SIPIs

Benefits of adopting REITs in Portugal

Masters in Finance 2017 – Work Project - Direct Research Internship

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Abstract

A. REITs Overview

- REITs were first introduced in the US in 1960
- This presentation starts with a brief overview of these investment vehicles around the world with focus on 2 main benchmarks: US, home to the oldest REITs market, and Spain, Portugal's best comparable market. These 2 benchmarks are used as reference throughout the rest of the presentation

B. Adoption of REITs in Portugal

- There are many benefits regarding the adoption of the REITs framework for the country as a whole, which is briefly discussed later in the presentation
- Therefore, the core question of this work is **why would Portuguese Investors want to adopt REITs in Portugal now?**
  - It is key to understand that (i) Portugal's Strong Market Momentum offers a unique window of opportunity to adopt the REITs framework, (ii) REITs are a worldwide success story with a proven track record, (ii) REITs are an asset class with extremely attractive asset features for investors in general and those already investing in real estate and (iv) REITs enable investors to diversify their portfolios
  - This last mentioned key point (i.e. Portfolio Diversification) is furtherly discussed in an in-depth analysis. For this purpose, and in order to assess the existence or not of the gains of diversification, the study considers historical data from the last 5 years. Then, it applies the Fama-French 3 Factor Model as the asset pricing model considered and analyses the consequent forward-looking frontiers. In order to perform this study, 2 portfolios are considered, with and without the REITs, across 2 different scenarios (an investor holding a base portfolio of US stocks and corporate bonds, and another already investing in real estate, holding a base portfolio of US stocks, corporate bonds and the index NCREIF TBI, which tracks the US real estate market on a quarterly basis)

C. Due Diligence

- Since this work has Portugal as it main focus, the presentation ends with a quick overview of the current REITs legislative situation in Portugal. The framework has already been mentioned by the current and previous Governments and is said to be under review
- Finally, this section considers the 3 key perceived risks, as the main areas of further due diligence to analyse and the ones that are potentially more challenging

Source: NAREIT

Table of Contents

Topics

Appendix

Source: NAREIT

REITs Overview

REITs at a Glance

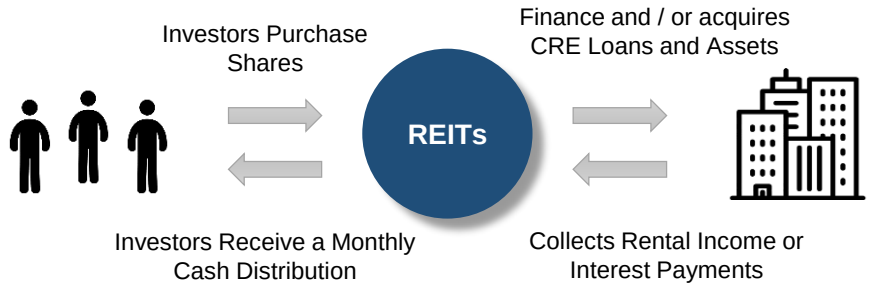
US

REITs are an a publicly listed real estate fund that benefit from corporate tax exemption in exchange for meeting a requirements, namely concerning its distribution policy

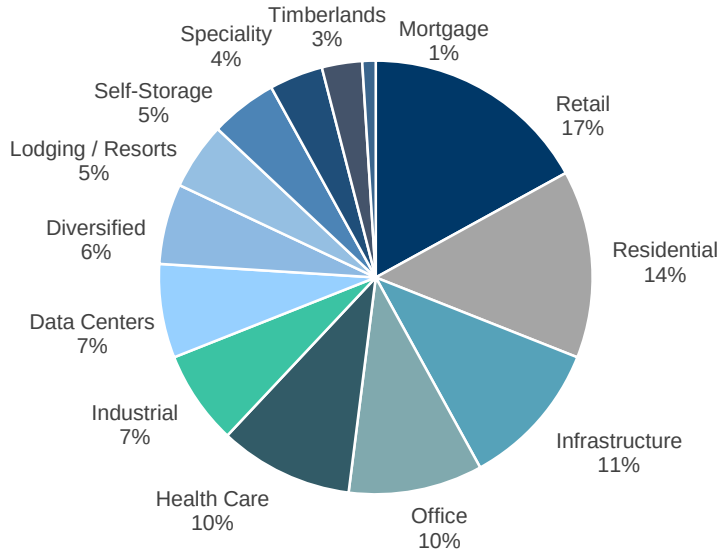
Brief Description

- A REIT is an entity with the fiscal benefit of tax exemption at the corporate level. Also, it owns and manages real estate assets that generate an asset-related income. These might include apartments, offices, shopping centres, hotels, warehouses, etc.
- In the US, the law providing for REITs was enacted by the US congress in 1960
- REITs are an investment vehicle that are created with the primary goal of attracting foreign and domestic investment in the real estate market, while providing a real estate investment structure, similar to the one a mutual fund provides for investment in stocks
- Overall, REITs are strong income vehicles because in order to avoid being subject to the US Federal income tax that generally must pay out an amount equal to at least 90% of their taxable income in the form of dividends
- As of October 2017, there were 223 REITs in the FTSE NAREIT All REITs Index and 189 REITs traded in the NYSE, resulting in a total market cap of $1.1tn
- On average[(1)]:
  - 59% of the annual dividends paid by this vehicles qualify as ordinary taxable income
  - 17% qualify as return of capital
  - 24% qualify as long-term capital gains
- REITs might be:
  - Publicly Traded: registered in the SEC and have their shares listed and traded on major stock exchanges
  - Public non-listed REITs: registered in the SEC but do not trade on national stock
  - Private REITs: offerings that are exempt from SEC registration and whose shares do not trade on national stock exchange

REITs Mechanics



REITs by Type



Source: NAREIT.

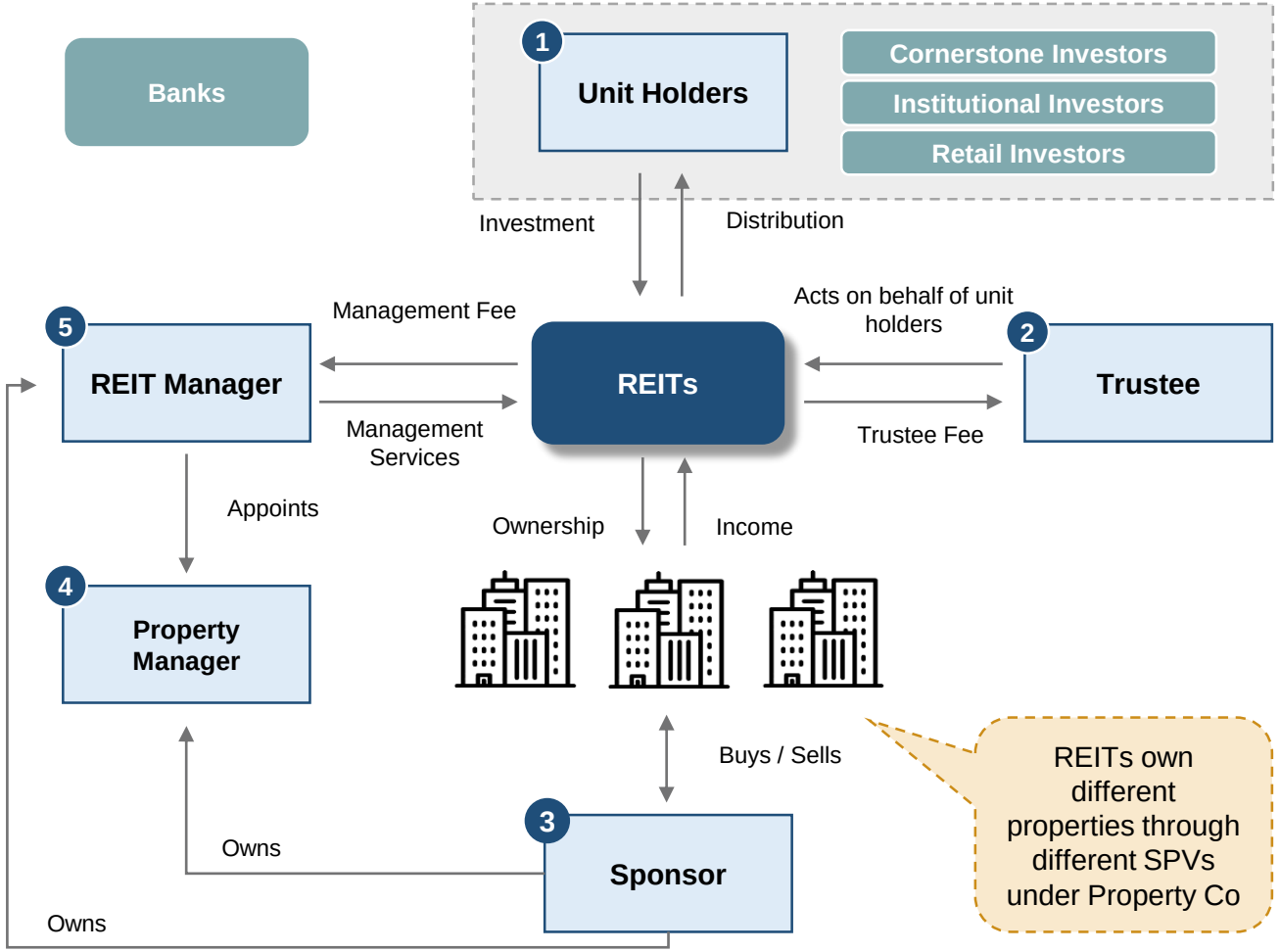
1. As of 2017'Q3.

REITs Mechanics

US

Similarly to a mutual fund, REITs involve several parties in order to avoid any potential conflict of interests

Typical REIT Structure



Main Roles

1 **Unit Holders**	▪ Investors who hold a stake on the fund ▪ In exchange for their investment, Unit Holders earn an income stream through periodically dividend distributions
2 **Trustee**	▪ Independent third party appointed to ensure that the interests of unit holders are protected ▪ Oversees management, typically having substantial control over Property Manager
3 **Sponsor**	▪ Responsible for setting up the REIT and appointing trustees ▪ Holds minimum required % of assets post-listing in order to ensure “skin in the game”
4 **Property Manager**	▪ Manages investments and identifies potential opportunities ▪ Undertakes lease agreements and ensures reporting and disclosure to stakeholders

Source: NAREIT, EY.

Legal Framework

Spain & US

An estimated 70m Americans own REITs through their retirement savings and other investment funds

	Spain	US
Year Enacted	▪ 2009, with significant changes in 2013	▪ 1960
Legal Form Share Capital	▪ Stock company ▪ Minimum share capital required is €5m	▪ Must satisfy specific organizational, asset holding, income source and distribution requirements ▪ One or more trustees must manage the entity
Listing	▪ Must be listed on a regulated stock exchange or on a multilateral trading system	▪ n.a.
Activities Restrictions	▪ 80% of the assets must be invested in (i) urban real estate held for rental, (ii) land for the developing of real estate in the following 3 years or (iii) the acquisition of shares in other REITs or other similar qualifying entities	▪ At least 75% of gross income must derive from rents from real property, interest on mortgages on real property, gain on disposition of real property, etc ▪ At least 95% of gross income must derive from sources aforementioned and passive sources, such as non-mortgage interest and dividends
Distribution on Operating Income	▪ Must distribute 80% profits obtained by the SOCIMI ▪ 100% of dividends obtained from other SOCIMIs ▪ In any case, the statutory reserve cannot exceed 20% of the share capital	▪ Must distribute at least 90% of its taxable income other than the net capital gain ▪ Any undistributed amount is taxed at the entity level ordinary US corporate tax rate (generally 35%)
Distribution on Capital Gains of Disposed Invetsments	▪ 50% of capital gains from the disposal of either real estate or shares must be distributed ▪ Remaining 50% must be reinvested in 3 years or it must be distributed	▪ If a REIT retains rather than distributes, its net capital gain and pays tax on such gain
Tax	▪ SOCIMI, in principle, is taxed at a 0% rate ▪ Taxation occurs at the shareholder level, on its dividends	▪ REIT, in principle, is taxed at a 0% rate ▪ Taxation occurs at the shareholder level, on its dividends

