Master Thesis submitted at Copenhagen Business School

# REAL ESTATE INVESTMENT TRUSTS

## AN INDUSTRY ANALYSIS WITH A SPECIAL FOCUS ON RECESSIONS AND COVID-19

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# Preface

When beginning this thesis project, we knew we wanted to focus on Real Estate Investment Trusts. We chose REITs as the topic of our thesis because of Alessandro's interaction with REIT stakeholders during his recent semester abroad in New York. With keen interest, we both started to research this unique industry and its interaction with the global economy.

In the last two decades, REITs have become a popular type of investment which has made it relatively easy to collect literature. However, even though the existing literature on REITs is extensive, it is extremely narrow in scope and only describes a very specific aspect of the multitude of interactions involving REITs. Little research has been done on REITs more generally, and much of what exists is outdated. Additionally, data on REITs are easily accessible online from many different sources. Although valuable to our research, this poses the challenge of sifting through the plethora of data in order to find the most essential metrics. Thus, we found limited resources that provided a clear picture on how REITs react in various economic conditions and their inherent impact on investor decision making. We therefore decided there was academic room to conduct our own analysis of REITs aiming to provide investors with updated insights into this unique industry.

During our thesis project, global society was shaken by the COVID-19 pandemic. Due to social distancing regulations, the crisis significantly impacted our ability to work together and thus a change in our workflow was required. After a transition period, we found a sustainable way to complete our thesis. Although the situation is dire, it provided us with an alternative objective for our thesis. That is, to better understand the impact of the coronavirus crisis on REITs by analyzing its historical data with a special focus on recessions.

We would like to thank our supervisor Associate Professor Emeritus Jens Lunde for helping us navigate the complicated industry as well as providing critical feedback in the academic process. We would also like to thank Professor Merrie Frankel and Professor Stephen J. Pearlman of NYU for introducing Alessandro to the topic, as well as assisting in our initial information and data gathering. Finally, we would like to thank our families and friends for supporting us throughout this long and demanding process.

We hope you will enjoy reading our thesis on Real Estate Investment Trusts.

Alessandro Daffré Bergur Løkke Rasmussen

# Executive Summery

Since their creation in 1960, Real Estate Investment Trusts have experienced a long and troublesome development. It was not until the late 1990s that REITs received the essential adjustments that made them the unique and valuable investment vehicle that they are today. With the REIT Modernization Act in 1999, the modern REIT was born. Therefore, the last twenty years provides the most significant time period for the analysis of REITs.

REITs are subjected to several regulations that safeguard the philosophy behind them. With the development of REITs, small investors were provided with the opportunity to invest in real estate. The regulations require that REITs' real properties account for at least 75% of their taxable income. In addition, REITs are pass-through investment vehicles and are thus required to distribute at least 90% of their taxable income to shareholders through dividends. Because of these unique requirements, REITs exhibit certain characteristics. With a majority of REIT investments being in hard assets, REITs show a high potential for portfolio diversification in the form of low correlation to other asset types. The total return provided by REITs include, due to high dividend payout requirements, a significant income return that historically has provided superior inflation protection compared to other asset classes. Depending on the average lease-terms and the nature of the underlying property assets, different REIT sectors show significantly different volatilities. For example, short average-lease terms, high portfolio rollover and cyclical property types will result in higher volatility.

We analyzed the performance of REITs in the last twenty years and found that short term holdings of REITs have performed worse than other assets and major indices. However, extending the timeframe to the whole twenty year period, we find that REITs show greater total returns than all other assets in the long run. Adjusting the total returns for asset volatility, REITs demonstrate the second best risk-adjusted return among all asset classes considered. Segregating the analysis into various REIT sectors, this paper finds that these vary significantly in fundamentals, but in general follow the same trends as the industry in general. Since some types of REITs are more cyclical, we found that different REIT sectors have varying volatility in the short term, but in the long term show positive performance. Furthermore, the study found that tech-related REITs currently perform significantly better than the industry average. We conclude that this is due to the technological development continuing regardless of economic cycles.

After analysing the macroeconomic factors that relate to REITs, this study arrived at five main conclusions: (1) Rising unemployment rate and low GDP expectations have a crucial impact on the overall

industry. (2) Demographic structure is a valuable indicator of performance for certain REIT sectors. (3) Interest rate movements negatively affect REIT prices in the short term. (4) REITs demonstrate a consistent inflation hedge over time. (5) Average lease term and portfolio rollover are precious indicators for the sensitivity of REITs to market fundamentals.

Furthermore, the study explored the four main interactions between fundamental drivers and REITs: (1) Treasury bond yields serve as effective indicators for REIT performance. Findings showed a strong negative correlation between 10-year Treasury yields and REIT stock prices. (2) The importance of NOI growth in REIT valuation. (3) Corporate bond yields and corporate bond yield spread are negatively correlated with REIT cash flow multiples. (4) Low leverage ratios and high debt cover ratios help REIT management to maintain a high level of financial flexibility.

Through an analysis on REITs and the performance of various REIT sectors during recessions, this study found that, although recessions are unique, they share three main factors that provide a framework for understanding different situations. By analysing the (1) type of recession, (2) macroeconomic elements and (3) REIT fundamentals, a more holistic understanding of certain economic situations can be achieved. The study found that, overall, REITs perform worse than other assets in the short term. However, when including the period of recovery, REITs perform much better than other types of assets in times of recession. This is due to their underlying hard assets and the significant income component. Through the lense of historical recessions, the study attempted to understand REITs in the current COVID-19 crisis. The findings were in line with the expectations and showed that REITs currently perform the second worst of the major indices in the analysis. Both in the previous recessions and during the current COVID-19 crisis, the study found that tech-related REITs show above average total returns compared to other REIT sectors.

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# 1. Introduction

## 1.1. Introduction

Real Estate Investment Trusts have existed since 1960, but it is only within the last twenty years that they have been considered a valuable investment vehicle. As publicly listed real estate, REITs exist in the intersection between traditional private real estate investments and the equity market. This makes REITs a unique and interesting investment vehicle that deserve to be explored further. Additionally, at the time of writing this thesis, the world is in the middle of a health and economic crisis caused by the COVID-19 pandemic. With the early signs of a global recession in mind, this paper will investigate REIT performance during economic recessions. Using the framework this historical analysis provides, we will seek to understand the novel situation currently impacting REITs and offer insight into expected future developments.

With this thesis, we seek to contribute valuable insights into how REITs, focusing on various sectors, perform during different economic situations. The thesis can be seen as two distinct parts, each with a specific purpose. The first part of the paper (ch. 2-4) analyzes the historical performance of REITs in order to create a theoretical foundation of their characteristics and performance. The second part (ch. 5-6) uses these findings to conduct an analysis on REIT performance during historical recessions. Through our analysis of the dot-com bubble and the Great Recession, we create a framework for our analysis of the current COVID-19 health and economic crisis.

In Chapter 2, we describe and analyse the development of REITs and their strict regulatory framework, which impacts the way they operate. This includes a subchapter on the main characteristics that REITs exhibit. These include high dividends, great diversification, as well as inflation protection. Furthermore, this chapter includes a definition of the REIT sectors, segregated on property types, which will be used throughout the later parts of the thesis. Following this chapter on the background of REITs, we conduct a performance analysis on REITs over the last twenty years in Chapter 3. We look into the split between income and price appreciation to understand the unique mix that REITs produce in terms of total return. We then compare REIT performance to other asset types in order to assess how the total returns that REITs provide measures against alternative investments. This analysis includes nominal as well as adjusted total returns and is followed by a deeper analysis on other major equity indices. Lastly, we provide a comparative analysis of REIT sectors, with the aim of illustrating how performance of different sectors varies in different circumstances. In Chapter 4, we seek to analyze the underlying economic drivers

and real estate fundamentals that impact REIT performance. Through this analysis, we achieve a deeper understanding of how and to what extent specific factors influence the performance of REITs.

Combining the findings of the previous chapters, we analyze REIT performance specifically during economic recessions in Chapter 5. The basis of the analysis will be the dot-com bubble and the Great Recession. Through this analysis, we aim to create a framework for understanding REIT performance that will become the backbone of our analysis of REITs in the current COVID-19 health and economic crisis in Chapter 6. This section seeks to provide valuable insight into how REITs and their underlying sectors perform presently as well as in the future short, medium and long term.

## 1.2. Problem Statement

Through an analysis of REIT characteristics, regulations and performances, it is the aim of this paper to provide investors with a more thorough understanding of the REIT Industry. Combining the findings of this paper, investors will enhance their tools to evaluate REITs in different economic situations. With a specific focus on recession analysis and industry drivers, the questions examined in this thesis are the following:

1. *How do the unique regulations that REITs are subject to impact their characteristics as an investment vehicle?*
2. *How do the fundamentals of REITs vary between sectors?*
3. *How do REITs perform compared to other asset classes?*
4. *What are the drivers that lead various REIT sectors to perform differently in different economic conditions?*
5. *How did REITs and their different sectors perform during historical recessions and how can this knowledge be used to analyse the impact of the COVID-19 crisis on REITs?*

## 1.3. Delimitation

Currently, REITs in the United States of America can be categorized into two main types: Equity REITs and Mortgage REITs. The key difference between these two types of REITs is that Equity REITs directly own income generating real estate, whereas Mortgage REITs lend funds to other real estate investors in return for mortgages on these properties. Equity REITs account for 94% of the total market capitalization (ch. 2.3) and is therefore by far the most common of the two types. Equity REITs and Mortgage REITs have significantly different business models, which results in them having deviating characteristics and

underlying drivers. Due to the limited scope of this thesis and their significant prevalence, only Equity REITs will be considered throughout this paper.

This thesis aims to analyze Equity REIT performance compared to other sources of investment. Thus, only publicly traded Equity REITs will be taken into consideration. There are many different indices available to monitor REIT stock performance. Since 2006, the Financial Times Stock Exchange Group (FTSE), one of the most important global index providers, has maintained the most widely accepted index. The FTSE NAREIT All Equity REITs Index, which includes all publicly traded Equity REITs, will be the standard classification of REITs throughout the thesis. Whenever a different index is used, it will be clearly stated. Within the considered index, there is a long subsection of REIT sectors. In our thesis, we have decided to include the eight sectors that we believe are the most significant. These are selected on the basis of the variety they represent and their importance in terms of market cap and potential future development. The included REIT sectors are: Office, Industrial, Retail, Residential, Lodging/Resorts, Healthcare, Infrastructure and Data Centre. Due to our initial findings on tech-related REITs, we found that it was essential for our analysis to include Infrastructure and Data Centre in our analysis. This solidified our decision to use the FTSE NAREIT All Equity REITs Index since a different index that is often considered, FTSE NAREIT Equity REITs, excludes Infrastructure.

In comparing REIT performance to alternative investments, we will be using NASDAQ Composite (Technology), Russell 2000 (Small-Cap), Dow Jones Industrial Average (Blue-chip & Large-Cap) and S&P 500 (Large-Cap). Throughout the thesis, these indexes will be referred to as “major indexes” and compared to the FTSE NAREIT All Equity REITs Index. There are other indexes that could have been used in this comparison, but we believe that this group of indexes together provides a representative picture of the United States economy.

When conducting our performance analysis, we exclusively use the time period from January 2000 to January 2020. As stated in (ch. 2.1), we have discovered that the modern REITs that we seek to analyze were shaped by the REIT Modernization Act in 1999. Therefore, the time period after this change is the main focus of this thesis. However, results from other scholarly works that may consider different time periods are used throughout the paper. These are included due to their valuable findings and the differing time periods covered will be specifically stated. Furthermore, the timeframe mentioned (January 2000 to January 2020) is also the rationale behind the choice of the two recessions included in (ch. 5). In order to maintain consistency, we will limit our recession analysis to the dot-com bubble and the Great Recession, both of which occurred within this period.

Due to the limited scope of this thesis, the analysis on the influence of macroeconomic factors on REIT performance (ch. 4) will be limited to a selection of key factors. By analysing unemployment rate, job growth, demographics, interest rates and inflation, we seek to cover a wide range of factors that will provide valuable insights. We acknowledge that there are other macroeconomic factors that could have been included given a wider scope and which may have provided additional insight. Likewise, in the subsequent analysis regarding the industry main drivers and performance benchmarks, we have decided to focus on four main specific interactions that we found to be the most valuable. We acknowledge that other variables may also be significant from an investor standpoint. However, we strongly believe that these four factors together constitute the most valuable framework for investment decisions regarding REITs.

When performing a variety of analyses, we will be using Fund From Operations (FFO) and Net Operating Income (NOI) as the two main metrics to describe REIT performance throughout the paper. These were chosen because they are the industry accepted standard metrics and thus are standardized and comparable.

## 1.4. Methodology

Through a thorough analysis of the history of REITs, as well as their characteristics, performance and underlying drivers, this paper seeks to provide the reader with a deep understanding of REITs. The paper follows the pragmatist research philosophy and, through abductive reasoning, seeks to make probable conclusions on the findings of the analyses (Rugg and Petre, 2007). The primary analysis in the thesis is quantitative since numerical data has been used to analyze performance and confirm or explore the interactions between variables. All data collected and used in the thesis are secondary data, meaning that they were initially collected by other sources. These sources are online databases and will in all instances be cited and sourced with any graphs, tables or figures that use them. The main sources of data we have used include NAREIT, EPRA and Bloomberg.

Throughout the paper, subsequent chapters build upon the findings of previous ones. The paper begins with a description and analysis of the key characteristics that REITs and REIT sectors have exhibited over the years in (ch. 2). This creates the necessary understanding of REITs required for an extensive performance analysis of REITs and REIT sectors in (ch. 3). Analyzing key macroeconomic factors and industry drivers that impact REITs performance in (ch. 4), we then combine all the findings from the previous chapters in our recession analysis in (ch. 5). This chapter then provides valuable insights

and creates a framework for understanding REITs in various economic scenarios. This framework is implemented in (ch. 6) in order to analyze the impact of the current COVID-19 health and economic crisis on REITs.

In our analysis on REIT development (ch. 2.1), we use the foundational work of (Chan, Erickson and Wang, 2003) and (Semer, Goldberg and Glicklich, 2009) to create the theoretical foundation for our analysis. By examining periods of reforms impacting REITs, we combine findings from the original law texts with other references in order to extract valuable conclusions for our analysis. The following sections (ch. 2.2) and (ch. 2.3) describe the key characteristics of REITs and the REIT sectors. This is done by referencing the special literature on REITs that covers these topics and includes the quantitative findings from these papers. All of Chapter 2 should be seen as the foundation for the further analysis in the rest of the thesis.

In our performance analysis in (ch. 3), we use secondary data collected from various sources to analyze and compare REIT performance to other assets and indices. In order to add value to our findings, we combined our analysis with the evidence from other references. Using abduction on our quantitative findings, we drew general conclusions for our further analysis.

In (ch. 4), we combine the use of specific literature on REITs with our own analysis of secondary data to explore the key macroeconomic factors and industry drivers. During this chapter, we use REIT specific metrics such as Fund From Operations (FFO), Net Operating Income (NOI) and Cash Available for Distribution (CAD). These allow us to conduct an extensive analysis both from a quantitative and a qualitative standpoint. Furthermore, we use certain metrics as a proxy for macroeconomic factors in order to perform our analysis. For instance, we use the Consumer Price Index to make an inflation estimate and use Gross Domestic Product to estimate consumer spending.

In (ch. 5), we use data from the National Bureau of Economic Research to identify and quantify recessions in the United States Economy. These provide the basis for our analysis on REIT performance in regard to recessions. Starting with the research from (Bohjalian, 2019) on the general performance of REITs throughout the business cycle, we use our collected secondary data to conduct a performance analysis on the two distinct recessions inside our determined time period (ch. 1.3). In

this chapter, we implement the findings from the previous three chapters and, through an abductive approach, extract general conclusions that provide the framework for (ch. 6).

In our COVID-19 analysis in (ch. 6), we are no longer able to draw upon specific research since the situation is unfolding as we speak. Therefore, this chapter draws upon our own findings in the previous chapters of this thesis as well as an analysis of secondary data collected on the limited time period available. The conclusions of this chapter are supported by initial findings by other stakeholders in the REIT industry.

# 2. Real Estate Investment Trusts

In this chapter we will uncover the origins of REITs as well as the unique characteristics that REITs and REIT Sectors exhibit. In (ch. 2.1) we start at the background for the development of REITs and move through each reform that impacted REITs. Through this historical approach we seek to describe the strict regulations REITs must adhere to. Combining these findings with scholarly work on REITs, we will in (ch. 2.2) outline the main characteristics that REITs as an industry exhibit. Lastly, by analyzing the industry and the underlying sectors in (ch. 2.3), we will seek to understand the similarities and differences between REIT Sectors.

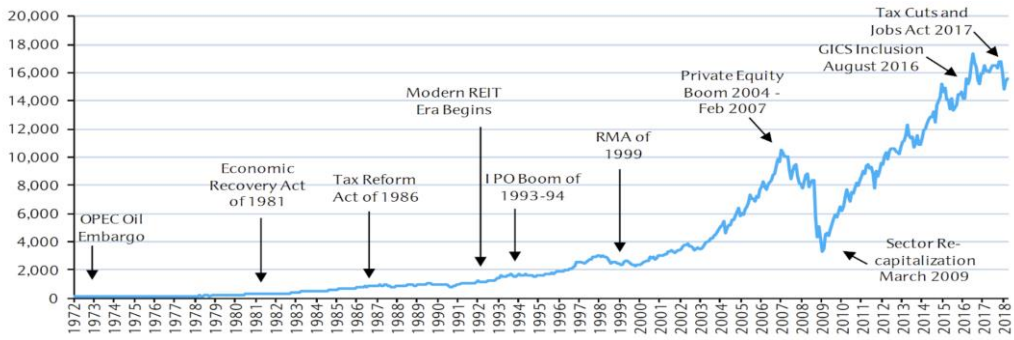
## 2.1. Background

Prior to the implementation of the original REIT rules in 1960 (U.S. Government, 1960) there existed no special status for REITs in the U.S. federal tax laws and REITs benefitted from no special privileges. However, this is not to say that REITs did not exist before 1960. REITs were invented in Massachusetts in the first half of the 19$^{th}$ century as a reaction to the state's prohibition of regular firms owning real estate (Halpern, 1976). REITs played a vital role in the development of many cities in Massachusetts and the surrounding states. With the adaptation of “The Revenue Act of 1936” the closely similar Regulated Investment Companies (RICs) (U.S. Government, 2020) achieved pass-through rights, which enabled these companies to avoid taxation on a corporate level. It took REITs almost 25 years to achieve the same rights as RICs and this happened in 1960 with law 86-779, which marked the official beginning of REITs as we see them today (Chan, Erickson and Wang, 2003; Semer, Goldberg and Glicklich, 2009).

In this chapter we will describe and analyze the special requirements that REITs are subject to in order to obtain and preserve their REIT status. The period covered in the chapter will be from 1960 to present day.

Starting from the original set of rules, each subchapter will analyze the most significant changes that were made to optimize REITs. Up until and including the REIT Modernization Act of 1999 each chapter covers a specific reform and the last chapter analyzes the period after 1999. In (ch. 2.1.1) we establish the foundation for REITs by describing the general terms of the original rules. The many problems REITs had trying to maintain their REIT status is covered in (ch. 2.1.2), including the changes that were introduced with the tax reform in 1976. In (ch. 2.1.3) we describe the tax reform in 1986 that gave REITs the possibility of creating subsidiaries. Through (ch. 2.1.4) and (ch. 2.1.5), we cover the subsequent reforms in 1993 and 1997 that modified the rules about subsidiaries from 1986. In the final regulatory section (ch. 2.1.6) we outline the newest regulatory changes to REITs through the REIT Modernization Act of 1999. Lastly, in (ch. 2.1.7) we analyze the general trends REITs have experienced since 1999. Figure 1 shows the development of REITs since NAREIT started tracking stock performance of the REIT sector in 1972 and illustrates the major milestones in the history for REITs.

***Figure 1 - Timeline of REIT History vs. Sector Performance (January 1972 - April 2018)***




Source: (Barclays Research Department, 2018), NAREIT, Thomson Reuters

### 2.1.1. Original REIT Construction

In order to qualify as a REIT the company had to pass four tests[1] that constitutes the fundamental principles for REITs. These tests revolve around the requirements for: (1) Organizational Structure, (2) Source of Income (3) Asset Types and (4) Dividend Payments. The purpose was to safeguard the rationale behind the special treatment REITs benefitted from, which was to also give smaller investors the possibility to invest in commercial real estate. The idea was to have REITs have a certain organizational structure, investments that were primarily in real estate, income derived from passive investments, and have the main part of the income being distributed as dividends. If all four tests were upheld and the company chose REIT status, then the REIT could benefit from the rules of pass-through companies, where

[1] These four tests are still essentially the same, with only a few changes according to the next few chapters.

the majority of income is paid in dividends instead of being retained in the company. (Chan, Erickson and Wang, 2003; U.S. Government, 2020)

As a pass-through company REITs are required to follow strict regulation when calculating taxable income, which also comes with an upside. REITs are allowed to subtract dividend payout from the regular income and subtract distributed capital gains from net capital gains. When combining these regulations, REITs can by distributing all earnings to shareholders, avoid corporate taxation completely. Besides the main requirements based on dividends (regular and capital gains), REITs are also required to exempt income from certain sources when calculating taxable income. This being income from properties bought in foreclosures (not being passive income) and income from long term capital gains. Furthermore REITs cannot subtract any deficit from the company's taxable income. The sum of income after these adjustments, and a few others[2], is defined as Real Estate Investment Trust Taxable Income or REITTI.(U.S. Government, 2020) REITs Taxable Income is subject to regular taxation for corporations. Although both income from foreclosures and long-term capital gains are exempted from REITTI, they are also subject to regular corporate taxation. However, the latter can be deducted by the dividends paid to shareholders[3].

Dividend paid to shareholders as regular REIT income is taxed at the shareholder level as regular income, where any income from REITs capital gain is taxed as long-term capital gains for the shareholder. In case a REIT suffers an overall deficit in the tax year, this cannot be deducted from the taxable income. In the meantime capital gains are taxed separately, meaning that REITs with an overall deficit will still be taxed by a potential capital gain, if this is not distributed to shareholders.

In the original structure from 1960 it was required that the ownership of the REIT was split between at least 100 shareholders[4] in order to ensure that the REIT was not owned by a narrow group of shareholders. Furthermore, the five or fewer largest shareholders were not allowed to, directly or indirectly, own more than 50% of the outstanding shares. This is referred to as the "five or fewer" rule and has since been adjusted in the Revenue Reconciliation Act of 1993 (ch. 2.1.4). (Block, 2011)

In order to make sure that REITs mainly invested in real estate and that the income accrued was primarily passive income, the company had to fulfil three tests on the income as well as three tests on the assets. The first income test requires the REIT to have at least 75% of the total income derive from real property[5]. Secondly at least 90% of the total income must come from real property, interests, dividends or gains

[2] I.R.C §857(b)(2)(D)
[3] I.R.C §857(b)(3)
[4] I.R.C §856(a)(5) and I.R.C §856(a)(6)
[5] I.R.C §856(c)(3)

from security sales[6]. Last income test requires that less than 30% of the REITs gross income can stem from gains from trade with short term securities and real property owned less than four years[7]. This is also referred to as the 30%-rule.

The asset tests are to a large extent similar to the income tests, as they seek to ensure the same results measured in a different way. First asset test states that at the end of each fiscal quarter 75% of the REITs value must be represented by real property, liquid funds or government securities[8]. Second asset test states that maximum 25% of REITs assets can fall outside the scope of the 75% in the first test. This is a repetition of the first test and has no unique impact. The third test is also called the diversification test and sets rules for the 25% of REIT assets that fall outside the scope of the first asset test. In order to maintain a diversified asset pool on these non-core assets it is not allowed to invest more than 5% of the REITs assets in one company and this must also not exceed 10% of the voting shares in said company[9].

According to Circular 1.856, rent accrued on a property by REITs must be divided into two types of rents if any "personal property" is included in the lease[10]. Personal property is defined as items that are non-essential for the property to function and is easily movable. An example is an apartment that already has lighting but is fitted with chandeliers (extra to regular lighting). These chandeliers are non-essential and easily movable. The rent accrued from personal property is not qualified income towards the 75% and 90% income tests covered above. If a REIT does not follow these requirements of splitting the rent whenever personal property is included, it leads to a loss of REIT status and thereby taxation as a regular company.

REITs acquiring property on foreclosure were originally at risk of failing the income- and asset tests. Especially when the REIT is forced to administrate the property for a period or sell it. In 1975 an adjustment gave REITs a grace window of two years to settle the property by either selling or transitioning the property to qualified property i.e. including it in the REIT portfolio. In this period all income from such properties that are not considered qualified income will be subject to regular taxation i.e. no deduction from paid dividends and regular corporate tax rate.

Besides the special cases of foreclosure properties, REITs are not allowed to own property with the main purpose of selling it. REITs were not supposed to get involved in active real estate trading, since the tax exemption was hinged on the fact that REITs are a vehicle for passive investment in real estate. Breaking

[6] I.R.C §856(c)(2)
[7] I.R.C §856(c)(4)
[8] I.R.C §856(c)(5)
[9] Ibid.
[10] Circular 1.856-4(a)

the rule, even unintentionally, led to loss of REIT status. However, the law included some ambiguity[11] that made management fear selling properties and became one of the first rules to be revised in later tax reforms. (Hyrup and Hamann-Hansen, 2001)

Regarding the rules on passive income it was essential to distinguish between acceptable and non-acceptable income. The law only states that income must be from acceptable passive sources[12], but a circular to the law states that acceptable income is generally the gross amount which is received from the right to use REIT property[13]. However, the law does state sources that are not acceptable passive income. Any amount received from furnishing or providing services to tenants other than through an independent contractor. This meant that REITs were not allowed to provide any form of services to tenants and were required to use independent contractors i.e. did not hold more than 35% stake in the REIT[14]. Even when using an independent contractor REITs were only allowed to provide customary services to tenants like water, light and heat. The rigorous rules meant that if any amount was received for non-customary services it could disqualify the entire REIT.

The primary benefit from REIT status is that all paid dividend to shareholders can be subtracted from the taxable income. This benefit comes from the fact that REITs are pass-through vehicles where 90% of the income is passed on to the shareholders[15]. If the REIT does not uphold this rule the company loses the right to deduct dividends from taxable income and is taxed as regular corporations. Besides regular income dividend the REIT also has to be precise in management and classification of capital gains, since the taxation of capital gains and regular income is completely divided[16]. There are no requirements for REITs to distribute capital gains in order to maintain REIT status. However, REITs has the possibility of deducting the capital gains distributed to shareholders from the total net capital gains[17]. Thereby the REIT is only taxed on the capital gains that are not passed on to the shareholders. In case of capital gains being distributed to shareholders as dividends the REIT must notify the shareholders no later than 30 days after the tax year, that parts of the dividends are capital gains and how large a part this constitutes[18].

According to the original REIT laws it was not allowed for REITs to deduct losses from the taxable income. The rule was hard to understand and most likely it stemmed from the fact that RICs, that cannot

[11] REITs are allowed to derive income from selling properties owned less than four years as long as the amount does not exceed 30 percent of the gross income according to §856(a)(4).

[12] I.R.C §856(c)(2)(C) and I.R.C §856(c)(3)(a)

[13] Circular §1.856-4(a)

[14] I.R.C §856(d)(3)

[15] I.R.C §857(b)(2)(B) states that 90 percent of income must be distributed to shareholders within 12 months of the accounting year.

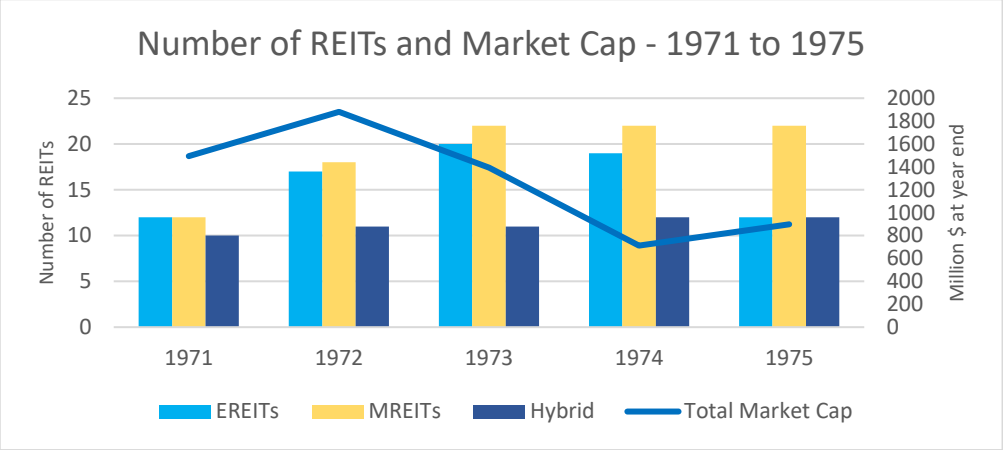
[16] I.R.C §857(b)(3)

[17] I.R.C §857(b)(3)(A)(ii)

[18] I.R.C §857(b)(3)(C)

have losses, were the model for REITs. Due to beneficial depreciation rules and a bad economic situation this point became a point of contention and resulted in several REITs deliberately disqualifying themselves in order to be able to take advantage of the substantial losses. In figure 2 we notice the drop in amount of REITs in the latter part of the period.

*Figure 2 - REIT evolution between 1971 and 1975*




Source: NAREI Research

Summarizing the initial period of REITs up until the first reform in 1976, we saw many REITs decided to not maintain their status. Therefore they were taxed as regular corporations, which in many instances was more attractive given the fact that losses were not deductible in future income under the special REIT rules. Furthermore it took immense resources to avoid disqualification at this time and it is unclear if the tax exemptions outweighed these costs. Figure 2 illustrates this low popularity where many REITs did not find the costs worth the benefits and sometimes disqualified themselves.

### 2.1.2. REIT Reform Revisits Main Sanctions

REITs first big reform came in 1976 and was not aimed at the fundamental taxation rules. The main purpose for REITs was still the possibility of avoiding taxation of mainly passive investments in real estate by distributing all of the income. Instead the focus of the reform was the structure of the rules that followed the four fundamental principles of REITs. The rules were too restrictive and the sanctions so extreme that many companies chose not to obtain REIT status. Mainly four areas seemed to raise the most concern in the original structure (Chan, Erickson and Wang, 2003). (1) Loss of REIT status as result of negligence, (2) limitations of both REIT income sources and asset types, (3) missing regulation of loss and (4) REITs could not become stock companies.

In common for all these topics was that a failure to fulfil the requirements led to complete disqualification without any possibility for dispensation. It was essential that these issues were resolved in order for REITs to realistically function and create value for shareholders.

The reform in 1976 loosened the grip with regards to the rules about disqualification and loss of REIT tax benefits. Failure to fulfill the different tests no longer led to loss of REIT status, as long as the reason for failure was due to reasonable causes. Instead REITs were charged a 100% tax on the income that was the excess amount of the tests. (U.S. Government, 1976) In cases where the failure to fulfil the requirements was due to too little dividends being paid out, the reform now allowed REITs to pay dividends retroactively equivalent to the lacking amount. This new rule, called the Deficiency Dividend rule, replaced the original rules on dividends.

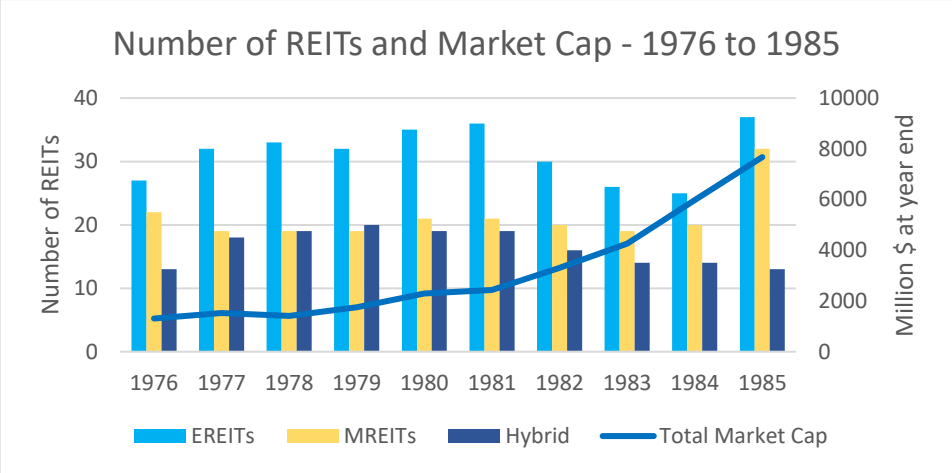
Increases in the distribution of income in form of dividends were also increased from 90 percent to 95 percent[19]. The main reason behind this increase was that the risks of being disqualified from negligence were no longer present, as well as the new possibilities to rectify too little dividends retroactively. Furthermore, the requirements to amount of income coming from real property was increased from 90 percent to 95 percent as well[20].

The changes in 1976 made it possible for REITs to maintain their unique status from year to year by allowing losses to be deducted on future income as well as changing the main sanction from automatic loss of REIT status to primarily penalty taxes. The likelihood of REITs being disqualified was significantly reduced and REITs now had better possibilities for planning in the short- and long-term. Most importantly for REITs value creation was the chance to deduct current losses in future income. However, other rules like the deficiency dividend rule also added significant value by helping management from getting disqualified due to negligence or miscalculations. The flexibility in the newly adopted changes to the rules increased the interest for REITs and is also reflected in figure 3.

[19] I.R.C §857(a)

[20] Tax Reform Act of 1976, §1604(d)

*Figure 3 - REITs evolution between 1976 and 1985*




Source: NAREIT Research

Despite the increased interest there was still a long way to go before REITs could conduct business without doing extensive analysis before making any moves. Furthermore, REITs assets were still restricted to passive investments where profits are not nearly as high as from active investments like city development, new projects, and etc. This restriction was undoubtedly hurting REITs versus regular corporations.

### 2.1.3. Qualified REIT Subsidiary

The Tax Reform Act of 1986 (TRA 86) marked a significant increase in the attractiveness of REITs as an investment vehicle (U.S. Government, 1986). The main theme for this reform was different types of subsidiaries with a special focus on 100% owned subsidiaries. The new rules, and especially the practitioners interpretation thereof, led to the practice of creating non-REIT subsidiaries. The benefit of these non-REIT subsidiaries contrary to the 100% owned subsidiaries was that they could provide services without the income from these services tainting the remaining income from real property. Prior to TRA 86, interests in other REITs constituted qualified assets, while interests in other corporations (non-REITs) did not. Even if the corporation in question only had real property assets[21]. Because of this, REITs were not able to separate assets in separate subsidiaries, which otherwise was a common practice to limit the liabilities of the parent company. In TRA 86 this was changed by treating the assets of a 100% owned subsidiary as if they were owned by the REIT itself, making these subsidiaries Qualified REIT

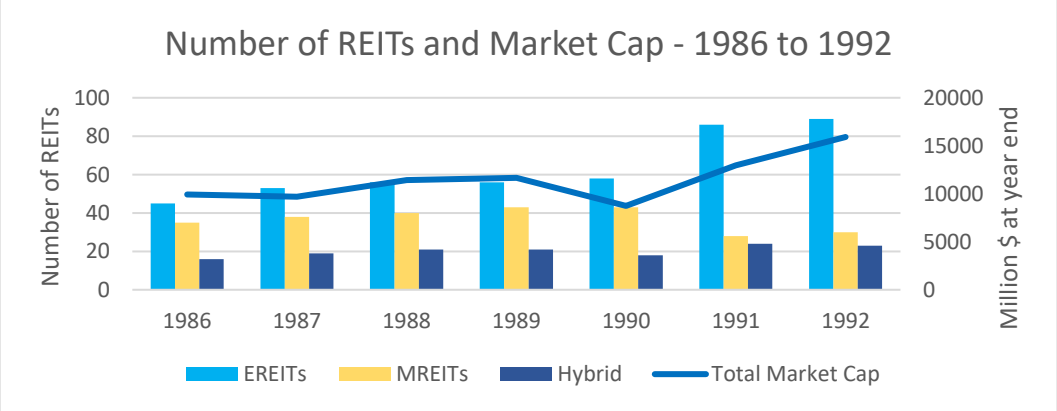
[21] I.R.C §856(c)(6)(B)

Subsidiaries (QRS)[22]. These are not allowed to produce income from services or any other non-qualified income, meaning that they have to live up to the exact same rules as the parent REIT.

In lieu of the creation of Qualified REIT Subsidiaries, many REITs also created Third Party Subsidiaries (TPS). These subsidiaries are not qualified and therefore they are taxed as regular corporations. Furthermore REITs are bound by the asset tests in regards to these non-qualified subsidiaries: (1) REITs are not allowed to own more than 10% of the voting rights in another company, (2) REITs interest in a non-qualified company cannot exceed 5% of the REITs total assets, and (3) 75% of the REITs value must be represented by real property, liquid funds or government securities. First hurdle can be somewhat mitigated by issuing voting and non-voting shares wherein the REIT can maintain a substantial interest while still only having 10% of the votes (Cutson, 1993). This construction is not optimal since the parent company still does not maintain control over the subsidiary. Second hurdle is the least troublesome since the test is done on each separate company and thus the non-qualified assets can be split into two or more subsidiaries until the interest in each is less than 5% of the REITs total value (Cutson, 1993). Lastly, the third and last hurdle regarding the 75% rule cannot be circumvented and must be closely monitored. The introduction of the Third-Party Subsidiary is important since it gave REITs the possibility to utilize their assets and expertise to offer the services related to real property. This allowed REITs to capture the fees they had previously paid to independent contractors for these services.

