An investigation into the role of listed property stocks in an investment portfolio in South Africa

By

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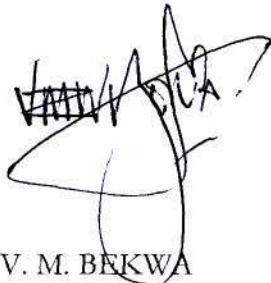Supervisor: Henry Mkhize

Date: 30 January 2006

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There is no confidentiality clause applicable to the research. However, every consideration has been given to the sensitivity of the research, but permission has been obtained from the parties who took part in the research to honour the publication of the results.
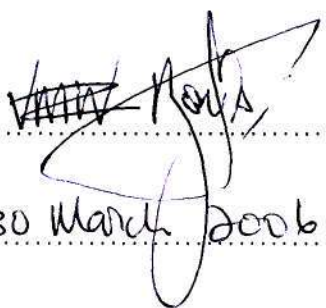
Sincerely

V. M. BEKWA

DECLARATION

This research has not been previously accepted for any degree and is not being currently submitted in candidature for any degree.

Signed...

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ABSTRACT

The primary purpose of the study is to carry out an investigation into the role of listed real estate stocks in a mixed asset class investment portfolio in South Africa and what weighting should be allocated to this asset class. The study involved collecting data from the last ten years from January 1995 to December 2004 and then comparing the data against data collected from the investment management industry, especially those entities with exposure to direct property and listed property stock holdings over long periods. The study investigates the benefits of listed property stocks in an investment portfolio in South Africa, and empirically tests the data collected using the mean-variance theory to determine the impact of listed property stocks on the performance (maximising returns) and risk (minimising risk) of investment portfolios. The Elton and Gruber computer programme is used to test the data to give an optimal weighting to the sector and produce an efficient frontier. The weightings are then used to work out the efficiency of a portfolio as a result of the inclusion of listed property stocks, and comparing it to a portfolio of just two asset classes, namely equities and bonds, at 75% and 25% weightings respectively.

The results demonstrated the benefits offered by listed real estate and revealed that the sector should be treated as a separate asset class from equities due to lower correlation of returns between these two asset classes. It also demonstrated that an increased allocation to the listed property sector would have resulted in better investment performance over the past ten years. The conclusions consistently pointed to the increased asset allocation of listed real estate in investment portfolios as the best long-term solution to diversification and volatility, as long as the liquidity and size of the sector improves. It is concluded in this study, that investment managers have underscored the relevance and allocation of listed real estate in investment portfolios in the past ten years, thus not optimising the performance and risk of their portfolios, as expected in retirement fund portfolios to the benefits of the members.

1. CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Real estate is amongst the oldest forms of investment, as it provides a capital base from which an investor can grow his/her wealth. Real estate provides the landlord with rental income from those who themselves do not own land, or sells the products that are grown and produced on the land. The stature of real estate as a form of investment has grown over the years. As Hartzell (1988:38) observes, real estate has become an important investment category that offers the investor unusually good risk reducing characteristics. According to Ibbotson Associates (2004), real estate investment trusts have become a major factor in the United States commercial industry over the last 10 years.

The need for this study was motivated by the continuing neglect of listed real estate as an asset class by investment managers, analysts and real estate practitioners in South Africa. The Alexander Forbes Large Manager Watch Survey (2004) shows that investment managers in South Africa have not recognised the benefits offered by listed real estate and have hence allocated below sector weightings on the JSE Securities Exchange in their portfolios. The term 'real estate practitioners' in this case refers to those that promote direct property even though listed property funds offered better yields and value. One of the tenets of real estate is that a large portion of the total returns comes from income growth or returns. The equation for total returns is made up of capital growth added to income returns or yields and a re-rating potential. In times when the markets are on an upward trend, investors prefer the major portion of their total returns to be from capital growth rather than income. In volatile times when the markets are on a downward trend or returns are not good, investors change to income producing assets such as high dividend-yielding shares and listed real estate in order to augment capital returns.

I-NET Bridge data has shown that listed property stocks pay out a major portion of their income therefore during periods of downward trends in markets, they will enhance the performance of any portfolio, by contributing a large portion of

income returns to total return. Equities have a lower initial income yield than listed property stocks. Hence the total return from listed property stocks is largely comprised of income than capital returns, especially in periods of distribution growth. According to Chen and Mills (2004), any portion of total return that is achievable with greater certainty limits the potential downside of an investment and lowers the vulnerability of the investment returns to negative surprises.

Portfolio managers are consequently evaluated on how well they perform, that is, the total return they achieve for the investor. Therefore, an overriding objective of a portfolio manager is to maximise returns in the short, medium and long term, weighing carefully the obvious trade-off between risk and return, and the capital growth potential of the asset class. Even though the portfolio manager might be aware of the risks, the returns from listed real estate have been harder to quantify, especially because it was not a well-researched and sizable sector in South Africa. Maritz and Miller (2004) also points out that 'academic research on the role of property in invesment portfolios has received scant attention, both internationally and locally. Those two reasons render property a neglected asset class.'

When it comes to the asset allocation decision on listed real estate in the portfolio, portfolio managers are faced with a number of considerable challenges to overcome. The first question that portfolio managers must address, involves the treatment of listed property stocks in the investment decision. For example, should listed real estate be classified as a separate asset class or should it be included as part of equities? According to I-Net Bridge data, there is a strong correlation between the income yields of listed property and bond yields. Following from this statement, should listed real estate be substituted for bonds in portfolios? The third question is how much real estate should be allocated to an investment portfolio in South Africa. The latter question stimulated this study which looks at the asset allocation decision relating to the optimal exposure to listed property stocks in balanced portfolios.

1.2 The problem statement

The problem statement arose from the above questions and led to the follow-on question of what have South African investment managers been doing in the past ten years. The problem statement is then: 'what is the optimal weighting to listed real estate in a balanced portfolio in South Africa?' The research is not intended to catch investment managers out, but it is aimed at enhancing the profile of listed real estate as an asset class by highlighting its benefits in an investment portfolio.

1.3 Purpose of the study

Listed real estate will continue to struggle as a neglected asset class in the institutional investment arena as long as this asset class is poorly researched and understood. The purpose of the study is to investigate the role of listed property stocks in an investment portfolio in South Africa. The study tries to uncover some of the most important facets of the property market, such as its relationship with other asset classes, risk-reduction benefits, and in the last ten years, the out-performance of listed property relative to other asset classes.

The aim of the research is also to increase the profile of listed real estate as an asset class with investment managers and companies that have direct real estate on their balance sheets, that the listed property sector is an alternative investment. Especially for companies, returns from the listed real estate sector could augment income from other areas of the business, *in lieu* of selling direct real estate holdings to the listed property funds. The growth of the listed property sector will lead to a more efficient market, potentially better returns and will result in an increase in the profile of the sector.

1.4 Research questions

This study attempts to answer the following research questions that are closely related to the purpose of this study. These research questions are:

- Do listed property stocks add value by minimizing volatility in a balanced portfolio?
- Do listed property stocks add value by maximizing returns in a balanced portfolio?
- What is the actual weighting that investment managers have allocated to listed real estate in balanced portfolios in the past ten years?
- What is the optimal weighting that investment managers, should have allocated to listed real estate in balanced portfolios in South Africa in the past ten years?

1.5 Research objectives

The hypothesis of the research is based on finding the optimal weighting of listed property stocks in a balanced portfolio in South Africa and what value is added by including listed property in balanced portfolios, whether they are optimized or not. The hypothesis asserts on two key areas that:

- The inclusion of listed property stocks in a South African balanced investment portfolio will enhance returns and reduce risk
- The optimal weighting for listed property stocks in a South African investment portfolio is between 5 - 10%.

The study will to prove that these two key areas will hold true in the South African context, based on the research undertaken and findings uncovered. The research objectives therefore are to uncover and answer the research questions and assess what impact the results will have on the hypothesis.

- The first objective is that the study aims to investigate the value added by including listed property stocks to minimize risk.
- The second objective is to investigate the value added by including listed property stocks to maximize returns.

- The third objective is to investigate the actual weighting of listed real estate in investment portfolios in South Africa.
- The fourth objective is to investigate the optimal weighting of listed property stocks in an investment portfolio in South Africa.

In order to continue, it is prudent to know what the limitations of the study are.

1.6   Limitations of the study

Real estate or property, in the context of this investigation, refers to property unit trusts (PUTs) as a sub-sector of listed properties, as opposed to all listed real estate entities in South Africa, such as property loan stock companies (PLSs) and redevelopment companies. While listed property stocks in the broader context, includes all the forms mentioned above, in this study the term is restricted entirely for listed property stocks as defined above.

The difference between property unit trusts (PUTs) and property loan stock (PLSs) companies has been the ability of property loan stock companies to gear their balance sheets or borrow, beyond 30% of real estate assets held in the company as suretyship, as required for property unit trusts. This means that PLSs contained debt on both the asset and liability sides of the balance sheets. Before 2003, property unit trusts were not allowed to gear the balance sheets, hence over a long period, PUTs would be more representative of the real estate sector performance than including both PUTs and PLSs as any movement in interest rates would have a much higher impact on the total returns of property loan stocks than property unit trusts, hence the exclusion of PLSs from the study.

One of the key tenets of both listed and direct real estate is that a huge portion of the total returns comes from income streams or rentals paid by the tenants occupying the physical properties. It was proposed in the dissertation proposal that a case study on one of the areas of study would be undertaken to prove the predictability of listed real estate as a provider of both income and capital returns. A case study on this aspect, one of the key characteristics of real estate could not

be undertaken as proposed in the dissertation proposal. Undertaking the case study would have resulted in a much broader investigation than currently undertaken and therefore lost the focus of the study.