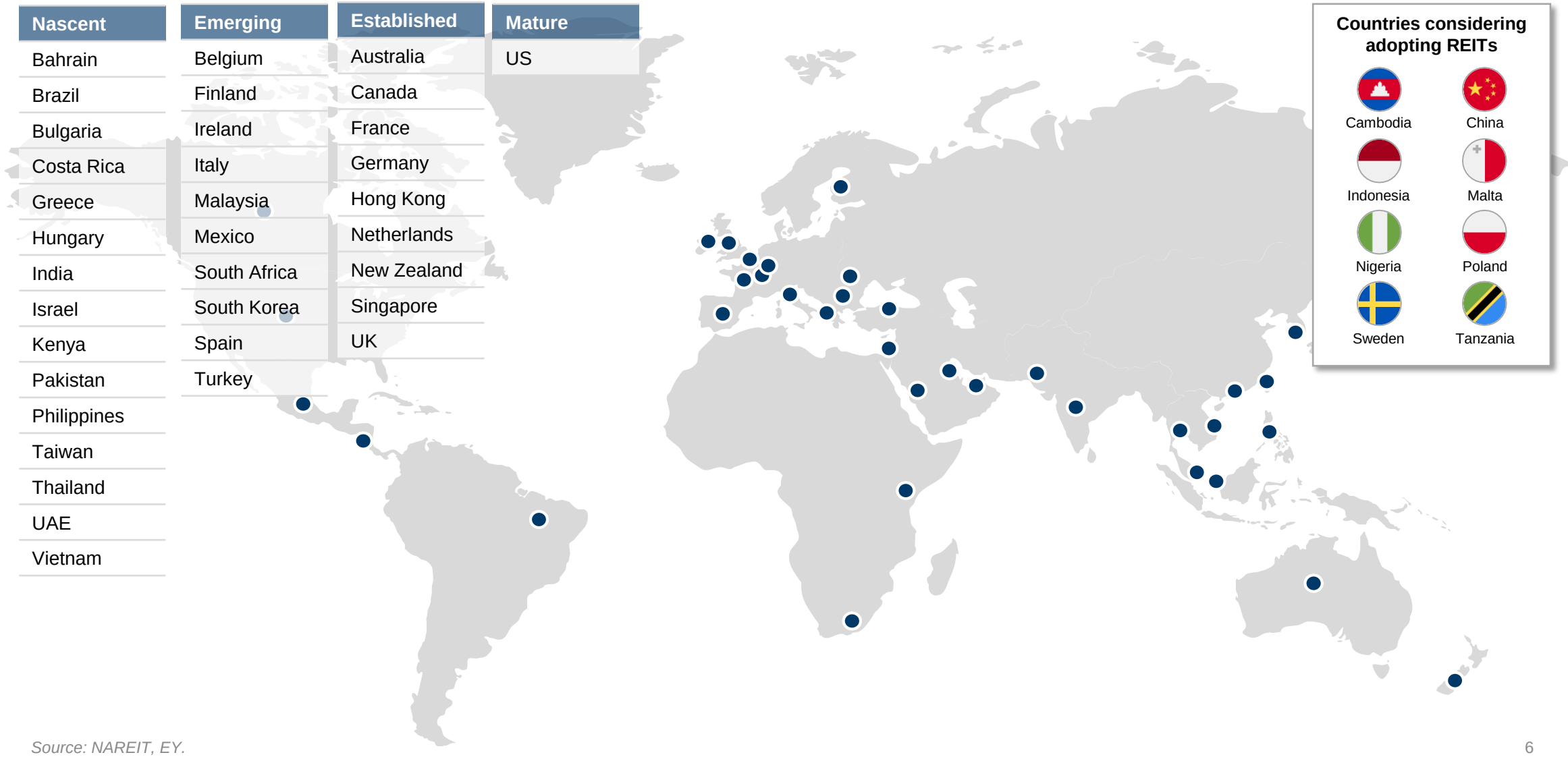
Source: KPMG.

Geographical Footprint

Worldwide Presence

REITs framework has currently been adopted in 36 countries across the 5 continents

Nascent	Emerging	Established	Mature
Bahrain	Belgium	Australia	US
Brazil	Finland	Canada	
Bulgaria	Ireland	France	
Costa Rica	Italy	Germany	
Greece	Malaysia	Hong Kong	
Hungary	Mexico	Netherlands	
India	South Africa	New Zealand	
Israel	South Korea	Singapore	
Kenya	Spain	UK	
Pakistan	Turkey		
Philippines			
Taiwan			
Thailand			
UAE			
Vietnam			



Source: NAREIT, EY.

Real Estate Market

Different types of investment

There are several ways of investing in the real estate market, depending on the ownership and type of investment. However, REITs allow investors to invest indirectly (i.e. without having to buy a house) but with more liquidity (i.e. public investment)

By Ownership

Private	▪ Available to those investors who can afford to directly own and manage a property or who are able to invest in a private fund
Public	▪ Accessible to the entire population ▪ Publicly traded in the major stock exchanges

By Type

Direct	▪ Involves acquiring an ownership interest in an entity that directly owns a real estate asset
Indirect	▪ Involves buying shares in a fund or a publicly or privately held company

Traditional Real Estate

- Buying and either selling or renting a real estate investment (Private and Direct)

NCREIF TBI

- Index that tracks the private real estate investment (Public and Direct)
- NCREIF TBI (”Transaction Based Index”) is equal-weighted transaction and appraisal index

NAREIT

- Index composed of REITs (Public and Indirect)

Equity

- A company that owns and/or operates income-producing real estate assets
- Owns a wide range of property types, including offices, shopping centers, hotels, apartments, amongst others, and derive most of its income from the rents of those properties

Mortgage

- Provides financing for income-producing real estate by purchasing or originating mortgages and mortgage-backed securities and earning income on the interest
- May finance both residential or commercial properties and get most of their revenue from interest earned on their investment

Hybrid

- A combination of both the Equity REITs and the Mortgage REITs different investment strategies

Source: NAREIT

Adoption of REITs in Portugal

Research Question

In order to convince Portuguese policy makers to adopt the REITs framework, it is a necessary condition to understand (i) if now is the right time and (ii) whether it would be successful

Topic Introduction

- The benefits for Portugal (i.e. to the country as a whole) of adopting the REITs framework are the following: (i) greater efficiency and liquidity in the real estate market, (ii) supporting the structured change in property markets to reduce costs and improve flexibility and quality for tenants, (iii) allowing for a greater inflow of FDI and (iv) stay competitive, specially given the increased pressure from the increasing number of countries adopting the same structure
- However, in order to guarantee that Portugal will be able to take full advantage of the aforementioned benefits REITs have to offer, it is necessary to understand if this would be successful amongst investors
- Therefore, the question is not why should Portugal consider adopting REITs, but, instead:

Why would Portuguese Investors want to adopt REITs in Portugal now?

Implied Key Questions

Is it now the right time?

- In order to answer this question, it is crucial to understand the underlying current economic context in Portugal, as well as the recent developments in the real estate market, in specific
- For the purpose, and as previously mentioned, 2 markets were chosen as benchmark: US, as it is home to the oldest REITs market and therefore the one that holds more available data and can provide more conclusions regarding REITs in general; and Spain, as it is the Portuguese best comparable market, in terms of size, investor appetite, legal framework, etc.

Why will it be successfull?

- In order to answer this question, it is key to understand (i) how did REITs succeed in other countries (i.e. US and Spain for the purposes of this work), (ii) why should / will investors invest in REITs
- Therefore, this presentation is twofold. On the one hand, it looks at past performance as an indicator of empirical results. On the other hand, it also tries to draw conclusions concerning the REITs specific features as well as the effects of adding it to a multi-asset portfolio

Literature Review

The benefits of REITs and its consequent adoption are examined not only in academic papers but also in many reports from various renown international institutions. Hence, both these 2 types of sources were included and weighted as equal

Institutional Reports	Key Takeaways
Benefits of US REITs, *Morningstar*	
▪ Morningstar examines what have been the major reasons that have made investors invest in REITs ▪ By examining the history and origin of REITs, the institution explains how these vehicles were created with the goal of enabling small investors to enjoy the rental income from commercial property ▪ It highlights the benefits of REITs as both an alternative to the traditional investment in the real estate market as well as a new asset class along with stocks, bonds and any other financial instruments	✓ High Yield ✓ Simple Tax Treatment ✓ Liquidity of REIT Shares ✓ Portfolio Diversification × Sensitive to Demand of other High Yield Assets
Understanding the benefits of REITs in the US market, *FTSE Russell*	
▪ FTSE Russell also examines what have been the major reasons that have made investors invest in REITs ▪ The report highlights REITs have enabled investors of all types to gain access to a regular income stream as well as to a diversified portfolio of real estate assets ▪ It also refers that investments in commercial real estate are often viewed by many as providers to a natural protection against inflation	✓ High Yield ✓ Consistent Source of Income ✓ Liquidity of REIT Shares ✓ REITs as an Inflation-Protecting Investment
The Benefits of REITs, *London Stock Exchange*	
▪ The London Stock Exchange report highlights the fact that UK-REITs provide a range of important benefits to companies and investors. Also, because these are listed on the main market, they also enjoy all the other benefits associated with London's equity markets ▪ Moreover, it groups REITs benefits into for (i) for Companies: Tax efficient structure, access to new capital, potentially closer performance to NAV, acquisition currency and (ii) for Investors: Tax transparent, potentially high yield returns, low gearing, portfolio diversification, liquidity and strong corporate governance	✓ Tax Transparent ✓ Potentially High Yield Returns ✓ Low Gearing ✓ Portfolio Diversification ✓ Liquidity of REIT Shares ✓ Strong Corporate Governance

Source: NAREIT

Literature Review *(Cont'd)*

The benefits of REITs and its consequent adoption are examined not only in academic papers but also in many reports from various renown international institutions. Hence, both these 2 types of sources were included and weighted as equal

Academic Research	Key Takeaways
Diversification Benefits of REIT Preferred and Common Stock, *Boudry, Walter; deRoos, Jan and Ukhov, Andrey*	
▪ The study analyses the diversification benefits of REIT preferred and common stocks from 1992 to 2012, by examining the optimal mean-variance portfolios of an investor ▪ It concludes that REIT preferred stock provides significant diversification benefits to all equity investors as a venue for risk reduction for constrained investors. It concludes that REITs provide significant value dimension to investors. Moreover, REITs allow long only investors the ability to achieve higher total return portfolios	✓ High Yield ✓ Consistent Source of Income ✓ Liquidity of REIT Shares ✓ Enhanced Return-Risk Adjusted Performance
Globalization of Real Estate Markets – Introduction of REITs in Sweden, *Ekborn, Alexander and Sandberg, Peter*	
▪ The study illustrates the benefits of introducing REITs and examines the inclusion of European REITs in a multi-asset portfolio in an outward bend of the efficient frontier ▪ The authors argue that the introduction of REITs has made property markets in other countries more competitive as well as more comparable to other type of other asset classes. Hence, this has created additional pressure for the remaining countries such as Sweden to initiate similar structures to take advantage of the same benefits	✓ Consistent Source of Income ✓ Liquidity of REIT Shares × Cyclicality of the Real Estate Market ✓ Enhanced Return-Risk Adjusted Performance
The Benefits of investing in REITS, *Reynolds, Nicholas*	
▪ REITs offer investors the opportunity to acquire a diversified portfolio of real estate with an investment structure that is generally liquid ▪ The study highlights the fact thatREITs must be owned by at least 100 investors and the advantage of being exempt from corporate income tax (allowing investors to avoid the problem of double taxation, on earnings and dividends) as the major reasons why investors benefit from adding REITs to their portfolios	✓ Consistent Source of Income ✓ Transparency ✓ Liquidity of REIT Shares ✓ REITs as an Inflation-Protecting Investment

Source: NAREIT

Key Investment Highlights

Portuguese REITs, which are a proven success story worldwide, would allow Portuguese investors to take advantage of the current Portugal's strong market momentum while having access to a new asset class

1

Portugal's Strong Market Momentum

- The European market is currently going through a market boom. Portugal is well positioned in the economic cycle, outperforming the EU in terms of growth in multiple economic indicators. Moreover, the real estate market has been growing notably during the last years, with an evident yield compression and prices rising

2

Worldwide Proven Success Story

- Since its creation, REITs are a tremendous success story. In the US, it has been supported by both Democrats and Republicans since the beginning of its existence, in 1960. Followed by an expansion to the rest of the world it is currently present across 26 countries. Portugal's comparable market, Spain, which adopted REITs in 2009 is, another empirical example of REITs' proven track record

3

Attractive Asset Features

- REITs have the unique advantages of providing investors with higher demand, given their attractive dividend yields, access to a fixed stream of income secured by long term leases, much higher liquidity when compared to the traditional investment in the real estate market (i.e. buying and renting a property), managed for professionals with expertise, more transparent than closed real estate funds and enabling investors to diversify its portfolios

4

Portfolio Diversification

- A major benefit of the adoption of REITs is the introduction of a new asset class, which, through portfolio diversification, allows for higher risk-adjusted returns. In turn, these translate into higher utility and thereby social welfare. Overall, portfolio theory shows that a new asset class allows for a more efficient asset allocation. Finally, it is possible to prove that an expansion of the efficient frontier translates into higher utility

Source: Market Realist

Portugal’s Strong Market Momentum

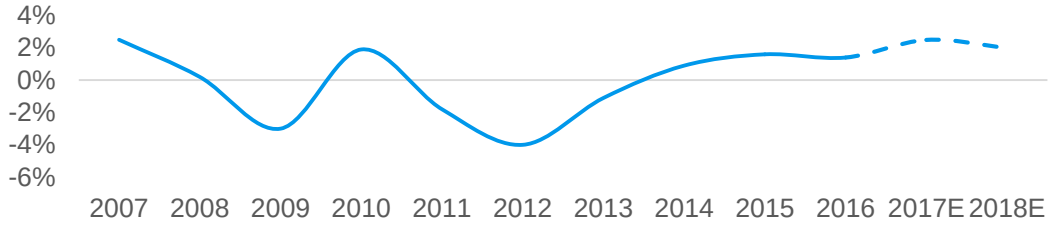
Portugal´s Strong Market Momentum

Macro Dynamics

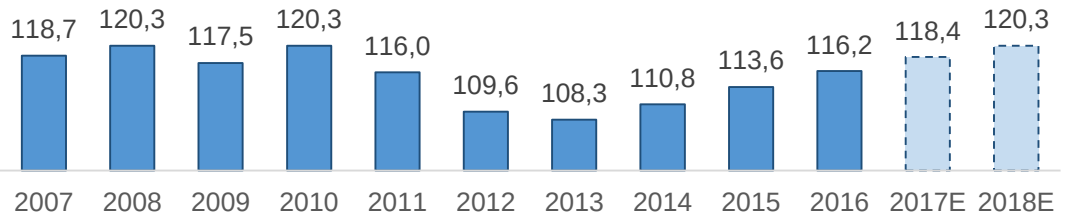
Portugal is well positioned in the economic cycle currently dominating Europe, growing significantly and regaining momentum and the trust of international investors relative to the country's economic resilience