With the TRA 86, REITs saw an increase in popularity as well as an easier access to high profit business which had been out of reach beforehand. REITs took a step away from pure passive investments towards more active investments in the form of projects and city development. This development indicated higher expectations of future growth and this can be seen in figure 4.

*Figure 4 - REITs evolution between 1986 and 1992*




Source: NAREIT Research

[22] I.R.C §856(c)(4)

### 2.1.4. Revenue Reconciliation Act of 1993

The Revenue Reconciliation Act did not significantly change the rules on REITs and was not focused on the issues that REITs were facing. However, the reform did change the "five or fewer" rule in favor of attracting more institutional investors to the industry in the form of pension funds. Furthermore, the reform made significant changes to the rules on Unrelated Business Taxable Income that had been the major hurdle to get more pension funds to invest in REITs. Institutional investors represent a significant amount of the available investment capital on the market. In 1993 they had between $2.5 and $3 trillion invested, whereof only less than 5% or $125 billion were invested in real estate (Walton, 1994)(Walton, 1994). Thus, it was a huge unrealized investor segment that REITs wanted to access.

REITs are required to have a dispersed ownership structure where, for one, five or fewer owners are not allowed to own more than 50% of the REIT value[23]. In 1993 the reform added §856(h)(3), which had a significant impact in attracting pension funds. Up until now, when testing the ownership diversification, investors like pension funds had been treated as one investor. However, they represent a vast amount of pension depositors and with the new rule, the test "saw through" the fund and counted the number of depositors instead[24]. Thereby the amount institutional investors like pension funds could invest in REITs was greatly increased.

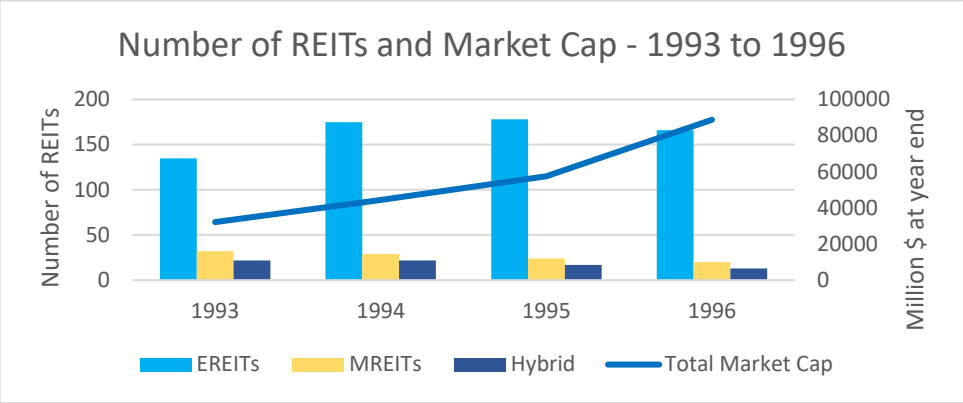
In order to further attract institutional investors the reform also changed the Unrelated Business Taxable Income rules that had deterred many pension funds from investing. Institutional investors are generally tax-exempt entities, but UBTI seeks to tax the investments that are incompatible with the purpose of the tax exempt. Rent, dividends, and interest are normally outside the scope of UBTI. However, when these sources of income are from debt-financed real estate some of the income will be treated as UBTI. The reform added two exemptions of (1) dividends from debt-financed REITs and (2) income from debt-financed real property owned by pension funds[25]. The first exemption made all dividends from REITs non-UBTI income if the original rule of "five or fewer" was upheld (Richmann, 1993). The second exemption dealt with cases where the new possibility of seeing "through" the pension funds had to be used. In those cases pension funds that owned more than 10% of the REIT value would have to treat some dividend as UBTI income. Even then there were a few ways to avoid being taxed on UBTI[26] (Richmann, 1993).

With the relaxation of UBTI and "five or fewer" it became possible for institutional investors to invest much larger amounts in REITs, without having to pay taxes on the received dividends. This increased the

[23] I.R.C §856(a)(6)
[24] I.R.C §856(h)(3)
[25] I.R.C §514(d) and I.R.C §514(c)(7)
[26] I.R.C §856(h)(3)(C) and I.R.C §856(h)(3)(D)

propensity to invest greatly and is reflected by a big increase in the total market cap after 1993 as seen in figure 5.

*Figure 5 - REITs evolution between 1993 and 1996*




Source: NAREIT Research

### 2.1.5. Taxable REIT Subsidiary

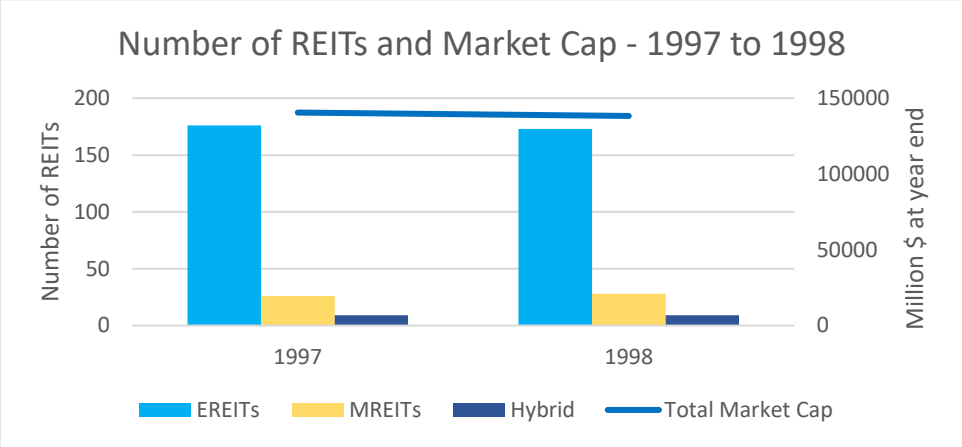
The Tax Relief Act of 1997 introduced the Taxable REIT Subsidiary (TRS) to the REIT toolbox (U.S. Government, 1997). The addition of this type of subsidiaries gave REITs the possibility of moving past what was traditionally seen as passive investment companies. REITs are now allowed to own up till 100 percent of one or more taxed subsidiaries as long as the total value of all these ownerships does not exceed 20% of the REITs total assets[27]. Since the new subsidiaries pay taxes as regular corporations they are allowed to offer all types of services to tenants and non-tenants of REIT properties. This gives REITs new possibilities to offer both common and uncommon services to tenants and especially non-tenants without this income being a potential risk for disqualification of REIT status. Additionally, this gave REITs the chance to be competitive on services, create customer loyalty, and tap a new source of income that was previously handed off to independent contractors. This new TRS structure was meant to replace the TPS structure that had been used until 1997. In order to become a TRS both the parent company and the subsidiary had to choose this[28]. Instead of REITs owning all the non-voting shares and only a small amount of voting shares, it was suggested that they should be allowed to own more than 10% (up till 100%) of the subsidiary if it is a TRS. However, this was not implemented in the Tax Revenue Act of 1997, but would be introduced in 1999.

The cost of this new potential was a complex set of tax rules in order to make sure that these new subsidiaries pay their fair share of corporate taxes (Brandon and Deluca, 2000). The complexity

[27] I.R.C §856(c)(4)(B)
[28] I.R.C §856(I)

introduced in 1997 still haunts REITs. As a result, REITs have to do their due diligence whenever they utilize these tools. However, the introduction of TRS gave REITs the tools to become much more active businesses and made the whole REIT industry much more competitive. With only two years until the next reform affecting REITs it is hard to see the results of the Tax Relief Act of 1997 in the numbers of REITs and the total market cap, that both remained steady as seen in figure 6.

*Figure 6 - REITs evolution between 1997 and 1998*




Source: NAREIT Research

### 2.1.6. REIT Modernization Act of 1999

The most recent reform affecting REITs was the REIT Modernization Act of 1999 (U.S. Government, 1999). This reform, as the name suggests, was aimed at REITs and mainly sought to adjust the rules implemented by the Tax Relief Act in 1997. Now REITs can practically offer any kinds of services through taxable subsidiaries. In addition, the suggestion of changing the rules on ownership limitations in other corporations to exempt these Taxable REIT Subsidiaries was implemented. REITs were now allowed to own more than 10% (up till 100%) if both parent and subsidiary agreed to the TRS status[29].

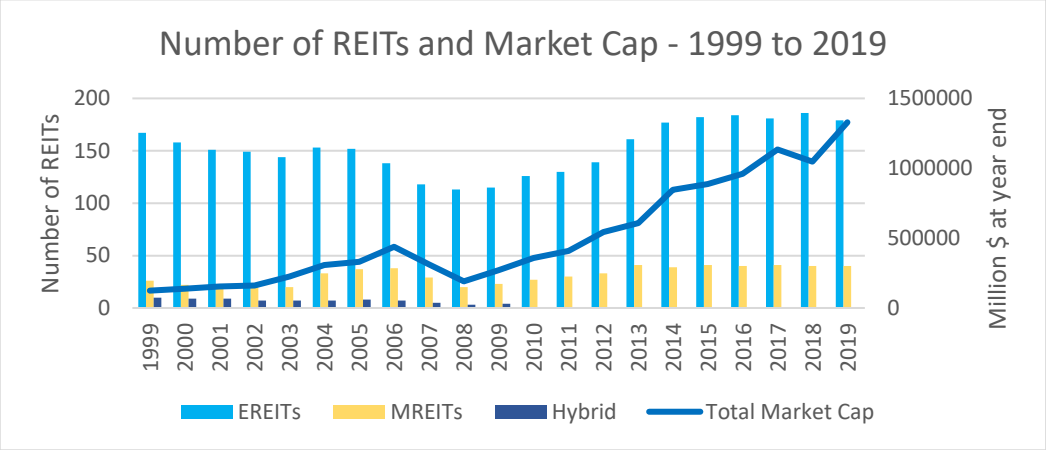
Another noteworthy change the REIT Modernization Act introduced was that the requirements to dividends paid to shareholders was reduced from 95% back to the original 90%. All income that is not distributed through dividends are still taxable on corporate level, but it gave REIT management the possibility to retain more earnings.

After the Tax Relief Act in 1997 as well as the small adjustments of the REIT Modernization Act in 1999, REITs were now highly competitive corporations with great possibilities of increasing their income scope through services and more active projects. Because of this, REITs can to an even larger extent benefit

[29] § 856(I)

from economies of scale. In the years following 1999 there was an increase in market cap combined with a small decrease in the amount of REITs, which meant that REITs became fewer and larger as seen in figure 7.

*Figure 7 - REITs evolution between 1999 and 2019*




Source: NAREIT Research

### 2.1.7. Recent REIT Development

In the years following the last regulatory reform of REITs in 1999, REITs underwent a great growth. The total market capitalization increased drastically while the total amount of REITs remained generally stable. In the little over twenty years since 1999 there have been no regulative changes to REITs and therefore it is reasonable to attribute most of the change in REIT performance to the economic situation as well as the real estate fundamentals in this period. In the years leading up till 2007 a combination of historically low interest rates, easy access to debt capital and strengthening fundamentals led to one of the largest commercial real estate bubbles in history (Barclays Research Department, 2018).

In February 2007, the real estate bull market (Chen and Scott, 2020) came to an end including, but not limited to single-family, commercial property and real estate stocks. Several banks declared bankruptcy or were forced to sell at distressed prices, which resulted in the S&P 500 falling nearly 40%. However, REITs remained stable with stocks being flat for the first nine months until the Lehman Brothers' bankruptcy which spread the risk to all asset classes. The market concern was that the credit crisis would erode the flow of capital to real estate for a long period of time and this made REITs fall quickly.

REITs utilized one of their primary advantages in the beginning of 2009 in order to counter the market unease regarding insolvency in the industry. REITs raised an aggregate of $21 billion in 2009 and this successfully rallied REIT equities. In 2010 the real estate fundamentals started to improve for most property types. This was due in part to global demand for income and in part because investors were

seeking primarily yield. They saw REITs as a double-sided hedge. On one hand REITs would provide stable income e.g. from leases in case of macroeconomic downturn. On the other hand, REITs have underlying hard assets that provide inflation protection in case of economic recovery and the resulting inflation.

Beginning in 2011 and moving forward until today the real estate fundamentals have improved and remained fairly stable. This has resulted in increased market capitalization up until the investor sentiment changed around the election in 2016, as shown in figure 7. Investors already perceived real estate to be in the late part of its cycle and the expectation, and later implementation, of the tax reform bill in 2017 further changed investor sentiment for the worse. The tax reform bill is mainly seen as to benefit corporations that pay full tax rates and thus not benefit tax-advantaged REITs as much.

The REIT performance in the last few years was mainly driven by real estate fundamentals remaining fairly strong. Ultimately the market capitalization of Equity REITs has increased to an all-time high in 2019 of $1.3 trillion (NAREIT, 2020a).

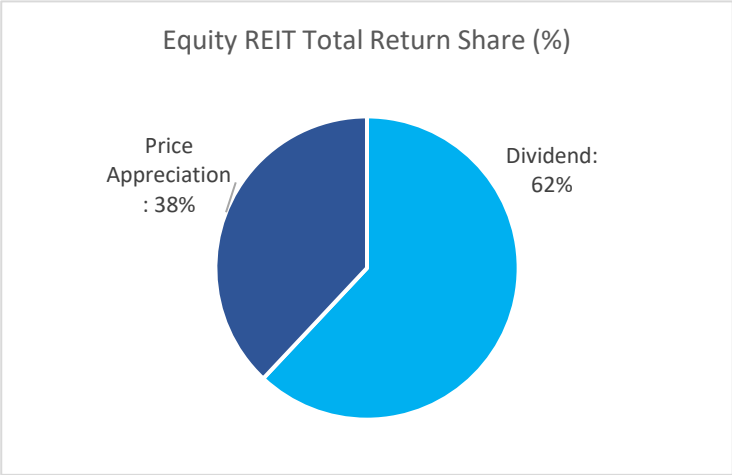
## 2.2. Main Characteristics

There are several characteristics that together helps us understand what REITs are and how they act under different situations. In this chapter we will go through these characteristics one at a time, which will create the foundation for understanding the unique investment vehicle that REITs are. In (ch. 2.2.1) we will describe how REITs, as a total-return vehicle, includes a significant income component in the form of dividends. This will be further explained in (ch. 2.2.2). Subsequently, we will study why REITs are considered a great source of both diversification (ch. 2.2.3) and inflation protection (ch. 2.2.4). Lastly, the last two sections will cover the notions of REITs liquidity (ch. 2.2.5) and volatility (ch. 2.2.6).

### 2.2.1. Total-Return Vehicle

There are several different ways to evaluate the performance of investments. When investing in real estate assets it is most common to evaluate the investment using total-return. This is also the case for REITs that are a total-return asset class. Total-return includes two categories of return, which are income return and capital appreciation (Kenton, 2020). Income return covers the distributions from a REIT in the form of dividends paid out to shareholders. Whereas capital appreciation is the change in market price of the REIT stock.

*Figure 8 - Dividends make up for a great proportion of REITs total return*




Source: NAREIT Database

The weights of the two sources of return varies between investments. When dissecting the total returns of REITs in the last 20 years we find that only about 38% comes from price appreciation, which exemplifies how important dividend is to REITs total return, comprising about 62 percent (Barclays Research Department, 2018). Therefore, the more efficiently a REIT can increase its earnings, the higher the return it provides to investors. Given that dividends are a major part of a REIT's return, they must continuously seek to find new ways to increase earnings and, by extension, dividends. Overall this can either be done by internal- or external growth. Internal growth revolves around trying to improve the existing portfolio of the REIT. This can be accomplished through better occupancy rates, raising the rent, optimizing expenses by outsourcing, redevelopment of properties or other ways to increase earnings or decrease expenses in current properties. On the other hand, external growth is about acquiring and developing new properties.

When REITs decide to invest in new properties as part of their external growth, they must also contemplate what kind of investment they want to acquire. This includes what type of property, which relates to the sector the REIT operates in. But it also relates to the riskiness and quality of the property. Normally properties are divided into (I) Core, (II) Core Plus, (III) Value-Add and (IV) Opportunistic Investment. Each type comes with fundamental characteristics as well as standardized expectations on performance (Pagliari, 2020).

(I) Core (income) property is the least risky type and is considered the most passive of the four investment opportunities. Properties of this class are characterized by very little need for active management, will mostly be occupied with credit tenants, and use long-term leases. The expectations on Core properties is an annualized return between 7% and 10%, which will mainly come from cash flow from the property and not appreciation. (II)Core Plus (growth and income) property is considered slightly riskier than the core investment. The properties are still of high quality and well occupied, but they have a potential to be improved through management efficiencies, better tenants or light property improvements. The expectation for Core Plus properties are slightly higher at 8% to 10% annually, but also comes with less predictable cash flow and requires active management. (III) Value-Add (growth) property is seen as moderate to high risk. When the investor purchases the property it produces little to no income and comes

with some problems that will have to be fixed. The potential for these properties are high and the goal is to add the value needed in order to realize this potential in the form of cash flow. Due to the growth status of these properties, the expected return is between 11% and 15%. (IV) Opportunistic Investment strategy is by far the riskiest type of all the strategies. As with Value-Add, this type of property is considered growth and is characterized by complicated projects with long timelines for return on investment. These types of properties also require a lot of experience to manage and therefore the expected returns are 20% or higher in order to compensate for the time and work needed. (Shilling and Wurtzebach, 2012)

Besides these four categories of investment types, there are also other special categories to take into account. One of these types of investments are LEED (sustainability) investments. They are related to environmental and sustainable property investments and besides the general performance, they can potentially affect brand image.

### 2.2.2. Dividends

Dividends is the distribution of a portion of a company's earnings to a specific class of shareholders. They are decided and managed by the company's board of directors and vary in frequency and size between companies, industries and types of assets (Chen, 2020b). REITs are by their regulation required to distribute a minimum of 90% of their total income to shareholders in the form of dividends[30] (Ferst and MacCrate, 2000). However, many REITs often exceed the minimum requirements of 90% (Wang, Erickson and Gau, 1993). Distributing most of the income leaves REITs with the task of raising capital, and incur the costs of this, whenever they want to invest in a project. It may seem odd that REITs do not retain more earnings, but the likely explanation is that the expectations and requirements of a higher dividend comes from the shareholders. To minimize the need for shareholders to supervise the REIT management, they seek to reduce the amount of capital available. This will keep REITs on the debt market where it can raise funds for new projects. As a part of this, shareholders are then transferring their supervision requirements and costs to the market instead (Easterbrook, 1984).

The sizable dividend from REITs has led institutional investors like pension funds to invest heavily in REITs (Barclays Research Department, 2018). Institutional investors are interested in a balanced return on investments and the goal is to create a portfolio that combines equity appreciation with a steady stream of inflation-adjusted income (Whiteside, 2020).

[30] 1960 with the introduction of REITs the dividend requirement was 90%. In 1976 it was increased to 95% and later in 1999 it was decreased again to the current 90%.

### 2.2.3. Diversification

Portfolio theory tells us that in order to optimize your investments you should seek to diversify your portfolio in a way that minimizes or completely removes unsystematic risk (Hull, 2018). Unsystematic risk is specific to a certain company or an industry, and therefore by spreading your investments to several significantly different companies or industries you minimize the risk your portfolio holds. In order for an investment to be a suitable diversification it must have as low a correlation to your current investments as possible.

REITs have seen a moderate correlation with other major indices over the last 15 years as seen in table 1. Over time the increased acceptance of REIT as an asset class, along with greater index inclusion and liquidity over time, has allowed REITs to trade more in-line with changes in the real estate value rather than overall equity markets. This has resulted in a decreasing correlation over time. However, there remains a moderate correlation and this tells us that investor sentiment towards REITs still remains a key factor in performance (Barclays Research Department, 2018).

*Table 1 - Total Return correlation between REITs and other major indexes*

| Total Return Correlation | | | | |
|---|---|---|---|---|
| | 3-year | 5-year | 10-year | 15-year |
| S&P 500 | 0.52 | 0.36 | 0.74 | 0.70 |
| Dow | 0.49 | 0.30 | 0.69 | 0.65 |
| NASDAQ | 0.40 | 0.26 | 0.66 | 0.62 |
| Russell 2000 | 0.43 | 0.32 | 0.75 | 0.72 |
| Russel Midcap | 0.57 | 0.45 | 0.79 | 0.75 |

Source: NAREIT, Thompson Reuters, Barclays Research

Taking a broader look at different asset classes researchers found the correlations shown in table 2 (Beath, 2019). Analyzing the results we find two main findings. First of all, as highlighted in green, REITs and unlisted real estate returns were highly correlated which is not surprising given the similarities in underlying assets. Secondly, as highlighted in yellow, REITs and unlisted real estate returns had relatively low correlations with bonds and listed equity returns.

*Table 2 - REITs demonstrate a relative low correlation with all asset classes*

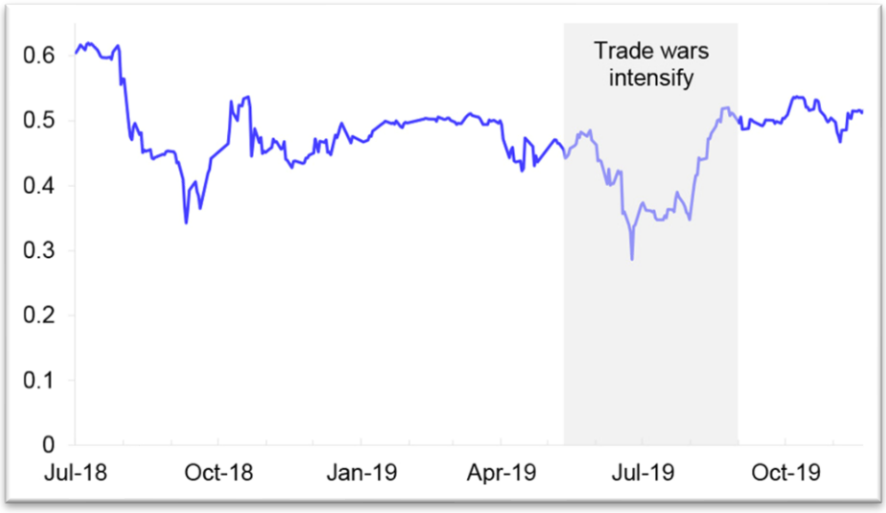
| Key Correlations between Asset classes (1998-2017) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **REITs** | **Private Real Estate** | **U.S. Long Bonds** | **U.S. Large Cap** | **U.S. Small Cap** | **Non-U.S. Equities** | **Private Equity** | **Hedge Funds** |
| **REITs** | 1.00 | 0.91 | -0.03 | 0.53 | 0.62 | 0.56 | 0.49 | 0.50 |
| **Private Real Estate** | - | 1.00 | -0.06 | 0.47 | 0.57 | 0.54 | 0.53 | 0.43 |
| **U.S. Long Bonds** | - | - | 1.00 | -0.41 | -0.51 | -0.50 | -0.61 | -0.30 |
| **U.S. Large Cap** | - | - | - | 1.00 | 0.92 | 0.89 | 0.85 | 0.92 |
| **U.S. Small Cap** | - | - | - | - | 1.00 | 0.88 | 0.89 | 0.79 |
| **Non-U.S. Equities** | - | - | - | - | - | 1.00 | 0.89 | 0.85 |
| **Private Equity** | - | - | - | - | - | - | 1.00 | 0.79 |
| **Hedge Funds** | - | - | - | - | - | - | - | 1.00 |

Source: CEM Benchmarking 2019

The explanation for this is that real estate as an asset class, and thereby REITs by proxy, is one of the three fundamental investment asset classes. Stocks and bonds are considered the other two fundamental asset classes and together they all amount to $79 trillion in investable assets in the United States. Real estate investments, which exempts single-family homes, is estimated to be $17 trillion and thereby 21% of the total amount of investable assets. Furthermore, real estate has its own unique underlying drivers and its own business cycle that is different from that of stocks and bonds. This uniqueness of REITs combined with the size of the asset class explains the low correlation with other indices and provides the potential for portfolio diversification (Wilshire, 2019).

In the summer of 2019 REIT investors saw the benefit of the diversification REITs provide to the rest of the equity market. As the US-Chinese trade war intensified and impacted the stock market significantly, REITs provided a safe harbor. This is evident from the lowered correlation between All Equity REITs Index and the S&P 500 (NAREIT, 2020c)

*Figure 9 - Correlation between the S&P 500 and the NAREIT All Equity REITs Index*




Source: (NAREIT, 2020c), Bloomberg, NAREIT

### 2.2.4. Inflation Protection

One of the growing concerns among investors is inflation and how to guard against it in your investments. Especially in times of high inflation you want to divert your investments to inflation protected assets and REITs have historically shown that they are a good source for this. The underlying assets in REITs focus on the real estate income, which is income earned from renting out the owned properties. The reason why real estate works well with inflation is, as inflation rises, so does property values, and so does the amount a landlord can charge for rent, earning higher rental income over time. This helps to keep pace with the rise in inflation (Funari and Barwick, 2019).

This intuition is reflected in the historical data where REITs have provided superior inflation protection compared to both fixed-income assets, equities and commodities. This is especially remarkable since commodities is often viewed as one of the most effective hedges against inflation. In 6 month rolling returns REITs have historically had 73% of the periods providing a total return equal to or higher than that of inflation, edging out the S&P 500 Index with 3 percent points (Wilshire, 2019). Inflation and inflation protection is crucial to the overall analysis of this thesis and as such is also explored in further detail in (ch. 4.1.4).

*Table 3 - REITs provide the highest inflation protection among the indexes considered*

| REITs as a Source of Inflation Protection | | | | | |
|---|---|---|---|---|---|
| | **S&P GSCI Total index** | **S&P 500 Index** | **FTSE NAREIT All Equity REITs Index** | **Barclays Capital U.S. Aggregate Index** | **Barclays Capital U.S. TIPS Index** |
| **6 month rolling returns** | 56% | 70% | 73% | 66% | 65% |
| **12 month rolling returns** | 56% | 76% | 76% | 73% | 70% |

Source: Wilshire Compass, U.S. Department of Labor, Bureau of Labor Statistics

### 2.2.5. Liquidity

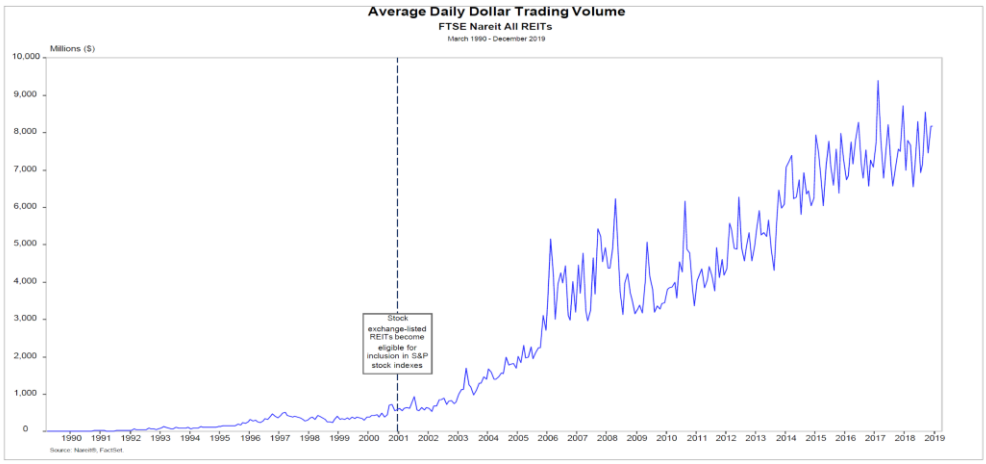
Real estate as an asset class is by nature a very illiquid asset because it can take a long time to sell and buy properties. It can take months or even years to sell, and thereby liquidate, direct real estate investments. However, one of the benefits of publicly traded REITs is that it gives the investors the possibility to buy and sell interests in real estate returns instantaneously. Thereby adding liquidity to the real estate investments (Barclays Research Department, 2018).

In 1955 Boulding (Boulding, 1955) expressed that "Liquidity is a quality of assets which is not a very clear or easily measurable concept." So even though the addition of REITs logically made the real estate market more liquid, there is still today not a unified definition of how to measure financial asset liquidity. In 1985 Kyle (Kyle, 1985) created three transactional characteristics that measure the liquidity of a financial asset.

(I) Tightness: the cost of liquidating a position over a short period of time. (II) Depth: the ability to buy or sell large quantities of shares with minimal price impact. (III) Resiliency: propensity of prices to recover quickly from a random shock to the market.

When looking at the daily trading volume of REITs we see a steady growth indicating that the liquidity of the asset is increasing. Reading the graph we find that FTSE NAREIT All REITs has an average daily trading volume (ADTV) of around $8,000 million, which makes it a highly liquid stock where large buys or sales can take place without a significant impact on the stock itself (NAREIT, 2020c).

*Figure 10 - REITs shows high liquidity*




Source: (NAREIT, 2020c), NAREIT, FactSet

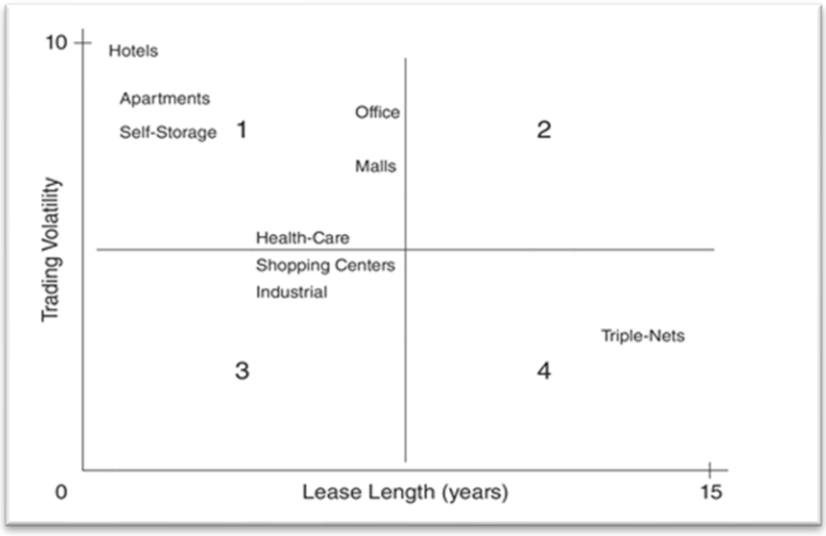
With liquidity also comes the risk of volatility since the continuous trade with the publicly traded REIT impacts the daily prices. Investors in private REITs often pinpoint the lack of volatility as one of the main benefits of investing in these REITs over publicly traded ones. In line with most shareholders they appreciate the fact that they do not have to worry about the daily price movements in their investments. However, as mentioned earlier this comes at the price of liquidity as it can take a long time to redeem an investment in a private REIT.

### 2.2.6. Volatility

As with all other publicly traded financial assets, REITs trade at different daily stock prices and the change in these is referred to as the volatility of the stock. When it comes to REITs there are two main factors that can influence the volatility of the specific REIT. These are lease lengths as well as the nature of the underlying property assets the REIT operates (Li, 2012).

Generally speaking the shorter the lease length a REIT operates, the more volatile the stock of this REIT will be, because the operating income can change in a shorter time span. When it comes to the nature of the demand for the property types the REIT owns and operates, it also plays a significant impact on the trading volatility, which is a proxy for risk. Some demand for certain property types is much more cyclical and dependent on economic trends than others. An example is that demand for hotels is much more dependent on the economic state than demand for warehouse space. People do not have to travel, but goods have to be stored and distributed to grocery stores and other vendors regardless.

*Figure 11 - REIT sectors relationship between trading volatility and lease length*



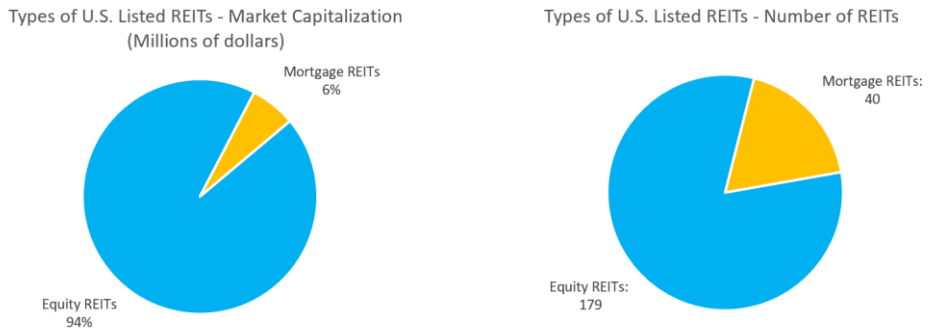

Source: (Krewson-kelly and Thomas, 2016)

When analyzing lease length and trading volatility on different property types we can create figure 11, which depicts the relationship between longer leases and less trading volatility. Knowing this relationship investors' can choose to invest in REITs with specific property types according to their risk tolerance. Besides volatility, leases also impact the ability for real estate performance to follow economic conditions. With long leases, the time it takes for a property's cash flows to reflect the current economic condition is greatly increased. This can be utilized to predict REIT's performance during times of economic expansion and contraction (Krewson-kelly & Thomas, 2016).

## 2.3. REIT Industry and Sectors

In (ch. 1.3) we covered that REITs can cover two main types and for the purpose of this paper REITs will always refer to Equity REITs. Prior to 2010 there existed a third type of REIT, which was the Hybrid REIT. REITs in this category have since been reclassified into the current two categories and Hybrid REITs no longer exist. Equity REITs are the most common of the two remaining types and are REITs that own and operate property. Mortgage REITs are much fewer in numbers and operate by acquiring or creating mortgage and debt securities backed by real estate (Barclays Research Department, 2018).
Ultimo 2019 Equity REITs constituted 82% of the total amount of publicly listed REITs with 179 out of 219 (figure 12). Analyzing the total market capitalization for both REITs, we find that Equity REITs accounted for 94% with a total market capitalization of $1.25 trillion as is illustrated in figure 12 (NAREIT, 2020a).

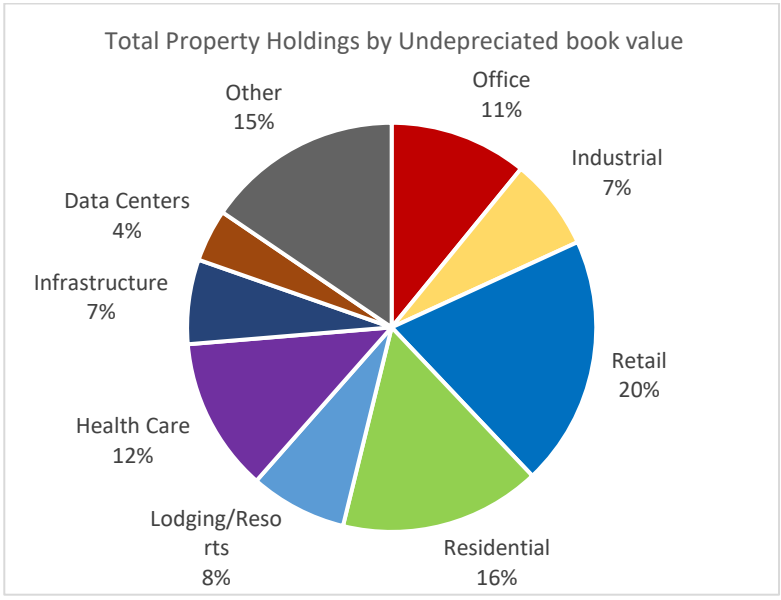
*Figure 12 - Equity REITs and mREITs diversification*




Source: NAREIT

In accordance with our delimitation, we will only focus on Equity REITs. When segregating the industry into sectors, the groupings revolve around the type of property owned by the RIET. The NAREIT Composite Index has created a list of the segments used in the industry. For the purpose of this thesis we will use the following REIT sectors: Industrial, Retail, Residential, Healthcare, Office, Infrastructure, Data Centre and Lodging/Resort. The distribution of the different sectors can be seen in figure 13.

*Figure 13 - REIT sectors diversification*

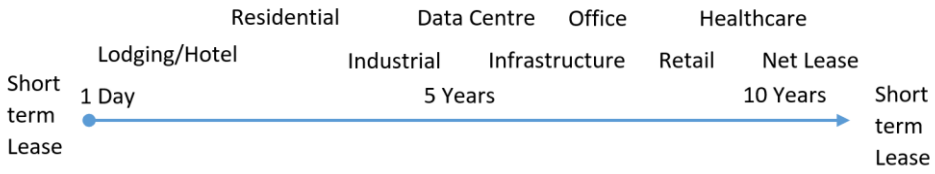



Sources: NAREIT T-Tracker

Even though REITs have many similarities in how they operate and the regulation that they must follow, they also differ from sector to sector (Pfeffer, 2009). Different types of properties are subject to various main drivers that impact demand and performance differently. One factor that significantly impacts sector differentiation is leases. Depending on the type of property and tenant, leases are constructed significantly

different. The major factor that differentiate lease contracts between sectors is the length. Lodging/Resort REITs have the shortest leases among all, with customers being able to rent on a daily basis. Self-storage and Residential also have short lease-terms often less than a year, as seen in figure 14. Shorter lease-terms provide REITs with the flexibility to seize gains from economic upturns, but also makes the REIT more susceptible to the negative changes that might occur. Longer lease-terms as with Health Care and Office provide stability due to the fact that neither party involved can change the terms of the contract quickly in response to economic fluctuations (Qing and Orzano, 2020)

*Figure 14 - Typical Lease Term vary among different REIT Sectors*

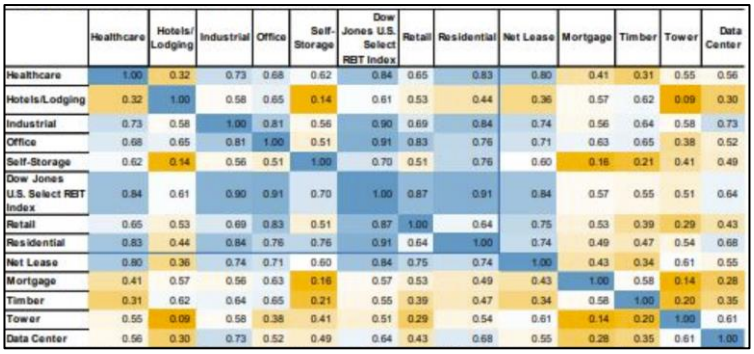



Source: S&P Dow Jones Indices LLC

As a special case we have net leases. This type of lease is not linked to a certain property type, but instead is a special lease construction. In net leases, the agreement between the REIT and tenant includes a part of or all of the taxes, insurance fees, and maintenance costs for a property in addition to rent (Chen, 2020). With this type of lease the overall risk is passed on to the tenant, leaving the REIT with little risk and a passive steady income.