The research topic is limited to the retirement fund (balanced mandates) industry. Most of the retirement funds have outsourced their investment management services to external asset managers. The premise of the research is that the views of the investment managers therefore represent those of the retirement fund industry.

1.7 Structure of the Dissertation

Chapter One introduces the topic matter, its importance and rationale for undertaking the investigation.

Chapter Two of the investigation is a literature review that concentrates on the current trends in the international and South African real estate markets in order to draw conclusions on the likely impact of these trends on real estate investment philosophies. It gives a background to the manner in which modern portfolio techniques have been applied to real estate with particular reference to current practice in the SA retirement industry.

The literature review covers the following areas:

- Modern portfolio theory (section 2.2)

- Real estate as an investment (section 2.3)

- Investment characteristics of SA listed real estate (section 2.4)

- Real estate investment performance (section 2.5)

- Real estate diversification benefits (section 2.6)

- Real estate allocation to the SA retirement funds industry (section 2.7)

Chapter Three describes the research methodology. The study involved collecting data from credible electronic feed sources and interpreting the data using computer

software (Microsoft Excel) in order to manipulate the data. The study also involved designing a questionnaire which would be used to collect data from practising investment managers about their perceptions and asset allocations to listed real estate in the different strategies of portfolio management. There is no control group and all variables will be measured at the same time via a questionnaire, and the interrogation of electronic databases. The research methodology is based on quantitative measures where one collects data from secondary sources and interprets that data to come to a conclusion.

Chapter Four presents all the findings from both the questionnaire and the secondary data.

Chapter Five discusses the research findings, focussing on the benefits of listed real estate and its suggested optimal weighting in investment portfolios. The result is applied, using modern portfolio theory techniques, to quantitatively allocate real estate to a portfolio initially comprising of shares (75%) and bonds (25%). The allocation is optimised and an efficient frontier created.

Chapter Six concludes the investigation and looks at areas of future research.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 Overview

There is still much debate as to where real estate fits into an investment portfolio. Much of the discussion centres on listed real estate. For example, the following questions are posed:

- Should listed property stocks be classified under shares or should they be classified independently?
- What are the benefits of including listed real estate in an investment portfolio?
- Will these benefits continue to flow into the future?

Issues such as these constitute the heart of this investigation and act as fundamental points of departure in this study of the relationship between listed real estate and other asset classes, both now and into the future. Before investment managers can accept listed real estate as an equal asset class to bonds and shares, a number of problems relating to real estate still need to be sorted out. The scarcity of funds allocated to listed real estate will continue to hinder the growth of the sector and using investment managers as the source of capital for property managers will continue to be limited.

The overall purpose of this literature review is to provide a concise overview of real estate as an investment asset class. In conducting the literature review, it was prudent to look at local and international trends of investing in listed real estate, and also the characteristics of listed real estate as an investment asset class internationally and in South Africa.

2.2 Modern Portfolio Theory

Markowitz (1952) introduced the concept of modern portfolio theory (MPT) – or portfolio theory. It is reported that thirty-eight years later, he shared a Nobel Prize with Merton Miller and William Sharpe for what has become a broad theory for portfolio selection. Portfolio theory provides a broad context for understanding the interactions of systematic risk and reward. It has profoundly shaped how

institutional portfolios are managed, and motivated the use of passive investment management techniques. The mathematics of portfolio theory is used extensively in financial risk management and was a theoretical precursor for today's value-at-risk measures (www.riskglossary.com).

According to Markowitz (1952), the basic idea in MPT is to minimise the overall risk, or volatility in the portfolio, associated with a given target total return for an investor's portfolio. This theory recommends that the risk of a particular asset class (stock) should not be looked at on a standalone basis, but rather in relation to how that particular asset class' (stock's) price varies in relation to the variation in price of the market or market portfolio.

The theory goes on to state that given an investor's preferred level of risk; a particular portfolio can be constructed that maximizes expected return for that level of risk. An optimised portfolio will be one where the risk is minimised, by weighting the different assets (asset classes), in order to achieve a maximum return. When weighting the asset classes, the asset class covariance is taken into account in order to come up with an optimal portfolio. According to Sharpe (1964), a portfolio's risk-return characteristics can be measured by what he named the Sharpe ratio, defined as the excess return per unit of risk:

$$ S \quad = \quad \frac{k_p - k_{FR}}{\sigma_p} $$

k_p represents the portfolio return; k_{fr} represents the risk-free rate; and σ_p is the standard deviation of portfolio returns k_p.

The Sharpe ratio is a direct measure of reward-to-risk. The higher the Sharpe ratio, the higher is the efficiency of the portfolio. The theoretical framework of the dissertation has been based on the tenets of modern portfolio theory. Modern portfolio theory has provided much of the underlying motivation for including real estate in the retirement fund portfolios. In modern portfolio theory, the goal is to maximise the expected return subject to some risk constraint. There is no standard definition of risk, but in most cases it is defined as the standard deviation

(volatility) of returns from an asset. In Reilly and Brown (2003), risk is defined as "the uncertainty that an investment will earn its expected rate of return".

2.3   Real estate as an investment

One of the most common forms of listed real estate is in the form of real estate investment trusts. The real estate investment trust or REIT began life in the United States, and was created by the US Congress in 1960 to enable small investors to make investments in large, income producing real estate. Although there are approximately 23 countries across the world where REITs have been established, only three contain REIT markets that are mature enough.

According to a report by Datamonitor (2003), Australia was one of the first countries to follow the US lead, with Canada introducing REITs only in the early 1990s. A REIT is essentially a tax-conduit vehicle in corporate or trust- form that combines the capital of many investors to acquire and hold real estate or provide financing for all forms of real estate. Reilly and Brown (2003) describe REITs as investment funds that hold portfolios of real estate investments. The following table shows the value and growth of REITs in the global market.

Table 2-1 Global Real Estate Investment Trusts Sector Value: US$ billions, 1999-2003

	$ Billions	Growth
1999	167.5	
2000	166	-0.90%
2001	187.2	12.80%
2002	200.8	7.30%
2003	273.4	36.10%

Source: Datamonitor: Global Real Estate Investment Trusts: Industry Profile. (May 2004)

The United States REITs market, upon which all these countries have based their framework, dominates the global market, accounting for 80% of the sector's value in 2003, according to a report by Datamonitor (2004). In the United States, the Employee Retirement Income Security Act (ERISA) was passed in the mid-1970s, to limit abuses in the pension fund world by creating a series of regulations to govern plan sponsor behavior (Winograd, 2002). According to Winograd (2002), ERISA was inspired by modern portfolio theory to promote prudent portfolio

diversification in order to reduce overall risk and stimulate pension fund investment into real estate.

Markowitz's modern portfolio theory predicts that diversification of a portfolio makes it possible simultaneously to enhance expected return, whilst reducing risk, as measured by the volatility of expected results. In applying modern portfolio theory, the main focus was to identify optimally diversified portfolios, that is, mixture of asset class portfolios that lie on the so-called 'efficient frontier' of portfolios that minimize the overall portfolio volatility, for any given total return target. These portfolios would then be considered prudent investments that would result in an acceptable risk and return trade-off.

It can be argued that the three key criteria for designation of a separate asset class are sufficient size, competitive risk-adjusted returns and unique return characteristics (low correlation) relative to other asset classes. An asset class that is significant in size and which tends to be uncorrelated to other asset classes provides diversification benefits in a mixed-asset class portfolio. According to Fisher and Sirmans, the traditional arguments for including real estate in a mixed asset portfolio are:

- Real estate has a low correlation with stocks and bonds
- Real estate has historically had a high inflation-adjusted rate of return relative to stocks and bonds
- Real estate has a positive correlation with both anticipated and unanticipated inflation, and therefore provides an inflation hedge.

2.4   Investment characteristics of South African listed real estate

The value of total assets and liquidity of this asset class has grown tremendously over the past ten years, with Maritz and Miller (2004) noting that 'listed property is a growing sector on the JSE'. The growth in size of the sector was followed by the increase in liquidity of the sector as more direct property portfolios were securitised. The following chart depicts the growth of the sector by using the total

assets of the listed real estate sector in South Africa over the past decade to December 2004.

Table 2-2 Growth in total assets in the listed real estate sector in South Africa (1995 –2004)

	Growth in total assets of the listed property sector in South Africa (Rm)
1995	3,463
1996	3,952
1997	4,890
1998	7,296
1999	7,909
2000	11,547
2001	19,929
2002	25,238
2003	34,668
2004	42,746

Source: I-Net Bridge, own database

According to Geltner and Rodriguez (2003), liquidity refers to the ability of the investor/owner of the asset to quickly and inexpensively convert the asset held into cash at or very near the current full-market value of the asset. Listed property stocks on the JSE had previously been characterized by low liquidity, however as the graph will show, this has started to change as the market capitalization of the sector and the returns from the sector have outperformed other asset classes. The following graph shows the increase in liquidity in the sector on a quarterly basis.