Strong Macroeconomic Dynamics…

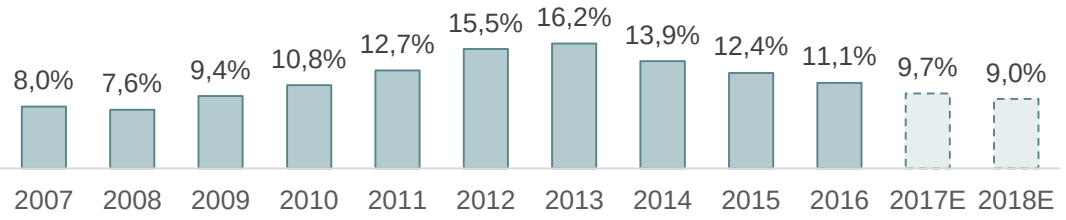
Real GDP YoY Growth (%)



Private Consumption (€bn)



Unemployment Rate (%)



- Portuguese real GDP has been quickly recovering, currently growing at c.1.4% (vs. -4% in 2012). Moreover, it is expected to grow c.2.5% next year, c.2.0% in 2018, c.1.7% in 2019 and then at c.1.2%from 2010 onwards. Since 2012, real GDP growth has been growing at a c.1.1% CAGR
- Next year, private consumption is expected to reach c.€120.3bn in 2018, the peak the country had only seen in 2008 and 2010. Also, it has been growing at a 1.5% CAGR 2012-16. Private Consumption is expected to grow c.2.0% and 1.5% in 2017 and 2018, respectively
- Unemployment rate has been dropping substantially, from 16.2% in 2013, to 11.1% in 2016. Moreover, the number of unemployed has been decreasing at a faster pace than the EU-28 average. In 2018, it is expected to be around 9.0%, close to the levels the country saw before the 2008 economic crisis
- In 1st September 2017, Moody´s changed Portugal's outlook from stable to positive
  - *"Moody's expects that the broad-based economic recovery underway will increase the resilience of Portugal's growth to shocks, supporting its credit profile. Furthermore, improving investment dynamics, in so far as they are directed to productive opportunities, could also bolster potential growth in Portugal"*
  - *"Strong economic activity in the first half of 2017 (2.8% year-on-year), the highest since 2000, supports Moody's assessment of a marked pick-up in GDP growth to 2.5% in 2017, above expectations for euro area average growth"*

Source: IMF; OECD; Cushman & Wakefield; JLL.

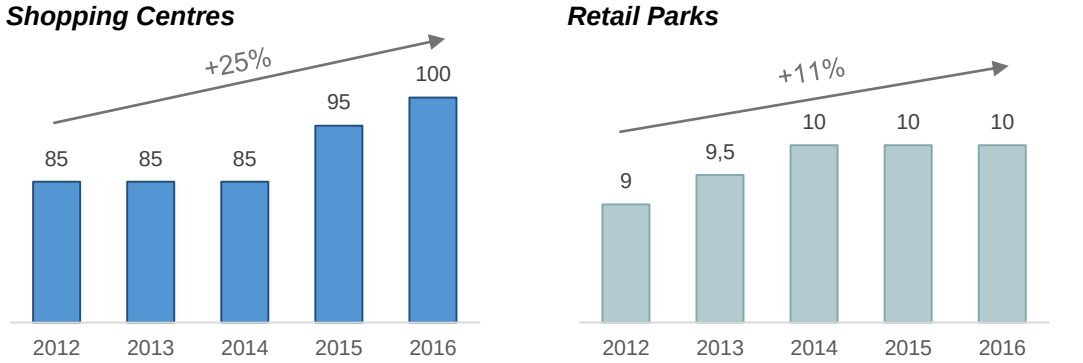
Portugal´s Strong Market Momentum

Real Estate Dynamics

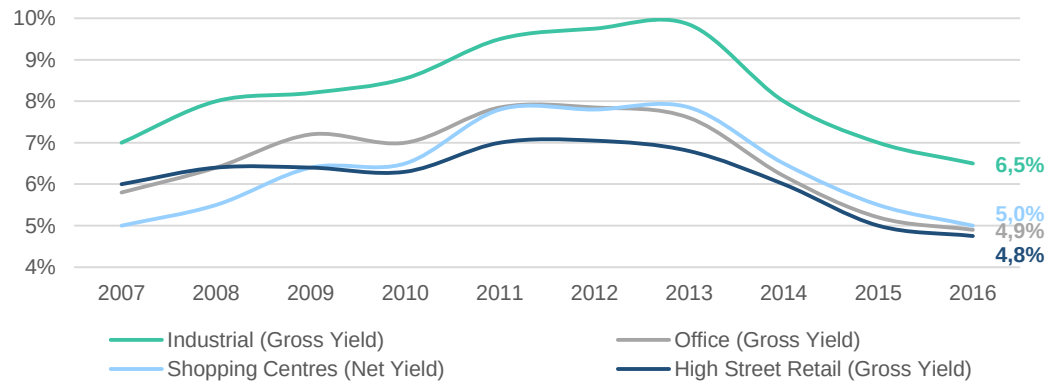
Portugal's real estate is growing at a fast pace, with rising prices and an evident yield compression as yields exceed the peak registered in 2007

…on the Back of a Growing Real Estate Market

Price per sqm per month (€)



Prime Yields (%)



- Portuguese real estate market is growing significantly, with a substantial recovery since the financial crisis
- Rent prices in shopping centres achieved a +25% total growth from 2012 to 2016 and in retail parks +11% during the same period
- Moreover, the trend is expected to continue in the future, as it did during 2017
- In terms of capital invested, the first semester of 2017 was higher than the average of the last decade and ongoing operations should make this year the one with highest volume of investment in Portugal's real estate market
- Simultaneously, it is possible to see evidence of the current real estate boom through the present yield compression
- Moreover, the capital appreciation of real estate assets are shown by the current yields levels, which already exceed the peak registered in 2007
- Since 2007 until 2016, yields evolution can be described by:
  - Industrial: 6.5% in 2006 vs. average yield of 7.0%
  - Shopping Centres: 5.0% in 2006 vs. average yield 5.8%
  - Office: 4.9% in 2006 vs. average yield 5.8%
  - High Street Retail: 4.8% in 2006 vs. Average yield 5.3%
- Recently, the Portuguese newspaper *Expresso* reported that price per sqm per month in *Avenida da Liberdade was c.€10,000*
- Finally, the low interest rate environment in Europe, at an all time low, together with the growing real estate attractiveness, indicate that this trends might continue for years

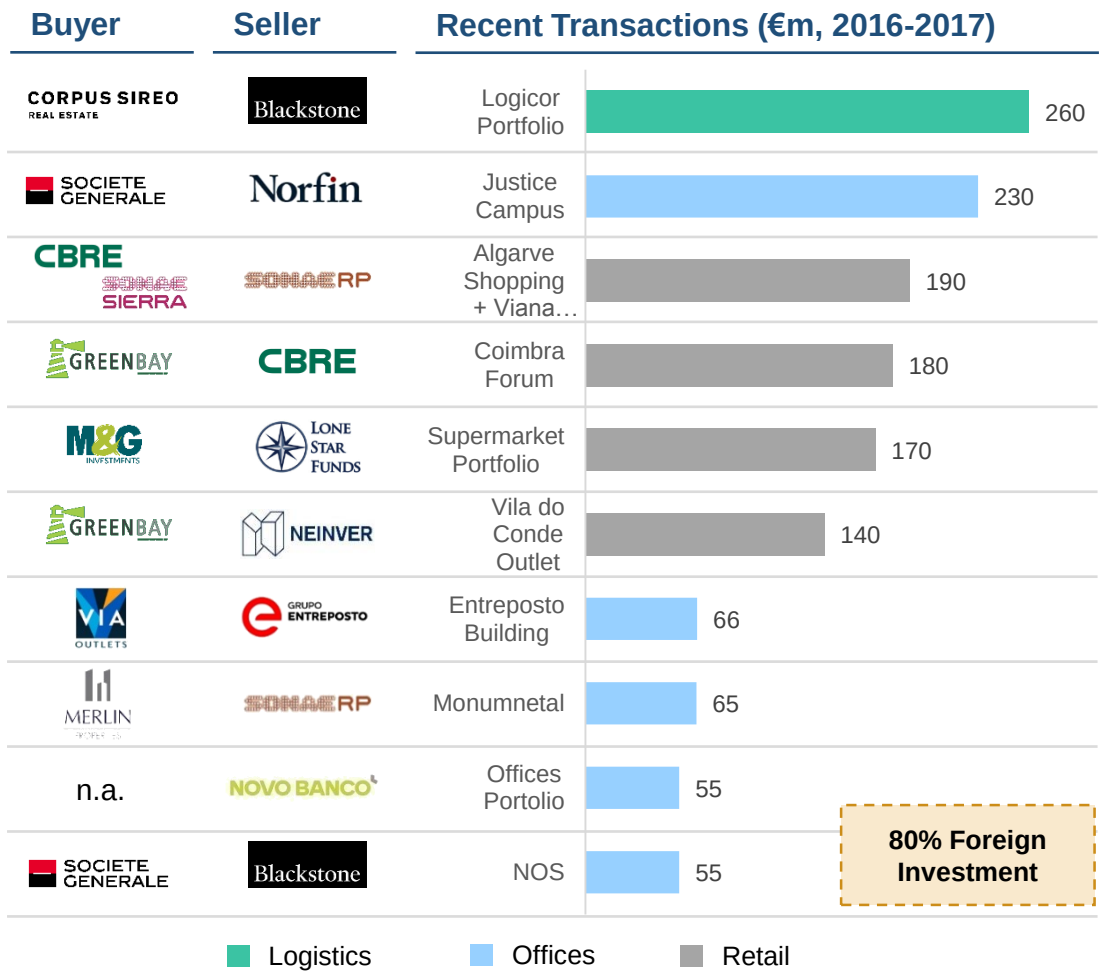
Source: IMF; OECD; Cushman & Wakefield; JLL.

Portugal´s Strong Market Momentum

Real Estate Dynamics (Cont'd)

REITs legislation would enable Portuguese private investors in general and pension funds to take full advantage of the current real estate opportunities

…on the Back of a Growing Real Estate Market



- During last years, a large amount of capital has been flowing into the Portuguese real estate market. Foreign investments accounted for more than c.80% of recent transactions in 2016 and 2017
- The influx experienced in the last years is influenced not just by the situation in Portugal but also by the economic context of the rest of Europe. Portugal is well-positioned in the economic cycle
- Moreover, Portugal has seen the development and increasing professionalism of the real estate market. However, most Portuguese investors have not participated in this process, mostly due to the ineffective ways real estate capital is organized
- The majority of foreign investors are well organised as real estate funds according to a relevant and specific legislation and with a clear specialisation in different types of assets, with different risk profiles and expected returns
- Hence, foreign investors are provided with (i) More effective ways to allocate capital, (ii) Lower cost of capital and (iii) Access to a much broader investor base, including institutions and private investors
- Overall, Portuguese investors in general and pension funds (i) receive limited access to the abundant real estate investment opportunities and (ii) private individuals, with exception of the wealthiest, have no alternatives for real estate investments. The solution is the legislation for the Portuguese Real Estate Investment Trust

Source: Cushman & Wakefield.