In order to illustrate how similar and different some REIT sectors are, a recent study looked at the correlation between the different REIT sectors (Qing and Orzano, 2020). As can be seen in figure 15, most traditional commercial real estate sectors are highly correlated, but the correlation between traditional and non-traditional sectors like data centers and infrastructure is much lower. This supports the argument that because these property types are so different, the different fundamental drivers of these sectors strongly influenced the differing returns.

*Figure 15 - REIT sectors correlation*



| | Healthcare | Hotels/ Lodging | Industrial | Office | Self-Storage | Dow Jones U.S. Select REIT Index | Retail | Residential | Net Lease | Mortgage | Timber | Tower | Data Center |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Healthcare | 1.00 | 0.32 | 0.73 | 0.68 | 0.62 | 0.84 | 0.65 | 0.83 | 0.80 | 0.41 | 0.31 | 0.55 | 0.56 |
| Hotels/Lodging | 0.32 | 1.00 | 0.58 | 0.65 | 0.14 | 0.61 | 0.53 | 0.44 | 0.36 | 0.57 | 0.62 | 0.09 | 0.30 |
| Industrial | 0.73 | 0.58 | 1.00 | 0.81 | 0.56 | 0.90 | 0.69 | 0.84 | 0.74 | 0.56 | 0.64 | 0.58 | 0.73 |
| Office | 0.68 | 0.65 | 0.81 | 1.00 | 0.51 | 0.91 | 0.83 | 0.76 | 0.71 | 0.63 | 0.65 | 0.38 | 0.52 |
| Self-Storage | 0.62 | 0.14 | 0.56 | 0.51 | 1.00 | 0.70 | 0.51 | 0.76 | 0.60 | 0.16 | 0.21 | 0.41 | 0.49 |
| Dow Jones U.S. Select REIT Index | 0.84 | 0.61 | 0.90 | 0.91 | 0.70 | 1.00 | 0.87 | 0.91 | 0.84 | 0.57 | 0.55 | 0.51 | 0.64 |
| Retail | 0.65 | 0.53 | 0.69 | 0.83 | 0.51 | 0.87 | 1.00 | 0.64 | 0.75 | 0.53 | 0.39 | 0.29 | 0.43 |
| Residential | 0.83 | 0.44 | 0.84 | 0.76 | 0.76 | 0.91 | 0.64 | 1.00 | 0.74 | 0.49 | 0.47 | 0.54 | 0.68 |
| Net Lease | 0.80 | 0.36 | 0.74 | 0.71 | 0.60 | 0.84 | 0.75 | 0.74 | 1.00 | 0.43 | 0.34 | 0.61 | 0.55 |
| Mortgage | 0.41 | 0.57 | 0.56 | 0.63 | 0.16 | 0.57 | 0.53 | 0.49 | 0.43 | 1.00 | 0.58 | 0.14 | 0.28 |
| Timber | 0.31 | 0.62 | 0.64 | 0.65 | 0.21 | 0.55 | 0.39 | 0.47 | 0.34 | 0.58 | 1.00 | 0.20 | 0.35 |
| Tower | 0.55 | 0.09 | 0.58 | 0.38 | 0.41 | 0.51 | 0.29 | 0.54 | 0.61 | 0.14 | 0.20 | 1.00 | 0.61 |
| Data Center | 0.56 | 0.30 | 0.73 | 0.52 | 0.49 | 0.64 | 0.43 | 0.68 | 0.55 | 0.28 | 0.35 | 0.61 | 1.00 |

Source: (Li and Orzano, 2020) S&P Dow Jones Indices LLC. Data as Sept. 30, 2019

### 2.3.1. Office

Contrary to most other REIT Sectors, Office REITs does have any sub sectors. Instead the sector covers all REITs that operate and/or own office real estate. The properties in the sector vary in location and purpose. They range from all-urban to all-suburban and also in their particular focus such as offices for government agencies, high-tech companies or financial firms (REIT Institute, 2020).

Office REITs as a sector have different dynamics in play depending on the location and type of office property. Studies conducted on the submarkets of the London office market found that the prediction of rents highly relied on different dynamics depending on the submarkets (Wheaton, Torto and Evans, 1997; Stevenson and McGarth, 2003). However, generally speaking office REITs tend to prosper when economic conditions are improving. This leads to increased demand for office space, which in turn gives the landlord bargaining power that results in higher rents. Also, it becomes easier for the office tenants to pay their rent on time.

Office REITs are one of the medium sized sectors with 11% of the total market according to figure 13. It is considered one of the traditional sectors (Qing and Orzano, 2020) and as figure 15 shows us, it is highly correlated with other traditional sectors such as Industrial and Residential. In addition, as seen in figure 15 the average lease-terms in the Office REIT sector are medium to long with contracts signed for more than 5 years on average.

### 2.3.2. Industrial

Industrial REITs amount to 7% of the total market according to figure 13. Within the scope of this analysis, the term describes REITs that invest and manage warehouses and distribution centers. It excludes self-storage facilities, which are summarized in a different sector category, which is not included in this

thesis. Depending on the function, for example, storage, distribution, or processing, industrial properties can differ significantly in their structure and fungibility (REIT Institute, 2020).

Moreover, industrial properties are driven by different fundamentals and trends. Their performance and physical market cycle depend heavily on the development of the trucking and distribution industry, which was influenced by major shifts in the last decade (Mueller and Mueller, 2007). Industrial REITs normally lease industrial space to manufacturers, retailers, transportation companies, third-party logistics providers, and other enterprises with large-scale distribution needs.

Industrial REITs are one of the smaller sized sectors with 7% of the total market according to figure 13. It is considered one of the traditional sectors (Qing and Orzano, 2020) and as figure 15 shows us, it is highly correlated with other traditional sectors such as Office and Residential. As seen in figure 15 the average lease-terms in the industrial REIT sector are medium with lease contracts normally signed for 5 years at the time.

### 2.3.3. Retail

Different REIT property subtypes are included in Retail REITs and the sector in total accounts for 20% of the total market as seen in figure 13, making it the single biggest REIT sector. On a property focus level, it can be differentiated between three main categories: Shopping Center REITs, Regional Malls REITs, and Other Retail REITs. Generally, regional malls are shopping malls that are designed to service a larger market than a "conventional" shopping mall. An outlet mall is a special type of shopping mall where manufacturers sell their products directly to the public through their own branded stores or sell returned goods and discontinued products, often at heavily reduced prices. Shopping Center REITs are usually in neighborhoods with a grocery anchor tenant and other small convenience merchants (Pfeffer, 2009; REIT Institute, 2020).

The Retail sector is highly susceptible to the economic conditions as it revolves around leasing space to stores. Since consumer spending is very correlated with the economy, Retail can greatly benefit from economic growth, but conversely they are also greatly affected by economic downturn. Retail REITs are moderately correlated with both traditional and specialty REIT sectors as can be seen in figure 15. According to figure 14, Retail REITs average lease-term goes from around 5 years up closer to 10 years depending on the type. Thereby lease-terms are considered medium to long for this sector. However, in some cases Retail REITs sign contracts with anchor tenants that are close to 20 to 30 years in length.

### 2.3.4. Residential

Due to the different terms referring to REITs that invest in residential real estate, a precise classification and a term designation are necessary. Most important, this thesis focuses on multi-family income-producing real estate only. A company that is active in residential "for sale, not for rent" home ownership markets cannot be a REIT. Residential (for sale) home ownership markets are a production process, where inventory is used to manufacture a product that is sold to customers. This concept is completely different for a REIT, which acquires/sells and manages income-producing apartment buildings. Consequently, real estate cycles are different between these two sectors, driven by different fundamentals. For example, a large share of borrowers, by virtue of poor credit history, unstable income, and other characteristics, would not have been able to qualify for a mortgage without the subprime lender market. This is different from commercial real estate, where the insolvency risk depends on the credibility of (multiple) tenants in a building (Chinloy and Macdonald, 2005).

Residential REITs is the second biggest sector with 16% of the total market according to figure 13. It is considered one of the traditional sectors (Qing and Orzano, 2020) and as figure 15 shows us, it is highly correlated with other traditional sectors such as Office and Industrial. As seen in figure 14 the average lease-terms in the industrial REIT sector are medium with normally around 5 years on leases.

### 2.3.5. Lodging/Resorts

Lodging and Resort REITs, which are often referred to as Hospitality REITs, are a type of Equity REIT involved with the ownership and management of hotels, resorts and other accommodations that rent space to tenants. Hotels can be classified by their amenities and level of service, and different REITs may specialize in one or more hotel classes. In general, the spectrum of customers who frequent the properties in this REIT sector is wide, from vacationers to business travelers (REIT Institute, 2020).

Naturally, good economic conditions favor Hospitality REITs as consumers have more money to spend on vacations and profitable businesses can afford more business travel. A negative factor that continues to weigh down Hospitality REIT values is the growth of a sharing economy and players like Airbnb. These alternative lodgings are more likely to have their largest impact upon hotel compression (the percent of total occupancy) during bad economic times when consumers seek the lowest possible prices.

Hospitality REITs is one of the smaller sectors with 8% of the total market according to figure 13. Since Hospitality REITs are very susceptible to economic conditions, where more traditional properties are more resilient, the sector has a below average correlation with most other sectors as seen in figure 15. As seen in figure 14, Hospitality REITs have the shortest leases of all REITs as the tenants can occupy a rental for as little as one day.

### 2.3.6. Health Care

Health care REITs own and manage a variety of health care-related real estate and collect rent from tenants. The sub-sectors include medical office buildings, senior housing, hospitals, medical labs, nursing facilities, and post-acute care facilities (NAREIT, 2020b).

The sector sits at the intersection between real estate and health care investments and is generally considered a non-cyclical investment. Patients have to go to the doctor regardless of the economic situation, but at the margins a recession can make some patients postpone checkups and treatment of minor conditions because of the cost (REIT Institute, 2020).

Health Care REITs is a medium sized REIT sector with 12% of the total market according to figure 13. Health Care REITs are moderately correlated with both traditional and specialty REIT sectors as can be seen in figure 15. As seen in figure 14, Health Care REITs involve lease contracts that are among the longest in the industry with average lease-terms close to 10 years.

### 2.3.7. Infrastructure

Infrastructure REITs own and manage infrastructure real estate and collect rent from tenants that occupy that real estate. Infrastructure REITs' property types include fiber cables, wireless infrastructure, telecommunications towers and energy pipelines. Because of the diverse nature of infrastructure REITs, some are more cyclical (economically sensitive) than others. However, they tend to be less cyclical than many other types of real estate (NAREIT, 2020b; REIT Institute, 2020).

The types of industries that lease properties from infrastructure REITs are highly regulated. This can work for or against these REITs. For example, regulation and zoning issues limit communication tower supply, giving a big advantage to REITs that own these properties. They have strong tenant retention and pricing power. On the other hand, new regulations can often be costly, so it is important to realize that there are significant risks.

Infrastructure REITs is one of the smaller sectors with 8% of the total market according to figure 13. Infrastructure REITs are considered one of the specialty sectors (Qing and Orzano, 2020) and as figure 15 shows us, it is highly uncorrelated with traditional sectors such as Office and Residential. Infrastructure assets are leased on a long-term basis and most closely resembles industrial leases with average lease-terms of 5+ years as can be seen in figure 14.

### 2.3.8. Data Centers

Data Center REITs, also called Data Storage REITs, manage and own facilities that safely store digital resources for customers. The primary focus of data centers is to ensure reliable operation of information

systems and safekeeping the data used by these systems. For many companies, any break in service can disable IT operations and cripple the entire business. Cloud computing is meant to mitigate the risk that any one data center failure will disrupt customer operations, as data and services are distributed over multiple physical locations with automatic switching in the event of a site failure (NAREIT, 2020b).

Differentiation exists within the sector. For example, some data centers might offer advanced high-speed networks while others provide low-cost wholesale storage. Internet traffic is the primary driver of Data Center REITs performance. The digital economy has experienced exponential growth, and this pattern is expected to continue through several coming years. Higher network traffic drives the need for servers, storage devices and communications gear. This trend is only loosely coupled to the business cycle, because e-commerce is often the low-price provider of goods and services, and the requirements of big-data and trading applications are expected to grow regardless of economic conditions, within reason (REIT Institute, 2020).

Data Center REITs is so far the smallest of the included sectors with 4% of the total market according to figure 13[31]. Data Centers are considered one of the specialty sectors (Qing and Orzano, 2020) and as figure 15 shows us, it is highly uncorrelated with traditional sectors such as Office and Residential. Data centers are resembling industrial lease-terms and as seen in figure 14 the average lease-terms are normally around 5 years.

## 2.4. Conclusions

In this chapter we have analyzed the development of REITs from a poor imitation of RICs in 1960 to the highly sought unique investment vehicle it is today. Through a range of adjustments up until 1999, REITs were polished and optimized to function in the modern economy. REITs are given special tax considerations due to the fact that they are pass-through companies and as such are required to distribute at least 90% of their taxable income to investors. REITs must derive at least 75% of their gross income from real property and the ownership structure is highly restrictive. No more than 50% of outstanding shares can be owned by five or fewer individuals, with some special rules for institutional investors. Analyzing the key characteristics of REITs we found that being a total-return asset, REITs comprise both income return and price appreciation. Especially the income return in the form of dividends is a key factor in explaining REITs high source of inflation protection. REITs focus on income generating real estate has provided investors with a great source of diversification, especially in times of uncertainty. Furthermore, we found that REITs, contrary to regular real estate assets, have a high liquidity because they are publicly traded. Lastly, the chapter covered how different REIT sectors have distinct characteristics in form of

[31] Timber and Specialty REITs are slightly smaller, but not included in this analysis.

average lease-terms, types of tenants and natural demand. These differences, together with general findings of the chapter, will prove essential in understanding REITs industry and sector performances in Chapter 3.

# 3. Performance

This chapter will seek to analyze the performance of REITs through different metrics and compare these results to other types of assets. In order to create the preconditions for our analysis we will in (ch. 3.1) go through some of the key definitions that will be used in the subsequent analysis. We begin our study in (ch. 3.2) by measuring REITs performance on an aggregated industry level and then compare this to other asset classes as well as other major indices. Following this analysis, we segregate REITs into various sectors defined in (ch. 2.3) in order to assess the performance of specific REIT sectors in (ch. 3.3). Lastly, based on our findings, in (ch. 3.4) we draw some conclusions with the aim of achieving a better understanding of REITs performance over time.

## 3.1. REIT Performance Measures

During our analysis in (ch. 3.2) and (ch. 3.3) we will use diverse indicators valuable for the purpose of our analysis. However, in order to obtain a clearer picture of the analysis we pursue in the next subsections, this part (ch. 3.1) briefly illustrates these factors and their application.

### 3.1.1. REIT Indices

REITs come, as we have covered in (ch. 1.3) and (ch. 2.3), in many forms and therefore it is essential to be precise and consistent in our data selection. For the purpose of our analysis we will use the "FTSE NAREIT All Equity REITs" index unless otherwise specifically stated. This excludes mortgage REITs as we also stated in (ch. 1.3). Otherwise, it includes all Equity REITs as long as they meet the minimum size and liquidity criteria on the NYSE, the Nasdaq National Market System, and the American Stock Exchange. The index is market-cap-weighted and is calculated on a total-return basis (Wilshire, 2019).

### 3.1.2. FFO and CAD

REIT is a capital-intensive industry characterized by high asset values. This leads to a significant amount of depreciation that affects cash flow measures. Due to this characteristic the GAAP net income is not considered a solid indicator of REIT earnings. (Yungmann and Taube, 2001) This is because depreciation expenses under GAAP do not account for a considerable amount of the cash flow of a REIT. Therefore,

as we described in (ch. 1.4), the REIT industry in the United States has adopted the concept of FFO (and AFFO) as an earnings metric. For this reason, this will be the main measure used in our analysis (Goolsbee and Maydew, 2002; NAREIT, 2002). Below it is shown the most widely used format of FFO calculation.

$$FFO = \text{GAAP Net Income} + \text{Gains (or losses)from sale of property} + \text{Depreciation and amortization} + \text{Adjustments for unconsolidated partnerships and joint ventures}$$

Furthermore, since FFO does not aim to be a measure of dividend-paying capacities, Cash Available for Distribution (CAD), or Adjusted FFO (AFFO), have been developed. The latter is commonly used as a price multiple and it is usually compared to Profit/Earnings ratios of common stocks. CAD is calculated as FFO minus recurring capital expenditures.

### 3.1.3. Dividend Yield

By being considered a total-return vehicle, REITs entails high amount of income return that is paid to investors in the form of dividends (ch. 2.2.1).Therefore, during our analysis we will be using the concept of dividend yields as a way to measure dividends compared to the stock prices. The calculation is obtained by dividing the total annual dividend per share with the share price and it offers an estimate of the dividend-only return of a stock investment (Chen, 2019).

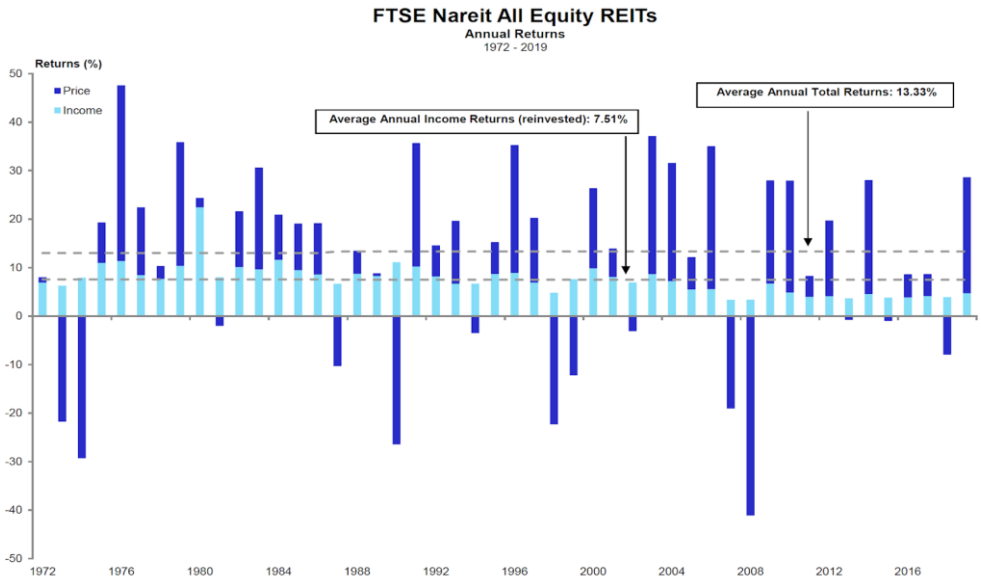
### 3.1.4. Sharpe Ratio

As discussed in (ch. 2.2.6), REITs are highly volatile. In recent years investors have become much more vigilant in their choice of investments when it comes to risk. Therefore, we will be utilizing Sharpe Ratios to determine the risk-adjusted performance and compare this between investments. The ratio shows the average return earned in excess of the risk-free rate per unit of volatility or total risk. Subtracting the risk-free rate from the mean return allows an investor to better isolate the profits associated with risk-taking activities. Thereby, it explains whether a portfolio's excess returns are due to smart investment decisions or a result of excessive risk taken. Generally, the greater the value of the Sharpe ratio, the more attractive the risk-adjusted return (Hargrave, 2020).

## 3.2. REIT Industry Performance

Real Estate Investment Trusts have performed very well since 1972 where NAREIT started tracking the performance. As per (delimitation) and (ch. 3.1.1), this thesis focuses on Equity REITs on the FTSE NAREIT All Equity REITs index and figure 16 shows the yearly performance of this index. As described earlier, REITs are total-return vehicles (ch. 2.2.1), and as such the returns include an income return and a price appreciation. In the graph below we see that the average annual income returns for the whole period is 7.51% and the average annual total returns (when adding the price appreciation) is 13.33%.

*Figure 16 – FTSE NAREIT All Equity REITs Index Annual Performance*

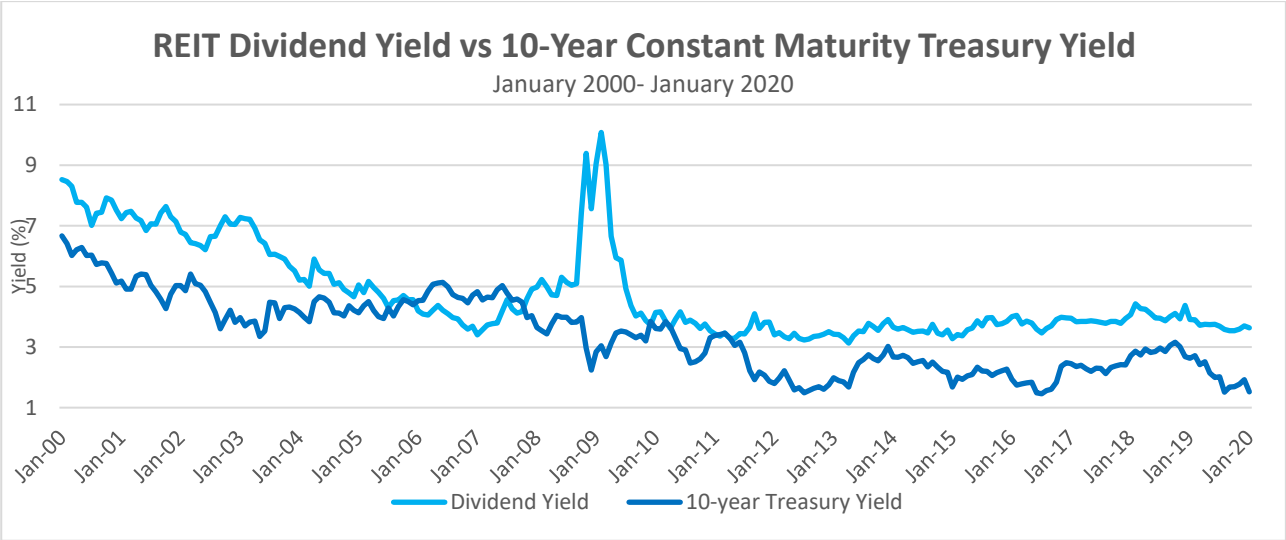



Source: (NAREIT, 2020c), NAREIT, FactSet

As seen in figure 16, dividend income represents one of the main drivers of REITs robust performance over years. Its combination with price income then provides the solid structure that makes REITs perform well in most economic situations.

The dividend yield provided by REITs is very strong and outperforms the 10-Year Constant Maturity U.S. Treasury Yield almost consistently as can be seen in figure 17 (NAREIT, 2020c)

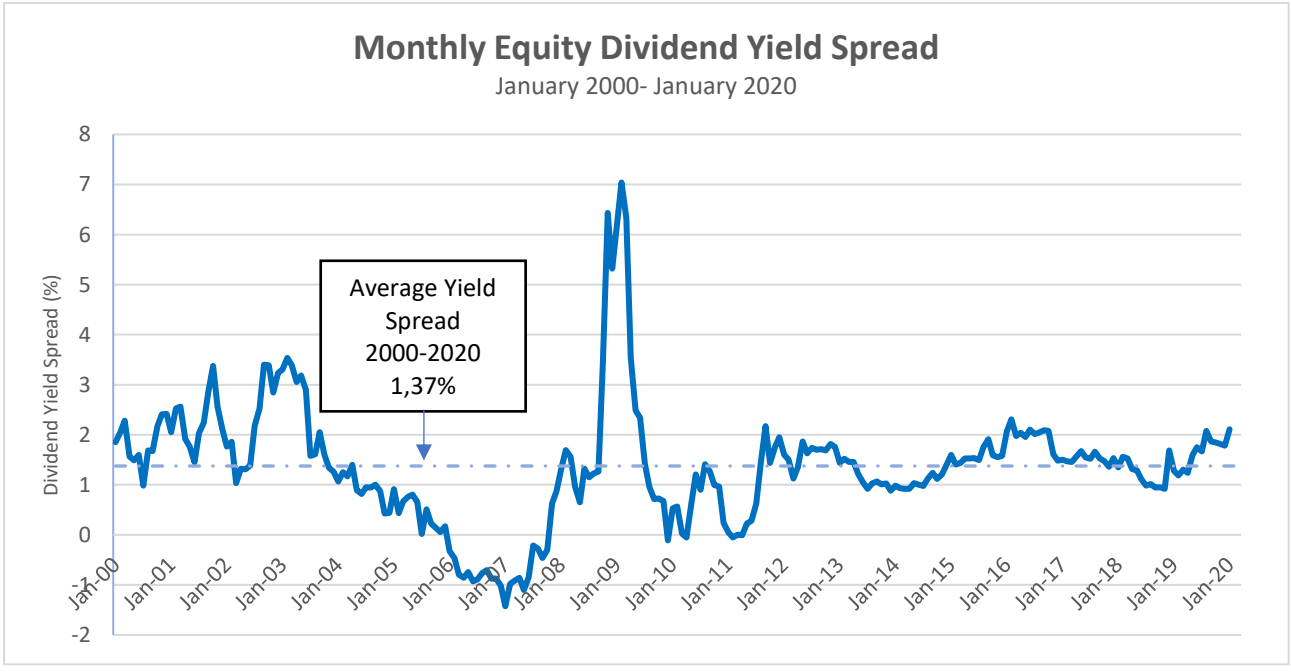
*Figure 17 - REITs provide a robust dividend yield which consistently outperforme the 10-year Treasury yield*




Source: NAREIT, Federal Reserve Economic Data

Thus, investing in REITs over 10-Year Constant Maturity U.S. Treasury, provides the investor with a benefit in the form of a greater yield. By subtracting the difference between the two yield curves we find the spread that is shown in figure 18. The spread explains the benefit (downside) of investing in REITs over 10-Year Constant Maturity U.S. Treasury. The average yield spread over the last twenty years has been 1.37%, meaning that investors gained almost 150 bps higher yield on average investing in REITs.

*Figure 18 - REITs Dividend Yield Spread*

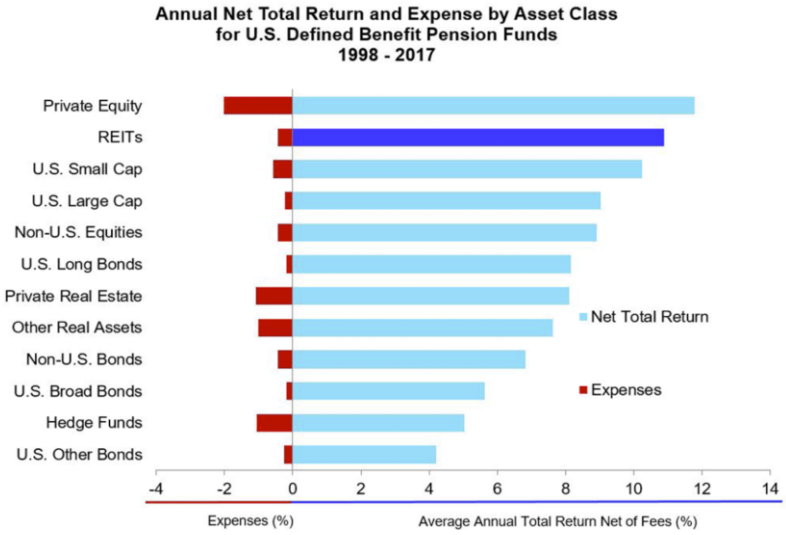



Source: NAREIT, Federal Reserve Economic Data

### 3.2.1. REIT Performance versus other asset classes

Assessing the performance of REITs is only really valuable if it is compared to the performance of alternative investments. In a study on pension funds' investments returns they measured twelve different asset classes returns against each other (Beath, 2019). The study included data from more than 200 pension funds and looked at the realized investment performance over a twenty-year period from 1998 to 2017. In the first part of the study they analyzed the performance of each asset class based on average annual total return and the expenses incurred by investing in them. The results are illustrated in figure 19 where the asset classes are arranged in order of the net total return from worst in the bottom, to best at the top. According to these results, figure 19 illustrates that REITs performed the second best with 10.9%. As mentioned, the expenses incurred by investing in an asset class is deducted from the total return and provides the net total return performance used for the ranking. Private Equity stands apart, because it performs the best despite a high level of expenses.

*Figure 19 - REITs as the second highest total return among various asset classes*

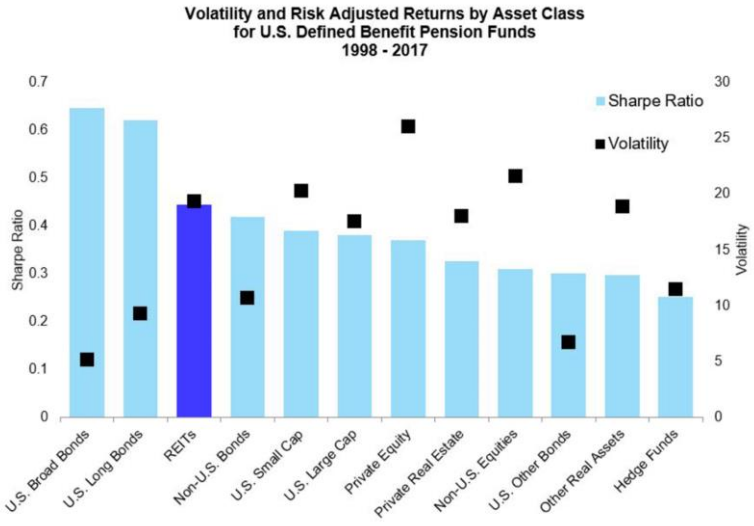



Source: (Beath, 2019), CEM Benchmarking 2019, NAREIT

With investor preferences trending towards stability and REITs being considered fairly volatile, it is valuable to consider the performance of investments adjusted for volatility. Sharpe Ratio (ch. 3.1.4) is a valuable measure to assess the return on investment when adjusting for risk. In the same study conducted on realized pension fund returns, researchers used Sharpe Ratio to measure the twelve asset classes' total returns adjusted for their volatility (Beath, 2019). Figure 20 shows the results of their analysis. The higher the ratio, the better the risk adjusted returns are. Thus, the best performing assets are the governmental fixed assets in the form of the U.S. Broad Bonds and U.S. Long Bonds. The high ratio is driven by the

fact that these assets are much less volatile. Despite this, analyzing other equities, REITs demonstrate the highest Sharpe ratio (0.44), reflecting their high returns and just above average volatility. In contrast, unlisted real estate had a much lower ratio measuring 0.33, reflecting lower returns and comparable volatility to REITs (NAREIT, 2020c).

*Figure 20 - REITs shows the highest risk-adjusted total return among comparable equities*




Source: (Beath, 2019), CEM Benchmarking 2019, NAREIT

In sum, considering the above analysis, REITs are performing at the top of asset classes. The costs from investing in REIT assets is on the low end and thereby the net total return is the second highest of all assets, only outperformed by private equity. When including the volatility of the assets, REITs show the highest adjusted total returns outside of governmental bonds. However, governmental bonds risk adjusted performance is mainly driven by the extremely low volatility but offers far lower returns. The risk profile of investors greatly matters and REITs should mainly be compared to other equities. The high net total return from private equity seen in figure 19 is offset by the highest volatility of all asset classes, making REITs the best performing equity.

### 3.2.2. REIT Performance versus major indices

Real Estate Investment Trusts are publicly listed and therefore it is valuable to compare their performance to that of other major indices. When comparing the indices, we use different time periods to illustrate that the performance has varied over the years and depending on the starting point, different indices have performed the best.

Total returns in different time periods are listed in the table below for the major indices considered in this analysis. As we can see the average annual total return varies significantly depending on the outlook.

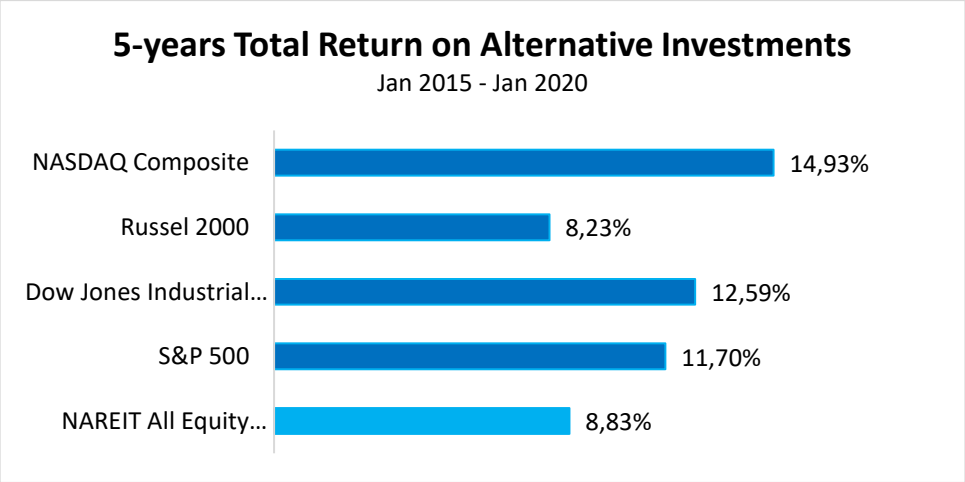
*Table 4 - REITs total return compared to other major indexes*

| *Intervals* | NAREIT All Equity Index | S&P 500 | Dow Jones Industrial Average | Russel 2000 | NASDAQ Composite |
|---|---|---|---|---|---|
| **2020 YTD** | -5,85% | -8,27% | -10,55% | -11,36% | -4,37% |
| **1-Year** | 28,66% | 31,49% | 25,34% | 25,52% | 36,69% |
| **3-Years** | 10,29% | 15,27% | 15,73% | 8,59% | 19,86% |
| **5-Years** | 8,83% | 11,70% | 12,59% | 8,23% | 14,93% |
| **10-Years** | 12,59% | 13,56% | 13,40% | 11,83% | 16,05% |
| **15-Years** | 8,35% | 9,00% | 9,45% | 7,92% | 9,91% |
| **20-Years** | 11,60% | 6,06% | 7,18% | 7,59% | 4,03% |
| **30-Years** | 10,78% | 9,96% | 8,11% | 9,49% | 10,45% |

Source: NAREIT ReitWatch

In the last five years REITs have had an annual average total return of 8.83% which is the second lowest of all indices. The NASDAQ Composite performance in the same period amounts to an annual average total return of 14.93%, which is in part driven by the incredible development of technological information firms (listed on NASDAQ Composite) over the same period.

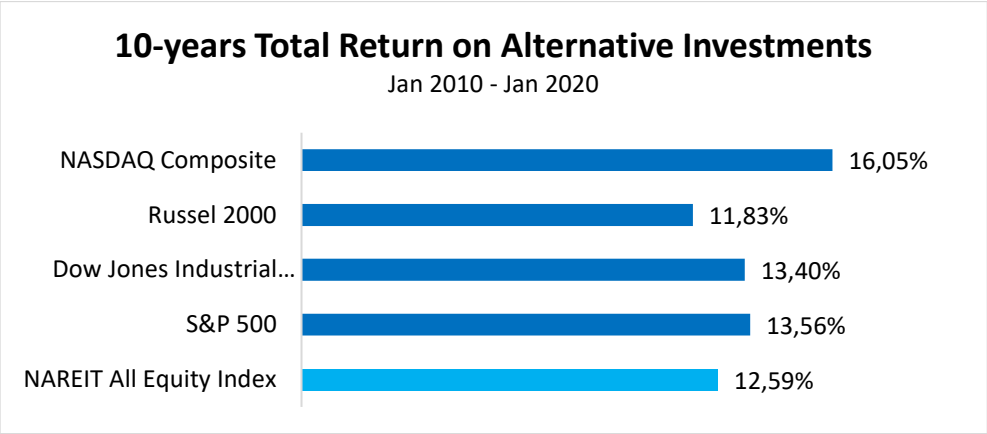
*Figure 21 - REITs short-term performance against other indexes*




Source: NAREIT, Bloomberg

When expanding the period to 10 years we find that the average annual returns are closer between the indices, but that ranking remains mostly the same. The chart illustrates how REITs maintain the second lowest position with 12.59% while NASDAQ Composite continues its leadership among the indices considered with 16.05%.