Figure 2-3 The increase in liquidity of the listed real estate sector
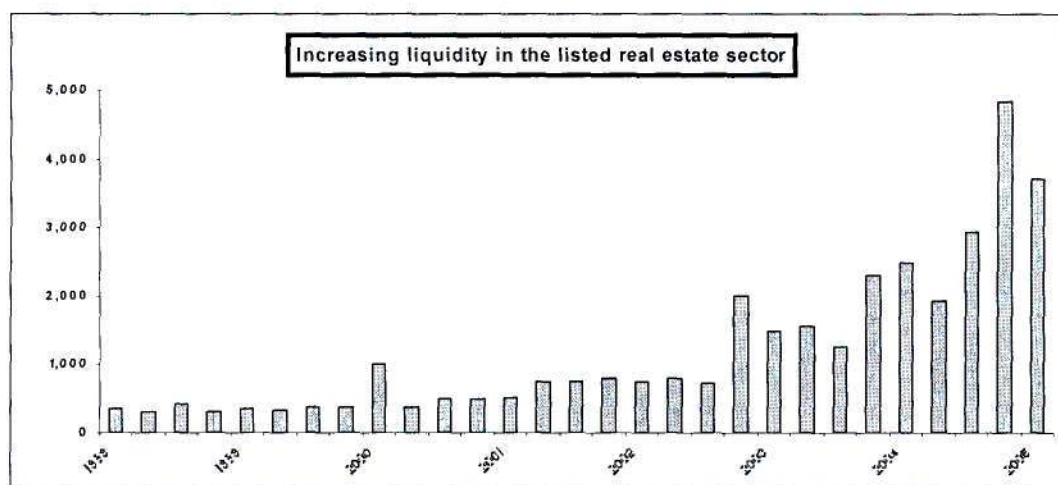
Source: JSE Securities Exchange (South Africa) June 2005

Listed property stocks can be divided into two categories, i.e. property unit trusts and property loan stocks in South Africa. According to the Association of Property Unit Trusts, a property unit trust (PUT) is a portfolio of investment grade

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properties. It is structured as an investment company that owns the total issued shared capital and loan accounts of property companies. The shareholders in a PUT own units in the trust, with a management company running the affairs of the PUT. Investors in PUTs therefore get a share of the portfolio's rental income in the short term, while the value of the units themselves increase in the longer term, mainly because of the rising value of the underlying properties in the portfolio. PUTs are highly regulated and are governed by the Collective Investment Schemes Act under the auspices of the Registrar of Unit Trusts – a Financial Services Board function.

A property loan stock (PLS) is a linked unit representing an ordinary share in the property investment company and a debenture, which is essentially a loan to the company. A debenture bears interest at a variable rate, according to the increase or decline in value in the underlying units. The property investment company owns shares in property companies that, in turn, directly own one or more properties. Similarly with PUTs, the interest is taxed in the hands of the investor, thus the PLS can pass the tax burden onto the taxpayer and incur minimal costs, as long as it pays out most of its distributable income.

Property loan stock companies are a riskier investment than property unit trusts because there is no statutory limit to its borrowings relative to the value of its underlying assets. Thus a PLS has the same objectives as a PUT, but with less control and more flexibility.

2.5 Real estate investment performance

In the United States, as everywhere else in the world, the listed real estate sector has outperformed all other asset classes in the past ten years. This phenomenon has not only taken place over a short period, but over a longer period. Using the Fidelity Real Estate Investment Portfolio as a proxy for real estate performance, one would see that it has outperformed the S&P500 over a 10-year period. If two investors had invested US$10,000, one into the REIT portfolio and the other into the S&P500, the investor who invested into REITs would have a portfolio valued

at US$32,070, outperforming the S&P500's return of US$28,629. Fidelity Asset Management provided the figures.

The South African listed real estate market has done the same, by outperforming the JSE All Share Index over a 10-year period. The South African equivalent is that an investor would have invested R10000 and after the ten-year period, would have had a portfolio worth R66555, whilst the JSE All Share Index would have delivered R30837 over the same period. The All Bond Index, incidentally, would have delivered R60444. These figures were compiled using the secondary data collected. The following graph shows that listed real estate has outperformed in the South African capital market.

Figure 2-4 PUT index vs Bonds and ALSI (1995-2004)
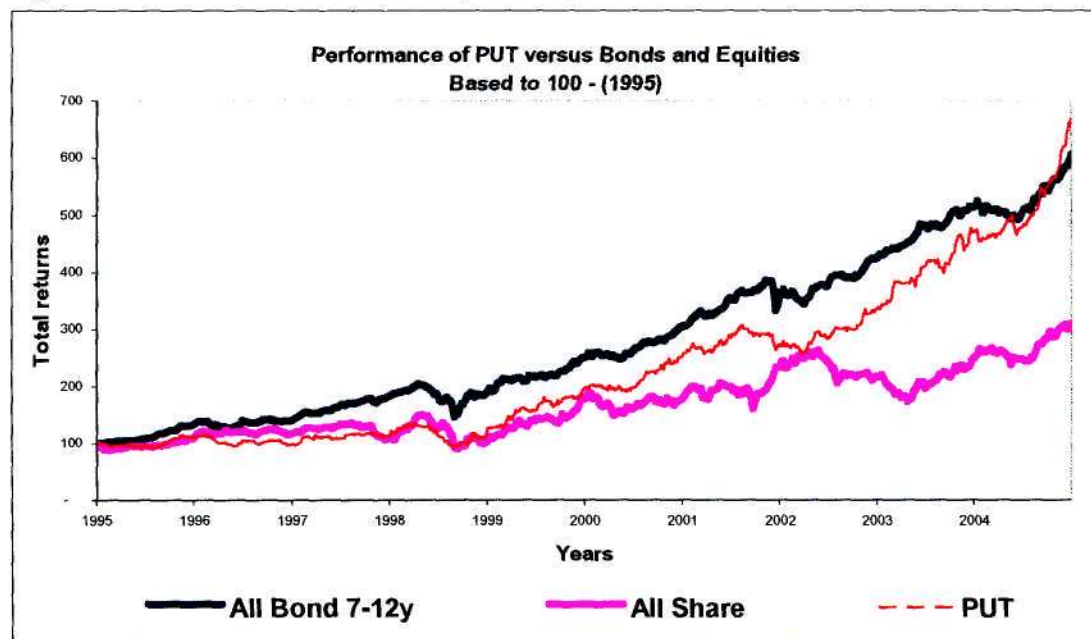
Source: I-Net Bridge

The out-performance as can be seen in the graph has come in the latter part of the ten-year period. What is also noticeable is that the gains in the property market have been steady, unlike the equity markets, highlighting the lower volatility of listed real estate.

2.6 Real estate diversification benefits

As it has already been observed that listed property stocks have outperformed other asset classes over the past ten years at a lower volatility, the diversification benefits of listed property needed to be looked at. Markowitz (1952) pioneered a new approach by identifying the collective importance of all the investor's investment holdings. The interrelationship among individual holdings was identified in the context of the classic investment trade-off between risk and return. Hudson-Wilson, Fabozzi and Gordon (2003), identified four main reasons why a portfolio should be exposed to property:

- To accomplish overall risk-reduction of the portfolio by combining asset classes that respond differently to expected and unexpected stimuli in the environment.
- To achieve returns above the risk free rate and deliver strong cash flows to the portfolio.
- To hedge against unexpected inflation
- To constitute part of a portfolio that is a reasonable reflection of the overall investment universe and the economy.

Over the last four decades, investment management attention has shifted from an emphasis on asset allocation to a more balanced emphasis on diversification and the interrelationship of individual asset class characteristics within the portfolio. Diversification in a portfolio context takes place when an asset, which is imperfectly related to the other assets in the portfolio, (the lower the correlation, typically the better the diversification benefits) is added to the portfolio. In a recent study, Hoesli, Lekander and Witkiewitz (2004) found real estate to be a very effective portfolio diversifier in seven countries on three continents over the period 1987 – 2001. In a previous study by the same authors (2003), investment in offshore directly held real estate was found to reduce portfolio risk.

A complete hedge against inflation is formally defined as an asset where the nominal returns vary in a positive one-for-one with inflation (Tarbert, 1996: 77). Historically, investing in commercial property has been perceived as providing a hedge against inflation. Research into the qualities of real estate, relating to

inflation, has been carried out in a number of countries. Results show that in the long run real estate seems to provide a better hedge against inflation than common stocks (Hoesli, 1994: 51). This is particularly true for unexpected inflation. One might expect a low correlation between conventional gilts and property, as the former is inflation prone and the latter is generally viewed as an inflation hedge (Fraser, Lesihmann and Tarbert, 2002: 354).

The role of commercial real estate in mixed asset portfolios has been the subject of extensive research over recent years, with many studies advocating large-scale allocations to the sector. Existing studies provide conflicting results regarding whether real estate investment trusts, effectively optimise and diversify institutional portfolios. Several papers document that the benefits of diversification concentrate at the macro level since asset allocation determines the majority of return variability (Brinson, Randolph-Hood and Beebower, 1995).

Several studies have examined the benefits of diversification of REITs in mixed-asset class portfolios. Glascock, Li and So (2000) show that from 1972 to 1991, REITs are segmented from the common stock market, while they are co-integrated from 1992-1996. They argue that the benefits from including REITs in a multi-asset portfolio diminish after 1992. Glascock *et al*, (2000) also show that REITs are co-integrated with un-securitised real estate for their full sample period. These results suggest that there is no role for REITs in portfolio risk reduction regardless of whether institutional portfolios are allowed to invest in direct real estate.

On the other hand, Liang and McIntosh (1998) argue that the benefits of diversification from including REITs in a multi-asset portfolio increase after 1992. Liang and McIntosh (1998) concluded that REITs have become more "unique" over the last five years of the sample period 1984-1997, and should be included in a multi-asset portfolio of equity and fixed income assets to achieve better risk-return trade-off. In South Africa the listed real estate cycle turned positive after the 1998 Asian crisis resulted in a 9% hike in interest rates. When the economic fundamentals started improving and interest rates started to decline, the performance of listed real estate came to its own –especially against equities (see figure 2.4). Listed real estate has outperformed equities over the past seven years,

except for two years. In the light of this out-performance, the researcher looks at the allocation of listed real estate in the retirement fund industry.