Worldwide Success Story

Worldwide Proven Success Story

US

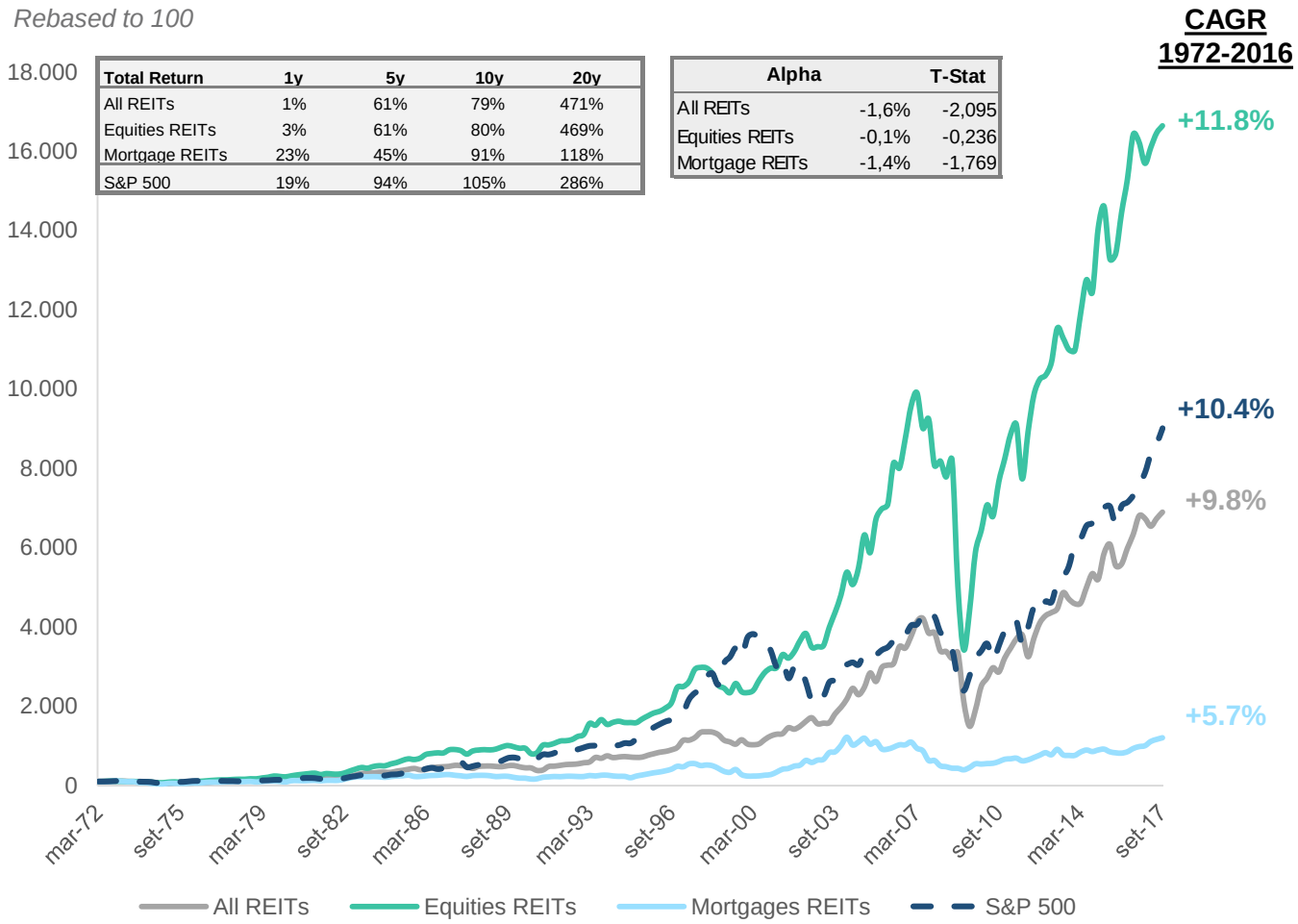
All REITs, Equities REITs and Mortgage REITs have delivered a +11.8%, +9.8% and +5.7% CAGR 1972-2017, respectively

Total Return Performance ($)

Rebased to 100

Total Return	1y	5y	10y	20y
All REITs	1%	61%	79%	471%
Equities REITs	3%	61%	80%	469%
Mortgage REITs	23%	45%	91%	118%
S&P 500	19%	94%	105%	286%

Alpha	T-Stat
All REITs	-1,6%	-2,095
Equities REITs	-0,1%	-0,236
Mortgage REITs	-1,4%	-1,769



Source: NAREIT.

Comments

- Equities REITs have outperformed the S&P 500, which has been growing at a +10.4% CAGR 1971-2016 (vs. 11.8%)
- It is important to highlight how all REITs indexes were affected by the current financial crisis, given its full exposure to the real estate market
- In terms of total returns, All REITs and Equities REITs have outperformed the S&P 500 over the last 20 years
  - All REITs total return was 471%
  - Equities REITs total return was 469%
  - Mortgage REITs total return was 118%
- During these years, all the 3 REITs indexes have shown its consistency in terms of dividends distribution, thereby proving how good of a source of a fixed stream of income these investment vehicles are:
  - All REITs delivered an average dividend yield of 7.5%
  - Equities REITs delivered an average dividend yield of 6.7%
  - Mortgage REITs delivered an average dividend yield of 11.4%
  - Although in terms of alpha, none of the REITs indexes seem to have generated abnormal returns during the period considered, potentially driven by the the impact of the 2008 crisis, REITs have had a positive overall performance

Worldwide Proven Success Story

Spain

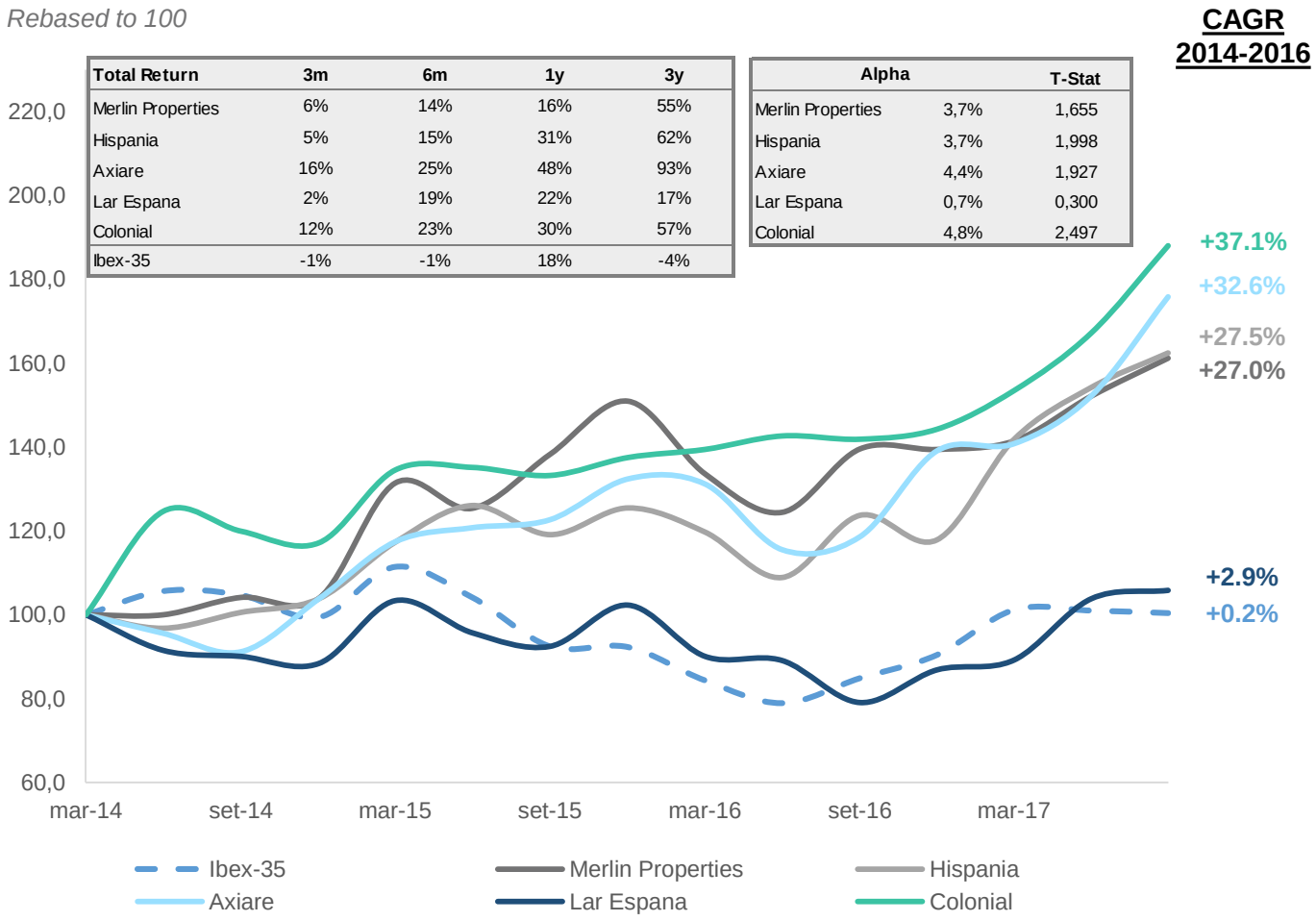
All major SOCIMIs have outperformed the Ibex-35 Index substantially since its creation achieving a CAGR 2014-16 up to +37.1%

Total Return Performance (€)[1]

Rebased to 100

Total Return	3m	6m	1y	3y
Merlin Properties	6%	14%	16%	55%
Hispania	5%	15%	31%	62%
Axiare	16%	25%	48%	93%
Lar Espana	2%	19%	22%	17%
Colonial	12%	23%	30%	57%
Ibex-35	-1%	-1%	18%	-4%

Alpha		T-Stat
Merlin Properties	3,7%	1,655
Hispania	3,7%	1,998
Axiare	4,4%	1,927
Lar Espana	0,7%	0,300
Colonial	4,8%	2,497



Comments

- Since 2014, Merlin Properties, Colonial, Hispania, Axiare and Lar Espana share price has delivered a +17.2%, +23.4%, +17.6% , +20.7% and +1.9% growth, respectively
- In other words, top SOCIMIs have outperformed the Ibex-35 substantially
- Currently[2], Merlin Properties, Colonial, Hispania, Axiare and Lar Espana have a market cap of €5,505m, €3,294m, €1,665m, €1,450 and €761m, respectively
- Moreover, the Spanish REITs have been providing investors with attractive dividend yields:
  - Merlin Properties (2.8%)
  - Hispania (2.2%)
  - Axiare (1.2%)
  - Lar Espana (0.5%)
  - Colonial (2.0%)
- Moreover, the Spanish SOCIMIs have outperformed the Spanish equities index, Ibex-35
- In terms of alpha, Spanish SOCIMIs have generated positive abnormal returns
  - With the exception of Lar Espana, all abnormal returns, which range from 3.7% to 4.8%, are statistically significant for a 10% level of confidence (t-stat 1.645)

Source: NAREIT, Bloomberg as of Q3'2017.

1. Axiare only IPO on July 2014.

2. As of Q3'2017

Attractive Asset Features

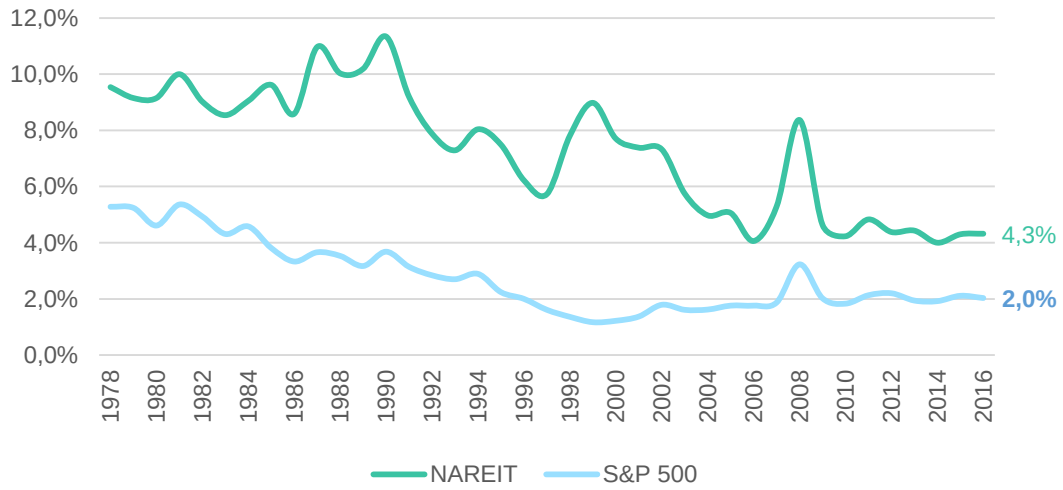
Attractive Asset Features

Main Features

REITs provide investors with enhanced returns through an attractive dividend yield, which becomes even more interesting in the current low interest rate environment. Additionally, REITs are a secured fixed source of income managed by professionals

1 High Yield

Dividend Yield Evolution (%)



- REITs are a high-yield investment. For many investors, the main attraction of REITs has been their dividend yield, specially when compared to other asset classes
- The dividend yield for REITs was about 4.3% in September 2016, well above the average yield of the S&P 500 but still pretty far below the longer-term average for REITs, which had been trending in the 7-8%

2 Income is Secured by Long-Term Leases

- Given the specific mechanics of these frameworks (i.e. distribution, capital and investment requirements) REIT dividends are secured by stable rents from long-term leases
- Additionally, many REITs managers employ conservative leverage on the balance sheet
- In opposition to many other investments, the REIT characteristics and specific legal framework enable investors to benefit from a sustainable source of income that is less dependent on economic conditions
- Also, another benefit versus other asset classes is that REITs are an inflation-protecting investment given the link between rents and the CPI

3 Professional Management

- Most REITs are managed by highly skilled and experienced real estate managers. Hence, in opposition to the traditional real estate market, the average investor does not need to have the skillset to manage high-income bearing properties
- REIT shares are bought and sold on a stock exchange. By contrast, buying and selling property directly involves higher expenses and requires a great deal of effort

Source: NAREIT

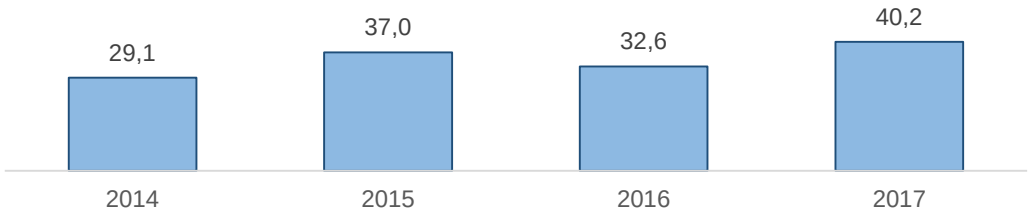
Attractive Asset Features

Main Features (Cont'd)

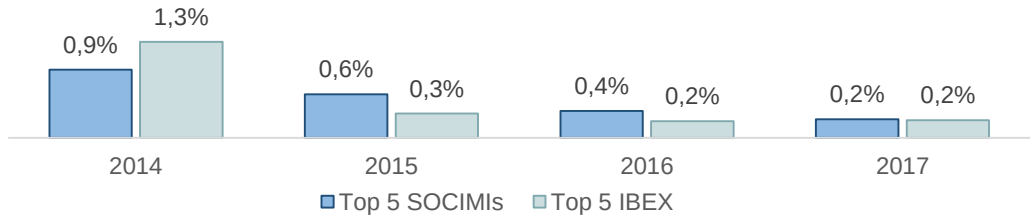
REITs allow investors to invest in the real estate market with increased liquidity higher transparency while enabling investors to diversify their portfolios by adding a new asset class to their pool of investments

4 Liquidity

Top 5 SOCIMIs(1) Average Daily Volume Traded (€m)



Average Bid-Ask Spread (%)(1,2)



- REITs shares are normally traded in the major stock exchanges, enabling investors to have access to a liquid market
- As opposed to buying and selling the asset, trading it on a stock exchange requires is substancially less expensive

5 Transparency

- The SEC registered REITs are required to make regular disclosures, enabling investors to be more informed and REITs transactions more reliable

6 Portfolio Diversification

- Generally, real estate prices are not correlated to stock prices, making REITs an attractive asset class to add to a portfolio

Source: Bloomberg as of 2017'Q3.