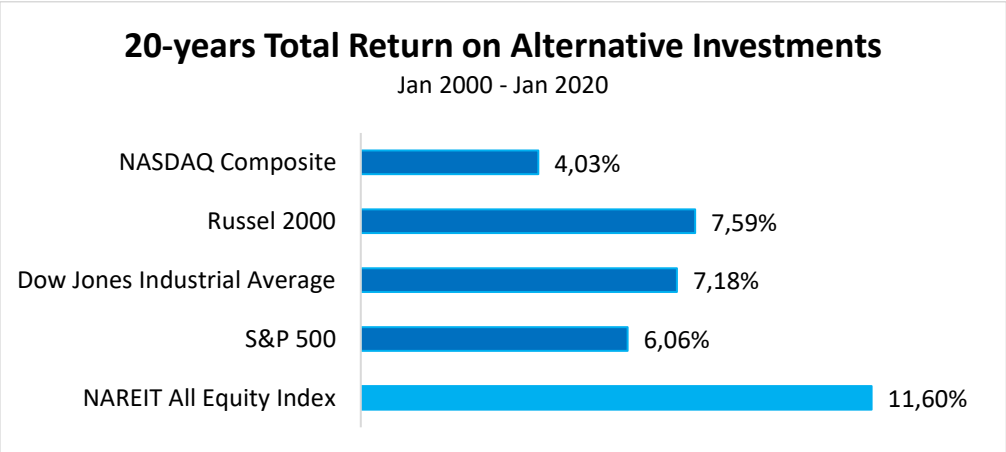
*Figure 22 - REITs 10-year total return against other indexes*




Source: NAREIT, Bloomberg

Expanding the time period to include the last twenty years we find a new outcome. REITs remain fairly stable with an average annual return of 11.60%, but at the same time all other indices are performing much lower average annual returns with Russell 2000 having the second highest return with only 7.59%. According to our findings discussed earlier in this paper, this trend might be explained by considering REITs unique characteristics. REITs rely more heavily on hard assets than the other indices in consideration. Therefore, REITs are much less sensitive to economic trends and thereby they provide superior recession resistance. Because this new expanded time frame includes two new recessions, this might explain the lower average total returns provided by the other indices and why REITs might have a superior recession resistance. This will be analyzed in further detail in (ch. 5) where we will look at REITs performance during times of recession specifically.

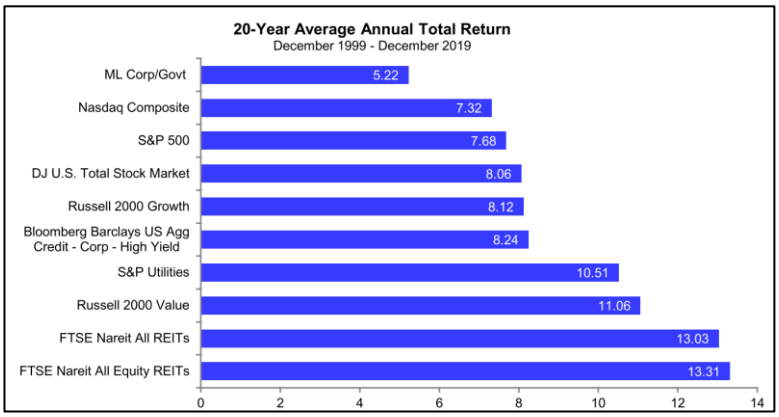
*Figure 23 - REITs long-term total return against other indexes*




Source: NAREIT, Bloomberg

Like the analysis on other asset classes we discussed in section (ch. 3.2.1), it is valuable to analyze the performance of the indices in regard to the volatility that they show. In a study performed over a 20 year period from December 1999 to December 2019 researchers looked at the average annual returns of different indices(NAREIT, 2020c). The average total returns differ slightly from our own analysis and can be seen in figure 24. This is because the time period is slightly different. However, as with our own analysis above, REITs performed the best with 13.31% when considering the FTSE NAREIT All Equity REIT Index. The other indices, Russell 2000, NASDAQ Composite and S&P 500 are ranked in the same order, but with slightly different returns.

*Figure 24 – Twenty-year average total return of various asset classes (%)*

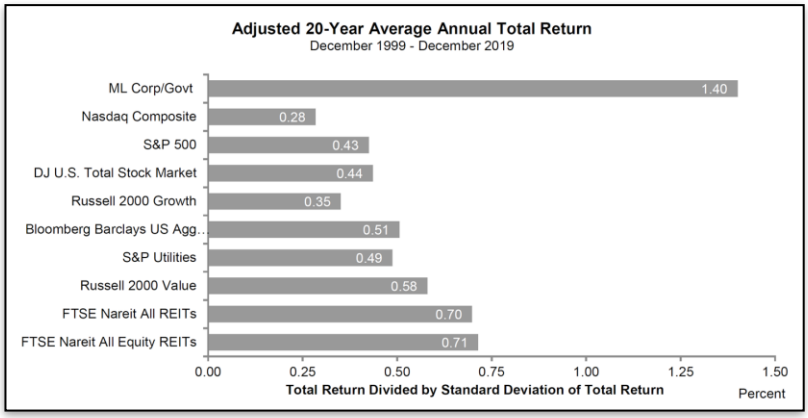



Source: (NAREIT, 2020c), NAREIT, FactSet
Note: Nasdaq Composite returns are price only

In order to then get the risk adjusted returns, the above results on average total return were then adjusted for the volatility. Taking each total return and dividing it by the respective standard deviations, they found that REITs were the second highest performing category with 0.71 as seen in figure 25. The highest performing category was ML Corp/Govt with 1.40, but as we saw in figure 24 this category had the lowest performance without adjusting for risk. ML Corp/Govt is a bond index and referencing our findings in (ch. 3.2.1), our data showed that governmental fixed assets offer the best performance in terms of risk-adjusted returns basically because their risk is so low.

In regards to the indices we are measuring REITs against, the graph shows us that their performance adjusted for risk amounts to the same ranking in between themselves. REITs have a higher risk adjusted total return than all four other indices followed by Russell 2000 as the second highest with 0.58. NASDAQ Composite adjusted for risk is now the lowest of all categories and therefore also the five indices with 0.28. (figure 25)

*Figure 25 - Twenty-year risk-adjusted total return of various asset classes*




Source: (NAREIT, 2020c), NAREIT, FactSet
Note: Nasdaq Composite returns are price only

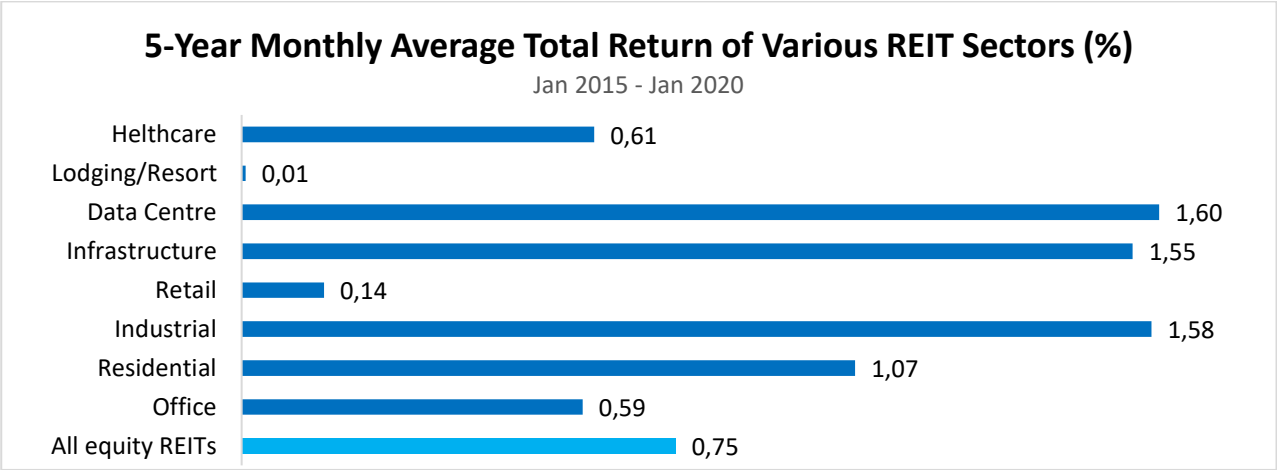
## 3.3. REIT Sectors Performance

The stability of REITs and their performance stems, among other things, from the fact that the underlying assets are diverse. The FTSE NAREIT All Equity Index covers all the different Equity REITs in different sectors. In this section we will look at the individual sectors described in (ch. 2.3) and their performance in order to ascertain how they individually perform in different aspects and time periods.

### 3.3.1. Total Returns

As with REITs in general, one of the main metrics for measuring performance for REIT sectors is the total return on investment. Looking at the monthly total return for each sector we arrive at the monthly average total return in the last five years which can be seen in figure 26. The graph clearly illustrates that even though the monthly average total return for all Equity REITs is 0.75%, some sectors perform significantly better and worse. Lodging/Resort and Retail REIT sectors are worth noticing as they both have a monthly average total return close to zero with 0.01% and 0.14% respectively. These are both very cyclical sectors and the average is a result of big fluctuations that on average are close to zero (ch. 2.3). At the other extreme we have Data Centre, Industrial and Infrastructure that are all performing twice as well as the industry average. Data Centre is a relatively new REIT sector from December 2015 and as such the data included in the calculation is a slightly smaller sample than that of the other sectors. Even still the impressive performance of 1.60% shows that this sector is on the rise. Together with the high performance of infrastructure of 1.55% and Industrial with 1.58% we can see that sectors involved in the current technological revolution are at the forefront of REIT performance.

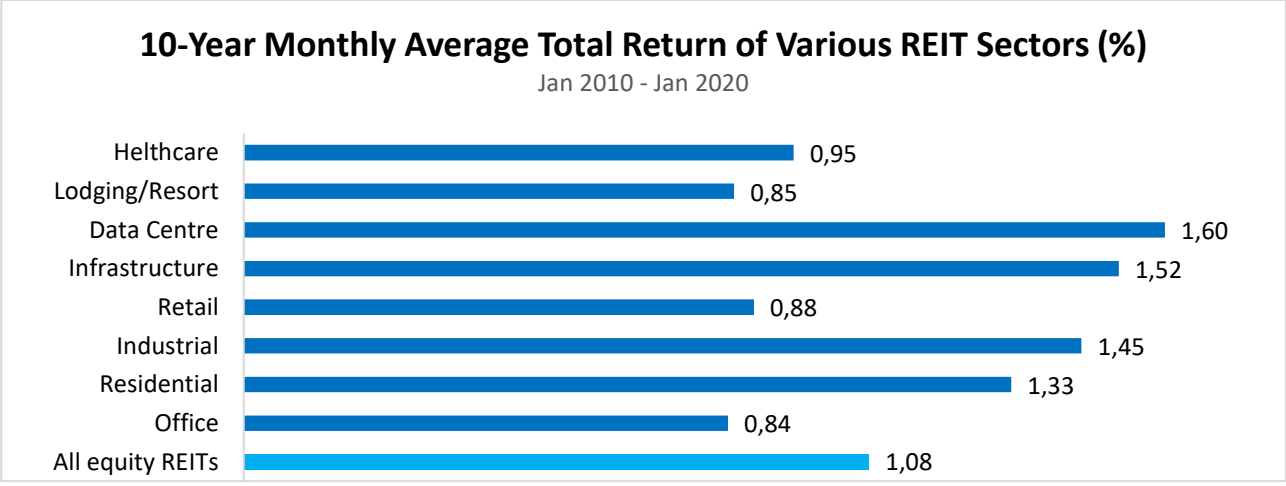
*Figure 26 - Various REIT sectors short term total return*




Source: NAREIT
Note: data for Data Centre starts from Dec 2015

Taking a slightly longer time period into consideration we see a more stable picture where all sectors considered are performing monthly average total returns at close to one percent. As mentioned earlier, the data for the Data Centre REITs only includes the last five years and therefore it is not comparable to that of the other sectors in this timeframe. However, the sectors linked to the online technological revolution, excluding Data Centre, are still the highest performers with 1.52% for Infrastructure and Industrial, that includes warehouses and distribution centers (e.g. online retailing), at 1.45%.

*Figure 27 - Various REIT sectors 10-year total return*

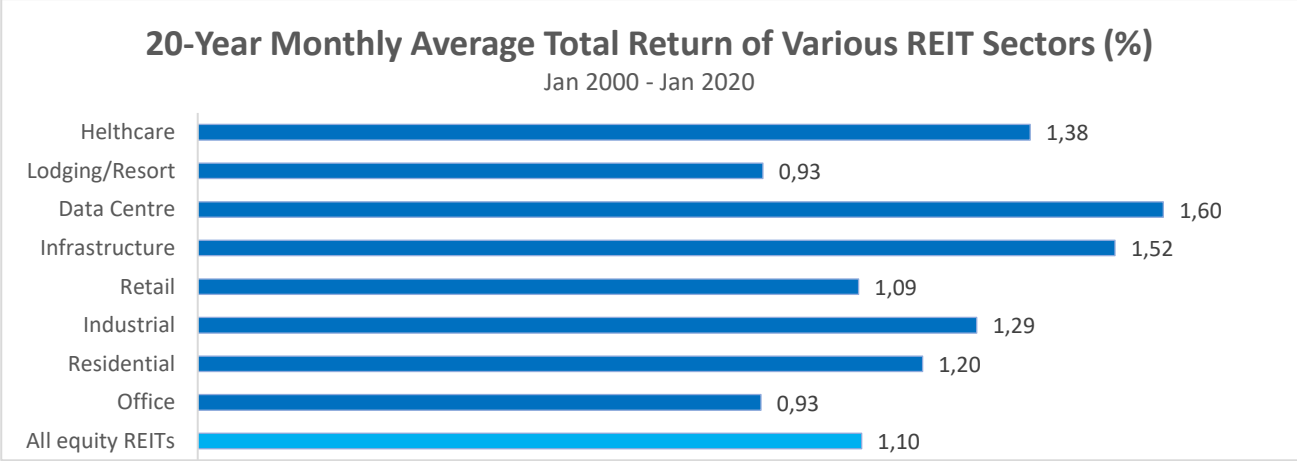



Source: NAREIT
Note: data for Data Centre starts from Dec 2015, data for Infrastructure starts from Jan 2012

In addition, if we expand the interval to include the last 20 years, we see that the spread between the highest and lowest performing sector is smaller than any of the other time periods. Since Date Centre and Infrastructure does not have data that goes back more than eight years, for this time period we will disregard them. Therefore, Health Care is the best performing sector in the last twenty years with a monthly average total return of 1.38%. Lodging/Resort and Office both show a monthly average total return of 0.93% as the lowest sectors in this timeframe.

According to our previous findings we know that sectors are affected by different external factors. Thereby, REIT sectors show distinct periods of rising results. For this reason, by spanning the analysis over a very long period we are more likely to see a stabilized complete picture of how each sector performs on average.

*Figure 28 - Various REIT sectors long term total return*




Source: NAREIT
Note: data for Data Centre starts from Dec 2015, data for Infrastructure starts from Jan 2012

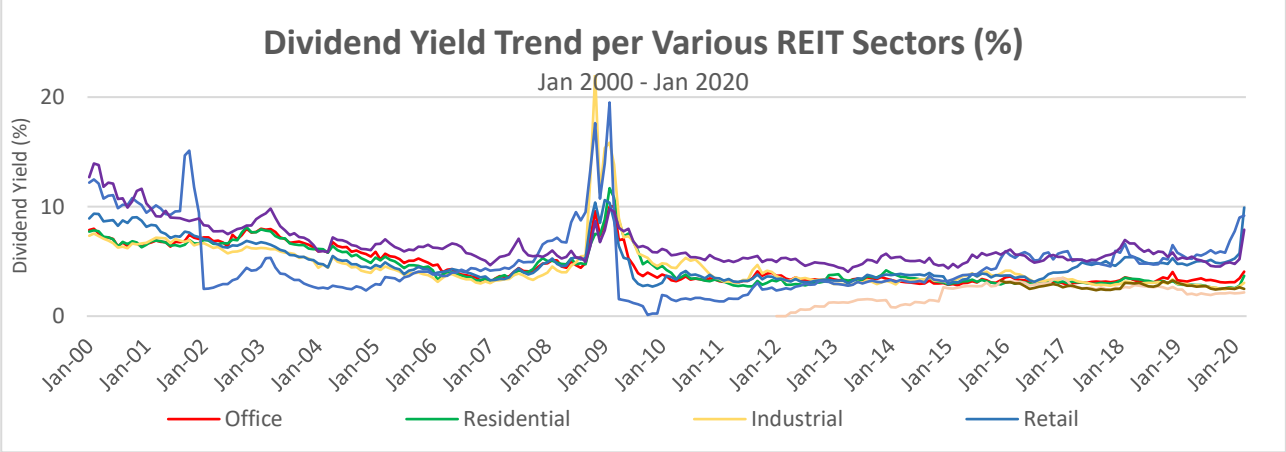
The data shows us that in the long-term Lodging/Resort and Office are the two sectors that perform below the industry average. Meanwhile Residential, Industrial and Health Care all perform significantly better than the industry average, while Retail almost resembles the industry average. Data Centre and Infrastructure has shown great promise since their introduction in 2015 and 2012 respectively and at least so far, they have shown above industry average returns.

### 3.3.2. Dividend Yields

When analyzing the performance of individual REIT sectors, it is also important to look at the dividend yields. As with the overall industry, the total return of sectors also includes a significant income component. In figure 29 the development of dividend yield per sector is shown over the last 20 years.

Tracing the performance, we see that generally all sectors follow the same trend and the noticeable shocks to the dividend yield is present in all sectors. However, we can also see that the level of change in dividend yields varies between sectors, both negatively and positively.

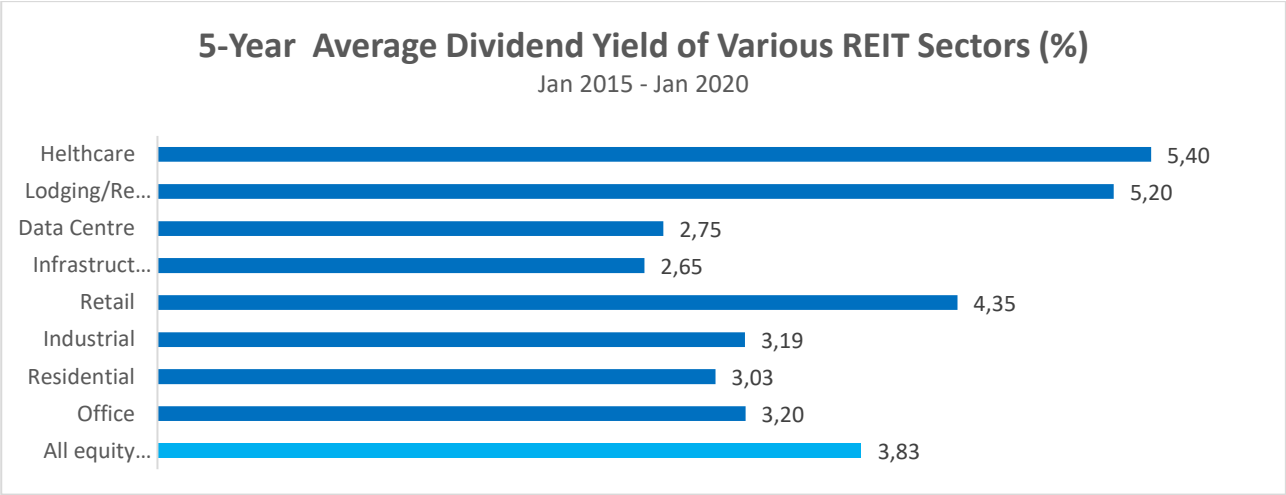
*Figure 29 - Various REIT sectors dividend yield trend*




Source: NAREIT

In order to more closely compare the dividend yield performance of the different sectors we analyze the data in a series of time periods. Firstly, we look at the last five years and the results, as seen in figure 30, shows us that the average dividend yield for the industry is 3.83%. Three sectors are contributing with above average yields and thereby carrying the industry average. These are Health Care, Lodging/Resort and Retail with 5.40%, 5.20% and 4.35% respectively. Interestingly two of the sectors with the highest total returns for the same five year period, Data Centre and Infrastructure, have the lowest dividend yields of 2.75% and 2.65% respectively. Most likely this low dividend yield is due to the fact that these sectors are being heavily invested in by investors that are predicting the sectors to perform very well moving forward. Thereby the stock's market price is considerably higher than the dividend payments the REITs can currently pay and considering the formula for dividend yields in (ch. 3.1.3) we know this would drive down the yield.

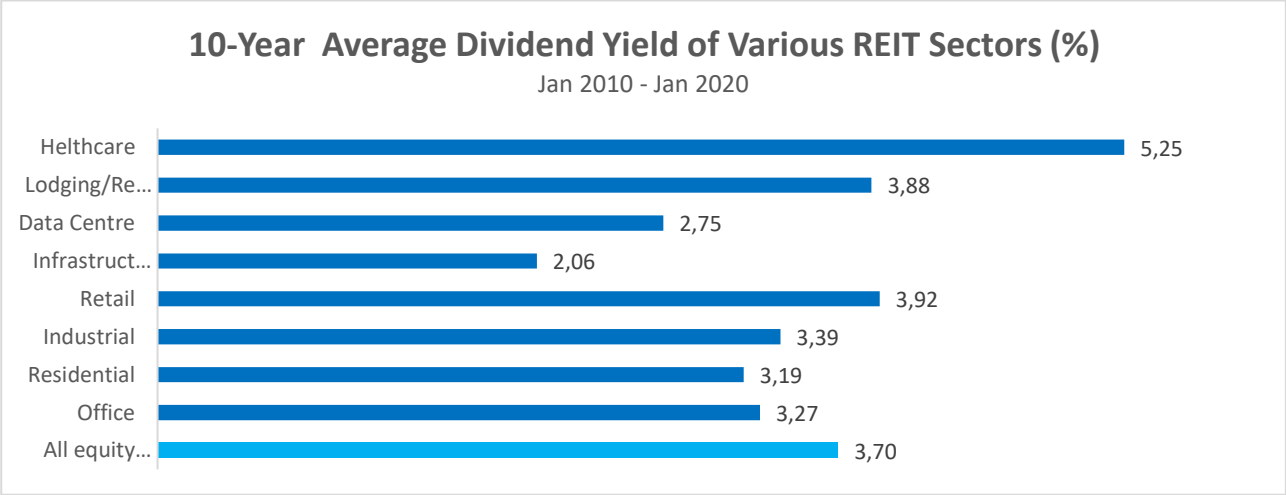
*Figure 30 - Various REIT sectors short term dividend yield*




Source: NAREIT

Expanding the time period to cover the last 10 years we see that dividend yields generally remain the same across most REIT sectors. The industry average is slightly lower with 3.70%. Health Care remains the sector with the highest dividend yield of 5.25%, but Lodging/Resort that had the second highest performance now has a significantly lower dividend yield of 3.88%. Infrastructure shows a significantly lower dividend yield than the industry average of only 2.06%.

*Figure 31 - Various REIT sectors 10-year dividend yield*



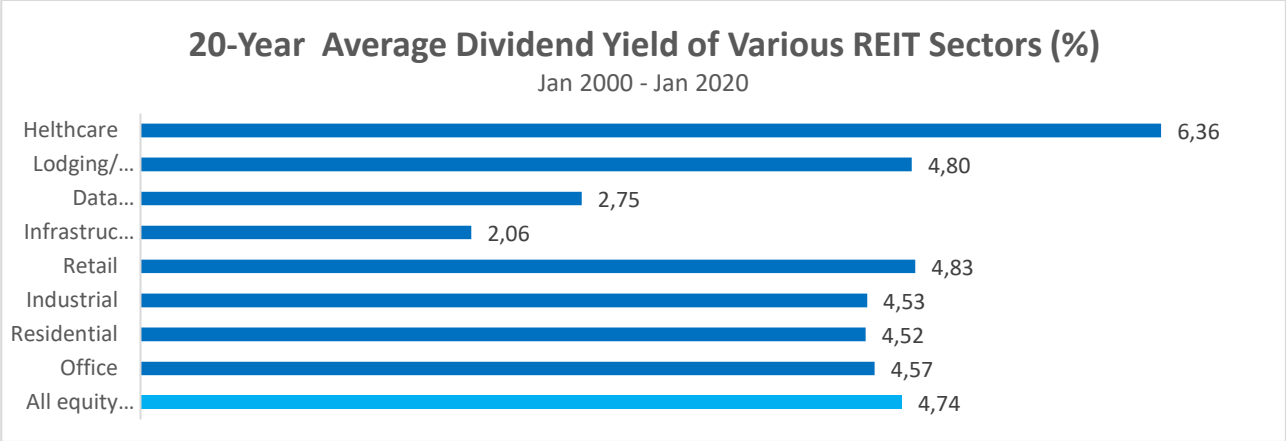

Source: NAREIT
Note: data for Data Centre starts from Dec 2015, data for Infrastructure starts from Jan 2012

Taking a much longer time period into consideration we find that over the last twenty years the dividend yield varies less between most sectors. The industry average is 4.74% and is the highest of the three calculated averages in this analysis. This tells us that the dividend yields on an industry average were

historically higher than they have been in recent years. This can be explained by the increased popularity of REITs, which in turn has provided a decent price appreciation that exceeds the income return increases. Thereby the dividend yield, which is calculated by dividends and stock prices, has fallen slightly over the years (ch. 3.1.3).

Excluding Data Centre and Infrastructure which both do not include data this far back, we see that all but one sector have close to industry average dividend yields. Health Care outperforms the rest of the industry with impressive 6.36% dividend yields, which supports the findings for the 5 and 10 year period as the sector with highest dividend yields. Furthermore, we see that also in this time period both Lodging/Resort and Retail supplies above average dividend yields with 4.84% and 4.85%. The traditional REIT sectors (Office, Residential and Industrial) all perform slightly below the industry average with 4.57%, 4.51% and 4.51% respectively.

*Figure 32 - Various REIT sectors long term dividend yield*




Source: NAREIT
Note: data for Data Centre starts from Dec 2015, data for Infrastructure starts from Jan 2012

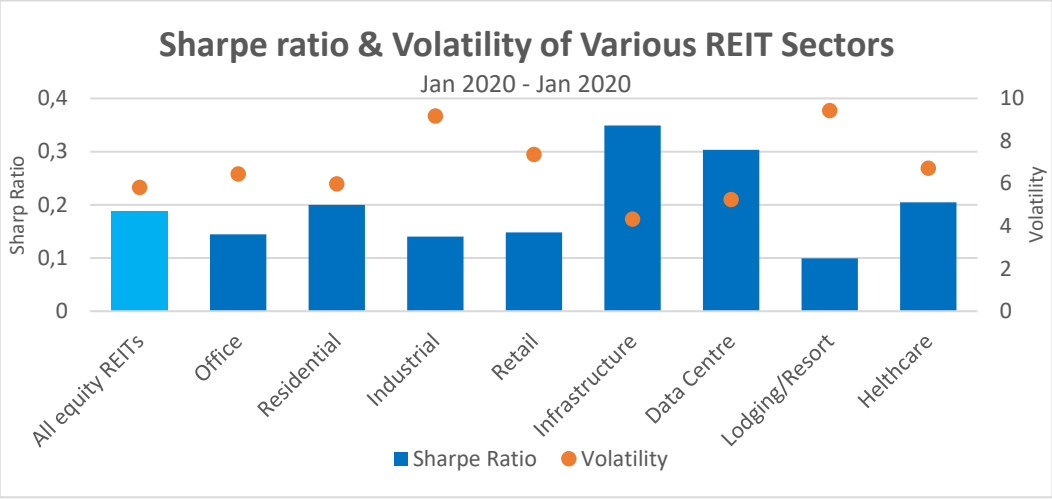
### 3.3.3. Risk Adjusted Performance

As described earlier in (ch. 2.2.6) and (ch. 3.2.1) we know that investors have different risk willingness. Thus, it is valuable to analyze the risk adjusted performance of investments. REITs are generally considered fairly volatile, but this varies significantly between the underlying sectors. In figure 33we can see that some sectors like Industrial and Lodging/Resort have high levels of volatility between 9x and 10x, where the newer technological sectors Infrastructure and Data Centre lies between 4x and 5x.

Using Sharpe Ratio (ch 3.1.4) we can analyze the risk adjusted returns for the different sectors and looking at figure 33 we see that the Infrastructure and Data Centre REITs sectors greatly outperforms the rest of the sectors with 0.33 and 0.32 respectively. These findings align well with the previous analysis of total returns for sectors. In figure 28 we found that these sectors performed way above the industry average.

According to this they have the lowest volatility of any sector and thus, these two sectors provide the best risk adjusted performance. On the other hand, Industrial REITs which were a top performer in nominal total returns are pushed down in rankings by a significantly higher volatility than that of most other sectors. Outside of the specialty sectors (Data Centre and Infrastructure) Residential and Health Care show the best risk adjusted performance, both with Sharpe Ratios of 0.18.

*Figure 33 - Various REIT sectors risk-adjusted return (Sharp Ratio)*




Source: NAREIT
Note: data for Data Centre starts from Dec 2015, data for Infrastructure starts from Jan 2012

## 3.4. Conclusion

In this chapter we conducted a series of analysis on REITs and the underlying REIT sectors performance. Through our study we found that REITs since 1972, where data started, have had an impressive average annual total return of 13.33%. In line with our findings in (ch. 2.2) these results included a significant amount of income return with an average of 7.51%. Comparing the strong dividend yields that REITs provide with the 10-Year Treasury yield we found that in the last 20 years REITs had a 1.37% spread (ch. 3.2).

Evidence demonstrated the high volatility of REITs stocks. However, due to their unique characteristics of total return vehicles with a high portion of dividend income, REITs showed robust cash flow and performance in the long run. As a result, by considering 5 and 10 year periods, REITs showed lower returns that the other indexes analyzed while they outperformed the same indexes considering the average total return of the last 20 years. Analyzing the risk-adjusted performance, we found that among several other indices and asset classes REITs had the best performance besides governmental bonds. The

performance of these bonds was mainly driven by extremely low volatility but offered far lower returns. However, by taking into account investors risk-profile, we outlined a superior performance demonstrated by REITs in comparison to other publicly traded equities.
Subsequently, conducting a sector analysis we confirmed our theories in (ch. 2.3) suggesting that REIT sectors are affected by different external factors. In the short term we recorded significant differences between various sector performances. However, expanding the timeframe we saw more stable return and lower volatility. Furthermore, we observed that REITs have varying underlying fundamentals, resulting in some sectors being more cyclical than others. Evidence showed how REIT sectors linked to the technological revolution have shown impressive non-cyclical returns.

# 4. REIT Industry main drivers and multivariate impact analysis on REITs performances

The first part of this chapter will provide a broad overview of the REIT industry main drivers. Subsequently, a more detailed and thorough analysis will be performed considering how inherent macroeconomic factors and industry fundamentals interact, affecting REITs performance. This study aims to help investors in analyzing their investment decision under different economic circumstances as well as serves us as a baseline in approaching the next two chapters of this paper.

## 4.1. Macroeconomic factors affecting REIT industry

As described in (ch. 2.1), REITs are pass-through entities which must invest the vast majority of their investment portfolios in real estate projects. Hence, even though REITs are well diversified firms that involve investments in several different property types, they follow analogous fundamentals. We believe that shedding light on these main drivers will help us explaining and dissecting REITs performances.
Many macroeconomic factors, the overall health of the economy as well as sector specific determinants effectively impact REIT industry leading performances to diverge. Among all, job growth, interest rates, demographics, inflation and real estate cycles will be taken into consideration in this first level analysis.

### 4.1.1. Unemployment Rate and Job growth

Job growth[32] represents a measure of economic health and expansion that in different degrees affects every business sector and property type. It usually implies that more people are able to buy more goods and are looking for a place to live. Thus, especially within the so-called "white-collar", it directly translates into higher consumer spending[33] and increased commercial real estate (CRE) demand which in turn will boost various REIT sectors incomes. Among all, evidence outline how during periods of high employment growth, Retail and Residential REIT sectors shows the highest increment in earnings measures (e.g. FFO and NOI) fostering higher returns and greater market capitalization. (Appx.1) (Case, 2000)

Job growth not only benefits firms that are directly affected by the inherent increase in household spending but also it entails indirect positive spillovers on other REIT sectors. Thereby, rising job growth influences even companies that are less dependent on consumer purchasing power or property price appreciation. Manufacture and Industrial REITs represent valuable examples on how this factor leads to overall improved economic conditions which in turn benefits the entire society. (Barclays Research Department, 2018)

The unemployment rate represents another important element that along with job growth influences REITs returns. This measure decreased continuously for the past 10 years hitting a low at 3.5% in December 2019. (*Labor Force Statistics*, 2020)

*Figure 34 - Unemployment rate in the U.S.*


Source: U.S. Bereau of Labor Statistics, FRED
Notes: Shaded areas indicate U.S. recessions

This raised concerns over a future economic slowdown due to a potential lack of available workers. However, by including in the analysis the labor force participation rate, it is possible to obtain a more

[32] Job growth is considered as the rising number of available workplaces in specific business sectors
[33] Consumer Spending is calculated in term of changes in Gross Domestic Product (GDP)

meaningful measure. Labor force participation rate by prime age workers has long been one of the most reliable cyclical indicators of economic growth showing the economy's active workforce at any given time. Figure Z shows how this measure remained at its lowest level (at almost 63%) in the recent years. Therefore, combining the findings from these indicators we can see that even though the employment market seems to be saturated there is still room for employment growth which in turn might positively affect REITs performance. (Schnure, 2020b)

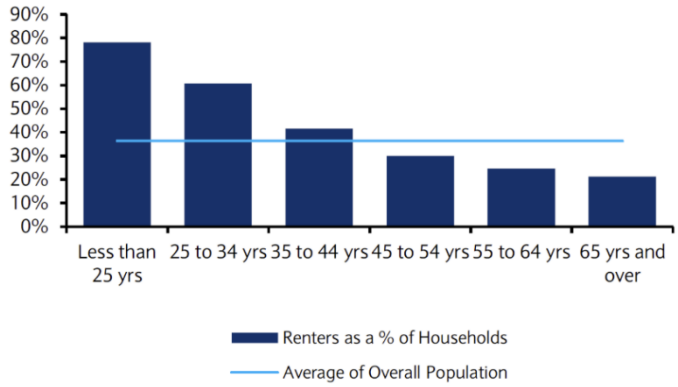
*Figure 35 - Labor force participation rate in the U.S.*


Source: U.S. Bureau of Labor Statistics, FRED
Notes: Shaded areas indicate U.S. recessions

### 4.1.2. Demographics

Another key macroeconomic factor that influences the overall economic situation and REITs performance is demographics. Along with job growth, population density, age and growth, have a high and direct influence on the demand for retail and residential properties that can positively impact the respective REIT sectors. As with all these variables we are considering though, all REIT sectors are to a certain degree affected. A valuable example is Industrial and Office REITs which indirectly benefit from a larger population. This entails greater household incomes and higher demand for consumer goods that in turn drive REITs earnings up. In addition, it is worth understanding how different age clusters contribute differently to rent growth, occupancy rates and overall spending. According to Barclays' research department, people between 18 and 35 have a higher propensity to rent. (figure 36)

*Figure 36 - Young people have a higher propensity to rent*




Source: (Barclays Research Department, 2018), U.S. Census Bureau

Therefore, a population with a higher percentage of youngsters in the early stage of their career, along with a low unemployment rate, usually implies improved rent demand. This pushes rent prices upwards, positively affecting REITs revenues. (Barclays Research Department, 2018)

Demographic structure development represents a key factor that helps us shaping a baseline scenario useful for further consideration regarding REITs performance and its evolution over time.

### 4.1.3. Interest rates

Interest rates represent another crucial macroeconomic factor that clearly affects real estate. Particularly, they play a direct and meaningful role from a property sector perspective.

Historically, mortgage rates moved in tandem with long-term Treasury rates affecting borrowing costs. (figure 37) Higher borrowing costs lead developers to slow down their investment as well as pushing down homeownership rates. (Barclays Research Department, 2018) This effect generates a negative impact on real estate demand and so on CRE[34] prices. In such circumstances, the most affected REIT sectors are those which intrinsically shows higher sensitivity to market fundamentals (e.g. Lodging/Resort and Residential). (ch. 2.3)

*Figure 37 - Mortgage rate and long-term Treasury rate moves together*


Source: Board of Governors (FHLMC), FRED
Notes: Shaded areas indicate U.S. recessions

[34] Commercial Real Estate

Moreover, from a broader perspective, a rising (declining) interest rate scenario has traditionally highly influenced the overall economy, driving occupancy rate and job growth downward (upward). Analyzing historical trends, we found that a rising interest rate scenario has often brought a slowdown in development projects and it has often matched with a period of economic contraction where job growth declined and vacancy rates surged. Conversely, low interest rates are usually seen as a positive sign for the general economic health. Central banks can, through monetary policies, reduce interest rates (e.g. FED funds rate) fostering economic growth which in turn positively affect the real estate industry.