2.7   Real estate allocation in the retirement industry

The term asset allocation has different meanings to different people. Asset allocation can be divided into three categories: policy or strategic asset allocation, tactical asset allocation and dynamic strategies for asset allocation.

According to Kazemi and Martin (2001), strategic asset allocation can be characterized as a long-term asset allocation decisions. The objective is to determine the long-term normal asset mix that will represent the appropriate level of risk and return in order to achieve the long-term goals of the retirement fund. Kazemi and Martin (2001), describe tactical asset allocation as representing an active departure from strategic asset mix. The changes will be as a result of shifts and responses to those shifts in risk-reward characteristics of the different asset classes resulting from changes in the investment environment. Dynamic trading strategies for asset allocation are designed to change the distribution pattern of the investment portfolio or retirement fund (Kazemi and Martin, 2001). Through this strategy, an investment manager can create a new asset class, one that may not exist in a pure form in financial markets. Any asset allocation strategy that systematically changes over time could be considered as a dynamic trading strategy.

While asset allocation can be performed on any portfolio with two or more assets, it is most commonly applied to asset classes. Asset allocation is the process of allocating funds to each asset class. Much analysis has been performed which indicates this may be by far the most important decision when constructing the portfolio. Each asset class will generally have different levels of return and risk. They also behave differently. At the time one asset is increasing in value, another may be decreasing or, at least, not increasing as much and vice versa. When making asset allocation decisions based on asset classes it is assumed that each asset class is

diversified sufficiently to eliminate specific or non-market risk. The measure used for this phenomenon is called the correlation coefficient.

Correlation coefficient is a measure of the degree to which two assets (or investments) move together. The value of the correlation coefficient ranges from -1 to +1. Assets that have a correlation coefficient of –1 are perfectly negatively correlated. This means that their values move simultaneously in opposite directions and magnitude. For a value of +1 they are perfectly positively correlated. Therefore their values move simultaneously in the same direction and magnitude. A correlation coefficient of 0 indicates there is no relationship at all. In reality, most assets have some positive correlation, although it may be very low.

The retirement fund industry has always had a bias towards real estate, but in the direct form. In South Africa, a number of the properties that have been sold to the listed real estate sector have been from retirement funds disposing of their interests in direct real estate and in most cases, converting to listed real estate and not cash. This was mainly done to improve the liquidity of all underlying investments within that retirement fund. Fund managers generally consider real estate a separate asset class. In terms of the prudential investment guidelines applicable to retirement funds, the asset class is seen as comprising a set of behaviours that distinguish it from other asset classes.

The main challenge in the decision about adding real estate to a portfolio is to determine what real estate can do for the portfolio. This involves the objective analysis of diversification benefits, risk-return characteristics and the portfolio's time horizon. Objective factors can be overwhelmed, however, by emotional and political factors affecting the investment manager.

Hudson-Wilson (1989:209) endorses the argument that a key objective of any portfolio management exercise is to diversify away as much unsystematic risk as possible. Investors do not get additional returns for assuming risk that can be diversified away. The first consideration is how relevant the diversification attribute of real estate is for the fund. The answer depends on the fund's need for return

and tolerance for risk and on how real estate might contribute to the achievement of the fund's objectives.

For example, a pension fund that is fully funded, receives continuous contributions, and serves a fairly young population may be able to accept less return for less risk. For that fund, the attribute of diversification may be the primary reason for being in real estate. Assuming the fund is making its minimum required return, the trustees may consider ideal, a core portfolio consisting of pure real estate equity combined with a portfolio of mortgages. This combination would provide diversification benefits and produce a fairly stable, low-risk return stream.

Consider, on the other hand, a pension fund that is under-funded and the employer is unable to make additional contributions to the fund each year. With an ageing population, the trustees are seeking the highest absolute returns. This fund might be inclined to time the markets and exploit different cycles, and it would certainly take more risks than the first fund. In this case, the diversification attributes of real estate are less important than the achievement of high absolute returns.

McBride (1995:66) maintains that the investment universe, both internationally and locally, has changed over the last 15 years. Today, a wide array of new instruments is available, offering most combinations of risk and expected return that is required to achieve the objectives of a fund. A retirement or insurance fund today can invest in many other diversification assets other than real estate. Examples are international debt and equity, emerging market debt and equity, private equity, venture capital, high-yield debt securities, commodities, derivatives. Therefore, McBride (1995:66) argues, the uniqueness of real estate as a deliverer of diversification has been diluted.

To include real estate, a fund manager who invests in a broad array of asset classes has to be comfortable that the return he expects to achieve from real estate can be achieved in the market and that the return is commensurate with the existing risks. These factors will depend on the market cycle; so fund managers must be realistic. Ironically, many institutional investors in South Africa assume a perpetual 18% to

20% total return for real estate. This expectation is based on an average yield or cap rate of 10% with net rental income growing at 8% to 10% per year. Even though these are the expectations, allocations to real estate have been low relative to the returns and risk characteristics of the sector.

Using the appropriate time horizon is critical in making the decision to allocate to real estate. McBride (1995:66) argues that investors do not have to subscribe to the buy-and-hold-forever theory, but they do need a long horizon. Tactical changes can certainly be made to the fund, but making large and frequent allocation changes in what are essentially illiquid markets is difficult. However this was so in the past, but no longer as the listed real estate sector as already mentioned has made huge strides to address liquidity and size. Participant-observation of industry practice has led the researcher to confirm that this is indeed a problem in SA, especially the size of the sector, even though it has grown exponentially over the past ten years.

Over the past twenty-five years, a large number of studies have been devoted to understanding the contribution of real estate to a mixed-asset portfolio. Foremost was the idea that real estate offered diversification benefits because of its low correlation with other asset classes. Many studies in the 1980s, such as Folger (1984), Hartzell, Hekman and Miles (1986), Webb and Rubens (1987) and Firstenberg, Ross and Zisler (1988), concluded that real estate should comprise 20% to 30%, or more of a diversified portfolio. In the 1990s, work by Ziering and McIntosh (1997), Ziobrowski and Ziobrowski (1997) and Kallberg, Lui and Greig (1996), also found that real estate should still be a significant part of an overall asset portfolio. All of these studies used traditional mean-variance portfolio optimization.

According to Craft (2005), traditional mean-variance models predict allocations to private and public real estate of over 50%. In reality, over the last 10 years allocations to real estate for defined benefit pension funds have averaged between 4% and 5%, according to Pensions and Investments annual survey of the 200 largest pension plans in the United States of America (USA). The following chart shows the average asset allocation in retirement plans in the USA.

Figure 2-5 US – Listed real estate allocations in pension funds
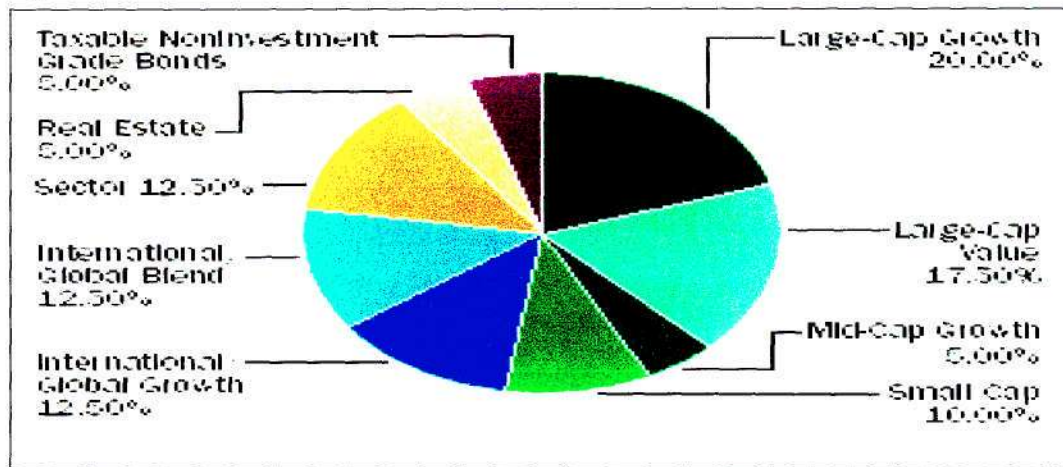
Source: Fidelity Asset Management, 2004

In South Africa, very little research has been undertaken to conclude on the allocation of funds to listed real estate. In a report by Dr Jaco Maritz and Karen Miller (2004) for Cadiz Financial Strategists, they suggested that the allocation to listed property in historical minimum variance and optimal portfolios is between 6% and 13%. However, according to the Alexander Forbes Large Manager Watch survey to December 2004, the average asset allocation to listed property in the SA Best Investment View category declined from 1.50% in 2000 to 1.38% in 2004. The weighting is way below international norms, and also way below the optimal allocation (see Chapter 5). The only limiting factor in South African portfolios is the size of the listed property sector, which makes up about 1.82% (I-Net Bridge data as at 31 December 2004) of the JSE Securities Exchange, but even then few of the investment managers have taken their exposure to the full JSE weighting. The size of the listed property sector has, however, been growing with more counters listing into the sector and promoting its liquidity.

2.8 Summary

The literature review has highlighted the importance of the area being researched, especially in the South African context where there has been no extensive research undertaken in the past ten years. The literature review has also highlighted the current status of the topic, especially since the topic is very relevant at the moment. The problem statement of what weight to allocate to listed real estate is dealt with in previous research, but not extensively especially in the South African context.

3. CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The research methodology is an important aspect of the thesis. It details how the research was conducted and any deficiencies in the research will be highlighted in the research methodology. The research was conducted using two methods of data collection: a questionnaire and the use of electronic feed sources to extract secondary data.