1. *Top 5 SOCIMIs includes Merlin Properties, Hispania, Colonial, Axiare and Lar Espana.*
2. *Top 5 IBEX-35 includes ArcelorMittal, Santander, BBVA, Telefonica and Iberdrola (excludes Inditex as data was not available).*

Portfolio Diversification

Portfolio Diversification

Methodology

To assess potential gains of diversification, a forward-looking analysis is performed with resort to the Fama-French 3 factor model and conclusions are drawn in terms of Sharpe Ratio in efficient frontiers within the mean-variance framework

Step	Description
1 **Theoretical Framework**	▪ In order to assess potential gains in terms of portfolio diversification it is necessary to decide the framework upon which the analysis of a comparative evaluation of several multi-asset portfolios should be performed ▪ The decision criteria chosen was the most common and more used in this and other similar topics, the mean-variance framework, the component of modern portfolio theory developed by Harry Markowitz in 1952 ▪ According to the mean-variance analysis, assets see the expected return maximized for a given level of risk, defined as variance, and gains are quantified in terms of risk-adjusted return illustrated by the efficient frontier
2 **Approach**	▪ Moreover, a forward-looking approach is implemented to the asset returns ▪ To pursue this analysis, expected returns were considered to be explained by the Fama-French 3 Factor Model, which assumes that an asset return is explained by the market risk premium, a size factor (small minus big) and a value factor (high minus low) ▪ The regression of historical returns on the Fama-French models yields coefficients (alpha, beta 1, beta 2 and beta 3) ▪ Finally, expected returns are calculated using these coefficients and according to a set of forward-looking assumptions assumed
3 **Data Collection & Assumptions**	▪ The period chosen for the scope of the historical analysis was the last 5 years and a periodicity is quarterly given that one of the indexes used (NCREIF TBI) is updated every 3 months ▪ Regarding forward-looking assumptions, risk free rate is assumed to be kept the same and therefore equal to the current 1 months US Treasury Bill (1.2%) and market risk premium is equal to 5.7% (in line with Damodaran vs. the historical average 15.4% during the chosen period)
4 **Results**	▪ Results are assessed in terms of gains of Sharpe Ratio, the measure of risk-adjusted return developed by William F. Sharpe ▪ With all inputs (i.e. historical volatilities and correlations and forward-looking expected returns) in place, the minimum variance portfolio – minimum variance combination of assets – and the tangency portfolio – maximum Sharpe Ratio combination of assets are calculated and insert the forward-looking efficient frontiers are drawn

Source: NAREIT

Portfolio Diversification

Theoretical Framework

Results are interpreted and conclusions are made in terms of risk-adjusted return, analysed within the context of the mean variance framework and the Fama-French 3 factor model is used as the asset pricing model

Multi-Asset Portfolio

- Modern investment process generally involves 3 steps of process:
  1. Choosing securities that are more likely to perform better in future than other asset class
  2. Selecting a portfolio of assets that will outperform other multi- asset portfolios
  3. Allocating best percentages of investments on assets according to the investors' risk aversion
- The general base case usually assumes the investor holds the efficient portfolio of US Corporate Bonds and US Stocks
- Then, a dynamic multi-asset portfolio invests in more diversified international asset classes

Mean-Variance Framework

- The mean-variance framework used to quantify the gains of adding an asset to a multi-asset portfolio in terms of portfolio diversification
- For this purpose, the Mean-Variance Framework was chosen and results are made within the context of the return-risk framework
- According to the mean-variance analysis, assets see the expected return maximized for a given level of risk, defined as variance, and gains are quantified in terms of risk-adjusted return illustrated by the efficient frontier
- The Sharpe Ratio, given by $\mathrm{SR} = \frac{Return - rf}{Standatd\ Deviation}$ is the measure of risk-adjusted return that allows for comparability of results

Fama-French 3 Factor Model

- The model is used to in order to draw the efficient frontiers, expected returns must be computed
- The calculation of the expected returns was done with the Fama-French 3 Factor model, an expansion of the CAPM model that also includes a factor of size (small minus big) and value (high minus low)
- Moreover, by including the aforementioned 2 additional factors, the model adjusts for the outperformance tendency, which is thought to make it a better tool for evaluating manager performance
- Then, by performing the regression of historical prices evolution(1) according to the Fama-French 3 factor model equation, the explanatory alpha and betas were obtained(2)
- Finally, in order to draw conclusions regarding forward-looking efficient frontiers that reflect realistic assumptions and investors' actual views instead, expected returns are computed with the coefficients obtained in the regressions
- The Fama-French 3 factor model is the following:

$$\boldsymbol{r = rf + \beta_1 * MRP + \beta_2 * SMB + \beta_2 * HML + \alpha}$$

Source: NAREIT

1. *Total Return Gross Dividends was considered in order to include dividend yield into the analysis, an important component of the REITs assets.*
2. *All regressions are included in the appendix 1.*

Portfolio Diversification

Portfolios Construction

To better examine the potential gains of portfolio diversification 2 different base case scenarios were assumed. In one the investor puts his money in stocks and bonds and in the other it also invests in real estate

Scenarios & Data Collection

Scenario A

Stocks	**Russell 3000**	+ **Equities REITs**	NAREIT
Bloomberg (Total Gross Dividends)		+ **Mortgage REITs**	NAREIT
Bonds	**US Bonds**	+ **All REITs**	NAREIT
FRED			

Scenario B

Stocks	**Russell 3000**	+ **Equities REITs**	NAREIT
Bloomberg (Total Gross Dividends)			
Bonds	**US Bonds**	+ **Mortgage REITs**	NAREIT
FRED			
Real Estate	**NCREIF TBI**	+ **All REITs**	NAREIT
Bloomberg (Total Gross Dividends)			

Step-by-Step

1st Step) Run Fama-French 3 Factor Model

- The first step is to compute each asset expected returns. For this purpose the Fama-French 3 factor model is used and the historical alpha and betas are obtained to then be applied to the future. Regressions were performed with quarterly data for the last 5 years

2nd Step) Forward-Looking Assumptions

- Expected returns for each asset are given by the already shown Fama-French 3 factor model equation, using the coefficients obtained in step 1 and the following assumptions:
  - Risk-Free: equal to the current 1 month US Treasury Bill of 1.2%
  - Market Risk Premium: equal to 5.7% (according to Damodaran)
  - SMB and HML: in line with historical average of the period chosen
- Also, some minor adjustments were made to alphas, the abnormal returns yielded by the regression, to make them more realistic:
  - Alpha NCREIF TBI: reduced 50% from 9.332%
  - Alpha NAREIT All REITS: reduced 10% from 6.252%
  - Alpha NAREIT All Equities: reduced 20% from 8.338%

3rd Step) Find Minimum Variance and Tangency Portfolios

- Find the minimum variance and tangency portfolios
- Then, efficient frontiers are obtained and conclusions are drawn in terms of Sharpe Ratio

Source: NAREIT

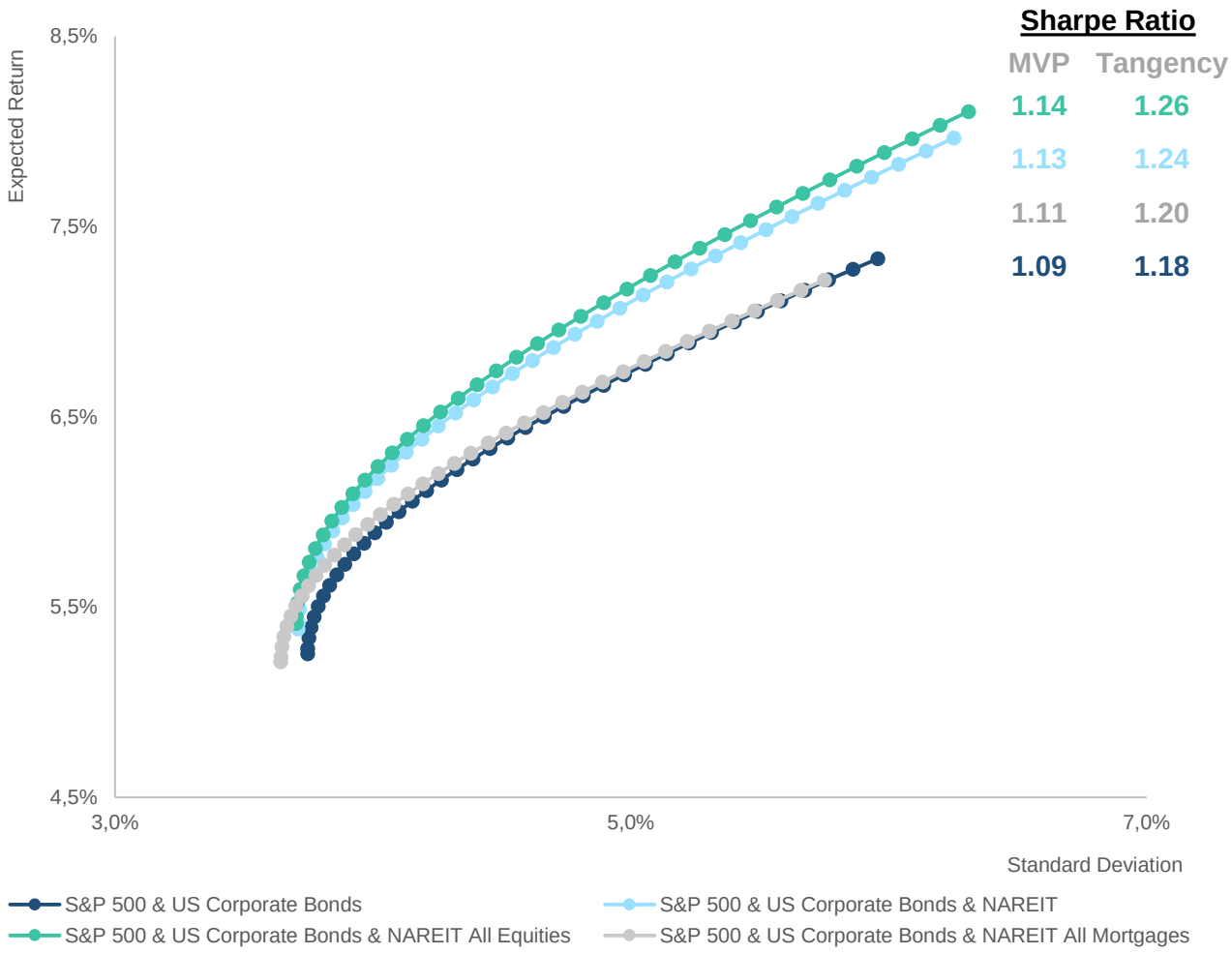
1. Only quarterly data available for NCREIF TBI (index is updated every 3 months)

Portfolio Diversification

Results

REITs enable an average investor holding a portfolio of stocks and corporate bonds to have relatively significant gains in terms of Sharpe Ratio, from 1.18 up to 1.26 (tangency portfolio)

Forward-Looking Efficient Frontiers – Scenario A



Key Takeaways

- Scenario A assumes a base case portfolio of US stocks and corporate bonds
  - Minimum variance portfolio allocates 21.9% in stocks and 78.1% in corporate bonds and tangency portfolio allocates 41.0% in stocks and 59.0% in corporate bonds
- Adding All REITs
  - Minimum variance portfolio allocates 19.6% in stocks, 75.3% in corporate bonds and 5.1% in NAREIT and tangency portfolio allocates 33.9% in stocks, and 53.0% in corporate bonds and 13.1% in NAREIT
- Adding Equities REITs
  - Minimum variance portfolio allocates 20.0% in stocks, 74.8% in corporate bonds and 5.2% in NAREIT and tangency portfolio allocates 35.0% in stocks, and 51.9% in corporate bonds and 13.1% in NAREIT
- Adding Mortgage REITs
  - Minimum variance portfolio allocates 16.9% in stocks, 77.7% in corporate bonds and 6.3% in NAREIT and tangency portfolio allocates 35.2% in stocks, and 59.6% in corporate bonds and 5.2% in NAREIT
- Overall, all REITs type make an investor holding a portfolio of US corporate bonds and stocks better off
- Equities REITs, followed closely by All REITs provide the best risk-adjusted return