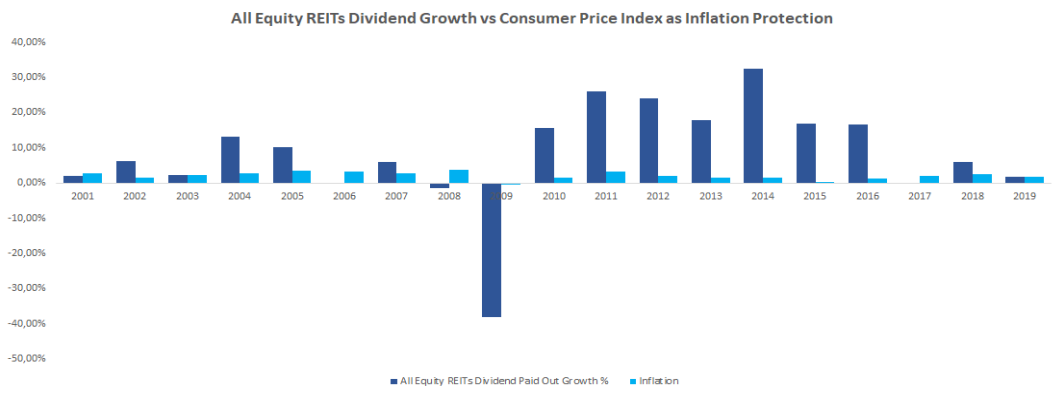
These macroeconomic measures may considerably influence REITs performances, especially considering their short-term impact on some sector specific results. However, since REITs are considered a total return investment vehicle (ch. 2.2.1), the relationship between interest rates and REITs performance remains unclear. According to some scholars, in the medium and long term, All Equity REITs Index total returns show almost no correlation with Treasury rate movements. (Barclays Research Department, 2018) Despite logical thinking and the macroeconomic outcomes we mentioned above, this controversial trend can be explained by considering the complex interaction that occurs between several variables affecting REITs performance. The Residential REIT sector, for example, mitigates the negative impact of a rising interest scenario (i.e. higher borrowing costs) through the resultant lower homeownership rate. The latter entails rising rents demand that provides greater price power to landlords which in turn positively affect REITs revenues. (Barclays Research Department, 2018)

Interest rate has a central role in our analysis. Along with its inherent macroeconomic meaning, it is extremely valuable as a comparative element in studying how several different variables interact, affecting REITs investment decisions and performances. Therefore, this topic will be further discussed later in this chapter.

### 4.1.4. Inflation

Like GDP and unemployment, inflation is an important measure of the state of the economy. It is defined as a sustained generalized rise in the prices of goods and services. This measure usually has a significant impact on firms' performance because it erodes the value of money and financial assets. In real estate, growing inflation can lead to higher construction costs, constraining development as well as rising rents of existing properties. However, in such an inflationary environment, hard assets such as real estate or gold have traditionally been viewed as an inflation hedge relative to fixed income and equities (soft assets). (Mowell, 2013) A practical way of measuring the inflation protection provided by REITs is to directly compare REIT dividend growth per share with inflation.

*Figure 38 - REITs provided a consistent inflation protection over time*

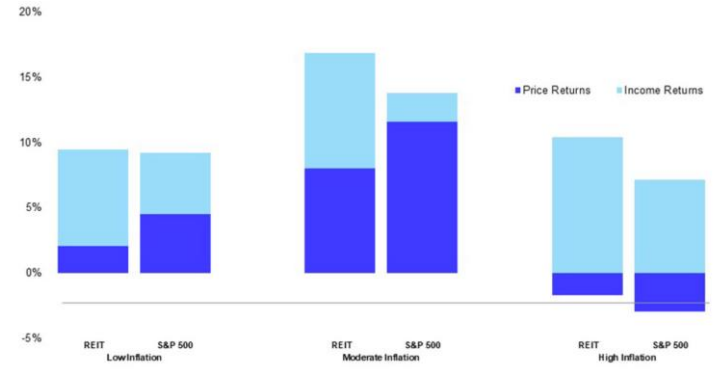



Source: U.S. Bureau of Labor Statistics, NAREIT

Figure 38 suggests that REITs succeeded in an extensive inflation hedge over the past 20 years. The only exceptions concern recession periods (e.g. 2001 and 2009) where inflation was mainly driven by monetary policies rather than economic expansion. On average, over the timeframe considered, our findings suggest that REITs annual dividend growth was about 8% which was almost 600 bps higher than the average annual growth of the CPI over the same period. (Appx.2) For this reason, also considering that many commercial lease contracts are linked to CPI by a periodic step-up mechanism, REITs are largely viewed as a profitable and more reliable source of investment. (Funari and Barwick, 2019)

Furthermore, some scholars collected evidence that intense capital shift towards real estate during strong inflation expectation periods actively contributes in fostering thriving REITs results (Mowell, 2013) Historically REITs were able to outperform most fixed income indexes. As extensively demonstrated in (ch. 3.2), during last twenty years REITs showed an average of 11.60% total return while S&P 500, Nasdaq Composite, Dow Jones Industrial and Russell 2000 total returns ranged between 4% and 8% (figure 23). (NAREIT, 2020c) In addition, considering the positive effect of inflation on REITs revenues, some research illustrates that a significant proportion of REITs superior performance is made up by income returns, i.e. the dividend yields.

*Figure 39 – REITs returns compared to S&P 500 return during different inflation periods*




Source: (Mowell, 2013), NAREIT

Especially for periods of high inflation[35] we can observe REITs' inflation hedge functionality. In such conditions, researchers found that the NAREIT All Equity Index benefitted from rising income, balancing the decreasing price trend and outweighing S&P 500 total returns. (Funari and Barwick, 2019)

Literature demonstrates that among all inflation causes, some of them appear to be more beneficial for REITs. There is evidence that REITs exhibit outperformance during periods of demand-pull inflation[36] or when inflation was rising due to upticks in capacity utilization and economic growth. This seems to be reasonable considering that the REITs have a higher beta to GDP than other risky assets such as high yield debt or direct real estate. In confirmation of this, scholars outline that in periods of economic expansion the relationship between CPI and same-store REIT NOI growth tend to show high correlation (e.g. $\rho$=0.75 in 2019). (Mowell, 2013)

However, despite these findings, other studies have pointed out a low correlation between CPI and NAREIT All Equity Index. This neutral relation is consistent with the high relevance of the equity component[37] of REITs returns which is highly susceptible to vagaries of the stock market. Therefore, reportedly, it is not inflation that drives this outperformance, but REIT valuations improve as investors anticipate greater income from the underlying assets. (Mowell, 2013)

[35] For the purpose of this analysis "high inflation" is considered higher than 3.5%

[36] In macroeconomics, the demand-pull inflation refers to rising prices as an effect of an imbalance in aggregate supply and demand. In such conditions, a growing demand, not supported by a similar growth in supply, drives price upwards.

[37] We define as "equity component of REIT prices" the price changes REITs undergo in relation to investors sentiment and to the perceived market risk associated thereto

### 4.1.5. Other real estate main drivers

Along with the key macroeconomic factors described above, we will now highlight other crucial elements that through their interactions affect the REIT industry performance.

**Rent prices**

Rent prices have an essential role in determining REITs revenues. However, they entail significant volatility because they are subjected to several market variables changes. Among all, job growth, occupancy rate and discrepancies between demand and supply for real estate have a substantial impact on landlord bargaining power and so on rents. During thriving economic conditions, where macroeconomics variables positively affect financial expectations, overbuilding represents one of the most common and damaging consequences for REITs performance. It generates excessive supply which drives vacancies up and in turn negatively influences rent prices. (Barclays Research Department, 2018)

**Lease terms**

Another crucial factor which is worth mentioning is lease terms. As discussed in (ch. 2.3), lease conditions vary by property type and the terms usually range between 12 months for Residential REITs to 20-30 years for certain Retail REITs.(Li, 2012) It has a significant importance in explaining performance divergences in different REIT sectors and their sensitivity to market fundamentals.

REIT investors widely use the weighted average lease term (WALT) to evaluate the company sensitivity to interest rate movements. Hotel REITs, for example, can reprise their rental agreement nightly which allows them to quickly adjust their leases to interest rate growth. On the other hand, Net Lease REITs involve long-term lease contracts (10 to 25 years). These, especially considering triple net lease[38], offer a sort of recession protection[39] entailing stable cash flows which results in lower trading volatility (figure14). (Krewson-kelly and Thomas, 2016; Qing and Orzano, 2020)

**Portfolio rollover**

Portfolio rollover is another fundamental factor that highly affects REITs returns and its sectors differentiation. It is defined as the percentage of leases in a portfolio expiring during any given year. It brings along with it a potential double meaning in relation to different economic conditions and property

[38] Triple-net lease structure is characterized by a long-term and relatively predictable income stream. In such a structure most of the expenses are pass-through the tenants. The latter are then responsible for paying all expenses related to property management: property taxes, insurance, and maintenance.

[39] Net lease REITs are the most secured source of equity investments. They offer two layers of recession resistance: the business itself and the lease structure. Even during periods of economic downturn tenants remain contractually obliged to pay their rents. Hence, unless the severity of the financial situation forces lessee to go bankrupt, none of these operational weaknesses would impact the performance of net lease REITs.

types. (Mowell, 2013) Low rollover implies greater revenue stability and lower sensitivity to several variables that affect the industry. However, in a fast-growing environment, where property prices and rents rise sharply, a low portfolio rollover (i.e. multiple long-term leases) implies a potential inability to capture revenue upsides. That is the case of Retail REITs where anchor tenants usually sign lease contracts for 20 to 30 years. (Barclays Research Department, 2018)

Therefore, by combining all these different factors, we can draw a clearer picture of how diverse REITs are structured and how they may differently react to potential market turmoil.

## 4.2. Interrelationship and Impact of the REIT Industry Main Drivers

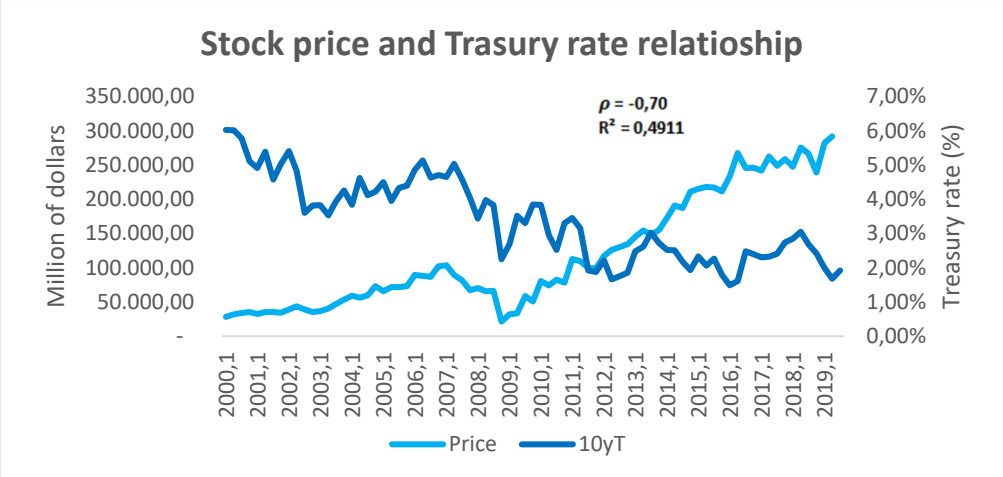
In this section we will focus on four industry specific main drivers which we believe represent the most valuable factors investors should consider in analyzing REITs investment opportunities under different circumstances. We acknowledge that other variables may be impactful and helpful from an investor standpoint. However, due to the limited scope of this thesis, we strongly believe these four factors, together with the macroeconomic considerations highlighted in (ch. 4.1), constitute the most valuable framework for investment decisions on REITs.

### 4.2.1. Treasury bond yields as a valuable indicator for REITs performance

As we briefly described above, historically, there was no clear relation between the FED funds rate, Treasury bond Yields and REITs performance. However, combining a few different considerations we can draw a clearer picture that may help investors have a better understanding on how these factors interact.

In order to clarify this relationship, we firstly differentiate the correlation between the 10-year Treasury bond yield and NAREIT All Equity REITs price by considering different time lags. Figure 40 shows a strong negative correlation ($\rho$=-0.70, $R^2$=0.50) between these two factors. However, deepening down our analysis, we observe that this relationship is representative only in the immediate term. That is explainable by focusing on the intrinsic nature of REITs hard assets which are largely considered a long-duration asset class (ch. 2.1.7). Due to this unique characteristic, evidence shows that REITs generate larger and more stable cash flow over time. Therefore, instead of being compared to other fixed income investments they might be priced off and benchmarked against Treasury or corporate bonds. For this reason, REITs valuations are subjected to negative fluctuation in the short-term, but they usually adjust in the medium-long term showing just little correlation. This reaction may be attributable to companies' perception of their capital need as well as the attractiveness of yields compared to alternative options. (He, Webb and Myer, 2003)

*Figure 40 - REITs performance seems to be negatively correlated with the 10-year Treasury rate*

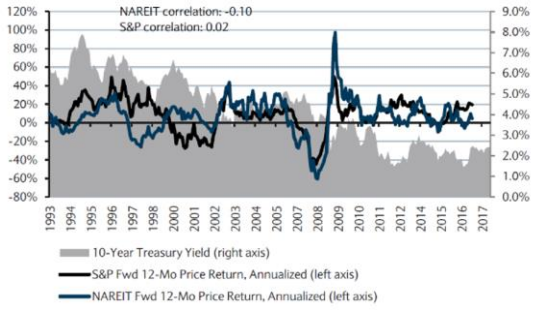


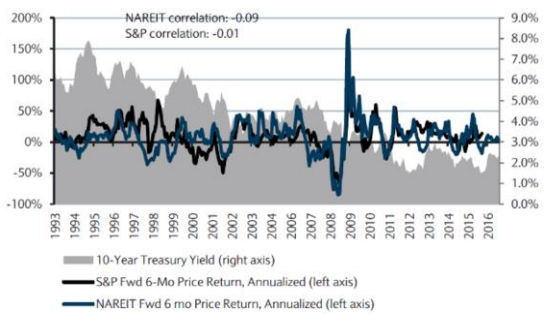

Source: NAREIT T-Tracker, Bloomberg and SNL Financial

Expanding our analysis, it suddenly appears clearer how this relation is biased and mainly based on market fluctuation and short-term reaction to yield changes. By adjusting stock prices for the average FFO of the All Equity REITs we can notice how the correlation coefficient shifts down from -0.70 to -0.64 with an R square of 0.41. (Appx.3) Price/FFO multiple represents a valuable earnings indicator for the REIT industry and so it constitutes a less influenceable factor in analyzing this unclear relationship.

The same intuition is confirmed by considering the 6 and 12 lagged forward stock returns. According to the NAREIT research department, lagging the data proves an inconclusive relation and low correlation between the variables considered. The data show a correlation coefficient of negative 0.09 and negative 0.10 for 6 months and 12 months forward stock returns, respectively. In addition, these results show a similar relationship between S&P 500 returns and the 10-year Treasury yields which indicates almost no correlation (-0.01 and +0.02 for 6-12 months lag respectively). (Barclays Research Department, 2018)

*Figure 41 - REITs price shows almost no correlation considering in the considering 6 and 12 month forward*



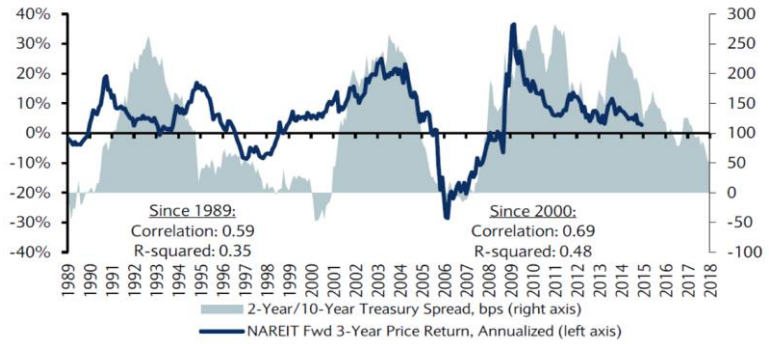

Source: (Barclays Research Department, 2018), Bloomberg, SNL Financial

As a result, according to some scholars, even though rising government bond yields may cause earnings multiples to contract in the short-term, REITs are usually driven by other fundamentals such as cash flows, competitive positioning and improving economic growth. (Krewson-kelly and Thomas, 2016)

Moreover, the spread between 10-year and 2-year Treasury bonds provides additional evidence which are extremely valuable in obtaining a greater understanding of the interaction between interest rate and REITs performance under different circumstances.

Barclays' equity research team analyzed this relationship comparing it with the returns realized by investors who invested in the NAREIT All Equity REITs index and held it for a minimum of three years. This study demonstrates that investors earned a higher return by buying REITs stocks when the yield curve was steep rather than flat (figure 42). (Barclays Research Department, 2018) The findings seem to be consistent with real estate fundamentals and monetary policies. Historically, a steep yield curve implied stronger growth expectation, optimism and greater long-term inflation which led to improved asset replacement values and higher nominal rents which in turn positively affected REITs performances. (Mowell, 2013; Barclays Research Department, 2018)

*Figure 42 - REITs performance was generally better when the yield curve was steep*



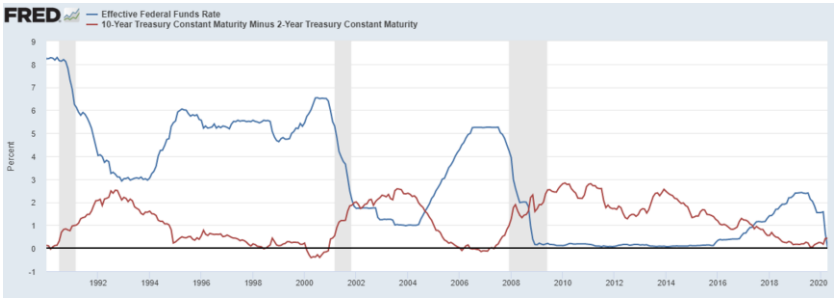

Source: (Barclays Research Department, 2018), NAREIT

Figure 42 demonstrates a quite high correlation between these variables over the past 20 years ($\rho$=0.69). Research suggest that the FED funds rate directly influences short term Treasury yields (figure 43) which are in turn negatively related to the spread between 10-year and 2-year Treasury yields (figure 44). (Martin, 2017) A steep yield spread often implies a lower FED funds rate which aims to boost the economy. Hence, by anticipating monetary policies under different economic conditions, investors might be able to predict REITs future returns and thereby benefiting from capital gains.

*Figure 43 - FED funds rate directly influences short term Treasury yields*


Source: FRED, Board of Governors of the Federal Reserve System (US)

*Figure 44 - The spread between 10-year and 2-year Treasury rate is inversely related to the FED funds rate*




Source: FRED, Board of Governors of the Federal Reserve System (US)

However, even though the interaction between the factors discussed above is representative, this analysis suggests that factors other than interest rates drive REITs results and broader stock performance over the medium term. Therefore, investing solely on the basis of movement in interest rates is potentially fraught with risk. (Barclays Research Department, 2018)

### 4.2.2. REITs share price sustainability: Cap Rate and NOI interactions

In this subsection we will discuss the importance of the capitalization rate[40] in determining REITs returns. Cap rate is largely considered a fundamental concept in the commercial real estate industry representing the percentage of return an investor would receive on an all-cash purchase. It constitutes one of most important indicators in real estate since it serves as a benchmark in evaluating various real estate investments. It is also a central metric because it forms the inherent discount rate in REITs valuation[41].

[40] The capitalization rate is a key measure used in real estate to compare different real estate investments. It is usually calculated as the ratio between the NOI generated by an asset to its market value. In this section we will refer to it in its accrued and general term by directly considering NAREIT All Equity REITs index cap rate.

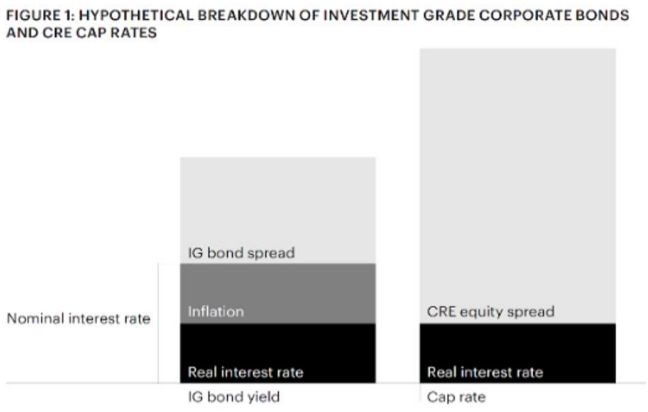
[41] The most widely used valuation method within the REIT industry is Net Asset Value (NAV). It is calculated as the ratio between NOI, which measures income-producing properties' profitability, and the blended cap rate of all firm's commercial real estate properties.

Therefore, due to the centrality of this element, we will focus on analyzing cap rate main drivers and its impact on REITs performance.

Over the past two decades, interest rates have fallen to historically low levels thanks to several structural and cyclical factors. Investors in commercial real estate (CRE) equity have been among the beneficiaries of this trend, as cap rates have declined in concert boosting property price appreciation and REIT valuations. (Conner and Liang, 2005) However, even though nominal interest rates are a good proxy for cap rates, deepening our analysis we found a more accurate metric which helps us explain this trend.

Given the nature of REITs investments (ch. 2.2.), studies suggest that instead of using common stocks as a benchmark it is more valuable comparing NAV to bond pricing method capturing differences and commonalities between the respective discount rates. (FS INVESTMENTS, 2019) Firstly, it is worth mentioning that both fixed income securities and CRE equity values[42] are driven by changes in interest rate. As interest rate goes up, the bond value as well as REIT valuation decrease. According to FS investment research department, while corporate bonds are driven by nominal interest rates (usually 10-year Treasury) plus an investment risk-based spread, cap rates rely more on real interest rate and CRE equity spread. (Figure 45) Real interest rates equal the nominal rate minus inflation expectations and represent the true benefit investors receive for lending their capital.

*Figure 45 - Hypothetic breakdown of investment grade corporate bond and CRE cap rate*




Source: (FS INVESTMENTS, 2019)

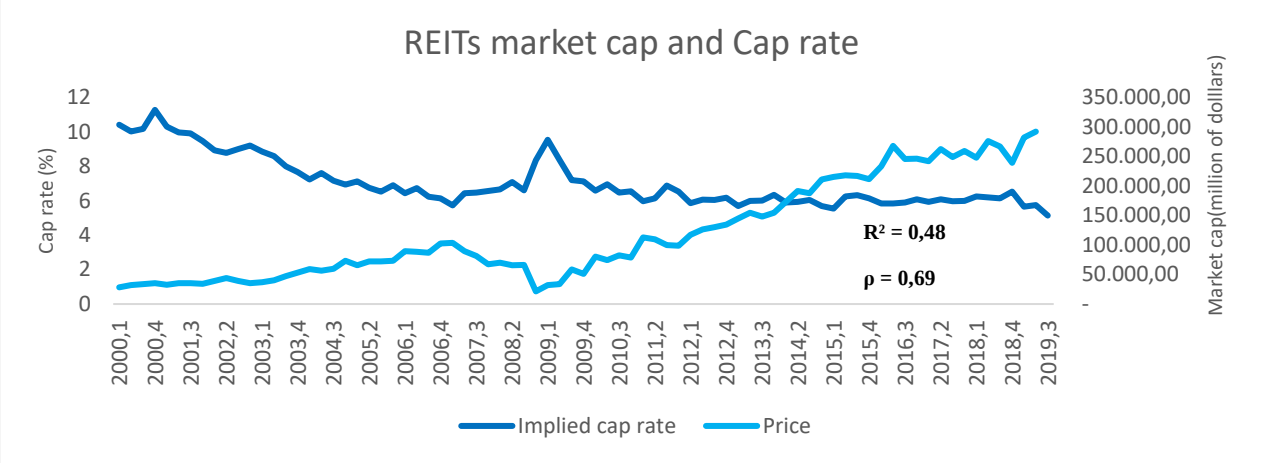
Thereby, in terms of interest rates, a key difference between fixed income securities and real estate properties is that bonds' yield typically responds to changes in nominal interest rates, while cap rates are more sensitive to real interest rates. (FS INVESTMENTS, 2019)

[42] Commercial Real Estate Equity values serve as a proxy for REITs prices

In support of these findings, appendix 4 shows a very strict relationship between cap rates and real interest rates. Evidence indicates a high positive correlation between these variables while the correlation with nominal interest rates appear less pronounced. This is because, since real estate properties and REITs lease contracts are usually linked to inflation, real estate tends to show less sensitivity to inflation than other fixed income assets. Therefore, cap rates move more closely with real interest rates, which strip out inflation, than to nominal interest rates. (FS INVESTMENTS, 2019)

Moreover, along with the direct and positive link between cap rate and natural rate of interest we can observe a strong negative correlation between cap rate and REITs market capitalization. (figure 46)

*Figure 46 - Strong negative correlation between REITs price and cap rate*




Source: NAREIT T-Tracker

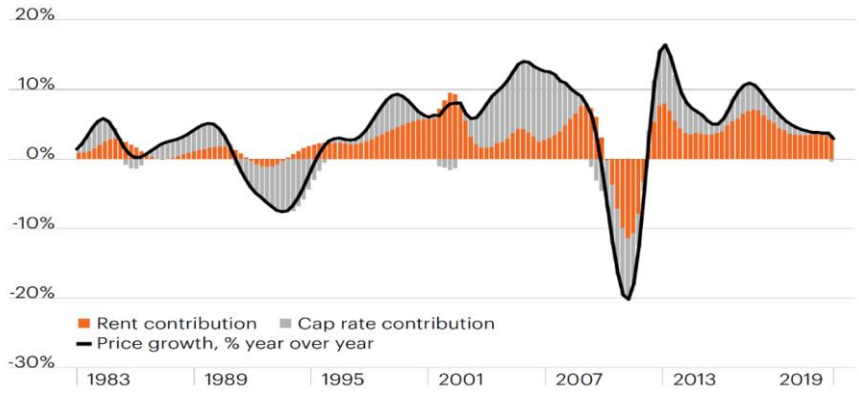
Real estate valuation increases are primarily driven by two factors: decreases in cap rate and increases in NOI. We will now focus on understanding each of these factors' contribution on price changes. Historically, rises in cap rate brought commercial real estate prices to drop. There are two elements that lead cap rates upwards: real interest rate and the equity spread. (figure 45) The latter represents an overall market risk driver that involves several elements among which economic downturn probability and market oversupply.

During the financial crisis, the drying up of the debt market, the general risk aversion among investors and faltering financial circumstances, led cap rates to surge mainly through widening equity spread. This more than offset the effects of expansionary monetary policies that pushed interest rate downwards over the same period. Along with cap rate rise, NOI growth also slowed down exacerbating losses among all REITs sectors that hit negative picks of almost 50%. (Appx.5) These time periods display the risk associated with cap rate increase, whether it is steered by shifts in real interest rates, spread widening or a combination of the two. In addition, even though real interest rate and cap rate usually move together,

we can conclude that real interest rate has a minor impact on price changes. It affects cap rates especially in conditions of stability when equity spread remains stable. (FS INVESTMENTS, 2019)

As at the beginning of 2020 cap rate was at historical lows, thus it is likely to rise. This might undermine REITs price increasing trend. Therefore, separating and determining the actual contribution of cap rate and NOI on price growth is fundamental for the purpose of our analysis. Figure 47 helps us create a framework for estimating future price growth development and its sustainability.

*Figure 47 - CRE price growth contribution: Cap rate and NOI growth*

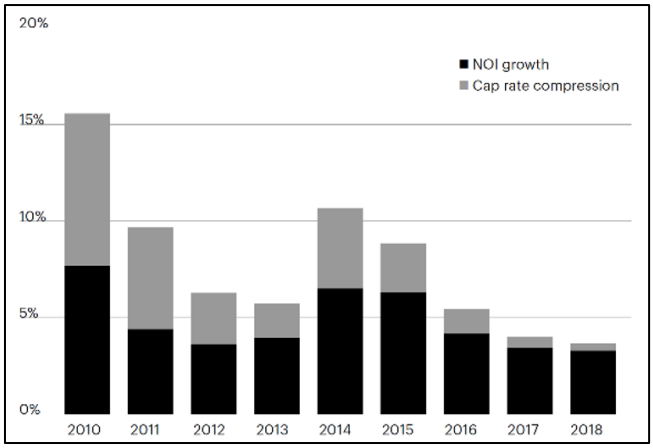



Source: (FS INVESTMENTS, 2019), CoStar

In the years prior to the financial crisis, much of the increase in prices had been due to cap rate decline, as price growth exceeded the increases in NOI. This phenomenon contributed to REITs price vulnerability that in turn generated significant problems during the Great Recession (2007-2009). (Schnure, 2019b) Subsequently, analyzing the after financial crisis period (i.e. 2010 and 2015), we can observe a similar trend. Over this period REITs experienced an average robust annualized 9.5% price growth which was mostly driven by cap rate contraction. Cap rate decline was mainly caused by central banks aggressive monetary policies that implemented the so-called "quantitative easing" programs[43]. Through these interventions they injected significant liquidity into the market driving real interest rates up and thereby cap rates down. Conversely, in the last few years, CRE prices showed an annualized 5.4% growth where about 80% of which was driven by NOI growth. (figure 48) During this time, most REIT sectors' price growth was driven by NOI improvements, ranging between an impressive 10% NOI growth for Industrial REITs to a 2% increase for Retail REITs. This trend is really promising for the future of REITs since a growth driven by NOI rise compared to cap rates is more reliable and consistent.(Appx.6) (Schnure, 2019b)

[43] In the next chapters we will focus more on recession. In such circumstances we will address more thoroughly the expansionary monetary policy pursued by the FED during the Great Recession

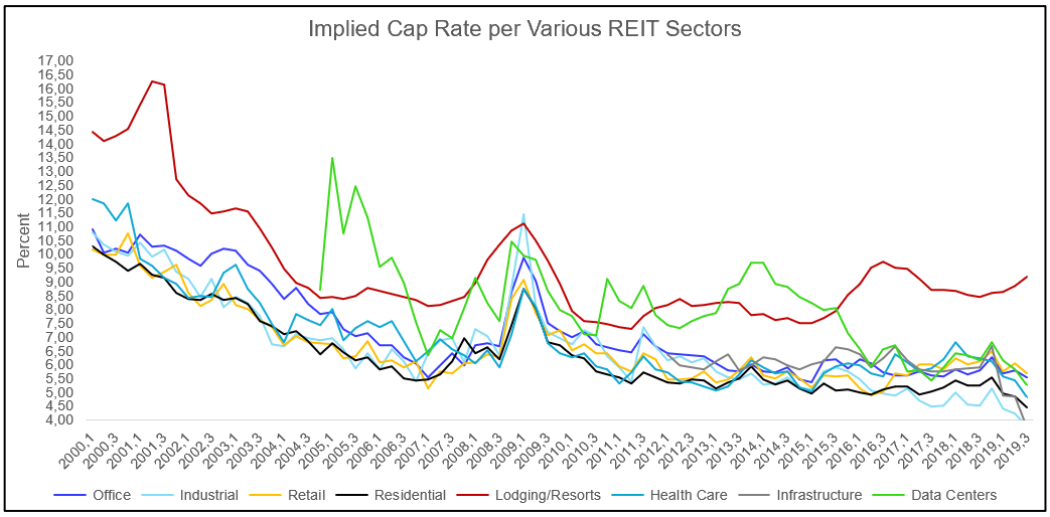
*Figure 48 - CRE price growth contribution*




Source: (FS INVESTMENTS, 2019), CoStar, NAREIT

Furthermore, upon the consideration made above, our findings suggest a comparative analysis between estimated cap rates and implied cap rates. The latter represents the cap rate that would result in a NAV equal to a REITs' current stock price. By comparing the implied cap rates with firms' specific estimated cap rates, it is possible to reach significant conclusions regarding REITs profitability. According to research, if the implied cap rate is particularly higher than the estimated cap rate, the firm in consideration is currently trading at a discount. Thus, it represents a stock buying opportunity. On the other hand, if it is particularly low, it means the firm is trading at premium, representing then a stock selling opportunity. (Barclays Research Department, 2018) The chart below outlines the implied cap rate trend over the past twenty years. It considers the most significant REIT sectors in terms of market capitalization. As discussed above, all REIT sectors increased dramatically over the period, showing continuously decreasing implied cap rates. However, in the last 10 years our findings highlight a changing trend among REITs sectors. Healthcare and Lodging/Resort REITs showed an increasing implied cap rate while Industrial and Residential demonstrated the greatest decrease of this measure. (Figure 49) Different sectors react differently to changes in macroeconomic factors leading investors to adjust their investments accordingly. Further evidence confirms the same results showing that implied cap rate movements are in line with changes in FFO per sector. (Appx.7) Sectors with a high implied cap rate usually have a lower level of FFO which negatively impact dividends paid out to shareholders.

*Figure 49 - REITs sectors implied cap rate (%)*




Source: NAREIT T-Tracker

In sum, market participants should carefully evaluate the potential risks of investments in commercial real estate, understanding price growth main drivers and their implication in different economic circumstances. (Schnure, 2020)

### 4.2.3. REIT Multiples and Corporate Bonds appear to be connected

In the previous subsections we focused on REITs price relation with several different market parameters. However, to provide an additional standpoint, we will now pursue a similar analysis considering the interaction between corporate bond yields and cash flow multiples. Our findings suggest that both these factors are strictly related to the market-wide perception of credit risk. During times with greater perceived risk at either company or macroeconomic level, both stock and bond investors look to be paid for those risks in the form of higher current yields. Hence, the interaction between these two elements helps increase the level of our analysis.

This study will consider cash flows and earnings multiples (P/CAD and P/FFO) as well as Baa seasoned corporate bond[44] yields. REIT multiples will be addressed in two different levels. Firstly, CAD multiples[45]

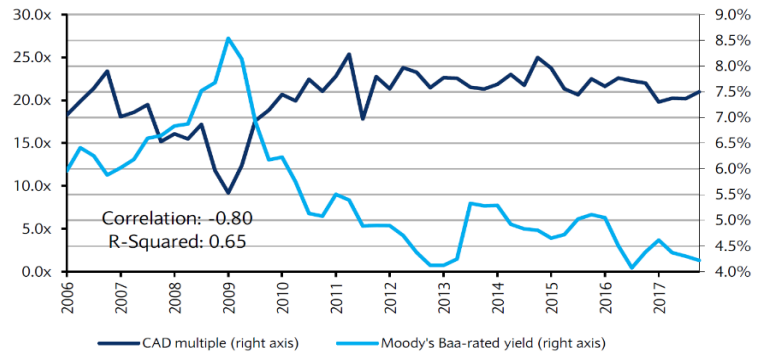
[44] For the purpose of this analysis, Baa seasoned corporate bond yields are considered. These are medium-grade obligations which show relatively low risk and are considered investment grade. Considering industry fundamentals and REITs debt structure, Baa corporate bond yield captures more idiosyncratic risks and volatility than higher graded corporate bonds. Therefore, by focusing on Baa corporate bond yields we consider a more compelling sample which is more in line with the REIT industry characteristics.

[45] CAD represents available funds that REITs generate and can distribute to shareholders as dividends. It is a key metric to assess REIT's strength. However, differently from FFO, there is not a clear and standardized rule regarding how CAD

will be examined. Subsequently we will focus on FFO metrics providing a different, less biased and more exhaustive standpoint.

History suggests that rising corporate bond yields and higher risk spreads translate into lower cash flow multiples. (Figure 50)

*Figure 50 - CAD multiples are negative correlated with Corporate bond yields*

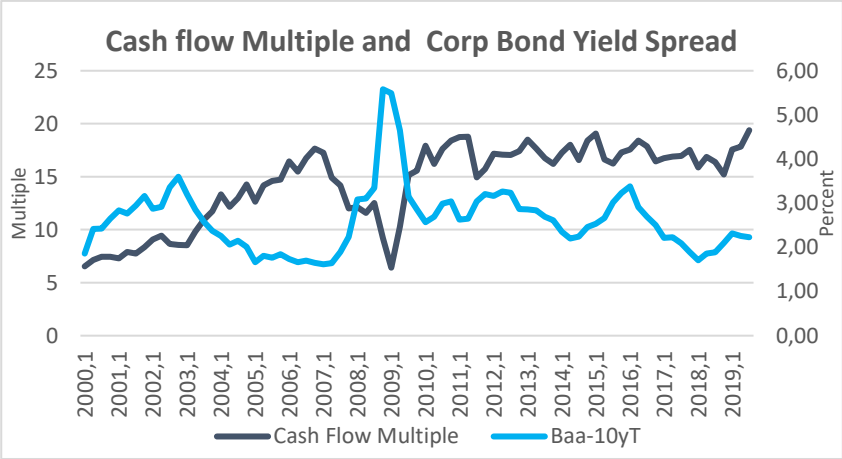



Source: (Barclays Research Department, 2018), Bloomberg

Some scholars outlined a strong negative correlation between these two factors determining a correlation coefficient of -0.80 with a related R-squared of 0.65. The latter indicates that yields on corporate bonds explain 65% of the movement of REITs multiple over the period examined, confirming our findings. (Barclays Research Department, 2018) In addition, data also shows a significant relationship between cash flow multiples and Treasury rates. However, this correlation is lower at a p=-0.59 for 10-year Treasury. (Appx.8) This leads us to consider corporate bond yield spread with 10-year Treasury as a more compelling risk-adjusted measure in analyzing REITs performance. (figure 51) By considering corporate bond yield spread, investors may determine the inherent perceived risk in the market optimizing their cash flows forecasting. (Barclays Research Department, 2018)

is calculated. Thus, since this measure is hardly subjected to analysts' biases towards certain calculation methods, we will focus on FFO metrics as well, providing a less biased and more thorough output.