3.2 Purposes of the study

The specific objectives of the study, as defined in section 1.5, are to:

- Investigate the value added by including listed property stocks to minimize risk.
- Investigate the value added by including listed property stocks to maximize returns.
- Investigate the actual weighting of listed real estate in investment portfolios in South Africa.
- Investigate the optimal weighting of listed property stocks in an investment portfolio in South Africa.

3.3 Overview

To achieve the purpose of the study and meet its objectives, the following data was gathered:

- Secondary data from electronic feed source, I-Net Bridge, IPD/SAPOA and the JSE Securities Exchange on each of the different asset classes in order to perform an asset allocation using an efficient frontier.

- Empirical data by means of a detailed questionnaire (see Appendix 1.2), which highlighted the perceptions and actual allocations to listed real estate in South African retirement fund portfolios.

3.4 Design of the study

To understand the field of real estate investment in South Africa, it was essential to approach the major practitioners in the asset management field for their opinion. An important element of the primary research has therefore been orientated towards understanding and documenting the opinions of the major groups or players in the SA retirement and investment industry. These are investment managers (provider of capital) and retirement funds, (holders and currently sellers of direct real estate to listed funds).

Thus, the design of this study has been influenced by the central assumption that practitioners in the field are the best source of information and ideas on the subject. A second assumption in the design has been the belief that the information gathered in the literature review and the empirical data gathered through the use of questionnaires and electronic sources needs to be used to develop an efficient frontier that will result in the identification of the optimal weighting that investment managers should have allocated to listed property stocks in the past ten years to outperform their benchmarks for the benefit of retirement funds and their members.

3.5 Data Collection and Manipulation

3.5.1 Questionnaire

3.5.1.1 Population

The universe of SA institutional investment managers represents the population with substantial investments into the different asset classes on the JSE Ltd.

3.5.1.2 The Sample

Ten investment managers across the investment management industry, representing the insurance, retirement funds and pure investment managers were sent questionnaires to participate in the study. Only six of the ten investment managers responded. The institutions representing investment managers or providers of capital are listed in Table 3-1.

Table 3-1 Investment management respondents

Institution	*Investment Fund Type*
Acsis	Private Wealth manager
Catalyst Securities	Listed property investments
Marriott Asset Management	Listed property investments
Mines Employees Pension Fund	Pension and Provident fund
Provest Management (Pty) Ltd	Listed property investments
Sanlam Investment Managers	Insurance and retirement funds

See Appendix 1.1 for details

Out of the ten randomly selected institutional investors, with substantial investment in commercial and industrial real estate either owned directly or through related entities and listed property funds (N=10, see Appendix 1.1), those in Table 3-1 represent those that responded to the questionnaire. They also represent the larger retirement fund investment managers in SA. The particular institutions selected to be included in the sample have played an important and active role in growing and developing the SA real estate market.

The sample of investment managers that participated in this study control approximately 50% of investment grade real estate in South Africa through listed real estate. The questionnaire was developed to elicit information on SA property market practice and respondents' views about what they construed to be pivotal concerns and possible solutions to perceived problems. Their response is important in order to achieve a broad base of opinion from the major market players.

A total of 18 questions were posed covering eight sections. Each question followed one of four formats as follows:

- Question requiring ranking of different options

- Questions requiring a choice between different options

- Questions requiring an indication of a strength of opinion

- Questions requiring a subjective opinion.

Each section and group of related questions is briefly described in the sections that follow (see Appendix 1.2 for an example of the questionnaire).

3.5.1.3 Representativeness of the sample

As the value of the listed real estate sector is relatively small when compared to the value of all the listed securities in South Africa, so is the number of important players in the market. The selection of each sub-sample was by means of stratified random sampling to include all the relevant variables of practice. The sampling was also affected on a deliberate basis to ensure inclusion of the major role players in the SA real estate industry. A 60% response rate has been found to be acceptable by the researcher, as the respondents still represent a major portion of those investment houses that have an exposure to property in one way or other.

3.5.2   Secondary data

Secondary data was gathered from electronic feed sources such as I-Net Bridge, IPD/SAPOA and the JSE Securities Exchange. The data collected was used to calculate total returns from each of the different asset classes. Proxies for the different asset classes were used in order to create a portfolio of mixed asset classes. Equities were represented by data from the All Share Index, which can be

obtained from electronic databases. Bonds were represented by data from the 7-12 year bond index, later referred as the Bond Index (ALBI). The reason why the 7-12 year bond index was used is that the modified duration of property is similar to medium-term bonds, rather than short-dated bonds. Cash, which was used as the risk-free rate, was represented by data from Alexander Forbes. As already mentioned, the representative for real estate is the Property Unit Trust (J255) index.

This data was then stored in a Microsoft Excel spreadsheet for easy manipulation and interrogation. The resultant quantitative data is then input into an investment management programme in order to produce a Markowitz efficient frontier, which will give the optimal weighting to real estate. It was found that Microsoft Excel was sufficient as an analytical tool, but in order to produce an efficient frontier, Elton and Gruber's Markowitz Module (The Investment Portfolio, Version 1) was used. Edwin J. Elton, Martin J. Gruber and Christopher R. Blake, in association with IntelliPro Inc, designed the Markowitz Module programme. The results of the programme will be revealed later in Chapter Five.

The data used for the research consisted of weekly closing prices of the indices (PUT, ALSI and 7-12 year All Bond) for the ten-year period from 01 January to 1995 to 31 December 2004, extracted from Intelligent Network Share Data Service (INET Bridge) (2004) and downloaded into a spreadsheet. The weekly data collected was compounded to a 10-year annualised return.

After manipulation, a table consisting of annual returns of the different asset classes over a period of 10 years was obtained. The annualized total return and annualized standard deviation of the asset classes was obtained. The standard deviations were used to determine the risk characteristics of the different asset classes. The standard deviation is the measurement of the deviation away from the mean of a set of data and is calculated as the square root of the variance, which is a measure of volatility. Therefore the more a stock's returns vary from the stock's average return, the more volatile the stock. Correlation coefficients measuring the historical relationship of returns on listed property and both equities and conventional bonds will be used. Portfolios were then constructed assuming an initial 75% and 25% weighting to the ALSI and bond index respectively.

Here are some key issues to consider when constructing efficient portfolios: if an investor limits oneself to low-risk securities, the investor will be limiting oneself to investments that tend to have low rates of return. So what the investor really wants to do is to include some higher growth, higher risk securities in the investor's portfolio, but combine them in a smart way, so that some of their fluctuations cancel each other out. (In statistical terms, the investor is looking for a combined standard deviation that's low, relative to the standard deviations of the individual securities.) The result should give the investor a high average rate of return, with less of the harmful fluctuations.

The science of risk-efficient portfolios is associated with Harry Markowitz and Bill Sharpe. Suppose the investor has data for a collection of securities (like the All Share Index stocks, for example), and the investor graphs the return rates and standard deviations for these securities, and for all portfolios the investor can get by allocating among them. Markowitz showed that the investor gets a region bounded by an upward-sloping curve, which he called the efficient frontier.

It is clear that for any given value of standard deviation, the investor would like to choose a portfolio that gives one the greatest possible rate of return; so the investor always wants a portfolio that lies up along the efficient frontier, rather than lower down, in the interior of the region. This is the first important property of the efficient frontier: it is where the best portfolios are.

The second important property of the efficient frontier is that it is curved, not straight. This is actually significant - in fact, it is the key to how diversification allows the investor to improve the reward-to-risk ratio. In statistical terms, this effect is due to lack of covariance. The smaller the covariance between the two securities - the more out of sync they are - the smaller the standard deviation of a portfolio that combines them. The ultimate would be to find two securities with negative covariance (very out of sync: the best years of one happen during the worst years of the other, and vice versa).

The next chapter presents the findings.

4 CHAPTER FOUR: RESEARCH FINDINGS

4.1 Introduction

The research findings are extricated from two sources of information, namely, the questionnaire and the secondary data.

4.2 Questionnaire data

The findings of the questionnaire are split into the main features of the questions that were presented to the respondents. The data has not been analyzed or commented on, with only the findings presented.

4.2.1 Assets under administration

Assets under administration ranged from less than R1bn to over R50bn. Seventeen percent of the fund managers had assets under administration of less than R1bn. Another 17% had assets between R1bn and R3bn. Thirty-three percent of the fund managers had assets under administration of between R3bn-R10bn. Another 17% of the fund managers had assets between R20 and R50bn, with another 17% having assets under administration of more than R50bn.

4.2.2 Investment style

All the managers considered their investment style as value oriented. This would be the case because listed property stocks have characteristics of value stocks. Value stocks typically have higher dividend yields, where the valuation of the income stream generated is not reflected in the price of the underlying stock.

4.2.3 Perception of listed real estate as an asset class

Eighty-three percent of the fund managers perceived listed property as a different asset class to equities, with only 17% considering it as part of equities.

4.2.4 Valuation of listed real estate

There is a strong correlation between listed property yields and bonds. Sixty-seven percent of the fund managers, value listed property using listed property yields relative to bond yields, whilst 17% of the fund managers value listed property based on whether the market value is at a discount or premium to the Net Asset Value of the underlying portfolio of properties. Another 17% value listed property on an earnings yield growth trade off, that is, the higher the yield, the less the earnings growth expectation, and the lower the yield, the higher the earnings growth expectation, which should compensate for the lower yield.

4.2.5 Constraints to investing in listed real estate

Sixty-seven percent of the fund managers felt that liquidity of the stocks was a major constraint in investing in the listed property sector. Seventeen percent (17%) of the fund managers felt that the size of listed property stocks themselves was a constraint to investing in the listed property sector. Another 17% of the fund managers felt that there was some other variable, other than those mentioned in the questionnaire constrained them to investing into the listed property sector. No specific mention was made of what the other variables might have been.

