insignificant due to low R^2 values.

Although the statistical analysis is unable to give a strong evidence of property type diversification benefits, SAREITs are continuing to embark on property type diversification strategies within their portfolios as shown on our initial statistical.

Further studies that analyse “firm leverage policies”; “management style”; “net asset values”; “size of REITs stock” and “property location (physical and economic nodes)” need to be done in conjunction with this study in order to yield more robust results.

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