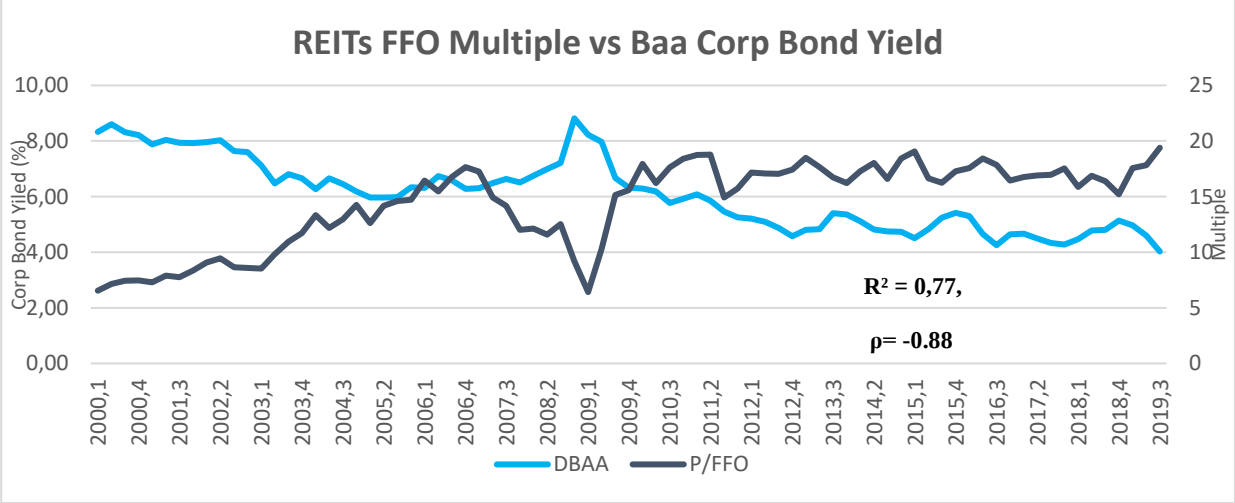
*Figure 51 - REITs cash flow multiples are negatively correlated to Corporate bond yield spread*




Source: Barclays, NAREIT, Bloomberg

Moreover, by looking at FFO multiples, we can obtain additional details regarding this valuable relationship. This metric has a more standardized formula which allows us to analyze further data and provide a more coherent assessment. (Vincent, 1999) Unsurprisingly, FFO multiple demonstrates the same strong negative correlation as with Baa corporate bond yields. Our findings highlight an even stronger relationship, showing a ρ=-0.88 and a R-squared of 0.77, which exceeds CAD multiple correlation coefficient by 70 bps. (figure 52 & Appx.10)

*Figure 52 - REITs FFO multiples are strongly negative correlated to Baa Corp Bond Yield*

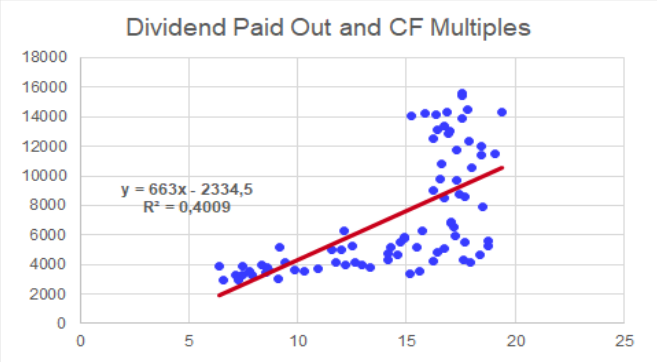



Source: Barclays, NAREIT, Bloomberg

Having outlined this relevant relationship, it is worth studying its implied impact on dividend payout. Over the long term, our findings outlined a positive correlation between these variables (ρ=0.63). (Figure 53) Therefore, under thriving economic conditions with low risk perception, investors may find attractive investing in REITs. Low corporate bond yield spread entails high expectation on REITs cash flows and earnings, fostering a rising demand for REIT shares. Despite this, our findings point out that taking into

account a shorter period (last 10 years), the correlation between these two variables is reduced to almost zero (ρ=0.05).

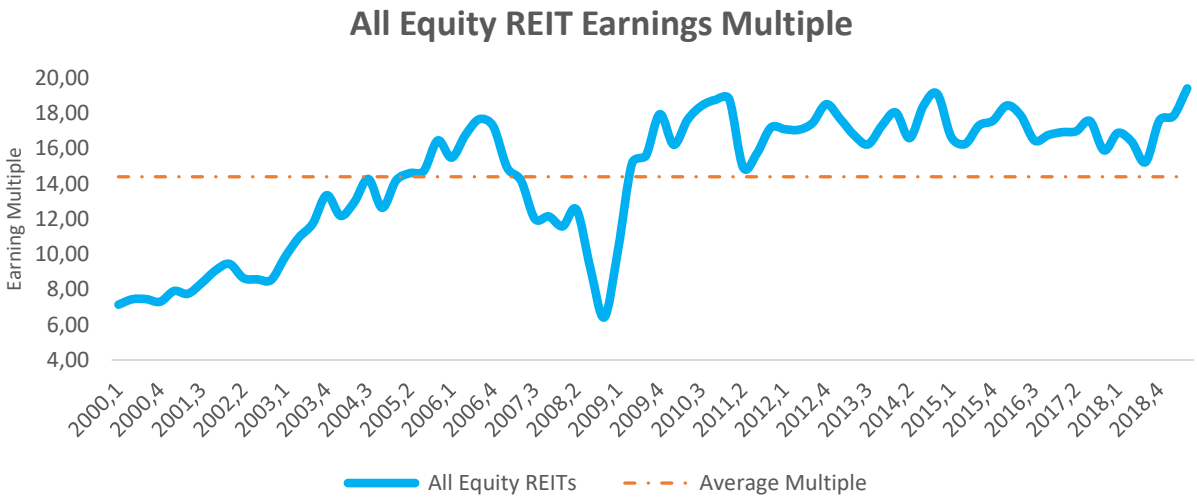
*Figure 53 - Cash flow multiples seems to be positive correlated with dividend payout*




Source: NAREIT T-Tracker, Bloomberg

In the last few years, REIT valuation skyrocketed, showing FFO multiples steadily above the industry average. (Figure 9) This trend was caused by a combination of several macro-economic factors as well as by investors' high expectation towards REITs earnings growth. Our study denotes that a relevant proportion of market price increase affects REITs FFO multiple variation. Therefore, being REITs a total return vehicle, by separating price to dividend contribution on investors returns, we can draw different and more effective conclusions. Although figure 53 depicts a significant relationship between dividend paid out to investors and P/FFO over time, other evidence suggests that this relationship is inconclusive from an investor's perspective. Hence, by looking at corporate bond yield spread, we provide valuable indication for potential REIT price appreciation but less compelling evidence regarding future dividend payouts.

*Figure 54 - REITs earning multiple*

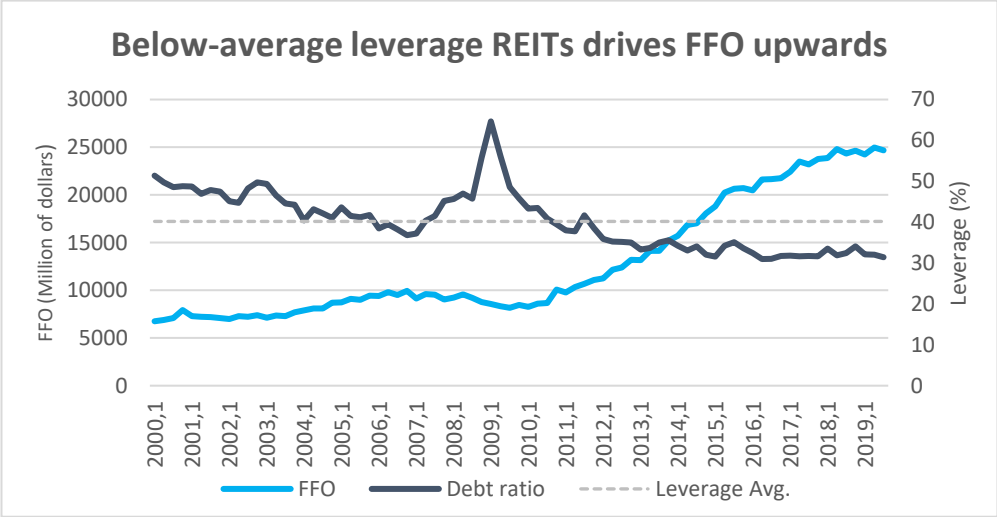



Source: NAREIT T-Tracker

### 4.2.4. How financial leverage influence REITs performance and profitability

REITs' capital structure represents one of the most important and intriguing elements in analyzing industry fundamentals. According to some scholars, highly leveraged REITs do not show as much financial flexibility as REITs that operate with below-average levels of debt. (Krewson-kelly and Thomas, 2016) As a result, REITs with a higher proportion of debt financing often are not able to benefit from opportunistic investments. Studies have demonstrated that above-average leverage REITs typically underperform their lower-leverage peers. (Giacomini, Ling and Naranjo, 2015) This section examines the overall role of REIT's cost of capital on firms' profitability and its impact on top management investment decisions.

*Figure 55 - REITs with low leverage demonstrates superior earning growth*




Source: NAREIT T-Tracker

Traditionally, corporate finance literature addresses capital structure concerns by starting from the analysis of the trade-off theory between the marginal debt tax shield and marginal bankruptcy costs. However, as we highlighted in (ch. 2.1.1), REITs are pass-through entities which do not share the same characteristics as most of the other firms. They are tax-exempt entities which are statutorily permitted to avoid the payment of income taxes at a company level. They are required to distribute at least 90% of their taxable income to shareholders as dividends which in turn pay individual taxes on their income. As a result, the theoretical benefit of debt financing outlined by the trade-off theory is eliminated. In addition, taking into account REITs asset nature and investment class boundaries it appears that even bankruptcy costs are enhanced by financial leverage. REIT is a capital-intensive industry that consists of firms that are required to base the vast majority of their income-generating activities on real estate assets which are, by nature, relatively large and illiquid. This leads REITs to be more exposed to local property market vagaries and cyclicality, entailing pronounced potential bankruptcy costs. Therefore, considering asset

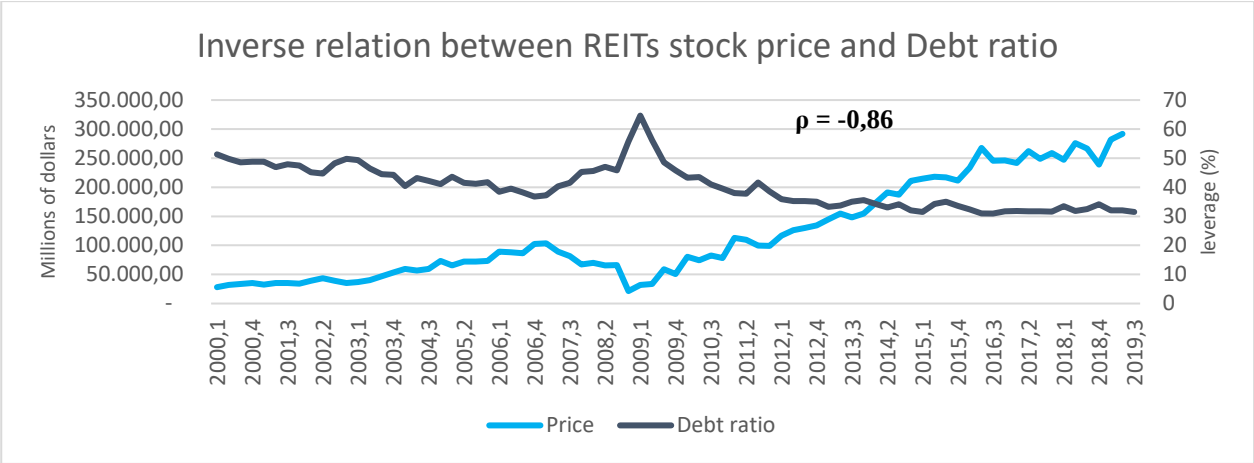
class restrictions and qualities, REITs show very limited diversification opportunities which increase the probability of encountering financial distress and in turn incurring substantial bankruptcy costs. (Harrison, Panasian and Seiler, 2011; Sun, Titman and Twite, 2015)

Furthermore, some scholars point out the inverse relationship between leverage and firm value. In a capital-intensive industry, financial flexibility represents a valuable feature since it allows firms to react promptly to unexpected expenses or investment opportunities. (Gamba and Triantis, 2008) In such a way, financially flexible firms produce better risk-adjusted returns. According to studies, the costs of financial flexibility from excessive leverage is estimated to be significant. Evidence suggests that this inverse relationship reflects the cost of lost financial flexibility from exhausting the debt capacity of a firm. (Riddiough and Steiner, 2020) This is particularly marked in the REIT industry because their institutional peculiarities make them more exposed to "principal-agent" conflicts concerning the spare debt capacity. Low cash retention due to payout restriction, high debt capacity given assets characteristics and capital-intensive investment opportunities requires REITs to extensively rely on external debt financing. As a result, this particular combination makes REITs highly sensitive to manager–shareholder conflicts over the use of spare debt capacity. A large level of debt financing leads to perks and management overinvestment which in turn undermine firms' value. (Riddiough and Steiner, 2020) In addition, pecking order effects[46] are also minimized. Considering the strict dividend payout policy and the low cash retention due to limits in asset sales, REITs have just a limited discretion regarding the type of financing sources they can deploy (internal or external). This results in a high external funds reliance that foster agency problems. (George Hendrikse, 2003; Harrison, Panasian and Seiler, 2011)

Our analysis confirms the negative correlation between REITs performance and leverage level. In pursuing this study, we considered not only price interaction with debt ratio, but also its impact on firms' profitability of income-generating real estate investments measures. The below charts illustrate this negative correlation. NAREIT All Equity REITs market cap shows a negative 0.86 correlation coefficient with the REITs financial leverage. The same trend is demonstrated considering NOI, which has a slightly less significant correlation coefficient ($\rho$ = -0,79) (Appx.10 & Appx.11)

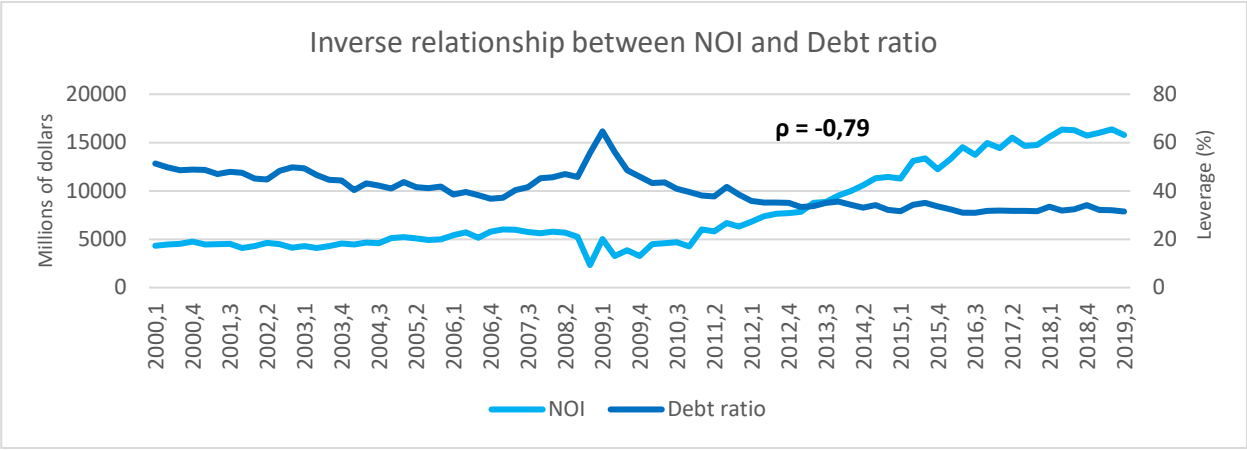
[46] The pecking order theory concerns firms' financing alternatives and their implications. It is important because it signals to the public how the company is performing. According to the theory, a company should prefer to finance itself first internally through retained earnings. Subsequently whether this source of financing is unavailable, a company should then finance itself through debt. Finally, and as a last resort, a company should finance itself through the issuing of new equity. Financing choice signals management perception of firm profitability. In common industries, if a company finances itself through issuing new stock, it is normally a negative signal, as the company thinks its stock is overvalued and it seeks to make money prior to its share price falling.

*Figure 56 - Inverse relation between REITs performance and Leverage ratio*




Source: NAREIT T-Tracker

*Figure 57 - NOI is negative correlated with the debt ratio*



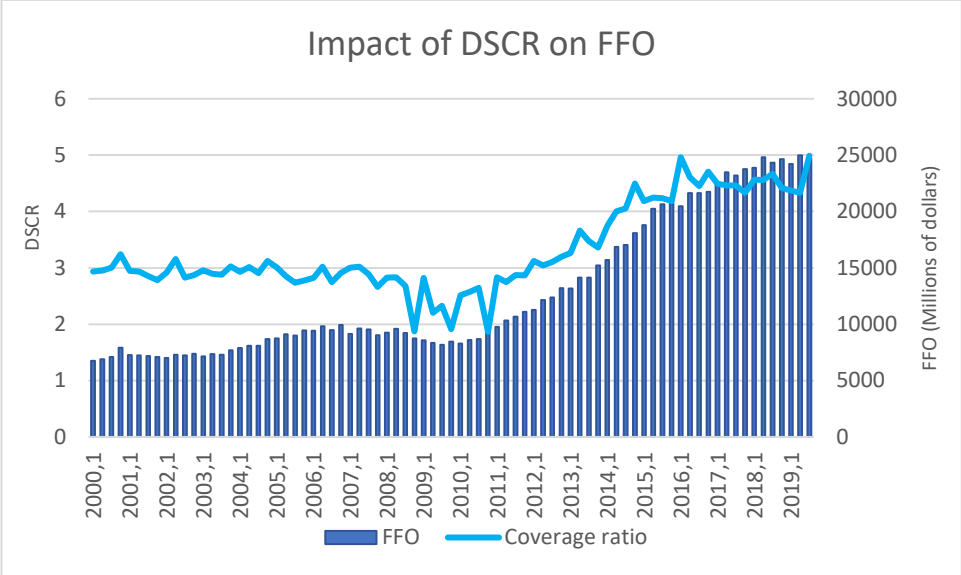

Source: NAREIT T-Tracker

For the purpose of this analysis, this second metric is more meaningful because it concerns firms profitability without taking into account market reactions and speculations which are inherently incorporated in stock prices. These results validate the theoretical consideration discussed above. Scholars highlight that low levels of debt financing lead firms to a more efficient use of their financial flexibility reducing the impact of management perks and over investments. (Feng, Ghosh and Sirmans, 2007)

Another crucial element which is worth analyzing is the debt cover ratio connection with firms' earning metrics. Debt service cover ratio (DSCR) represents a measure of a firm's financial flexibility. Our findings demonstrate how, as DSCR increases over time (higher financial flexibility), both REITs earnings and prices go up proportionally. (Figure 58) Riddiough and Steiner (2020) research highlighted

that on average, firms' value decline by almost 9% relative to the sample mean considered in their study after an increase of one standard deviation in leverage level. (Riddiough and Steiner, 2020)

*Figure 58 - Debt Service Cover Ratio and REITs earnings follow the same trend*




Source: NAREIT T-Tracker

Moreover, we expand our findings by showing how in the REIT industry unsecured debt helps mitigate conflict of interest between shareholders and managers. Unsecured debt consists of bonds issued by a firm that are not collateralized and not backed by other firm assets. These are usually subjected to strict covenants related to DSCR or operating earnings multiples. We provide further evidence that leverage declines when debt financing shows a higher proportion of unsecured debt usage reflecting the commitment value of the inherent covenants. According to researchers, unsecured debt contracts used to finance REITs involve a series of specific covenants that mitigate agency conflicts between management and shareholders over the preservation of the spare debt capacity. (Riddiough and Steiner, 2020) These covenants represent extremely valuable commitment mechanisms that help avoiding managers overinvestment and perks. Among all, the most common unsecured debt covenants involve a leverage level not greater than 60%, FFO to debt service ratio no less than 1.5 and a proportion of secured debt on total asset not higher than 60%. (Giambona, Mello and Timothy J. Riddiough, 2017) Such covenants are extremely valuable in mitigating conflicts of interest because of the severity of their effects. The violation of these restrictions may cause limited access to credit resources, improved accounting transparency, significant restructuring and refinancing costs as well as investment limitations. These would have a huge impact on management decisions, highly influencing their performance and bonuses. (Roberts and Sufi,

2009) Therefore, scholars outlined an inverse relationship between covenant violation and resultant debt issuance.

In addition, further evidence shows a similar negative relation between financial leverage and covenants incorporated in REITs' debt contracts. This demonstrates an ex-ante disciplining effect of unsecured debt covenants which is valuable in analyzing firm's capital structure. (Harrison, Panasian and Seiler, 2011; Riddiough and Steiner, 2020)

## 4.3. Conclusion

Chapter 4 plays a crucial role in the development of this thesis. In the first part of the chapter we introduced the REIT industry main drivers and the macroeconomic fundamentals affecting REITs performance. In this section we studied these factors impact both from a broader and a sector specific perspective. In our analysis we found that these five drivers are among the most important. (1) Rising unemployment rate and low GDP expectations have a crucial impact on the overall industry. (2) Demographic structure is a valuable indicator for certain REIT sectors performance. (3) Interest rate movements negatively affect REITs prices in the short term. (4) REITs demonstrate a consistent inflation hedge over time. (5) Average lease term and portfolio rollover are precious indicators for REITs sensitivity to market fundamentals.

Subsequently, in the second part of this study we shed lights on the links between several diverse factors and REITs performance. These provide the investor with a toolbox valuable for analyzing the REIT industry and its future evolution. In this stage we selected four main interactions between fundamental drivers and REITs returns drawing among others the following conclusions. (1) Treasury bond yields serve as effective indicators for REITs performance. Findings showed a strong negative correlation between 10-year Treasury yields and REITs stock prices. (2) The importance of NOI growth in REITs valuation. (3) Corporate bond yields and corporate bond yield spread are negatively correlated with REITs cash flow multiples. (4) Low leverage ratios and high debt cover ratios helps REITs management to maintain a high level of financial flexibility. This usually leads to greater performance.

With a deeper understanding of the intricate interactions that these factors have on REITs performance, we created the foundations for the analysis of the next two chapters of this paper.

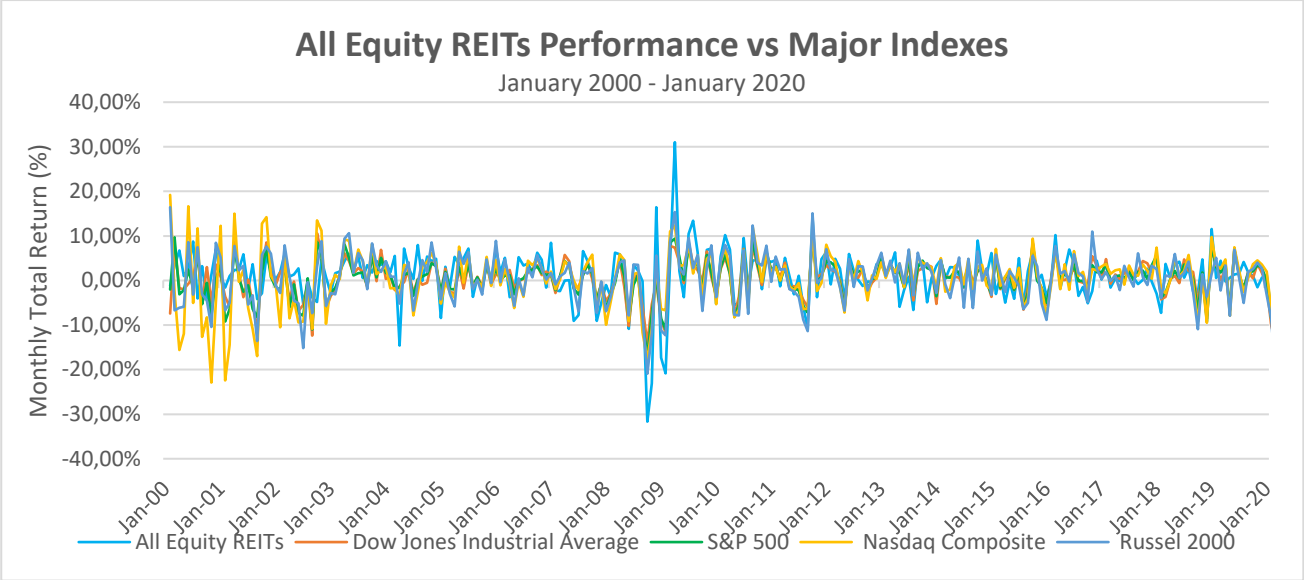
# 5. REITs and Recessions.

One of the key characteristics of capitalist economies is that they go through a repetitive cycle of booms and busts (D'Apice and Ferri, 2016). This is often referred to as the business cycle and describes the economic expansion and contraction that is happening at all times. According to the National Bureau of Economic Research the US Economy has since 1854 been through 33 cycles of varying length, but the overall cycle average is around 56 months(Business Cycle Dating Committee, 2020). However, some of the recent cycles have been closer to ten years. As a result, thereof it is now generally accepted that cycles, including busts/recessions, will occur each five to ten years (Askola, 2019).

During times of economic expansions most fundamentals and economic drivers are soaring, providing high returns to all investors. Contrary, during economic recessions the economy shrinks, people lose their jobs and investors lose money. In previous chapters we have discussed the various REIT characteristics that together show that REITs have an above average resilience to periods of economic downturn. In this chapter we will focus on how REITs perform during economic recessions and thereby create a framework for analyzing the current economic downturn linked to COVID-19.

Throughout the thesis we have operated with a time period of the last twenty years when conducting analysis on performance. As described in (ch. 1.4) this stems from the fact that the modern REIT was created with the 1999 tax reform and thus a period from 2000 to 2020 seemed like a logical timeframe. Figure 59 depicts the performance of REITs and other major indices in this time period. Reading the graph, we see two distinct periods of turmoil in the indices that also coincide with previous recessions. The first period can be seen around 2000-2002, which loosely coincides with the dot-com bubble. Secondly, we can observe another period that shows a great volatility around 2008-2010, which matches the Great Recession.

*Figure 59 - REITs total return compared to other major indexes*




Source: NAREIT, Bloomberg

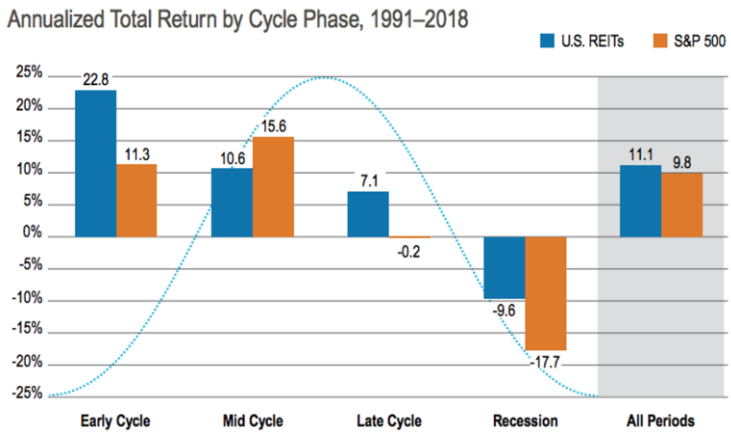
The main focus of this chapter will be these two distinct recessions that we have had in the last twenty years. As we will elaborate in the subsequent chapters, the recessions varied significantly in their origin, main drivers and impact on REITs. Understanding how different types of recessions impact REITs we seek to strengthen our framework for a more accurate analysis of the current COVID-19 led recession.
The chapter will consist of four sections. Firstly, we will revisit REITs characteristics and fundamentals that are important to recession performance in order to set the scene for the subsequent analysis of the two distinct recessions. In (ch. 5.2) and (ch. 5.3) we will analyze the dot.com bubble and Great Recession by looking at what caused the recession, how different actors behaved during the recession and how it impacted REIT performance. Finally, in (ch. 5.4) we draw conclusions from the chapter in order to create the framework for chapter 6.

## 5.1. Overall information of REITs performance in recessions

Real Estate Investment Trusts are unique entities that trade like equities, but mainly consists of real estate assets. Because of this uniqueness, REITs behave unlike other asset types and the results are overwhelmingly positive. Especially in times where the economy is in late-cycle or recession, researchers found that REITs outperformed other equities (Bohjalian, 2019). Figure 60 shows the findings of this study with averages of annualized monthly returns grouped by phase. As we can see from the graph,

REITs generally outperformed the S&P 500 index throughout the included time period from 1991 to 2018. Only during the Mid Cycle, where growth investments greatly increase in value, does S&P 500 outperform REITs.

*Figure 60 - REITs have been resilient in the Late Cycle and Recessions*




Source: (Bohjalian, 2019), National Bureau of Economic Research (NBER), The Conference Board, Thompson Reuter, Cohen & Steers

When the economy goes into Late Cycle and investors are anticipating slowing growth, investors tend to shift towards hard assets that can provide protection in harsh market conditions. In this thesis we have covered the unique REIT characteristics that can help explain the resilience they exhibit to recessions and why they outperform other equities during economic downturns.

REITs invest in and operate income generating real estate, that is based on leases as described in (ch. 2.3) and (ch. 4.1.5). Depending on the sector, leases vary in scope and length, but on an aggregated level REITs have predictable lease-based revenues. Therefore, REITs are less sensitive to economic conditions. In a study analyzing earnings growth by REITs and S&P 500, researchers show that REITs provided a more stable growth throughout the whole period. Especially in and around times of recessions, REITs are more versatile as can be seen in figure 61.

*Figure 61 - REITs show stable Earnings Growth*


Source: (Bohjalian, 2019), NBER, UBS, Bloomberg, Cohen & Steers
Notes: Blue line: REITs Y7Y FFO Growth; Orange line: S&P 500 Y/Y EPS Growth

REITs are total-return vehicles and as covered earlier in (ch. 2.2.1), this includes a substantial income return in form of dividends. Contrary to other equities, REITs are required by regulation to pay out 90 percent of income in dividends to shareholders as covered in (ch. 2.2.2). We know that REITs, mainly because of the high dividend growth, provide superior inflation protection compared to other equities as seen in (ch. 2.2.4). Especially in periods of high inflation, REITs income return contributes to an overall higher total return than that of S&P 500 as seen in (ch. 4.1.4).

Through the analysis so far, we also know that REITs have very low correlations with other assets, providing a good source for diversification. This is due to the fact that REITs are, for the most part, valued by the underlying real estate assets as we covered in (ch. 2.2.3). The great diversification that REITs provide are especially valuable in economic uncertainty.

As mentioned in the introduction to this chapter, economic recessions normally occur every five to ten years and tend to happen when the unemployment rate drops to four to five percent (Askola, 2019). Subsequently, because of the effects of the bust, this rate drastically increases as can be seen in figure 34. This rapid increase in unemployment creates a multitude of reactions that impacts REITs as well as other parts of the economy as described in (ch. 4.1.1). The risk of losing your job, or actually losing your job, decreases consumer spending. Furthermore, cutting the workforce reduces the demand for office, industrial and other REIT sectors.

Economic recession happens when the economic expansion has reached a point where the overconfidence in the future growth has led to overinvestments. The demand will no longer match the supply and recession will follow. It is a downwards spiral that at some point will naturally stop, when prices reach a level where investors that still have cash will start to invest again. This can take a long time and exacerbate the long-term impact of the recession. Therefore, governments always seek to minimize the impact of recessions by restoring confidence through monetary policy. Central banks (e.g. the Federal Reserve in the U.S.) will buy debt securities with newly created bank credit. Thereby the Fed lowers the interest rates in hopes that it will result in lower rates for businesses and individuals. Corporations can now access cheaper loans and thereby borrow money instead of having to fire employees or go bankrupt. As mentioned earlier, a rise in unemployment is heavily linked to a recession, but this helps in suppressing some of this effect. Also, individuals benefit from cheaper access to borrowing, letting them purchase more on credit, which keeps prices high.

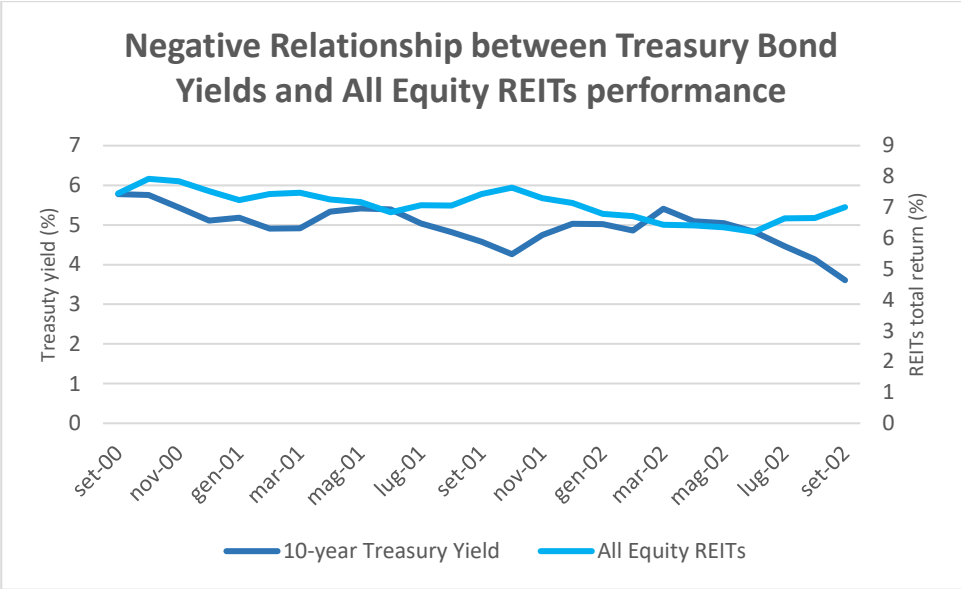
Normally central banks like the Fed purchase government bonds when conducting open market operations as described above. However, at times when the interest rate cannot be decreased further, the Fed will expand its operations to include buying corporate bonds and other assets to inject further money into the economy. When a central bank conducts a strong expansionary monetary policy like this and inject high liquidity in the market, it is known as quantitative easing.

## 5.2. The Dot-com Bubble in 2001

### 5.2.1. Background for the recession and REITs involvement

In the 1990s the U.S. Economy saw an unprecedented period of growth. In 1993 computer users gained access to the World Wide Web marking the beginning of the Information Age. The economy was now driven by information technology and a myriad of new companies seeking to utilize this was created. As covered in (ch. 4.1.3). the interest rates were steadily declining in this period, making capital easily available to drive this development. Furthermore, the Tax Relief Act of 1997, as covered in (ch. 2.1.5), lowered the top marginal capital gains tax making investors more willing to speculate. All these factors led to a rapid price appreciation in the stock market that was decoupled from the evaluations of the underlying fundamentals (Patel, 2010). Instead it was driven by investor sentiment that growth would continue. This bubble, which was later coined the dot-com bubble, burst in March 2001 resulting in a recession. The nature of the recession helps describing the impact it had on different parts of the economy. As an equity driven asset bubble, the recession had the biggest impact on stock prices. In uncertain times investors rotate capital to safer investments e.g. hard assets like real estate. Despite all these factors the recession was brief and shallow. According to the National Bureau of Economic Research the recession lasted eight months (Business Cycle Dating Committee, 2020). Because the recession was mainly based on stock price overvaluations, that will adjust itself given time, the Fed engaged with only a mild level monetary policy. The relatively low injection of liquidity led to only a slight increase in the corporate bond yield spread, which effects are covered in (ch. 4.2.3). However, evidence defines a more significant measure in the 10-year Treasury bond yield that in such conditions track more closely REITs performance evolution. Figure 62 illustrates this marginal impact by the implemented policies.

*Figure 62 - Treasury rate movements affected REITs total return during the dot.com bubble*

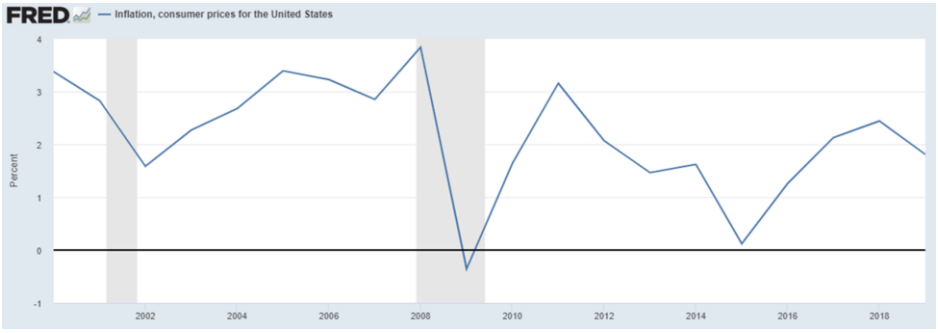



Source: NAREIT, FRED

Along with the aforementioned elements, analyzing some other significant fundamentals that have an impact on REITs (ch. 5.1), we will be able to see how this recession can be considered a shallow recession. Looking back at figure 34 we can read the unemployment rate leading up until the recession as well as the impact the dot.com bubble bursting had on it. In accordance with (ch. 5.1) we can see that in the time leading up until the recession, the unemployment rate was steady around four percent. Historically, this indicates that an economic contraction may be imminent. During the recession, the rate increased to about six percent. Although this is a significant increase, it does not compare to that of the Great Recession covered in (ch. 5.3).

Furthermore, the economic contraction endured in the dot.com bubble reduced the rate of inflation from around 3.5% to around 1.5% as can be seen in figure 63. This further exhibits a rather shallow recession and even more interestingly the recovery period after the dot.com bubble shows a rather high inflation era. As we have discussed in (ch. 2.2.4), historically this implied a shift towards hard assets that can provide a hedge against inflation (e.g. REITs).