4.2.6 Characteristics of real estate

Thirty-three percent of the fund managers responded that the inflation-hedge characteristic of listed property enticed them to invest into the sector. Another thirty-three percent felt that listed property offered diversification benefits, with a further 17% feeling that the consistency of cash flows was the main attraction to them.

4.2.7 Allocation to listed real estate (absolute return mandates)

Only 83% of the respondents participated in this category. Eighty percent (4) of the fund managers replied that the current exposure to listed real estate is between 0 and 2%, whilst only 20% of the fund managers replied that their current exposure is between 2.1% and 5%.

Again 80% (4) of the fund managers felt that the optimal allocation to listed property in absolute return funds should be between 0-2%, whilst 20% felt that the exposure should be higher, between 10.1 and 15%.

4.2.8 Allocation to listed real estate (asset allocation mandates)

Sixty-seven percent of the fund managers responded that the current allocation to listed property in asset allocation mandates is between 0 and 2%. Thirty-three percent of the fund managers responded that their exposure was between 5.1% and 10%.

Sixty-seven percent of the fund managers felt that the optimal allocation to listed property in asset allocation mandates should be between 0-2% whilst again, thirty-three percent felt that the allocation should be between 5.1% and 10%.

4.2.9 Allocation to listed real estate (total return mandates)

Only 83% of the respondents participated in this category. 100% of the respondents replied that the current exposure to listed real estate was between 0 and 2%, also indicating that they were at the optimal exposure.

4.2.10   Allocation to listed real estate (balanced mandates)

Eighty-three percent of the fund managers responded that the current exposure to all property (direct and listed) was between 0 and 2%. Only 17% replied that the current exposure to direct and listed was between 5.1% and 10%.

Sixty-seven percent of the fund managers felt that the optimal allocation to listed property in balanced mandates should be between 0-2%, whilst only thirty-three percent felt that the allocation should be between 5.1% and 10%.

4.3   Secondary Data

4.3.1   Returns

The annual returns of the four main asset classes are depicted on the table below.

Table 4-1 Annual total returns from 1 January 1995 to 31 December 2004

Year	PUT	ALSI	ALBI	Cash
1995	12.05%	13.93%	36.39%	13.38%
1996	-11.34%	3.35%	3.65%	16.31%
1997	22.94%	-5.80%	30.58%	17.22%
1998	3.67%	-5.91%	3.38%	17.79%
1999	55.99%	70.56%	31.18%	15.72%
2000	27.65%	-0.05%	20.97%	10.95%
2001	8.15%	30.55%	20.38%	10.61%
2002	22.80%	-6.62%	16.20%	11.53%
2003	40.22%	13.91%	21.11%	12.78%
2004	41.78%	24.85%	17.91%	8.22%

4.3.2   Standard deviation (Risk)

The annual standard deviations of the four main asset classes are depicted on the table below:

Table 4-2 Annual standard deviations from 1 January 1995 to 31 December 2004

Year	PUT	ALSI	ALBI	Cash
1995	1.15%	1.80%	0.88%	0.05%
1996	1.45%	1.61%	1.3%	0.06%
1997	1.96%	1.95%	0.99%	0.05%
1998	3.18%	4.63%	3.07%	0.23%
1999	2.57%	2.86%	1.48%	0.24%
2000	1.71%	2.80%	1.18%	0.04%
2001	1.71%	3.59%	2.00%	0.04%
2002	1.69%	2.51%	1.39%	0.11%
2003	2.05%	2.78%	0.76%	0.14%
2004	1.73%	1.96%	1.03%	0.42%

4.3.3   Correlation of returns between each asset class

The significance of the correlation matrix is that it identifies asset classes that move in line with one another. Table 4.3 (below) represents correlations of data throughout the study period, that is, from 1995 to 2004.

Table 4-3 Correlation of returns from 1 January 1995 and 31 December 2004

Year	PUT	ALSI	ALBI	Cash
PUT	100%			
ALSI	58.2%	100%		
ALBI	53.4%	41.8%	100%	
Cash	-32.4%	-13.4%	-12.9%	100%

4.3.4   Covariance matrix between asset classes

The extent to which two random variables vary together (co-vary) can be measured by their covariance. The value of the covariance is interpreted as follows: Positive covariance: indicates that higher than average values of one variable tend to be paired with higher than average values of the other variable. Negative covariance: indicates that higher than average values of one variable tend to be paired with lower than average values of the other variable. Zero covariance: if the two random variables are independent, the covariance is zero. This means that there is no

relationship between the two random variables. Table 4-4 represents the covariance matrix of returns during the study period.

Table 4-4 Covariance matrix between the asset classes

Year	PUT	ALSI	ALBI	Cash
PUT	3.65%	-	-	-
ALSI	2.51%	5.12%	-	-
ALBI	1.05%	0.98%	1.07%	-
Cash	-0.19%	-0.09%	-0.04%	0.09%

The next chapter discusses the findings.

5 CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Discussion

5.1.1 Questionnaire data

5.1.1.1 Asset manager views on characteristics of listed property

As the overall picture is important, the responses are considered in their entirety, but in Table 5.1 and 5.2 they are grouped into related questions, with responses. The questions as they appear in the table are shortened versions of the questions in the questionnaire, which can be viewed on Appendix 1.2.

As reflected in Table 5.1, 83% of the respondents agreed that listed property should be treated as a separate asset class from equities. This is the first step in acknowledging that the characteristics of listed property are different from equities, even though there might be similarities. When asked about valuation methodology, 66.7% of the respondents valued the listed property sector relative to bonds, based on income yields, with the remaining 33.3% favoring to value listed property on an earnings growth/income yield tradeoff or using discounted cash flows equally.

Table 5-1 Responses relating to the perceptions and characteristics of listed property

Item	Brief description of question	Managers (N= 6)	
		Yes	No
1.1	Listed property a separate asset class from equities?	83%	17%
		As % of total respondents	
1.2	**Valuation methodology**		
	Relative to bonds	66.7%	
	Based on NAV	0%	
	Discounted Cash Flows	17%	
	Yield/growth tradeoff	17%	
1.3	**Positive characteristics**		
	Inflation hedge	33.3%	
	Diversification benefits	33.3%	
	Consistent cash flows	33.3%	
1.4	**Constraints to investing in listed property**		
	Size of listed property sector	17%	
	Liquidity of the sector	66.7%	
	Other	17%	

When asked about the positive characteristics of listed property on an investment portfolio, three groups favoured an equal number of the options of inflation-hedge, diversification or the consistency of cash flows as an important consideration.

With respect to the constraints to investing in listed property, the response from 67% of respondents was that the liquidity of the sector was a major constraint. 17% responded that the size of the sector was a deterrent, with the remaining 17% responding that some other factors other than those in the questionnaire were constraints. When ascertaining the significance of the relationship between the size of assets under administration and the perception of listed property as an asset class, it seems that the more significant relationship is between the size of assets under administration and the liquidity constraint of the listed property sector. The larger asset managers, those with assets exceeding R5bn, responded that liquidity of the listed property sector was a major constraint, with the smaller fund managers, those with assets less than R5bn, replying that there were other constraints other than liquidity, which prevented participation into the listed property sector.

5.1.1.2   Asset manager views on exposure to listed property in portfolios

As already observed, 83% of the respondents felt that listed property should be treated as a separate asset class. With this in mind, 67% had segregated listed property management mandates. The other 33% had an equal exposure to listed property either in asset allocation or total return funds.

Table 5-2 Responses relating to views on exposure to listed property in portfolios

Item	Brief description of question	Managers (N=6)		
		Yes	Exposure through other mandates	
1.5	Segregated listed property mandates	67%	33%	
	Range of exposure to listed property	0-2%	2.1-5%	5.1-10%
1.6	**Balance fund exposure**			
	All property	83%		17%
	Listed property	83%		17%
	Optimal exposure to listed property	67%		33%
1.7	**Total return fund exposure**			
	Current exposure (N=5)	100%		
	Optimal exposure (N=5)	100%		
1.8	**Asset allocation fund exposure**			
	Current exposure	67%		33%
	Optimal exposure	67%		33%
1.9	**Absolute return fund exposure**			
	Current exposure (N=5)	80%	20%	
	Optimal exposure (N=5)	80%		20%

In Table 5.2, the asset manager views on exposure to listed property are depicted. When asked to comment on listed property exposure in balanced funds, 83% of the fund managers reported that their current exposure to all property and listed property was between 0 and 2%, whilst 67% responded that the optimal exposure to listed property should be between 0 and 2%. The current exposure to listed property in balanced mandates is in agreement with the data obtained from the Alexander Forbes Large Manager Watch, that the average exposure to listed property is 1.38%.

Respondents' views on the exposure to listed property in total return funds was surprising, in that all the respondents reported that the current and optimal exposure to listed property should be between 0 and 2%. The total return from listed property, annualized over a ten-year period, is 20.87% per annum, which has been higher than all the other asset classes. A more detailed analysis of the secondary data will follow shortly.

The views on the exposure to listed property in asset allocation funds, was that 67% of the respondents reported that their current and optimal exposure to listed property in asset allocation funds should be between 0 and 2%. The remaining

33% reported that their current and optimal exposure to listed property should be between 5.1% and 10%.

In absolute return funds, views were received from only 83% of the respondents. Of the respondents, 80% had a current exposure of between 0 and 2%, with the remaining 20% having an exposure of between 2.1% and 5%. Again 80% felt that the optimal level was between 0 and 2%, but 20% felt that the optimal exposure to listed property in absolute return funds should be between 5.1% and 10%.