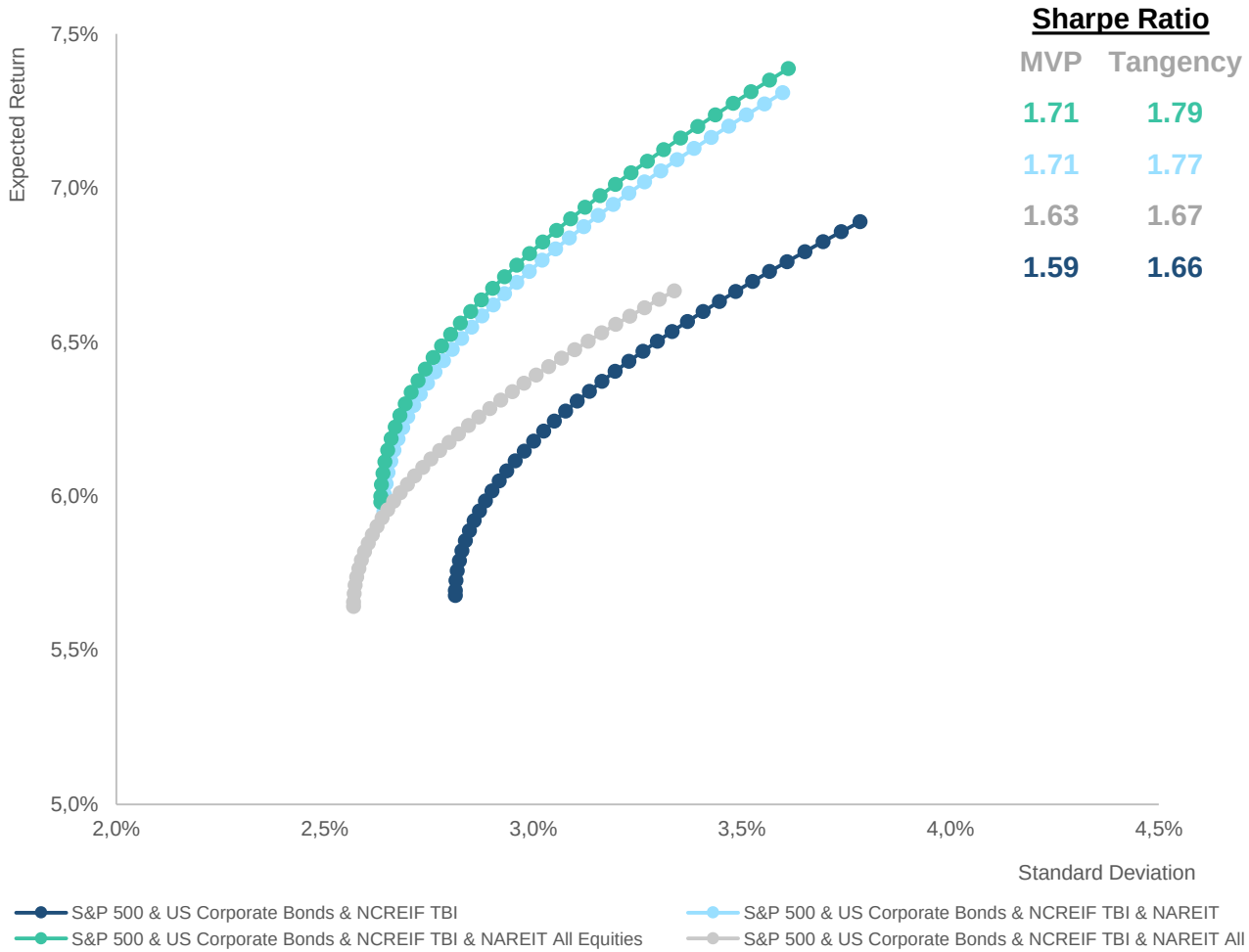
Source: NAREIT

Portfolio Diversifcation

Results (Cont'd)

REITs enable an average investor holding a portfolio of stocks and corporate bonds and private and direct real estate to have significant gains in terms of Sharpe Ratio, from 1.66 up to 1.79 (tangency portfolio)

Forward-Looking Efficient Frontiers – Scenario B



Key Takeaways

- Scenario B assumes a base case portfolio of US stocks and corporate bonds
  - Minimum variance portfolio allocates 19.0% in stocks and 47.5% in corporate bonds and 35.5% in NCREIF TBI and tangency portfolio allocates 28.4% in stocks and 34.1% in corporate bonds and 37.6% in NCREIF TBI
- Adding All REITs
  - Minimum variance portfolio allocates 14.4% in stocks, 40.3% in corporate bonds, 35.8% in NCREIF TBI and 9.6% in NAREIT and tangency portfolio allocates 20.2% in stocks, and 26.0% in corporate bonds, 40.1% in NCREIF TBI and 13.7% in NAREIT
- Adding Equities REITs
  - Minimum variance portfolio allocates 15.6% in stocks, 39.9% in corporate bonds, 35.7% in NCREIF TBI and 8.9% in NAREIT and tangency portfolio allocates 21.7% in stocks, and 25.4% in corporate bonds, 40.0% in NCREIF TBI and 12.9% in NAREIT
- Adding Mortgage REITs
  - Minimum variance portfolio allocates 11.1% in stocks, 45.5% in corporate bonds, 35.1% in NCREIF TBI and 8.3% in NAREIT and tangency portfolio allocates 19.2 % in stocks, and 34.3% in corporate bonds, 38.5% in NCREIF TBI and 8.0% in NAREIT
- Overall, all REITs type make an investor holding a portfolio of US corporate bonds and stocks better off
- Equities REITs, followed closely by All REITs provide the best risk-adjusted return

Source: NAREIT

Due Diligence

Current Situation

Recent Developments

In 2014, PSD and CDS-PP submitted a bill aiming at the introduction of REITs in Portugal, which was included in 2015 Budget but was not further discussed. Recently, the Government of António Costa has promised REITs for the near future

Recent News

- The introduction of a regime for Portuguese Real Estate Investment Trusts was included in the 2015 Budget. The Portuguese REITs would be called SIPIs (*"Sociedades de Investimento em Património Imobiliário"*)
- Moreover, the previous government targeted to create a regime similar to that of the Spanish SOCIMIs i.e.:
  - Non-regulated real estate company
  - Minimum share capital of €5m
  - Distribution within the range of 75-90%
  - Listed on the stock market
  - Transparent tax regime
  - Special Transitory tax regime for year 1
- Nevertheless, some challenges remain yet to be tackled, namely the 3 following main issues:
  1. Legal framework
  2. Tax regime
  3. Some constraints to initially listed companies
- Recently, the Portugal Real Estate Summit 2017 took place in Hotel Palácio Estoril in the 19th and 20th September and the Portuguese government "promised REITs for the near future"

António Medonça Mendes
Secretary of State for Tax Affairs

In the **Portugal Real Estate Summit 2017**, the Government said it plans to "attract investors with different profiles" and "introduce new ways of investment, developing partnerships, promoting the development of partnership companies, capable of stimulating the investment", claiming that the Government is working on the creation of REITs

Legal Status

In 2014, the parliamentary deputies from both PSD and CDS-PP submitted a bill aiming at the introduction of REITs in Portugal. According to the proposal made at the time, if approved, the government would be committed to define the qualification as a SIPI(1) on the following key points: (i) minimum share capital of €5m, (ii) debt covenants, (iii) fiscal structure, (iv) mandatory distribution within an interval between 75% and 90%, (v) the rules to apply to existing entities in the hypothetical transition to REITs, amongst others

14th November 2014

"The State Budget for 2015 brings good news, as it grants a legislative authorization to Government to create a new vehicle for investment in real estate assets destined to the lease, called Real Estate Investment Companies (SIPI)"

*"These vehicles will **provide access to the Portuguese market to a broad range of international investors**, including indirect ones, allowing them to enter and exit the market with another agility, given **the probable liquidity of the shares coupled with the attractive tax regime**. Let us hope that, contrary to what has been seen in the past with real estate funds, the scheme that will be approved will be a decal of schemes that are in place in other countries and which have proven to work."*

CBRE *14th November 2014*

Source: Portugal Real Estate Summit 2017, "Assembleia da República Portuguesa" and CBRE.

Portugal's Case

Red Flags

If Portugal decides to adopt the REITs framework, there are some challenges yet to be tackled. The inexistence of an alternative stock exchange, small market size and transaction regime are the identified key issues that would require further analysis

	Key Perceived Risks	Level
Inexistence of an Alternative Stock Exchange	? One of the most important conditions to have a successful development of the REITs market is to make it easier and fast for companies to list themselves in the stock exchange ? In Spain, in addition to the main continuous stock exchange, *Bolsas y Mercados Españoles* ("BME"), there is an alternative market, *Mercado Alternativo Bursatil* ("MaB"), designed specifically for SMEs and where most of the SOCIMIs are listed, beyond the largest Spanish REITs registered in BME ? However, in Portugal there is no viable alternative to the *Euronext Lisbon* (there is *Alternext* but has practically no registered companies), which would present a challenge specially in the first years of transition to the REITs framework	
Small Market Size	? A key issue concerning the adoption of the REITs framework is the real estate market size ? Currently, the Portuguese real estate market is c.€12bn(1), as of 31st December 2017, which is equivalent to Merlin Properties, Colonial, Hispania and Axiare market cap alone (c.€11.9bn)(2).Therefore, there is a discrepancy of size amongst Portugal and Spain, even though Portugal is solid in terms of growth prospects ? In turn, this might be a challenge in terms of both competition and how well Portuguese REITs in terms of liquidity, as it would probably lead to a market with less players and thereby less under the radar	
Transition Regime	? Finally, there are still numerous fiscal matters yet to be discussed, namely concerning the transition regime that would eventually be applied. In a transition process it would be key to have clear and well defined metrics on how the current closed real estate funds and *Sociedades Anónimas* would be able to turn into REITs ? In Spain, for instance, capital gains obtained by a SOCIMI corresponding to assets held prior to the election would be taxable only for the portion of gains allocated into the pre-SOCIMI holding period. Also, the law grants a two year period in order to meet certain REIT requirements, including the listing, during which the SOCIMI is taxed at 0% ? Although not a major challenge, as the case of Spain and / or many other countries would serve as basis, it is a key issue to take into consideration as, at least, it may affect the timing of adoption	

1. *According to "Funds People".*
2. *Bloomberg as of 2017´Q3.*

Appendix

Appendix 1

Fama-French 3 Factor Model Regressions

S&P 500

Historical alpha is 0.508%, beta MRP 0.93, beta SMB (0.16) and beta HML (0.02)

Regression

Regression Statistics	
Multiple R	0.992778041
R Square	0.985608239
Adjusted R Square	0.982729887
Standard Error	0.021004615
Observations	19

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.453222111	0.151074037	342.420995	4.94152E-14
Residual	15	0.006617908	0.000441194		
Total	18	0.459840019			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0.508%	0.006831865	0.744042288	0.46834709	-0.009478579	0.019644973	-0.009478579	0.019644973
Rm-Rf	0.932363164	0.030108972	30.96628978	5.20502E-15	0.868187408	0.996538919	0.868187408	0.996538919
SMB	-0.165895472	0.041488315	-3.998607151	0.001162606	-0.254325722	-0.077465223	-0.254325722	-0.077465223
HML	-0.020056293	0.020119274	-0.996869593	0.334638242	-0.062939511	0.022826925	-0.062939511	0.022826925

Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

US Corporate Bonds

Historical alpha is 2.924%, beta MRP 0.06, beta SMB (0.28) and beta HML (0.03)

Regression

Regression Statistics	
Multiple R	0.401186728
R Square	0.160950791
Adjusted R Square	-0.006859051
Standard Error	0.083647832
Observations	19

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.020132899	0.006710966	0.959126048	0.437448419
Residual	15	0.104954396	0.00699696		
Total	18	0.125087295			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	2.924%	0.027206912	1.074663173	0.299509063	-0.028751894	0.087228427	-0.028751894	0.087228427
Rm-Rf	0.059781133	0.119904614	0.498572415	0.625311958	-0.195789502	0.315351768	-0.195789502	0.315351768
SMB	-0.276287201	0.165221194	-1.672226145	0.115203197	-0.62844784	0.075873439	-0.62844784	0.075873439
HML	0.025042582	0.080122091	0.312555271	0.758921709	-0.145733613	0.195818777	-0.145733613	0.195818777

Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

NCREIF TBI

Historical alpha is 9.332%, beta MRP 0.03, beta SMB (0.01) and beta HML (0.01)

Regression

Regression Statistics	
Multiple R	0.382755234
R Square	0.146501569
Adjusted R Square	-0.024198117
Standard Error	0.013840512
Observations	19

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.000493214	0.000164405	0.858241586	0.483990068
Residual	15	0.002873397	0.00019156		
Total	18	0.00336661			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	9.332%	0.004501702	20.73044228	1.87512E-12	0.083727118	0.102917418	0.083727118	0.102917418
Rm-Rf	0.029931003	0.01983962	1.508647978	0.152161576	-0.012356147	0.072218153	-0.012356147	0.072218153
SMB	-0.011333012	0.027337779	-0.414554978	0.68433556	-0.069602108	0.046936083	-0.069602108	0.046936083
HML	-0.007385351	0.013257137	-0.557084927	0.585686601	-0.035642269	0.020871567	-0.035642269	0.020871567

Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

NAREIT All REITs

Historical alpha is 6.252%, beta MRP 0.33, beta SMB (0.15) and beta HML (0.15)

Regression

Regression Statistics	
Multiple R	0.290738345
R Square	0.084528785
Adjusted R Square	-0.098565458
Standard Error	0.236264028
Observations	19