*Figure 63 - Last twenty years Inflation in the U.S.*

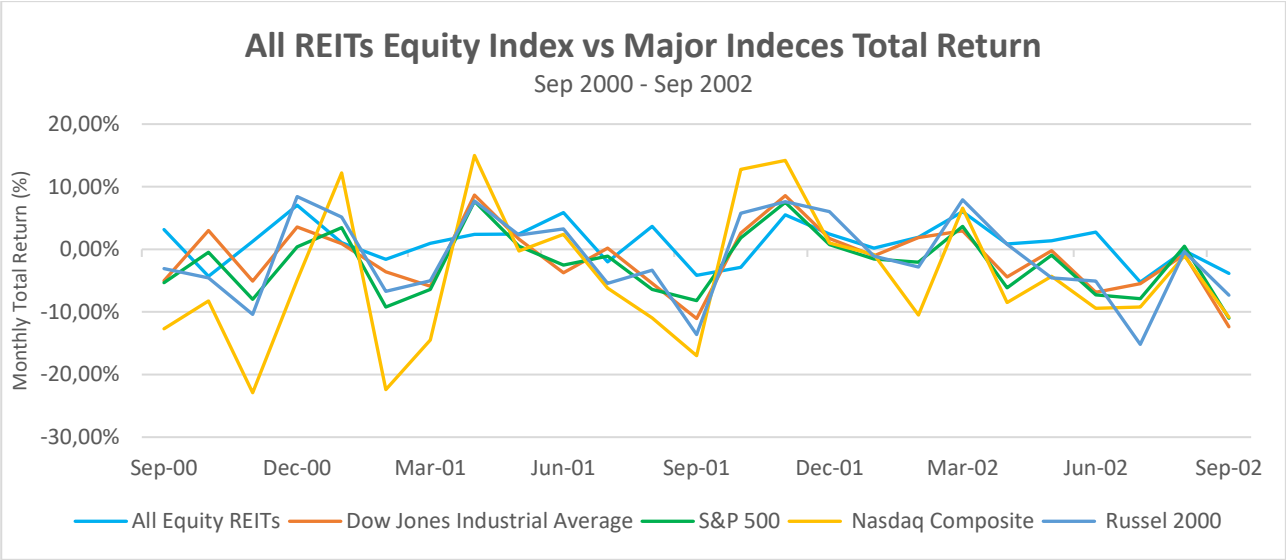



Source: FRED, World Bank

### 5.2.2. REITs Performance vs. Major Indices

The dot.com bubble led recession had a significant impact on the performance of most indices this thesis takes into consideration. In figure 64 we can see the development of the monthly performance for each of the five indices. As described in (ch. 5.2.1) the recession was mainly led by the speculation and malinvestment in technology companies during the boom of the Information Age. Reading the graph, we can see that Nasdaq Composite, which consists mostly of technology companies, is the most volatile of all the indices. The original shock to the market then spread to the rest of the indices and a clear correlation between all indices can be seen moving forward. This was mainly driven by investors losing confidence in the market in general.

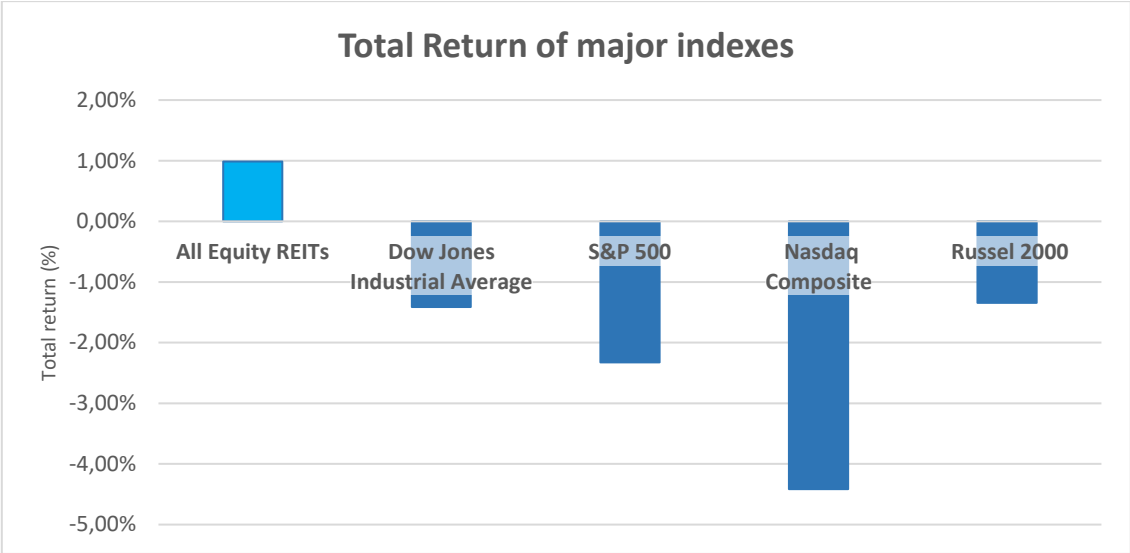
*Figure 64 - Dot.com bubble: REITs total return vs other indexes*




Source: NAREIT, Bloomberg

When analyzing figure 64 it is evident that REITs were less volatile than the rest of the indices during this recession. According to the theories covered in this thesis so far, we know that during economic uncertainty investors will move towards safer investments like hard assets. This is because growth investments, like no- and low-dividend equities, perform worse in times of negative economic growth. REITs are publicly listed companies like other equities, but because they contain a considerable amount of investments aimed towards producing income return, they provide a steady cash flow. Looking at the total return for each index for the duration of the dot.com recession in figure 65, we can see this distinction. In a recession that was led by an overvaluation in the stock market, REITs with their hard assets, managed to provide a positive average monthly total return of 1.0%. Meanwhile, considered the intrinsic characteristics of the recession, Nasdaq Composite showed a negative average monthly total return of -4.4%.

*Figure 65 - Dot.com bubble: REITs total return vs major indexes*

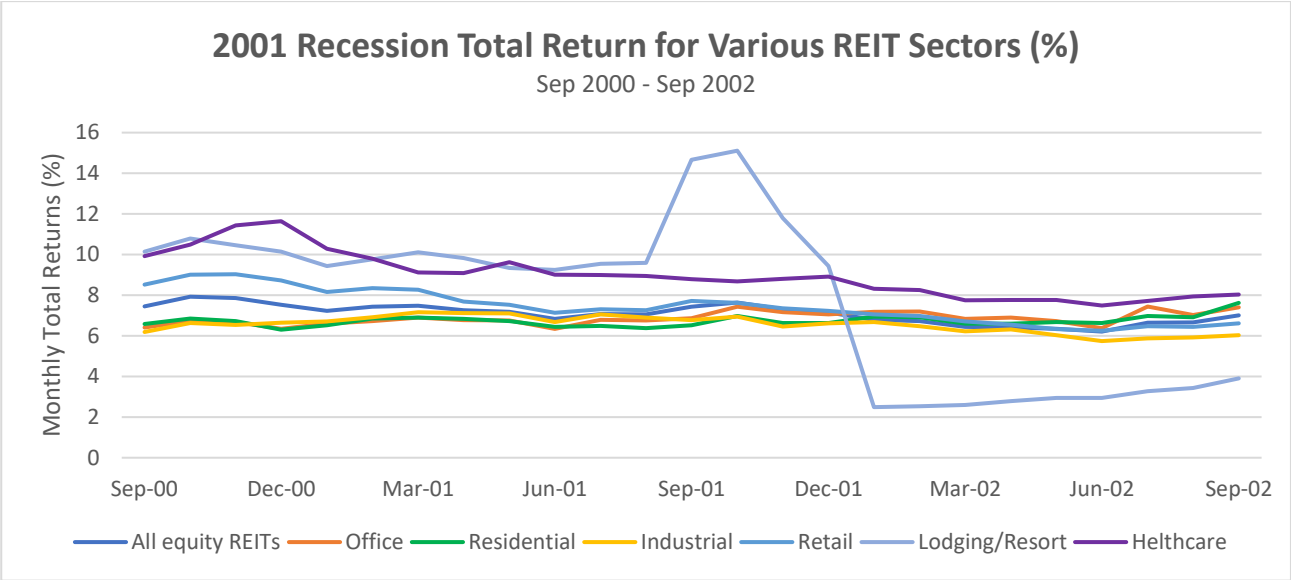



Source: NAREIT, Bloomberg

### 5.2.3. REIT Sectors Performance

We have already established that REITs outperformed the other major indices significantly during the dot.com bubble. This was due to the fact that the recession was driven by speculation and overinvestments. Therefore, the fundamentals that drive the evaluation of REITs remained intact. Moreover, the characteristics of REITs provide a resilience towards recessions in the form of lease based and income generating investments. However, as we have covered earlier in (ch. 2.3). this varies to a certain degree in between the specific REIT sectors. In figure 66 we can see the monthly total return for each sector separately. In accordance with the findings in chapter (ch. 5.2.2), all REIT sectors show strong performances throughout the recession. Lodging/Resort REITs is the only sector that stands out in the graph, showing an increase followed by a drastic drop in monthly total returns. As mentioned in (ch. 2.3.5), Lodging/Resort REITs are among the most sensitive of all REITs. This contributes in the explanation of why this sector is the only one showing diverging results.

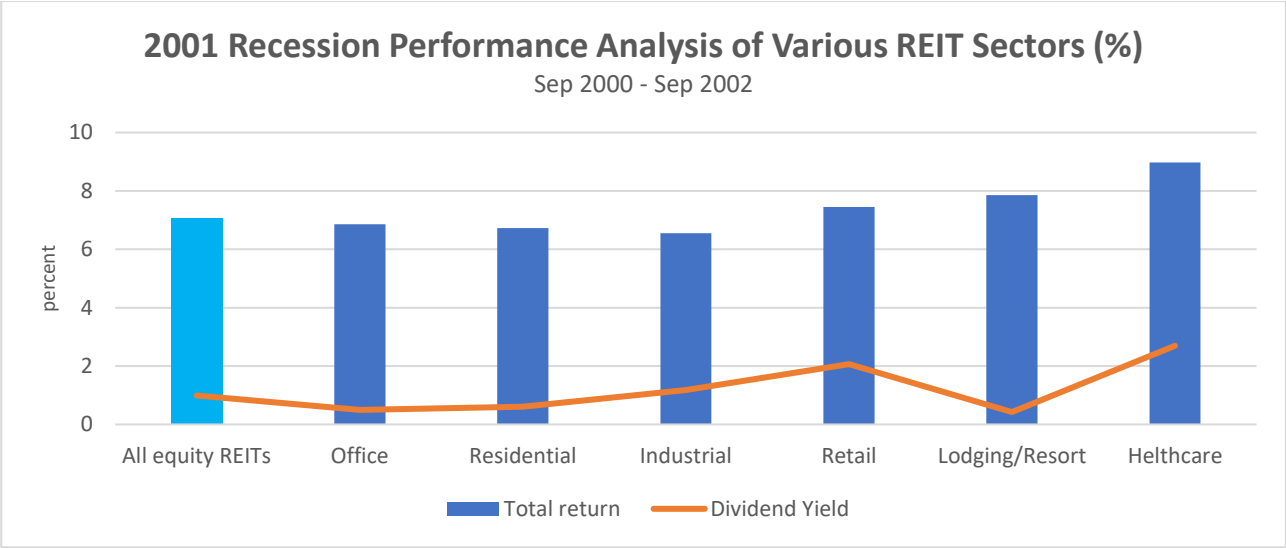
*Figure 66 - Dot.com bubble: REITs sectors total return trend*




Source: NAREIT, Bloomberg

Figure 67 depicts the average monthly total return over the two-year period including the eight months of recession. Reading the graph, we see that all sectors remained strong throughout the period ranging from Industrial with 6.5% to Healthcare with 9.0%. Lodging/Resort experienced a 7.9% monthly average total return despite the drop shown in figure 66.

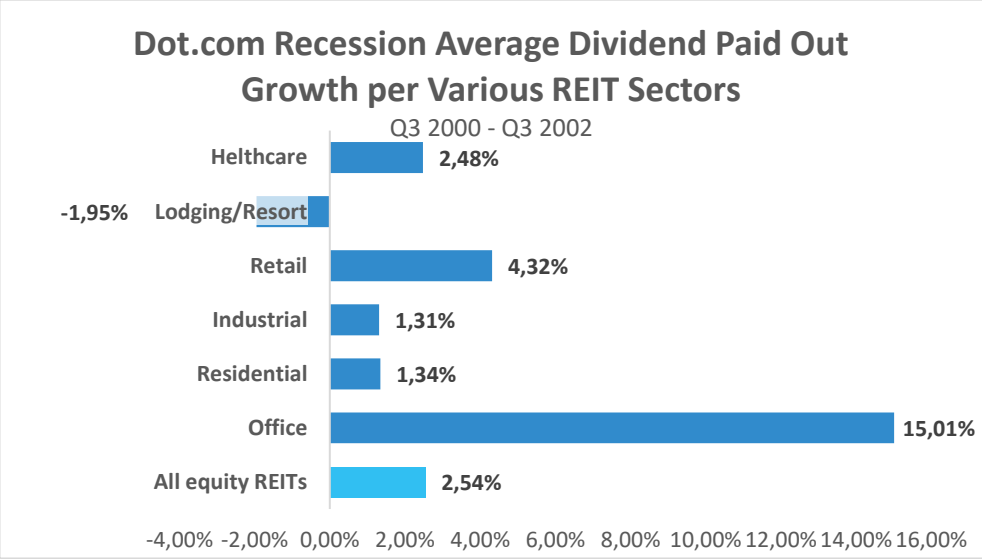
*Figure 67 - Dot.com bubble: REITs sectors total return*




Source: NAREIT, Bloomberg

By connecting these average total returns with the growth in dividend paid out shown in figure 68, we find a more holistic picture of how investors perceived REITs and how they performed during this period. According to figure 68 all sectors but one showed a growth in dividends on average during this recession. Lodging/Resort showed a negative growth in dividends of -1.95% compared to the average of all equity REITs of 2.54%. The negative growth in dividends show that Lodging/Resort was the sector hurt the most from the recession, which aligns with the theory that short leases and cyclical demand drives this sector. However, the total-return of the sector remained strong, showing us that investors believed in future growth of all REITs.

*Figure 68 - Dot.com bubble: REITs sectors dividend paid out to shareholders*




Source: NAREIT, Bloomberg

## 5.3. Great Recession (January 2007- January 2012)

### 5.3.1 Background for the recession and REITs involvement

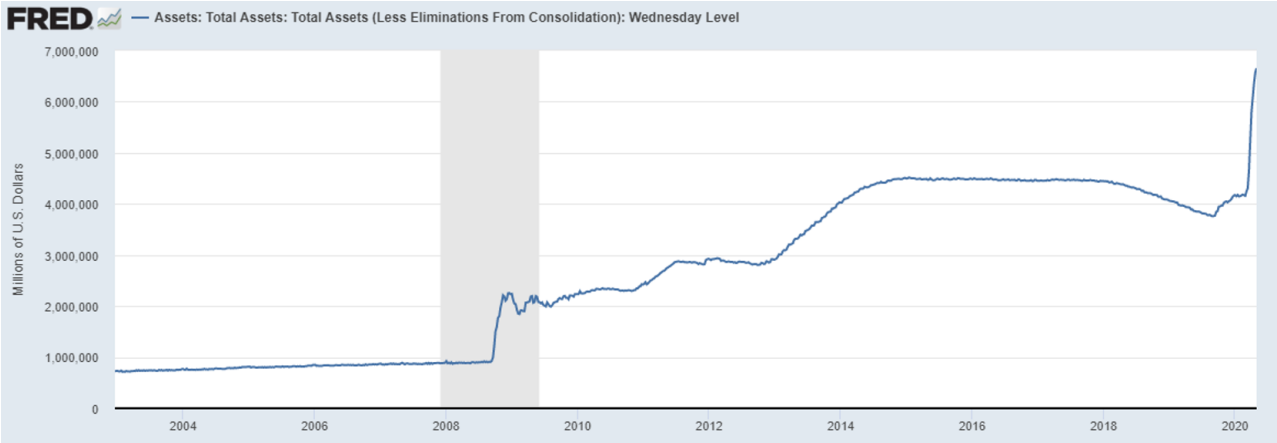
In the end of 2007, the housing bubble in the United States burst when the subprime mortgage crisis came crashing down. What has since become known as the Great Recession started as falling housing-related assets. Initially it was believed that the subprime mortgage crisis would be a relatively minor problem affecting only the US, but ultimately it spread and affected the entire global financial system (Elliot, 2020).

Contrary to the dot.com bubble covered in (ch. 5.2) this crisis was mainly driven by a real estate crisis and 2008/2009 became rough years for REITs. The housing market crashed, banks stopped working, and suddenly, refinancing debt became much more difficult or even impossible. REITs were forced to cut

dividends not necessarily because of operational issues, but because they needed liquidity to deal with maturating debt and other uncertainty. Dividend cuts, combined with a housing crash and troubled banks, led to massive volatility across the REIT sector, and this continues to negatively affect the sentiment of REITs to this day.

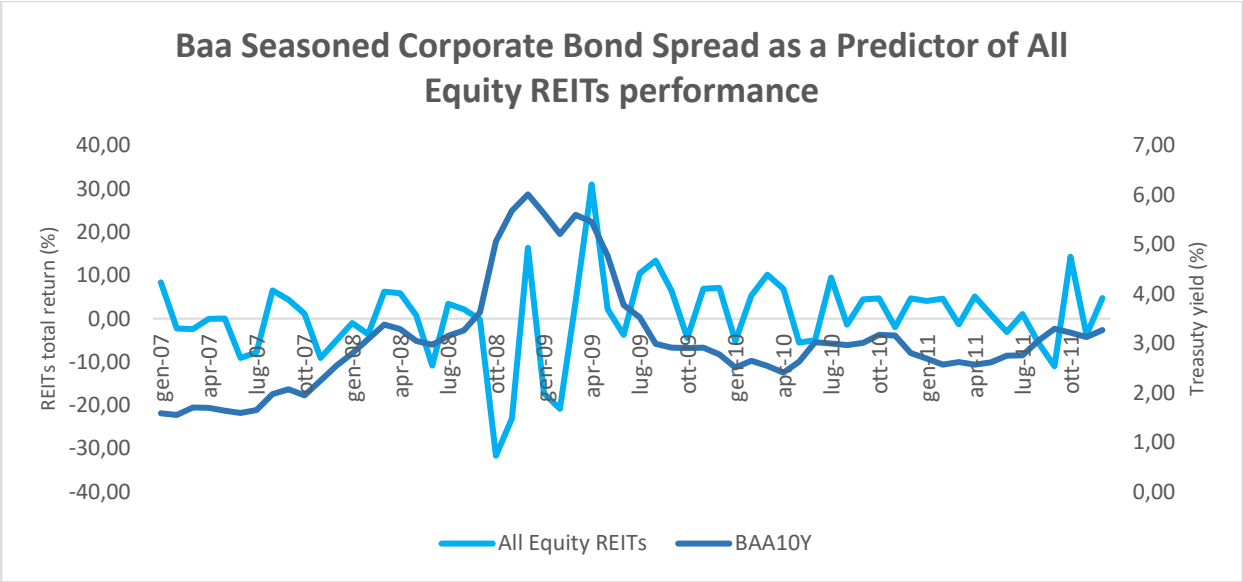
The Federal Reserve decided to take a much more aggressive approach to the financial crisis than it had done in the wake of the dot.com bubble. Figure Z12 shows what a drastic change this was from the previous strategy of the Fed. To increase the liquidity in the market, the FED implemented a massive economic plan which involved several different subsidies. The Fed injected large amounts of liquidity by buying short- and long-term government bonds as well as cutting the fed fund rate. Adding the uncertainty in the market during the recession, we can appreciate how the corporate bond yield spread was driven up significantly as can be seen in figure Z13. Historically, according to the findings in (ch. 4.2.3), we have seen REITs follow an inverse trend showing negative growth and returns when this spread increases.

*Figure 69 - Federal Reserve total assets (Liquidity injected in the market)*




Source: U.S. Bureau of Labor Statistics, FRED
Notes: Shaded areas indicate U.S. recessions

*Figure 70 - Corporate bond yield spread serves as a valuable benchmark for REITs total return*

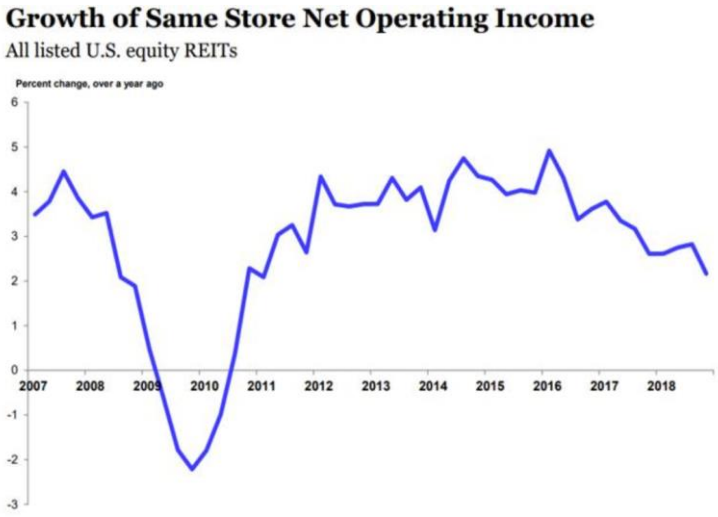



Source: NAREIT, FRED

In section (ch. 4.2.2) we covered how risk aversion, wavering financial conditions and the debt market drying up led cap rates to increase during the financial crisis. The underlying REIT fundamentals going into the financial crisis were weak and the NOI growth was lower than the cap rate decline. This was driven by high inflation and low interest rate. During the recession, the cap rate went up again, driven by the inherent equity spread. The aggressive monetary policies the Fed employed did not manage to offset this, because the equity component has a stronger impact on prices.

Considering all these factors it is also important to remember that REITs have characteristics that help protect against changing market conditions. REITs consist mainly of underlying real estate assets involving a multitude of diversified lease contracts. These are often highly diversified and thereby REITs can retain very steady property earnings even during recessions. The Great Recession was a real estate led crisis and is considered the sharpest real estate crash of all time. Therefore, it also included one of the worst SSNOI growths ever recorded. However, because of the durable and stable value just described, this “only” amounted to a -2% decline of SSNOI as can be seen in figure 71.

*Figure 71 - REITs same-store NOI during the Great Recession*




Source: NAREIT, (Schnure, 2019a)

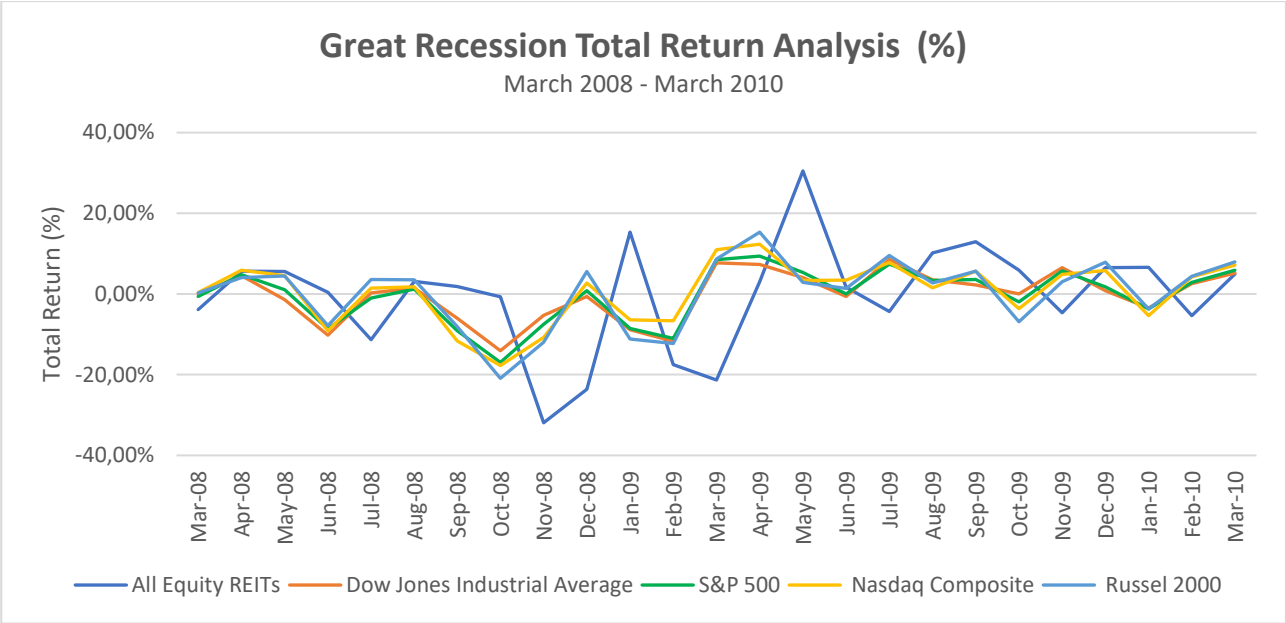
Aptly named the Great Recession shows a much higher impact on all fundamentals considered in the thesis and described in (ch. 5.1). In figure 34 we saw that the unemployment rate never exceeded the 6.3% from 2003 at the heels of the dot.com bubble. It steadily decreased over time until it dove under 5% prior to the financial crisis. During the 18 months the financial crisis lasted according to NBER (Business Cycle Dating Committee, 2020) the unemployment soared to 10.0%

As described in figure 63 the high inflation environment after the dot-com bubble was replaced by actual deflation during the financial crisis. In (ch. 4.1.4) we covered how this deflation led to bad REIT performance. Subsequently, during the recovery after the crisis the inflation went up again driven by the high amount of liquidity injected in the market over years (Figure 69). In this period, in line with our findings, REITs performed well with income return offsetting the inflation.

### 5.3.2. REITs Performance vs. Major Indices

The Great Recession involved a period of great uncertainty (Figure 72). In comparing these monthly total returns to the picture in figure 64 we see a drastically higher volatility among the indices. A key characteristic for REITs as covered in (ch. 2.3). is that to a large extent it is considered and evaluated by the underlying real estate assets. Because the recession was triggered by a real estate crisis, REITs were much more directly involved in the Great Recession. Analyzing the graph in figure 72, we can see that REITs are by far the most volatile of all the included indices, ranging from -30% to 30% on separate months within the recession period.

*Figure 72 - Great Recession: REITs total return vs other major indexes (trend)*

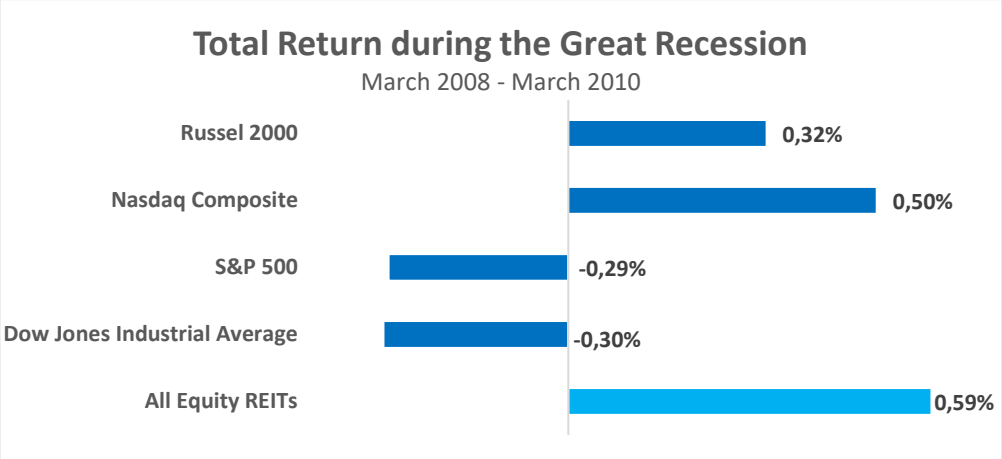



Source: NAREIT, Bloomberg

REITs are highly volatile as we discussed in (ch. 2.2.6), but in the medium to long term their performance stabilizes[47]. Therefore, we are considering a two-year period, which includes the initial recovery after the recession. Looking at the whole two-year period and averaging the total return for each index, we get the results shown in figure 73. Bearing in mind the high volatility shown for REITs in figure 72 it is interesting to see that REITs over the whole period performs better than any of the other indices and even comes out with a positive, but small, average total return. Even though the crisis originated in the real estate sector, it was in a separate area of the industry. The investor sentiment towards REITs was unstable, but overall REITs managed to show a slight growth. On the other hand, the crisis also spread to the rest of the financial market which in fact suffered worse total returns than REITs. Nasdaq Composite that had the worst performance in the dot.com bubble performed the second best in this period. After the correction of the previous tech bubble, the evaluation of technology companies was more in line with the underlying fundamentals. Therefore, the price adjustment in relation to the recession remained relatively mild.

[47] Considering a longer period between 2007 and 2012, we see that all indices adjusted, which can be seen in appendix 12

*Figure 73 - Great Recession: REITs average total return vs other major indexes*

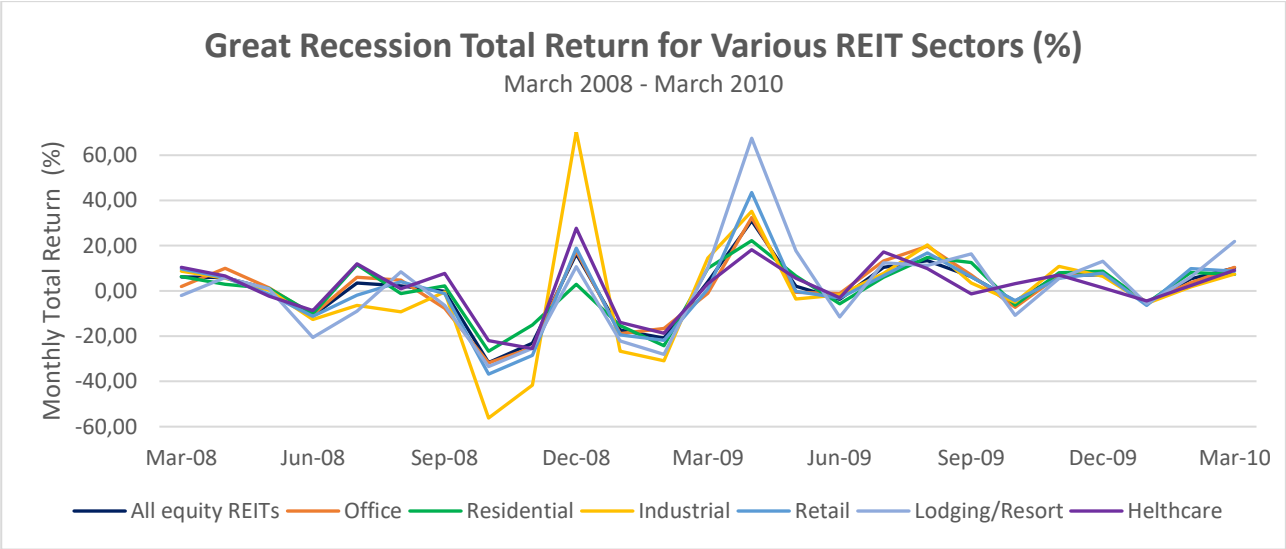



Source: NAREIT, Bloomberg

### 5.3.3. REIT Sectors Performance

Considering the overall industry, we now know that REITs had the most volatile total returns during the Great Recession, but also managed to slightly outperform the other major indices in the two year period. When segregating the industry in to the seven REIT sectors we can analyze how different property types performed during this recession. In figure 74 we notice that the volatility on individual sectors are much higher than that of the industry overall. We can see that especially sectors with short-medium lease terms show a higher volatility, like Industrial and Retail. REITs entered the Great Recession with very weak fundamentals and the subsequent rise in unemployment, decrease in household expenditures, lower GDP and deflation led sectors that were most sensitive to these conditions having significant volatility.

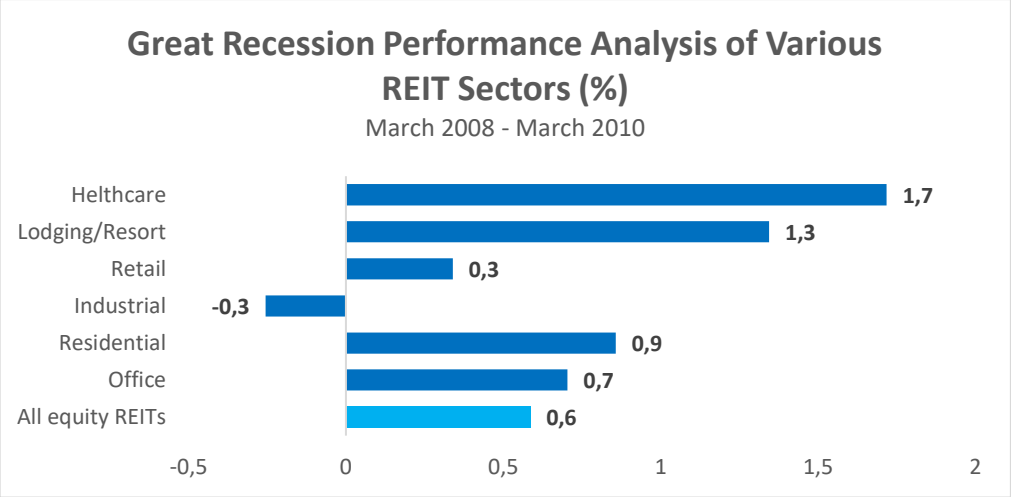
*Figure 74 - Great recession: Various REIT sectors total return (trend)*




Source: NAREIT, Bloomberg

Contrary to the dot.com bubble we see that the Great Recession had a major impact on the underlying fundamentals for REITs and specifically different sectors. Over the two-year period there were significant fluctuations in the performance for different sectors and when averaging the total returns for the whole period we get the results shown in figure 75. Considering the period also includes the initial recovery, we can see that most of the sectors have adjusted and the average monthly total return for the included sectors was 0.6%. However, Industrial REITs had a slightly negative average total return of -0.2% and Retail REITs performed below the industry average. These sectors are among the most sensitive to economic conditions due to their property types and lease lengths. On the other hand, a sector like Healthcare with very long leases and a non-cyclical demand performed way above the industry average with 1.7%.

*Figure 75 - Great recession: Various REIT sectors average monthly total return*




Source: NAREIT, Bloomberg

## 5.4. Conclusions

In this chapter we have analyzed REITs involvement and performance in two distinctly different recessions in the last twenty years. The findings tell us that REITs on an aggregated level generally have high volatility during recessions but outperforms other indices in the medium to long term. While REITs are publicly traded companies like the other equity indices, their singular focus on real estate investments provide them with unique characteristics that make them an interesting investment vehicle. Real estate is a durable and steady investment that retains its value during recessions, thus the underlying driver for REIT valuation is robust. REITs' good performance is driven by the high amount of lease-based stable cash flow that provides investors with high dividends that are especially valuable during economic downturn.

Although REITs in our analysis performed well in both recessions, it is also evident that there were a series of significant factors that were different. Each recession has its own unique characteristics, but we have analyzed that three categories cover the most influential drivers for REIT performance. In order to understand how REITs are positioned and how they might perform during and after a recession, we look at (1) Type of recession, (2) macroeconomic elements and (3) REIT fundamentals.

Analyzing a recession it is important to understand what the underlying drivers are. By understanding these drivers, we can start to analyze how real estate and therein REITs might be impacted. As we saw in both recessions there is an element of general investor discouragement that impacts all aspects of the economy, but there are also specific factors that deviated. The dot-com bubble was an asset bubble originating from an overvaluation in the stock market, specifically on the technology stocks. Therefore, by disregarding the general investor sentiment, we saw it impacted the regular equities much harder than

REITs. On the other hand, the Great Recession showed us that a recession based on a real estate crisis had a significantly stronger impact on REITs.

Secondly a crucial factor for describing REIT performance is the societal reaction to a recession. In this chapter we have seen how government and central banks react differently to different recessions. There are many factors that can influence the decisions to intervene, all of which are outside of the scope of this thesis. However, the actual interventions are of high importance. In the two recessions we saw how the Fed conducted vastly different monetary policies and how this impacted the recession differently. In the dot-com bubble we saw that the Fed only injected a modest amount of liquidity into the market, which led to only a slight increase in the corporate bond yield spread. However, in the Great Recession the Fed conducted significantly more aggressive operations which led to high impacts on the economy. The open market operations of central banks can help shorten a recession. Still, these interactions do not always manage to counteract the deflation and as we know this has a negative effect on the economy and REITs performance particularly.

Finally, to analyze the expected performance of REITs, it is imperative to understand the conditions in which REITs entered the recession. In the dot-com bubble we REITs were a great source of investment due to their hard assets in an overvaluation in the stock market, therefore the underlying fundamentals were not as important. However, in the Great Recession, REITs had weak fundamentals leading up to the recession resulting in exacerbated losses. Therefore, we must analyze REITs growth leading up until a recession in order to understand how it will fare during. Prior to the Great Recession we saw that cap rates and not NOI drove the growth, which made REITs much more susceptible to an economic downturn.

Recessions are unique and therefore there is no easy way to understand the outcome. In analyzing the two recent recessions we have found three key characteristics that, when analyzed can provide a fundamental explanatory framework for understanding REITs in a specific recession. These will be used in chapter 6 in order to analyze the current COVID-19 crisis and its impact on REITs.

# 6. REITs and the COVID-19 Pandemic

As highlighted in the previous chapter, the literature on the cause of recessions is vast (Bezemer, 2011; Brueggeman, William B;Fisher, 2011; Bagliano and Morana, 2012; Gaiotti, 2013; Jagannathan, Kapoor and Schaumburg, 2013; Bentolila, Jansen and Jiménez, 2018; Stiglitz, 2018). However, the root cause of the current global recession is novel in modern history. With the onset of the Coronavirus pandemic our society experienced a new type of economic downturn which was triggered by different elements from the past. This section of our paper aims to shed light on possible scenarios of REITs reaction to the

COVID-19 pandemic as well as contribute to the literature by demonstrating how non-financial factors can cause intense economic slowdown.