Before concluding, a few observations should be reiterated on the position of listed property as viewed through optimal allocation to the different portfolio strategies. In total return portfolios, the optimal weighting to listed property should fall in the 0 and 2%. This has been confirmed by 67% of the respondents. In asset allocation portfolios, the optimal weight should be between 0 and 2%. This has been confirmed by 100% of the respondents that participated on the question. In absolute return funds, the optimal weighting should be between 0 and 2%. This has been confirmed by 80% of the respondents. In balanced mandates, 67% of the respondents replied that the optimal allocation to listed property should be between 0 and 2%.

In conclusion, it seems that a few asset managers had an exposure to listed property in the past ten years. One cannot, however, conclude that the limited exposure to listed property has restricted out-performance, even though as an asset class, listed property has outperformed equities, bonds, cash and even direct property. The analysis of the secondary data follows.

5.2 Secondary data

Table 5-3 Compound returns and standard deviations of asset classes

	PUT	All Share index	All Bond index	Cash	Direct property
Total returns	20.87%	11.92%	19.71%	13.41%	13.40%
Standard deviation	19.11%	22.62%	10.33%	3.04%	9.43%

5.2.1 Total returns

The annual returns from 1 January 1995 to 31 December 2004 as shown in Table 4.1 represent an annual compounded figure, which represents total returns over the period. Table 5.3 shows that the total returns from listed property over the period have been the highest, followed by bonds and cash. Equities have returned the lowest returns over the period, even though according to the Alexander Forbes Large Manager Watch, the exposure to equities had increased from 55% in 2000 to 68% in 2004.

If one analyses the annual returns in Table 5.1, it will be evident that listed property has outperformed in four out of the last ten years. This is in 2000 and 2002 through to the end of 2004. Also one thing that must be observed is that there has been a fairly large differential in out-performance in the last three years from the listed property sector, hence the better returns over the full ten-year period, if they are compounded. However even using simple averages, listed property returns are still better than the other asset classes. The following section considers risk and risk is represented by the standard deviation of returns over the period.

5.2.2 Standard deviation of asset class returns

Cash is usually considered as a risk-free investment, because all the variables relating to cash, e.g. interest rate to be earned, the investment period and penalties for early withdrawal, are agreed upfront.

Cash exhibited the lowest standard deviation (risk) of returns. As already mentioned, the certainty of outcome in a cash investment is known and agreed upfront. Even when a deposit-taking institution fails, there usually is government assistance in order to bail out depositors. Interest rates do not adjust daily and therefore big movements in the returns on cash are rare.

Bonds exhibited the second lowest standard deviation. Bonds, especially the medium term bonds, will exhibit higher standard deviations, because the factors used to value those bonds have some risk element in them, for instance, the interest rate and inflation outlook factored into the valuations could be too conservative, with either a positive or negative result. This means that the certainty of outcome is reduced.

Listed property exhibited the second highest standard deviation. It should not be forgotten that listed property does exhibit the same characteristics as equities hence the standard deviation will be higher than bonds, and lower than equities. This is one of the characteristics of listed property that give it its unique character. The standard deviation of the sector has increased as the liquidity of the sector has grown.

Equities exhibited the highest standard deviation. As the widest-held asset class, this is expected.

5.2.3   Correlation between asset classes

The strongest return correlation is between equities and listed property. Listed property has the same characteristics as equities, in that it is an equity, but also exhibits bond characteristics such as high income yields and that both get affected by the same economic drivers e.g. interest rates movements. The correlation between listed property and equities is 58.2% over the ten-year period.

The second strongest return correlation is between listed property and bonds at 53.4%. Taking into account that a major portion of total returns in listed property

is from income, it is not surprising that the correlation is close to that achieved between equities and listed property.

Cash exhibited a negative correlation to all other asset classes, viz. equities, bonds and listed property. The weakest correlation was between listed property and cash, followed by equities and then against bonds. The only link the researcher can make between the listed property and cash, are the yields earned on listed property, which tend to be higher, and the growth in the income stream. Therefore investors will invest more into listed property when interest rates are low, to earn higher yields, and invest more into cash when interest rates are high.

5.2.4 Covariance matrix

The covariance, as already explained, is the extent to which two random variables vary together (co-vary). The portfolio optimisation tool in the computer program by Elton and Gruber uses the covariance to optimise the portfolio. The operation of the program is explained in more detail later.

5.3 Efficient frontier: allocation to bonds, equities and listed real estate

The process for establishing an optimal (or efficient) portfolio generally uses historical measures for: returns, risk (standard deviation), and correlation coefficients for each asset class to be used in the portfolio (or series of portfolios). In this study, the asset classes are bonds, equities and listed real estate. Even though the values for direct real estate have been given in Table 5.1 and 5.3, these were not used in constructing the optimal portfolio.

5.4 The problem of allocation to listed real estate in retirement funds

According to prudential investment guidelines, which are legislated investment guidelines intended to ensure a conservative investment spread for retirement
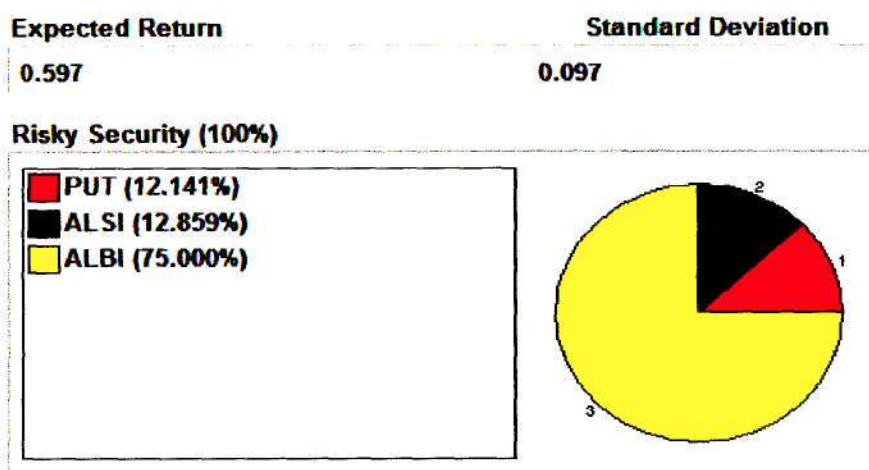
funding products, in order to protect the investor from loss of value due to risky investment selection, the exposure to listed property should be limited to 25% of a portfolio. This is what has been applied to the Elton and Gruber optimisation programme.

To run the programme, one needs to feed in the annual total return figures, the standard deviations of each asset class and then the correlation between the asset classes. The programme will then calculate the covariance between each asset class. When this has been completed, the programme asks you whether you would like to put in any weight constraints on any of the asset classes, such as not going over a certain weight in an asset class. This ensures that the programme gives you exactly what you asked for. This is also important in that the constraints of the prudential investment guidelines will be maintained or adhered to.

The researcher hypothesized that the exposure to listed real estate should be between 5-10%. However, the researcher has found that the actual exposure in retirement funds in South Africa has not been more than 2% or to be more precise, actual exposure to listed property has been 1.38% (Alexander Forbes Large Manager Watch). Two-thirds of the managers questioned, responded that the optimal exposure to listed property in balanced mandates should be between 0 and 2%, as reflected in the Alexander Forbes survey.

The following chart gives the results based on the Elton and Gruber programme. The results of the programme are compared to the researcher's starting point of an initial exposure of 75% to equities and 25% to bonds. The following pie chart shows an optimised portfolio, resulting in a decline in the exposure to equities, and an increase in the exposure to bonds and listed property stocks.

Figure 5-4 Pie chart showing the optimal weightings of the different asset classes

Expected Return   **Standard Deviation**

0.597   0.097

Risky Security (100%)

PUT (12.141%)
ALSI (12.859%)
ALBI (75.000%)

The J255 (PUT) is the listed property sector, with the J203 representing the All Share Index. JAYC10 represents the medium term bond index. The pie chart reveals that the exposure to the listed property sector should be 12.141%, whilst the ALSI exposure should be 12.859%. The highest exposure, according to the programme should be to bonds, at 75%. The weighted historical portfolio total return would be:

**Table 5-5** Weighted returns of the optimised portfolio

Asset class	Weight	Historical returns	Weighted returns
PUT	12.141%	20.87%	2.53%
ALSI	12.859%	11.92%	1.53%
Bonds	75.0%	19.71%	14.78%
Total portfolio			18.84%

In other words, the addition of listed real estate has increased the portfolio return from 13.87% to 18.84%. If the portfolio weights started from 75% equities and 25% bonds, the standard deviation of the portfolio would be 19.54%. However, the addition of the exposure to listed property, and optimising the portfolio, the weighted standard deviation of the portfolio would be 12.98%, leading to a more efficient portfolio. Therefore, the risk of the portfolio has been minimised. The Sharpe ratio for the optimised portfolio would then be 0.419 times, compared to a Sharpe ratio of only 0.234 times without an exposure to listed property. The impact of adding listed property stocks to the portfolio has been positive addressing the

first two research objectives (see section 1.5). The inclusion of listed property has added value by minimising risk and maximising returns, and has improved the efficiency of the portfolio as shown with the improved Sharpe ratio.

The following diagram shows the efficient frontier bisecting the securities market line to produce an optimal weighting to listed real estate. At the point where the securities market line and the efficient frontier bisect, represents the different weightings of the different asset classes as depicted in table 5-5.