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.07731191	0.025770637	0.461668176	0.713195532
Residual	15	0.837310364	0.055820691		
Total	18	0.914622274			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	6.252%	0.07684616	0.813617912	0.428590766	-0.101270301	0.226317125	-0.101270301	0.22631712
Rm-Rf	0.330877418	0.338671626	0.976985944	0.344070569	-0.390984065	1.0527389	-0.390984065	1.052738
SMB	-0.145522698	0.466668701	-0.311832994	0.759459866	-1.140203488	0.849158092	-1.140203488	0.8491580
HML	-0.152573298	0.226305543	-0.674191607	0.510446722	-0.634932146	0.32978555	-0.634932146	0.3297855

Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

NAREIT All Equities

Historical alpha is 8.338%, beta MRP 0.19, beta SMB (0.06) and beta HML (0.13)

Regression

Regression Statistics	
Multiple R	0.193717656
R Square	0.03752653
Adjusted R Square	-0.154968164
Standard Error	0.260607451
Observations	19

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.039720487	0.013240162	0.194948389	0.898197083
Residual	15	1.01874365	0.067916243		
Total	18	1.058464137			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	8.338%	0.084763991	0.983617666	0.340904031	-0.097294811	0.264045528	-0.097294811	0.2640455
Rm-Rf	0.198549311	0.373566597	0.531496425	0.602857526	-0.597689043	0.994787665	-0.597689043	0.9947876
SMB	-0.060375269	0.514751828	-0.117290052	0.908186294	-1.157542819	1.036792282	-1.157542819	1.0367922
HML	-0.138869739	0.249622895	-0.556318118	0.586197508	-0.670928346	0.393188868	-0.670928346	0.3931888

Russell 3000 + US Bonds

Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

NAREIT All Mortgages

Historical alpha is 0.894%, beta MRP 0.72, beta SMB (0.06) and beta HML 0.03

Regression

Regression Statistics	
Multiple R	0.41392014
R Square	0.171329882
Adjusted R Square	0.005595858
Standard Error	0.305396425
Observations	19

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.289248154	0.096416051	1.03376409	0.405874025
Residual	15	1.399004649	0.093266977		
Total	18	1.688252803			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0.894%	0.099331848	0.090039319	0.92944726	-0.202777051	0.220664595	-0.202777051	0.2206645
Rm-Rf	0.725511951	0.437769155	1.657293446	0.118221786	-0.207570915	1.658594816	-0.207570915	1.6585948
SMB	-0.061078842	0.60321901	-0.101254836	0.920689244	-1.346809726	1.224652042	-1.346809726	1.2246520
HML	0.038599963	0.292524023	0.131954846	0.89677372	-0.584900234	0.662100159	-0.584900234	0.6621001

Russell 3000 + US Bonds

Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

Appendix 2

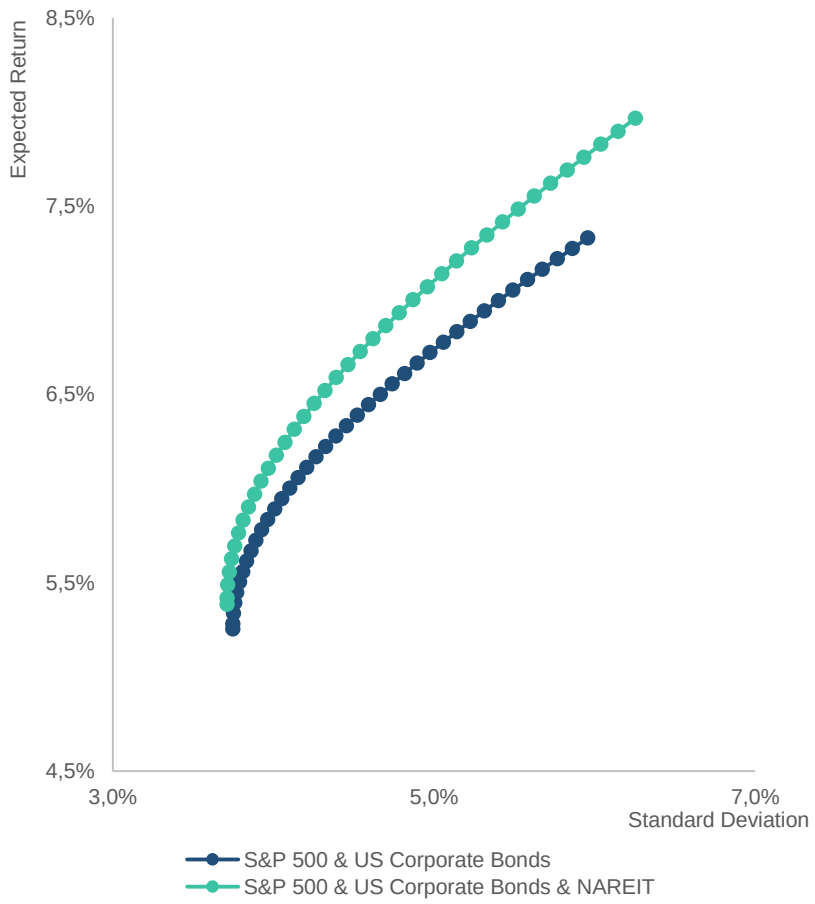
Portfolios Output & Efficient Frontiers

Base Case Scenario A

…adding NAREIT All REITs

REITs enable an average investor holding a portfolio of stocks and corporate bonds to have relatively significant gains in terms of Sharpe Ratio, from 1.18 to 1.24 (tangency portfolio)

Summary



Efficient Portfolios

Minimum Variance Portfolio

	Without REITs			With REITs			
	S&P 500	US Corp. Bonds	**Portfolio**	S&P 500	JS Corp. Bonds	NAREIT All REITs	**Portfolio**
Weight	21.9%	78.1%	**100.0%**	19.6%	75.3%	5.1%	**100.0%**
Return	8.1%	4.5%	**5.3%**	8.1%	4.5%	8.7%	**5.4%**
Standard Deviation	14.3%	8.3%	**3.7%**	14.3%	8.3%	22.5%	**3.7%**
Sharpe Ratio	0.48	0.39	**1.09**	0.48	0.39	0.33	**1.13**

Tangency Portfolio

	Without REITs			With REITs			
	S&P 500	US Corp. Bonds	**Portfolio**	S&P 500	JS Corp. Bonds	NAREIT All REITs	**Portfolio**
Weight	41.0%	59.0%	**100.0%**	33.9%	53.0%	13.1%	**100.0%**
Return	8.1%	4.5%	**5.9%**	8.1%	4.5%	8.7%	**6.2%**
Standard Deviation	14.3%	8.3%	**4.1%**	14.3%	8.3%	22.5%	**4.1%**
Sharpe Ratio	0.48	0.39	**1.18**	0.48	0.39	0.33	**1.24**

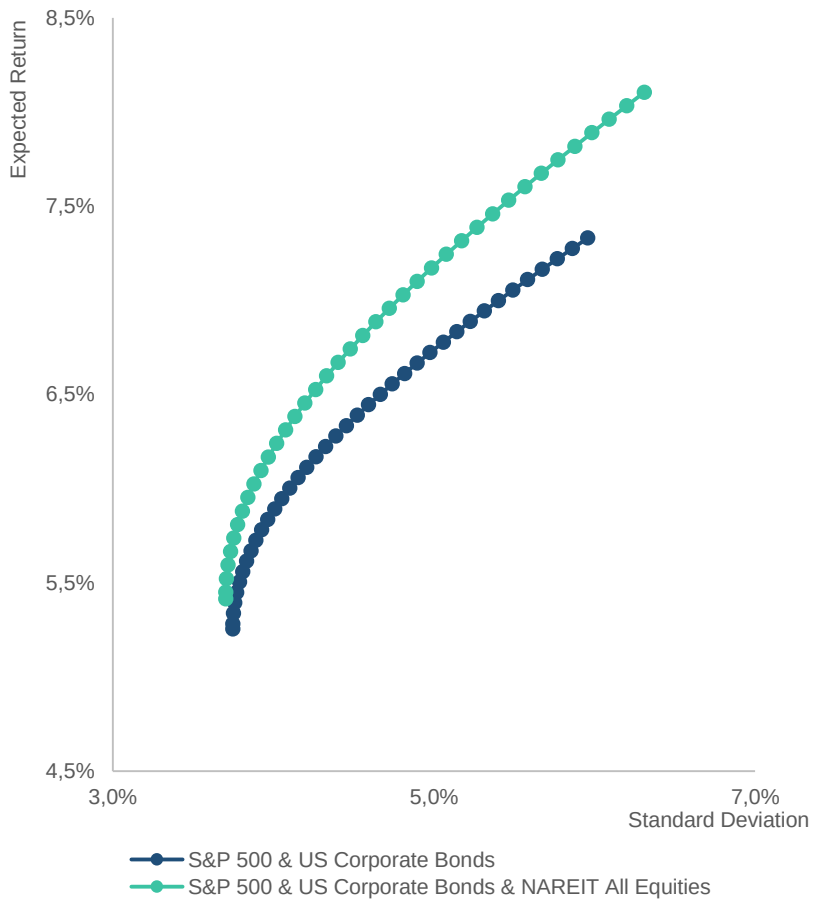
Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

Base Case Scenario A

…adding NAREIT Equities REITs

REITs enable an average investor holding a portfolio of stocks and corporate bonds to have relatively significant gains in terms of Sharpe Ratio, from 1.18 to 1.26 (tangency portfolio)

Summary



Efficient Portfolios

Minimum Variance Portfolio

	Without REITs			With REITs			
	S&P 500	US Corp. Bonds	**Portfolio**	S&P 500	US Corp. Bonds	NAREIT All Equities	**Portfolio**
Weight	21.9%	78.1%	**100.0%**	20.0%	74.8%	5.2%	**100.0%**
Return	8.1%	4.5%	**5.3%**	8.1%	4.5%	8.9%	**5.4%**
Standard Deviation	14.3%	8.3%	**3.7%**	14.3%	8.3%	24.2%	**3.7%**
Sharpe Ratio	0.48	0.39	**1.09**	0.48	0.39	0.32	**1.14**

Tangency Portfolio

	Without REITs			With REITs			
	S&P 500	US Corp. Bonds	**Portfolio**	S&P 500	US Corp. Bonds	NAREIT All Equities	**Portfolio**
Weight	41.0%	59.0%	**100.0%**	35.0%	51.9%	13.1%	**100.0%**
Return	8.1%	4.5%	**5.9%**	8.1%	4.5%	8.9%	**6.3%**
Standard Deviation	14.3%	8.3%	**4.1%**	14.3%	8.3%	24.2%	**4.1%**
Sharpe Ratio	0.48	0.39	**1.18**	0.48	0.39	0.32	**1.26**

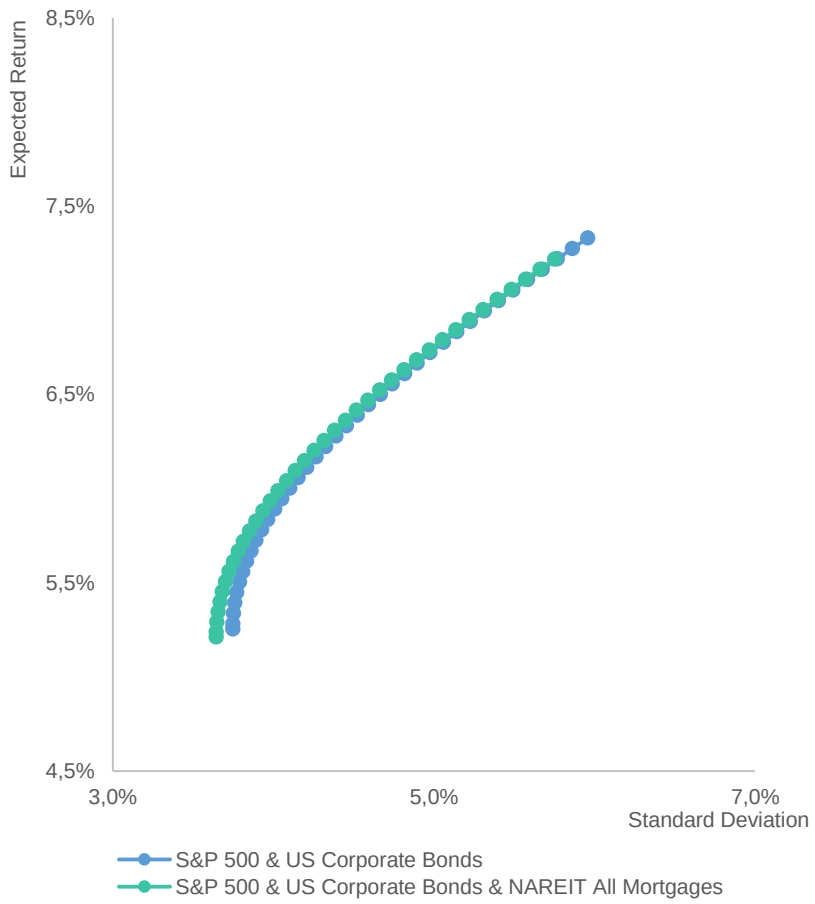
Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

Base Case Scenario A

…adding NAREIT Mortgage REITs

REITs enable an average investor holding a portfolio of stocks and corporate bonds to have relatively significant gains in terms of Sharpe Ratio, from 1.18 to 1.20 (tangency portfolio)