Figure 5-6 Efficient frontier
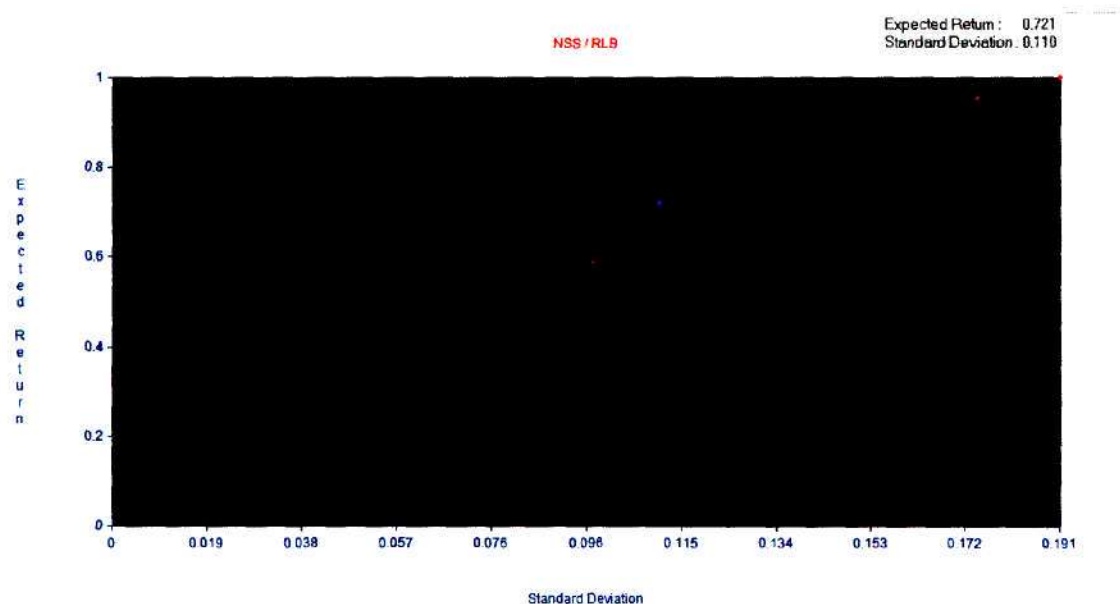
The securities market line starts at the risk free rate (13.41%), representing the compounded cash returns over the ten-year period.

6   CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1   Introduction

As defined in the introduction to this study, the specific objectives (see section 1.5) on which attention was centred were:

- To investigate the value added by including listed property stocks to minimize risk.

- To investigate the value added by including listed property stocks to maximize returns.

- To investigate the actual weighting of listed real estate in investment portfolios in South Africa.

- To investigate the optimal weighting of listed property stocks in an investment portfolio in South Africa.

Below are the major conclusions of this study and the recommendations that may be advanced on the basis of the findings.

6.2   Recommendations

6.2.1   Asset allocation to listed real estate

The investment management industry in the past ten years in South Africa has underestimated the returns from listed real estate, hence the under-allocation to the sector as already mentioned previously. As already mentioned, the study was not aimed at highlighting weaknesses of the investment management industry, but to highlight the listed real estate sector as an asset class. With all the portfolios created using the data collected, any addition of the listed real estate has led to improved returns. This is due to the covariance between the asset classes.

It is hypothesised that the exposure to listed real estate should be between 5 and 10%, but using the data collected, the optimal exposure to listed real estate should

actually be even higher than the study's hypothesis. The actual optimal (efficient) exposure should be around 12%.

If the sector is to thrive there are a number of issues that it has to address, such as:
- Size (market capitalisation) of the sector
- Transparency of listed real estate companies, and
- Liquidity of the sector

Recalling that one of the objectives of the dissertation was to improve the stature of listed property as an asset class, the changes or recommended changes in order to achieve that objective, have been highlighted in the following section.

6.2.2 A changing sector

The likely future trends in the changing SA real estate market may be summarised as follows:
- Real estate investment will remain the basis of a well-balanced portfolio
- A greater proportion of portfolio allocation will be to listed real estate
- Listed (securitised) real estate will, as the sector grows, provide a lower risk-return profile and will be more liquid than direct investment
- Commercial mortgage backed securities (CMBS) and real estate derivatives, are likely to be developed, and accepted further by the market, in order to provide further diversification
- The conversion of direct property into listed real estate (securitisation) is generally viewed as a lasting solution to the problem.

6.2.3 Threats to the sector

Threats to the SA real estate industry may be turned to opportunities that will pave the way for a more competitive asset class. Described below are some of the threats identified by the researcher, taken from involvement in the investment management profession, especially the exposure to the listed real estate sector.

These are the author's perceptions of the general threats to the industry, listed in order of severity:

- Continued lack of liquidity and size of the listed real estate sector and are likely to ensure that listed real estate remains an orphan of the institutional investment arena

- The potential inability of the real estate industry to compete with the ever-increasing sophistication in asset management and asset allocation methodology within an investment.

- Economic instability and hence poor demand for space.

- The real estate profession not taking the opportunity to grasp the necessity for rapid securitisation, and thus losing out to managers of other asset classes.

6.2.4   Opportunities for the sector

The opportunities may be lost to the real estate industry if not harnessed and exploited. The researcher feels that these are:

- The establishment of unlisted securitised real estate vehicles, possibly taking them public when market conditions are favourable

- The development of commercial mortgage backed securities and entry into the real estate debt market, currently the domain of the banking industry. This has already been under consideration for some time, but has only started to develop recently.

6.3   New and better skills

As the SA real estate market expands and embraces securitisation, derivatives and debt-based products (Commercial Mortgage-Backed Securities), the demands and opportunities for managers and professionals will change. The common denominator, however, underlying the future trends and products is the physical

asset, real estate. Therefore the continuing importance of traditional real estate analysis and management skills should not be underestimated. It is, however, critical for the profession that it quickly recognises that new and different skills will be required in order to address the changing needs of the capital markets.

The institutional investor today uses sophisticated, quantitative tools to objectively allocate capital to the different asset classes. As long as the investor is unable to confidently measure the performance of real estate, the allocation to a portfolio will remain small. The onus lies with the real estate profession to find and implement solutions to these problems and gain the confidence of the institutional investor. This process can only begin if the real estate profession employs the essential skills.

There is a definite requirement for skills that recognise the attributes, needs and influences of capital markets, so that the process of securitisation may be improved and expedited in order to expand the asset class. The new skills, which are supplementary and complementary to traditional investment management skills include the following listed below (in order of importance):

- An understanding of the investment process which includes modern portfolio techniques, risk-return analysis and the objective allocation of assets to an investment portfolio

- An understanding of underlying economic principles and its influences on real estate markets

- An understanding of the issues surrounding the various investment vehicles that might carry real estate

- An understanding of securities and equity markets

- An understanding of debt and credit issues

- An understanding of treasury and finance markets.

Clearly not every investment professional can possess all the above skills in depth. What will become increasingly important is that the right blend of skills are brought together in a team and that existing investment professionals have some

understanding of the capital markets and economic factors and how they impact upon real estate investment opportunities. Soon, it will no longer be adequate for an investment management team to comprise only equity and bond specialists.

6.4 Future fields of study

There are a number of fields of study that can be pursued in future, such as the impact of debt securitisation on the performance of listed real estate companies. This topic would deal more with the financing mechanisms used to finance the purchase of direct property, and what value is added by the use of alternative financing methods, relative to the traditional lending of banking institutions. Debt securitisation has recently been launched in South Africa, whilst in the United States it has been used extensively for a number of years.

6.5 Conclusion

The under-allocation to the listed property sector by the investment community has been highlighted time and time again in this study. The objectives of the study were carefully formulated and in this study addressed. One of the observations is how the investment environment has changed in the past ten years, with the increase in status of listed real estate. However, that status has not reached its peak.

When balanced portfolios in South Africa allocate the optimal weighting to listed real estate that will be the time when the sector has reached its peak.

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APPENDIX 1.1

Investment management respondents

Institution	Investment Fund Type
Acsis	Private Wealth manager
Catalyst Securities	Listed property investments
Investment Solutions	Multi-manager
Marriott Asset Management	Listed property investments
Mines Employees Pension Fund	Retirement fund
Oasis Asset Managers	Investment manager
Old Mutual Asset Managers	Insurance and retirement funds
Provest Management (Pty) Ltd	Listed property investments
Sanlam Investment Managers	Insurance and retirement funds
Stanlib Investment Managers	Investment manager

APPENDIX 1.2

QUESTIONS	Answer options
1. What is the size of funds under management	R0-R1.0bn R1-R3bn R3-R10bn R10-R20bn R20-R50bn +R50bn
2. What is the organization's management style?	Value Growth
3. Do you consider listed property as a different asset class to equities?	Yes No
4. Do you have a dedicated analyst looking after the listed property sector?	Yes No
5. In what portfolios, do you have property exposure?	Balanced Mandates Total Return Asset Allocation Absolute Return Dedicated Property portfolio
6. What percentage of your assets is invested in property (direct and listed) in balanced mandates?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
7. What percentage of your assets is invested in listed property in balanced mandates?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
8. What do you consider to be the optimal exposure to listed property in balanced mandates?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
9. What percentage of your assets is invested in listed property in total return funds?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
10. What do you consider to be the optimal exposure to listed property in total return funds?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%

11. What percentage of your assets is invested in listed property in asset allocation funds?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
12. What do you consider to be the optimal exposure to listed property in asset allocation funds?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
13. What percentage of your funds is invested in absolute return funds?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
14. What do you consider to be the optimal exposure to listed property in absolute return funds?	0-2% 2.1-5% 5.1%-10% 10.1%-15% 15.1%-20% +20%
15. How do you value listed property stocks?	Discount/Premium to Net Asset Value Relative to Bonds Distribution growth/yield trade off Discounted Cash Flows Other
16. What constraints, if any, have you encountered in constructing a portfolio of listed property stocks?	Liquidity of stocks Size of the listed property stocks Returns (performance) Other
17. What characteristics of listed property do you consider most relevant when considering the asset class?	Inflation-hedge Consistency of cash flows Risk-reduction benefits Diversification benefits