Summary



Efficient Portfolios

Minimum Variance Portfolio

	Without REITs			With REITs			
	S&P 500	US Corp. Bonds	**Portfolio**	S&P 500	US Corp. Bonds	NAREIT All Mortgages	**Portfolio**
Weight	21.9%	78.1%	**100.0%**	16.0%	77.7%	6.3%	**100.0%**
Return	8.1%	4.5%	**5.3%**	8.1%	4.5%	7.2%	**5.2%**
Standard Deviation	14.3%	8.3%	**3.7%**	14.3%	8.3%	30.6%	**3.6%**
Sharpe Ratio	0.48	0.39	**1.09**	0.48	0.39	0.20	**1.11**

Tangency Portfolio

	Without REITs			With REITs			
	S&P 500	US Corp. Bonds	**Portfolio**	S&P 500	US Corp. Bonds	NAREIT All Mortgages	**Portfolio**
Weight	41.0%	59.0%	**100.0%**	35.2%	59.6%	5.2%	**100.0%**
Return	8.1%	4.5%	**5.9%**	8.1%	4.5%	7.2%	**5.9%**
Standard Deviation	14.3%	8.3%	**4.1%**	14.3%	8.3%	30.6%	**3.9%**
Sharpe Ratio	0.48	0.39	**1.18**	0.48	0.39	0.20	**1.20**

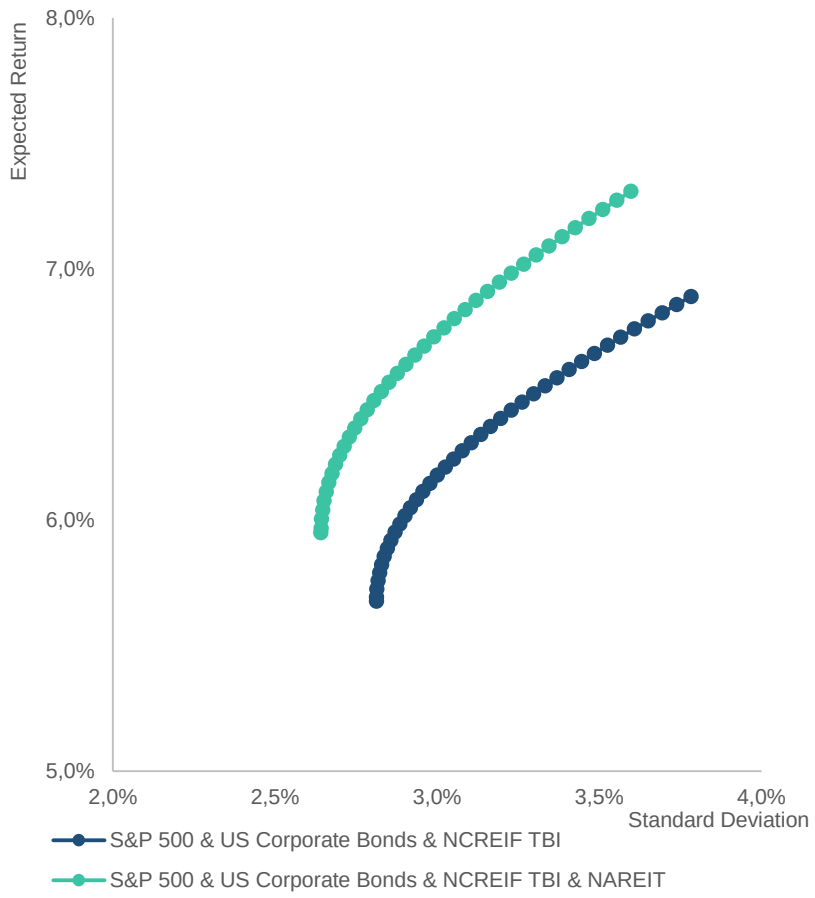
Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

Base Case Scenario B

…adding NAREIT All REITs

REITs enable an average investor holding a portfolio of stocks and corporate bonds and real estate to have relatively significant gains in terms of Sharpe Ratio, from 1.66 to 1.79 (tangency portfolio)

Summary



Efficient Portfolios

Minimum Variance Portfolio

	Without REITs				With REITs				
	S&P 500	US Corp. Bonds	NCREIF TBI	**Portfolio**	S&P 500	US Corp. Bonds	NCREIF TBI	NAREIT All REITs	**Portfolio**
Weight	19.0%	47.5%	33.5%	**100.0%**	14.4%	40.3%	35.8%	9.6%	**100.0%**
Return	8.1%	4.5%	6.0%	**5.7%**	6.9%	4.4%	6.0%	8.7%	**5.7%**
Standard Deviation	14.3%	8.3%	12.6%	**2.8%**	14.3%	8.3%	12.6%	22.5%	**2.6%**
Sharpe Ratio	0.48	0.39	0.38	**1.59**	0.40	0.38	0.38	0.33	**1.73**

Tangency Portfolio

	Without REITs				With REITs				
	S&P 500	US Corp. Bonds	NCREIF TBI	**Portfolio**	S&P 500	US Corp. Bonds	NCREIF TBI	NAREIT All REITs	**Portfolio**
Weight	28.4%	34.1%	37.6%	**100.0%**	20.2%	26.0%	40.1%	13.7%	**100.0%**
Return	8.1%	4.5%	6.0%	**6.1%**	6.9%	4.4%	6.0%	8.7%	**6.1%**
Standard Deviation	14.3%	8.3%	12.6%	**2.9%**	14.3%	8.3%	12.6%	22.5%	**2.8%**
Sharpe Ratio	0.48	0.39	0.38	**1.66**	0.40	0.38	0.38	0.33	**1.79**

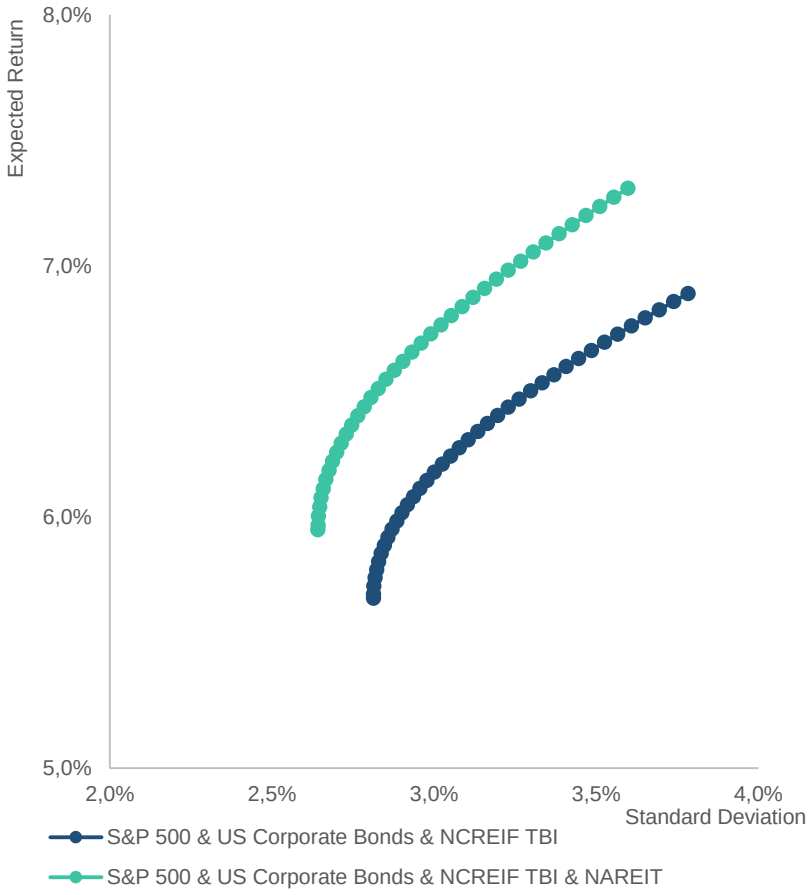
Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

Base Case Scenario B

…adding NAREIT Equities REITs

REITs enable an average investor holding a portfolio of stocks and corporate bonds and real estate to have relatively significant gains in terms of Sharpe Ratio, from 1.66 to 1.81 (tangency portfolio)

Summary



Efficient Portfolios

Minimum Variance Portfolio

Without REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	Portfolio
Weight	19.0%	47.5%	33.5%	**100.0%**
Return	8.1%	4.5%	6.0%	**5.7%**
Standard Deviation	14.3%	8.3%	12.6%	**2.8%**
Sharpe Ratio	0.48	0.39	0.38	**1.59**

With REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	NAREIT All Equities	Portfolio
Weight	15.6%	39.9%	35.7%	8.9%	**100.0%**
Return	6.9%	4.4%	6.0%	8.9%	**5.8%**
Standard Deviation	14.3%	8.3%	12.6%	24.2%	**2.6%**
Sharpe Ratio	0.40	0.38	0.38	0.32	**1.74**

Tangency Portfolio

Without REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	Portfolio
Weight	28.4%	34.1%	37.6%	**100.0%**
Return	8.1%	4.5%	6.0%	**6.1%**
Standard Deviation	14.3%	8.3%	12.6%	**2.9%**
Sharpe Ratio	0.48	0.39	0.38	**1.66**

With REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	NAREIT All Equities	Portfolio
Weight	21.7%	25.4%	40.0%	12.9%	**100.0%**
Return	6.9%	4.4%	6.0%	8.9%	**6.2%**
Standard Deviation	14.3%	8.3%	12.6%	24.2%	**2.8%**
Sharpe Ratio	0.40	0.38	0.38	0.32	**1.81**

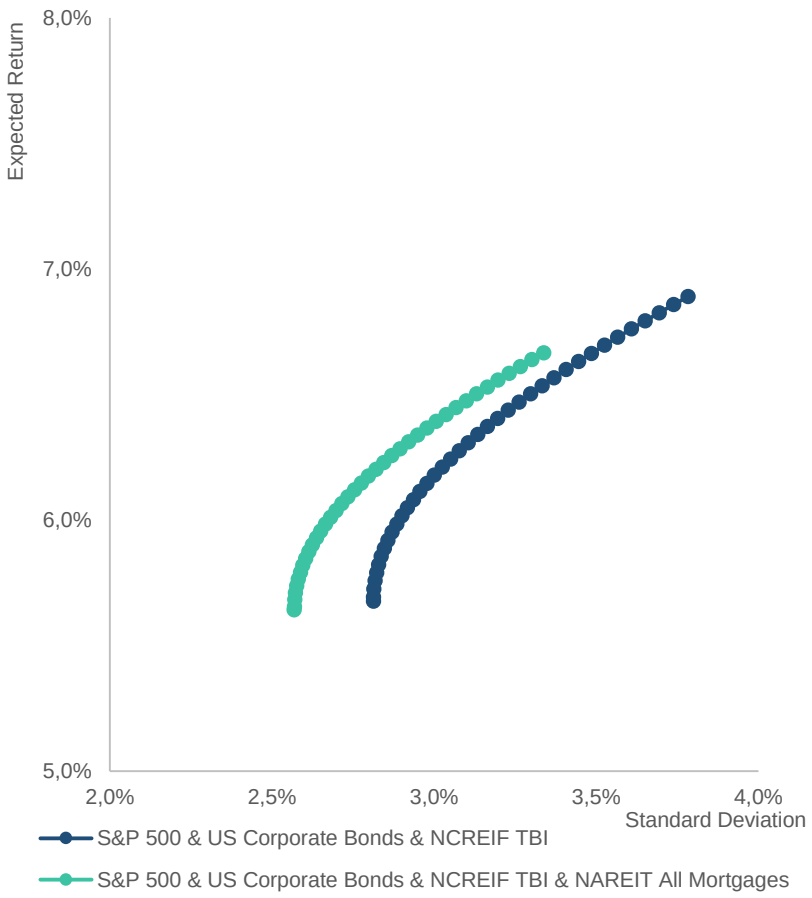
Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.

Base Case Scenario B

…adding NAREIT Mortgage REITs

REITs enable an average investor holding a portfolio of stocks and corporate bonds and real estate to have relatively significant gains in terms of Sharpe Ratio, from 1.66 to 1.70 (tangency portfolio)

Summary



Efficient Portfolios

Minimum Variance Portfolio

Without REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	Portfolio
Weight	19.0%	47.5%	33.5%	**100.0%**
Return	8.1%	4.5%	6.0%	**5.7%**
Standard Deviation	14.3%	8.3%	12.6%	**2.8%**
Sharpe Ratio	0.48	0.39	0.38	**1.59**

With REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	NAREIT All Mortgages	Portfolio
Weight	11.1%	45.5%	35.1%	8.3%	**100.0%**
Return	6.9%	4.4%	6.0%	7.2%	**5.5%**
Standard Deviation	14.3%	8.3%	12.6%	30.6%	**2.6%**
Sharpe Ratio	0.40	0.38	0.38	0.20	**1.67**

Tangency Portfolio

Without REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	Portfolio
Weight	28.4%	34.1%	37.6%	**100.0%**
Return	8.1%	4.5%	6.0%	**6.1%**
Standard Deviation	14.3%	8.3%	12.6%	**2.9%**
Sharpe Ratio	0.48	0.39	0.38	**1.66**

With REITs

	S&P 500	US Corp. Bonds	NCREIF TBI	NAREIT All Mortgages	Portfolio
Weight	19.2%	34.3%	38.5%	8.0%	**100.0%**
Return	6.9%	4.4%	6.0%	7.2%	**5.7%**
Standard Deviation	14.3%	8.3%	12.6%	30.6%	**2.7%**
Sharpe Ratio	0.40	0.38	0.38	0.20	**1.70**

Source: NAREIT, Bloomberg as of 2017'Q3 and FRED.