In analyzing the impact and the consequences of the COVID-19 outbreak on the REIT industry we will base our analysis on the framework we have developed during this thesis. Utilizing the framework created in chapter 5 we will firstly focus on the type of recession, the macroeconomic drivers and the REIT fundamentals discussed in (ch. 6.1), (ch. 6.2), and (ch. 6.3). These will lead us to form our expectations concerning REITs performance during this crisis in (ch. 6.4). Subsequently in (ch. 6.5) we will analyze the data currently available in order to evaluate our theoretical expectations and see if reality reflects this. Finally, we will draw conclusions from the theoretical framework and quantitative findings in (ch. 6.6). Historical trends and current development might provide helpful insights into forecasting possible evolutions of REITs performance in the months to come.

## 6.1. Coronavirus Outbreak Triggers a Severe Financial Turmoil Worldwide

The past decade has seen flourishing financial markets driven by expansionary monetary policies, high growth expectations and a general positive sentiment from investors. Despite this, 2019 brought concerns regarding a possible economic slowdown. Along with the eleven years since the Great Recession[48], the US-China trade war, the US presidential elections and the Brexit, led the IMF[49] to predict a slower global growth during 2020 of about 3.4%.[50] (International Monetary Fund, 2020) However, the outbreak of the COVID-19[51]pandemic changed the expectations and outlook dramatically.

The inherent characteristics of the virus caused significant pressure on the national public healthcare infrastructure worldwide. Thereby, most of the countries were forced to issue the so called "stay at home" nationwide policies with the aim of controlling its rapid spread. However, besides the tragic impact that the COVID-19 is having on public health, this paper aims to shed lights on its economic impact.

In addressing this concern, we outline two methods by which COVID-19 stifled economic activities. First, the "stay at home" policies encouraged social distancing which led to the shutdown of financial markets, corporate offices, businesses, and events. Second, the fast-paced spread of the virus generated significant

[48] Historically, as we discuss in chapter 5, the modern society has experienced economic slowdown with a pace ranging between five to ten years

[49] International Monetary Fund

[50] In April 2020, the newly adjusted World Economic Outlook projects global growth in 2020 to fall to -3 percent

[51] The COVID-19 pandemic, also known as the Coronavirus pandemic, is a persistent disease caused by SARS-CoV-2, a novel strain of coronavirus from the SARS species. The first outbreak dates back in December 2019 in Wuhan (China). The World Health Organization declared the outbreak a Public Health Emergency of International Concern on the 30th of January, and a pandemic on March 11 (2020). In the first quarter of 2020, Covid-19 cases have been reported in 187 countries accounting for about 250,000 deaths.

uncertainty regarding possible future scenarios which led consumption and investments to a dramatic slowdown.

The disruption caused by Coronavirus is not only devastating by itself, but also has spillover implications because it entails demand and supply shocks in almost every business area. The severity of the safety regulations imposed by governments around the world are having drastic implications on several industries and sectors of the economy. Among all, we register that the travel, entertainment and retail industries are the most affected. Travel bans are heavily influencing the aviation and tourism industry, sport event cancellation is affecting the sport and media industry, and the prohibition of mass gatherings is affecting the event, hospitality, and entertainment industries.

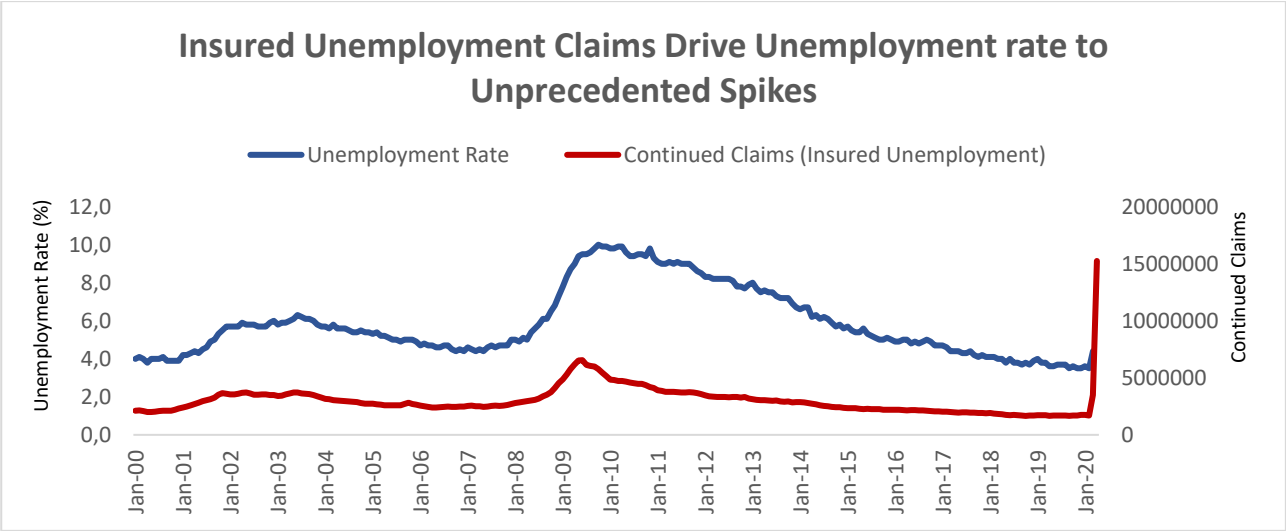
However, although most of the industries are negatively impacted, we record that other industries are less influenced and in certain specific cases they are even thriving in this tragic situation. Worldwide lockdown inevitably changed people's lives and routines. People started to work from home (when possible) limiting their external contact as much as they can. Technology has had a crucial role in enabling people to continue their life facilitating communication through online conference calls, e-learning platforms and providing essential good delivery through online retailing. The abrupt spread of the virus kick-started an equally intense technological awareness and diffusion in mostly every industry of our society. As a result, several tech-related businesses benefited and thrived in such harsh conditions. Among them, as we will explain further in this chapter, we note certain REIT sectors.

## 6.2. Macroeconomic Fundamentals Underlying COVID-19 Triggered an Economic Meltdown

The COVID-19 pandemic entails an economic crisis unlike anything else we have seen in recent times. The strict measures introduced by governments around the world to curtail the infection rate helps to protect the functioning of healthcare systems and the most vulnerable members of society, but has significant consequences even in the immediate term. As the US government locks down parts of the economy, we record unprecedented spikes in macroeconomic fundamentals.

As of April 30$^{th}$, around 30 million US citizens have filed for unemployment benefits, which underscore the deepening economic slowdown caused by the Coronavirus outbreak. By looking at the continued claims for insured unemployment and analyzing its relation over the previous recessions, we expect a huge rise in the unemployment rate. According to experts, this measure might exceed 16% which would be the highest rate ever registered since the Great Depression when the unemployment rate skyrocketed at 25%. (Lacina, 2020)

*Figure 76 - Unemployment claims rise dramatically during economic downturns*




Source: FRED, U.S. Bureau of Labor Statistics

As we discussed in (ch.4.1), unemployment rate and job growth are important elements that highly influence REITs performance. Faltering job market erodes household incomes prompting cutbacks in consumer spending which in turn generate a negative cycle of production cuts, lower demand, and layoffs. Depending on the severity of the crisis, this cycle repeats itself resulting in second- and third-round effects. Currently it does not seem like this crisis will move beyond first-round effects, but this might change with time (Schnure, 2020a)

Prolonged nationwide restrictions increase the bankruptcy risk for many companies reducing even further the production capacity. In such a situation, the risk of a massive scale-up of governmental and corporate debt rises, building up fundamental financial imbalances that could prolong the recovery period. All these factors mentioned have a severe impact on the overall economy, directly and indirectly influencing REITs performance.

To counteract these detrimental consequences, the FED is implementing a detailed economic plan. The latter involves several different subsidies and economic maneuvers that aim to help businesses and families in overcoming the financial meltdown. Chapter 5 has already thoroughly discussed the various monetary policies undertaken by the FED during the previous recession. However, as Jerome H. Powell[52] outlined during his Press Conference on April 29th, the FED is deploying its lending power to an unprecedented extent. Its main aim is trying to recover the US economy and avoid a deflationary spiral which would generate even greater economic damages. (Powell, 2020) In doing so, during the first quarter of the 2020, the FED stepped in with a broad array of actions which included $2.3 trillion in lending to

[52] Chair of the Federal Reserve Board of Governors.

support the financial market, businesses and households. Among all, the Federal Reserve has cut its target for the FED funds rate reducing the overnight interbank interest rate which aims to facilitate lending and to reduce the cost of borrowing. As investigated in (ch. 4.2.1), the FED funds rate is a benchmark for short-term Treasury yields and also affects longer-term interest rates. The chart below shows a critical condition where both FED funds rate and the spread between 10-Year to 2-Year Treasury bond yield are at their minimum term. In April 2020, the two interest rates mentioned plummeted to 0.05% and 0.43% respectively. This condition triggered an unconventional economic situation, defined in macroeconomics as liquidity trap[53] where the zero-bound interest rate is reached making the expansionary monetary policy less effective. (figure 44) (Korinek and Simsek, 2016)

According to our findings analyzed in (ch. 4.2.1), a flat yield spread curve implies faltering economic conditions with low growth expectation and high uncertainty which negatively affect REITs prices.

The low level demonstrated by the 10-Year Treasury rate is explained by the massive liquidity the FED injected in the market by purchasing enormous amounts of securities through quantitative easing. Chapter (5.3) illustrated how such monetary policy was fundamental during the Great Recession where the FED bought trillions of dollars in long-term securities increasing the money supply and encouraging lending and investments. The same mechanism has been implemented right after the COVID-19 was declared a pandemic. Along with QE, the Federal Reserve revived other programs that were used during the previous recession. Through the Commercial Paper Funding Facility (CPFF) and the Primary Dealer Credit Facility (PDCF) programs, the FED provided considerable funding directly to corporations by buying commercial paper and by offering low interest rates with flexible conditions to financial institutions. As a result, the FED increased its balance sheet by almost 60% bringing its total assets from $4.1 trillion (January 2020) to almost $7 trillion as of April 2020. Figure 69 shows how this rise was extremely faster than what happened during the Great Recession where a similar liquidity was injected in the market through several tranches of QE spread over six years. This outlines some differences between the two recession considered and the financial severity of the restrictions decided by the government to tackle the pandemic.

Monetary policy has a crucial role in determining the length and the magnitude of a recession. Injecting trillions of dollars in the market we can expect hyperinflation. However, considering the deflationary forces such as falling stock prices, decrease in GDP and in spending, a period of deflation seems to be more likely. Chapter (4.1.4) highlighted the high sensitivity of REITs to GDP as well as its positive relationship with inflation due to its inherent inflation protection characteristics. Thereby, in a deflationary environment we expect an intense fall of REITs prices.

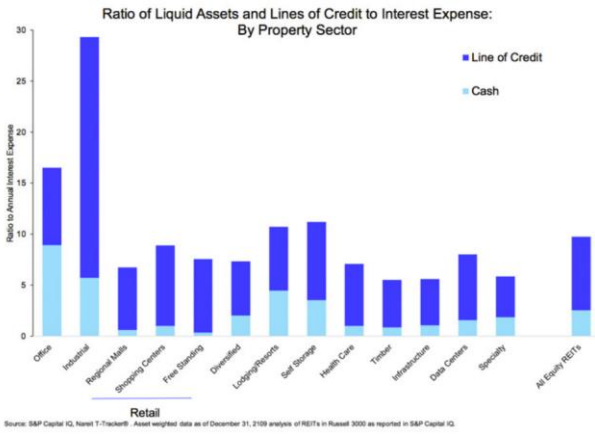
[53] "Liquidity trap" describes a controversial economic condition in which interest rates are extremely low and uncertainty drives the household savings rate upward. In such conditions, the zero-bound interest rate is reached leading monetary policy to be less effective in stimulating economic growth.

## 6.3. REITs Operational Fundamentals in Approaching the Financial Crisis

Although macroeconomic elements are pushing REITs towards a recession and the next months will be challenging, our findings suggest that the overall REIT industry approached this period of economic downturn with strong operational performance.

By looking at the end of 2019, chapter (ch. 4.2.4) pointed out how REITs showed the lowest leverage ratios, long-term debt maturities and high debt service coverage ratios[54] in more than twenty years. As we discuss in the aforementioned chapter, these solid fundamentals entail higher financial flexibility which allow firms to react promptly to unexpected expenses or investment opportunities. (Gamba and Triantis, 2008) In addition, REITs have also prepared themselves for economic uncertainty by building up their stock of cash and cash-like assets and maintaining substantial unused lines of credit. (Worth, 2020) The graph below illustrates the ratio of liquid assets and lines of credit to annual interest expenses by REIT sectors as of the end of 2019. The author highlighted how on average All Equity REITs have access to ten times the liquidity it would require to cope with average annual interest expenses. (Worth, 2020)

*Figure 77 - REITs sectors shows strong liquidity fundamentals*




Source: NAREIT, (Worth, 2020)

Thereby, by looking at the overall REIT landscape we can conclude that most of the REITs had solid liquidity positions moving into the crisis.

Strong operative performances are outlined not only by robust capital structure but also by rising earning metrics. NAREIT T-Tracker Q4 registered record earnings in the fourth quarter of 2019 with a 3% increase in FFO per share over the same quarter of the previous year. In addition, another important factor has been discussed in (ch. 4.2.2) where it has been demonstrated how in the past few years commercial

[54] Debt Service Cover Ratio: Chapter (ch. 4.2.4) describes in-depth the fundamental relationship between leverage, firm performance, and firm financial flexibility

real estate price growth (i.e REITs) was mainly driven by rises in NOI rather than by cap rate decline. The same trend could not be registered before the Great Recession where low cap rates and weaker fundamentals led to overvaluation and structural deficiencies.

However, as we will examine more thoroughly in the next sections, even though these robust fundamentals help mitigating the negative effects of the economic slowdown, as of April 2020 we record significant losses in the industry and in particular in certain REITs sectors which are more directly affected by COVID-19 restrictions.

## 6.4. Expectations for REITs during COVID-19

As a first level analysis, it is important to determine the intrinsic characteristic of each recession. As mentioned at the beginning of this chapter, Coronavirus pandemic follows different schemes and involves a type of economic downturn which is triggered by different elements from the past. However, evidence from chapter 5 allows us to capture differences and similarities between recessions, understanding how different factors impact REITs differently in various economic situations.

The current recession is led by a health crisis and as such deviates from both previous recessions considered in chapter 5. Since it is not founded on an overvaluation in the stock market (e.g. the dot-com bubble), we can expect the recession to have a broad impact on the economy. On the other hand, since the recession is not based on a real estate crisis like the Great Recession, we do not expect real estate to be singled out and perform worse than other assets. Findings on the past financial crisis demonstrated REITs high sensitivity to macroeconomic fundamentals. Record picks of unemployment rate, negative GDP growth expectations and high uncertainty fostered by a remarkable risk of a deflationary spiral, lead to a dramatic decrease in the NAREIT All Equity REITs stock price. However, according to our findings, during periods of economic turmoil REITs tend to show significant volatility and underperformance mainly in the short term. Analyzing evidence from chapter 5 as well as the strong REITs structural and operative fundamentals discussed earlier in (ch. 6.3), we believe REITs would reverse this negative trend outperforming the other major indexes in a medium-long term horizon.

Even though REITs are robust to economic downturn as mentioned above, we also know from our findings throughout the thesis that different REIT sectors react differently. In times of recessions we expect REIT sectors with a higher sensitivity to market fundamentals, with shorter lease terms and high portfolio rollover to perform worse. We expect this to hold true in the current recession and even though we expect these trends to adjust in the medium- to long term for all REIT sectors, we still expect this will have an impact on the performance of individual sectors.

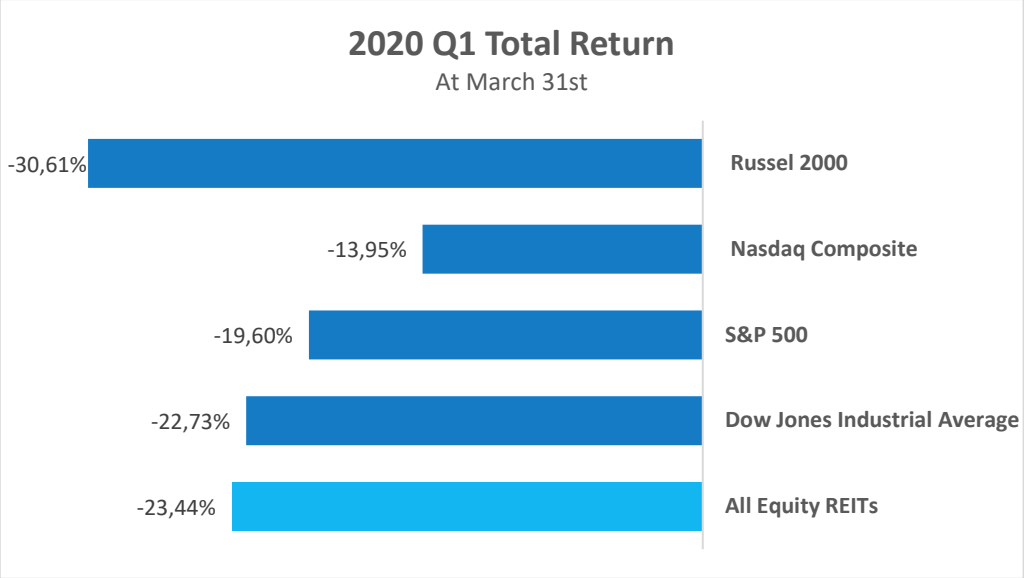
During the Great Recession we saw the first evidence that companies investing in the underlying technology revolution managed to get through the economic downturn rather unscathed (ch. 5.2.2). This trend combined with the nature of this crisis provides technology companies and REITs focused on this industry with a fertile landscape for economic growth. Because people are forced to stay at home as much as possible and avoid prolonged human contact, the rate of technological absorption and diffusion increased significantly. Suddenly every workplace used online meetings, individuals used different online platforms for socializing and people ordered essentials and other products online. REITs involved in these activities are historically performing very well, since the technological development has steadily increased over time and we expect that these REITs will continue to perform very well even during this recession.

## 6.5. REITs Performance Development

### 6.5.1. All Equity REITs Index Performance vs Other Major Equity Indexes during COVID-19 pandemic

In line with our analysis, Figure 78 illustrates that during the 2020 first quarter, NAREIT All Equity REITs Index underperformed most of the indexes showing the highest volatility (Appx. 13). On March 31st, the aggregate total return was -23% ranking the second worst among the indexes considered. In addition, unsurprisingly we see Russel 2000 and the NASDAQ Composite experiencing a -30% and -13% respectively, confirming historical trends. Even though the lockdown restrictions are influencing the economy as a whole, the high technological absorption leads NASDAQ based ETFs to outperform all the other indexes. The same trend, as we will discuss in the next subsection, can be appreciated even within certain REIT sectors. This helps the NAREIT All Equity REITs Index to mitigate some of its losses. On the other hand, as historical evidence has outlined in chapter 5, the negative performance demonstrated by the small-cap highly diversified Russel 2000 index can be explainable by weaker fundamentals and high trading volatility compared to other indexes (e.g. S&P 500 and Dow Jones).

*Figure 78 - COVID-19: REITs YTD total return vs other major indexes*




Source: NAREIT, Bloomberg

With the relaxation of the business and social restrictions we expect lower uncertainty and lower volatility of REITs stock prices. After an initial period of adjustments where REITs usually underperform, evidence shows that REITs tend to recover better and faster. Investors tend to shift their capital toward more stable and reliable sources of investments (i.e hard assets). Therefore, providing steady income returns and inflation hedge (ch. 4.1.4) even in periods of economic slowdown, REITs historically demonstrated superior performance in the long run.

For this reason, as well as the impressive earning measures, the high debt service cover ratio and great liquidity metrics demonstrated by REITs before the Coronavirus outbreak, we expect positive total return and a relatively significant shift of investment towards REITs.

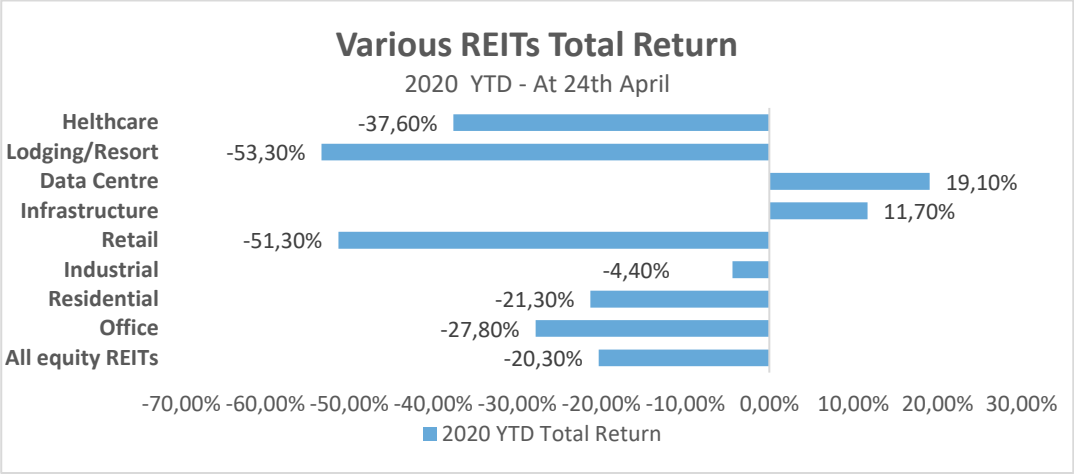
### 6.5.2. REITs Sector Specific Reaction to COVID-19

The REIT industry is populated by a multitude of REIT sectors. These are driven by several different factors (ch. 2.2) that affect differently their performance in various economic situations (ch. 3.4).

As previously illustrated, REITs were hardly impacted by the severity of the restriction implemented during the Coronavirus outbreak. The overall industry has suffered a negative 23% stock price decrease. However, as discussed above, not all REITs sectors are experiencing the same performance. The graph below illustrates a large discrepancy and diversity among various REIT sectors. Although COVID-19 restrictions were severe for most business areas they also had positive spillovers on certain industries.

Technological absorption and diffusion rose dramatically in the first few months after the Coronavirus outbreak leading tech-related firms to record user base and fast-rising incomes. As a result, the enhanced demand for data storage, cloud computing and telecommunication facilities[55] pushed Data Centre and Infrastructure REITs to experience stunning returns which, as April 24th, accounted for 19.1% and 11.7% respectively. Despite this positive exception, the same restrictions have had a drastic impact on all the other REITs sectors that demonstrated record lows, reaching almost 50% year-to-date.

*Figure 79 - COVID-19: Various REITs sectors total return (YTD)*




Source: NAREIT

Figure 79 confirms our findings showing that the worst affected REIT sectors are those with the higher lease portfolio rollover, short-term average lease structure and more importantly those which show a direct and significant sensitivity to market fundamentals. Therefore, unsurprisingly, Lodging/Resort and Retail REIT sectors demonstrated the lowest total return with 53.3% and 51.3% respectively. As expected, the harsh social distancing regulations and the high uncertainty that revolves around the COVID-19 led most of the directly affected firms to experience negative returns in the first stage of the Coronavirus outbreak. This raised concerns over higher delinquencies in rents which would negatively impact even those REITs which have solid fundamentals and long-term lease structures. Unexpectedly, the third worst performing REIT sector is the Healthcare REIT which on April 24th hit a low at -37%. This result slightly deviates

[55] In the last few years, the continuous rise in demand for high-speed wireless networks fostered the development of new technologies and more powerful telecommunication facilities. 2020 was expected to be a crucial year for the implementation of the new 5G technology worldwide. This brought greater attention and considerable investments within the industry benefiting the Infrastructure REITs

from our expectations, but it can be explainable by considering the nature of this recession. As we discovered in (ch. 2.1.5) we know

As investigated beforehand, along with long-term lease structure (figure 14) and low trading volatility (figure 11), Healthcare REITs are perceived as non-cyclical investments (ch. 2.3.6). These factors led Healthcare REITs to outperform the other REIT sector during the previous recessions (ch. 5.3.3) showing stable cash flow and low trading volatility. However, differently from the past, the COVID-19 pandemic directly involves a healthcare-based crisis which undermines the trust on healthcare facilities and increases the fear among the population. Healthcare REITs own a variety of healthcare-related real estate among which senior housing, specialized private clinics, and medical office buildings (ch 2.3.6). These are heavily affected by people deciding to postpone their cures and by the rising fear of getting infected in such facilities. Therefore, by also considering the weak fundamentals[56] shown by Healthcare REITs in approaching the crisis, these short-term deviating results can be explained.

Ultimately, in line with our expectations from the previous section (ch. 6.5.1), we expect rising and positive performance of all REIT sectors in the medium to long term. However, according to our findings in (ch.5), we also expect that the ranking between sector performances will remain almost unchanged.

## 6.6. Conclusions

COVID-19 outbreak has rapidly infected not only our health, but also our economy. Governments around the world implemented severe and restrictive measures which abruptly resulted in a world recession. In this chapter we sought to understand the characteristics of this economic downturn and its impact on the REIT industry. In doing so, we utilized the theoretical framework created in chapter 5 analyzing the type of recession, the macroeconomic drivers and the REITs underlying fundamentals. Subsequently, we studied the limited data on the current recession comparing them to our expectations.

The current recession does not involve neither an overvaluation in the stock market nor a real estate crisis. Therefore, being caused by a health crisis, the COVID-19-related financial crisis diverged from the previous recession analyzed in (ch. 5). The nationwide stay-at-home policies led to a near complete shutdown of financial markets, corporate offices, business, and events, generating imbalances between demand and supply which triggered a recession.

[56] Chapter (6.3) illustrated how Healthcare REITs had the weakest liquidity measures in approaching the COVID-19 pandemic. In addition, our findings outlined how in the previous years these REITs showed the highest rate of Net Acquisition demonstrating a high degree of overbuilding. This increases the sensitivity of the Healthcare REIT to market fundamentals changes

However, we found that this crisis also had positive spillovers. The new situation required an unprecedented adaptation of online solutions which led to improved technological absorption and diffusion. As a result, in line with our expectation, evidence showed how tech-related businesses, including certain REITs, benefitted by the COVID-19 outbreak.

Furthermore, by analyzing the macroeconomic factors we found that the current recession has led to almost unprecedented results. In the first quarter of 2020 we recorded a high unemployment rate, alarming GDP expectations and huge intervention by the FED. These factors jeopardized the positive expectation regarding REITs development before the crisis.

In addition, our analysis found that REITs entered the current recession in a strong position. Differently from the previous recession analyzed, evidence demonstrated how REITs showed solid operative and structural fundamentals. Significant growth in earning metrics and high debt cover ratio strengthened our projection of long-term positive results.

Analyzing the data we found that REITs provided a negative 23% total return. This was the second worst among the five indices in our analysis, only surpassed by Russel 2000. According to our findings in (ch. 2.2.6) we know that REITs are volatile in the short term, especially in times of recession. Thus, these results fall in line with our expectations. Because of the type of recession and REITs underlying fundamentals, we expect this to adjust in the medium- to long-term.

In our REIT sector specific analysis, we found similar results. These showed that generally REITs performed fairly bad in the first stage of a recession. In line with our expectations we found that tech-related REITs performed much better than any of the other sectors. On April 24th, Data Centre and Infrastructure provided 19.10% and 11.70% respectively. These were the only REITs sectors with a positive total return showing more than 30 percentage points above the industry average. We also found that the REITs with high lease portfolio rollover, short-term lease structures and high sensitivity to market fundamentals performed the worst in all sectors. This was demonstrated by Lodging/Resort and Retail performing -53.30% and -51.30% respectively. An outlier from our expectations are Healthcare REITs. With long lease terms and non-cyclical fundamentals, they have historically performed among the best sectors during recessions. However, during the period under examination, Healthcare REITs provided -37.60% total return, being the third worst of the sectors. Part of the explanation for this can be found in the unique origin of this recession. Despite this, in line with our expectations for the REIT industry in general, we expect all REIT sectors to follow the same positive trend.

We acknowledge that the data available on the COVID-19 recession is limited and we therefore are not able to fully understand REITs performance in this recession. As with our analysis in (ch. 5), a full historical analysis must be conducted on this recession once it has passed. This will offer a deeper

understanding of the complicated interactions in play. With a historical-based framework and limited current data, we have provided an educated guess on what will happen moving forward.

# 7. Conclusion

The goal of this thesis was to analyze the REIT industry in order to develop a thorough understanding of the unique characteristics it exhibits, the fundamental drivers that affect it as well as its performance. These findings are meant to create a valuable toolbox that investors can use to evaluate REITs in different economic situations. However, a special focus has been put on studying REIT behaviour and performance during various economic downturns. By doing so, we utilized the findings gathered throughout the paper in the final chapter (ch. 6) to obtain a clearer understanding of the impact of the current COVID-19 crisis on REITs.

In (ch. 2.1), we sought to understand the development of REITs since they were created in 1960. This includes an explanation of the strict regulations and unique advantages that come with the REIT status. Modern REITs were established in 1999 with the REIT Modernization Act, which represented the final adjustment to the original uncompetitive regulations. According to this Act, REITs are required to focus on real property and derive at least 75% of gross income from this source. Since REITs have a majority of their investments in hard assets, they are a great source of portfolio diversification through low correlation with other assets, as well as provide superior inflation protection (ch. 2.2). In order to maintain their status, which allows them to be tax exempt corporations, REITs must distribute at least 90% of their taxable income to investors. This categorizes REITs as pass-through investment vehicles, allowing them to provide a significant income return to investors. Real estate is generally considered an illiquid asset, but given that REITs are publicly listed and that our analysis has shown significant daily trading volumes, REIT shares demonstrate high liquidity. Our findings uncovered that REITs traded with fairly high volatility, which damper REITs performance in the medium to short term. However, this differs significantly when segregating the industry into various sectors or when extending the time frame considered. Data showed that the two main factors explaining this trend were the average lease-terms and the nature of the underlying property assets.

Through the REIT performance analysis developed in (ch. 3), we confirmed our findings discussed in the previous chapter (ch. 2). Since their introduction, REITs showed an annual average total return of 13.33%, which includes an impressive income return of 7.51%. The latter outlines how the stable cash flows that

REITs provide (in form of dividends) over time consistently succeeded in providing investments with inflation protection.

Comparing REIT dividend yields with the 10-year Treasury rate in the last 20 years, we found that REITs have outperformed this income vehicle with an average spread of 1.37%. Analysing REIT performance in comparison to other major indices, we found that REITs underperformed in the short term. Nevertheless, when viewed through the 20 year time frame, REITs significantly outperformed the same indices. Our findings suggested that this was due to their unique status as total return vehicles with a high portion of dividend income, which provided robust cash flows and performance in the long run. Further analyzing these long term returns, we found that REITs had superior performance in comparison to other publicly traded equities when adjusting for volatility. Conducting a sector specific analysis of REITs, we confirmed our findings in (ch. 2.3) by showing that sectors are affected by different external factors and have varying underlying fundamentals. This results in some sectors being more cyclical than others, which was evident from the varied performance shown by different REIT sectors in different time periods.

Moving beyond performance, we sought to understand the underlying factors and drivers influencing REIT performance. In (ch. 4), we found that rising unemployment rates and low GDP expectations have a crucial negative impact on the overall REIT industry. In addition, demographic structure is a valuable indicator for the performance of certain REIT sectors. Analysing how interest rate movements impact REIT performance, we found that there is a strong negative correlation between these two factors in the short-term. The average lease term and portfolio rollover of a REIT are precious indicators for its sensitivity to market fundamentals. Furthermore, findings showed that Treasury bond yields and REIT stock prices have a strong negative correlation, which makes it an effective indicator for REIT performance. We also found that NOI growth was a remarkably significant indicator of REIT valuation and price sustainability. In analysing the corporate bond yield and its spread with 10-year Treasury bonds, we learned that the latter is negatively correlated with REIT cash flow multiples. Lastly, we found that low leverage ratios and high debt cover ratios help REITs maintain a high level of financial flexibility which leads to greater performance.

Focusing on REIT performance in times of economic turmoil, we studied the two latest recessions (ch. 5): the dot-com bubble and the Great Recession. These provided unique and different insights into how recessions can impact REITs. Overall, we found that the high volatility of REITs is exacerbated during recessions, but REITs manage to outperform other indices in the medium to long term. We confirmed that real estate is a durable investment that retains its value during recessions. This positive performance is

mainly driven by the high amount of lease-based stable cash flow that provides investors with high dividends even throughout economic slowdowns. We found that, although the two recessions differ greatly, similar factors help describe the impact they had on REITs. We singled out three main factors: (1) the type of recession, (2) macroeconomic elements and (3) REIT fundamentals. Utilizing this framework when analyzing a specific situation will provide invaluable information on future REIT performance.

In our final chapter (ch. 6), we conducted an analysis on the impact of the current COVID-19 pandemic on REITs. Using the three main factors from (ch. 5), we sought to shed light on the current state of REITs. Policies implemented to counteract the health crisis led to a nearly complete shutdown of financial markets, corporate offices, business, and events. This resulted in imbalances between demand and supply and triggered a recession that is vastly different from the recessions analyzed in (ch. 5). Entering the COVID-19 crisis, REITs had strong fundamentals in the form of significant growth in earning metrics and high debt cover ratio. However, the first quarter of 2020 recorded very high unemployment, alarming GDP expectations, and an unprecedented intervention by the FED, which all negatively impacted the outlook of REIT performance. Considering the current situation, we found an unprecedented adaptation of online solutions which led to improved technological absorption and diffusion. Analyzing the limited available data, we found that tech-related REITs performed markedly better than REITs in any of the other sectors. On the other hand, we found that REITs with high lease portfolio rollover, short-term lease structures and high sensitivity to market fundamentals performed the worst. Using the limited data available from this crisis, we found that REITs provided a negative 23% total return, resulting in the second worst among the indices. However, due to our analysis on the factors of this recession and REIT characteristics, we expect this to adjust in the medium- to long-term. Similarly, we expect all sectors to adjust, but internal sector ranking to remain the same.

Considering the factors and time period we have chosen to include in this thesis, we have found REITs to be a valuable investment vehicle that offer unique characteristics. REITs provide investors with long term total returns that outperform other indices, even in the wake of economic recessions. High income return ensures inflation protection and, through low correlation to other assets, REITs provide a great source of portfolio diversification. We acknowledge that it was not possible to include all factors that would be relevant in analyzing REITs in the scope of our thesis, but we believe that valuable conclusions can be drawn from it nonetheless. In regard to the current COVID-19 crisis, it is important to acknowledge that our analysis is based on historical trends and limited current data. Therefore, it will be up to future research in the aftermath of the crisis to fully uncover the impact this recession will have on REITs.

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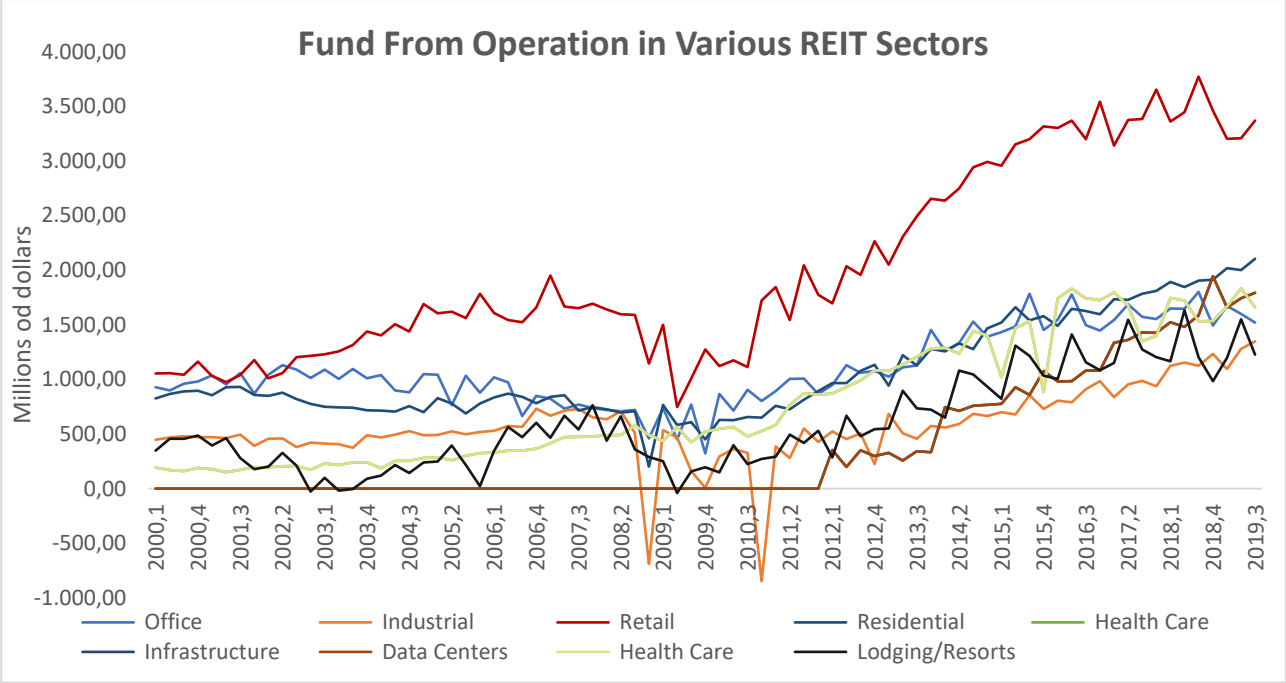
# Appendices

## Appendix 1 - FFO trend for various REIT sectors

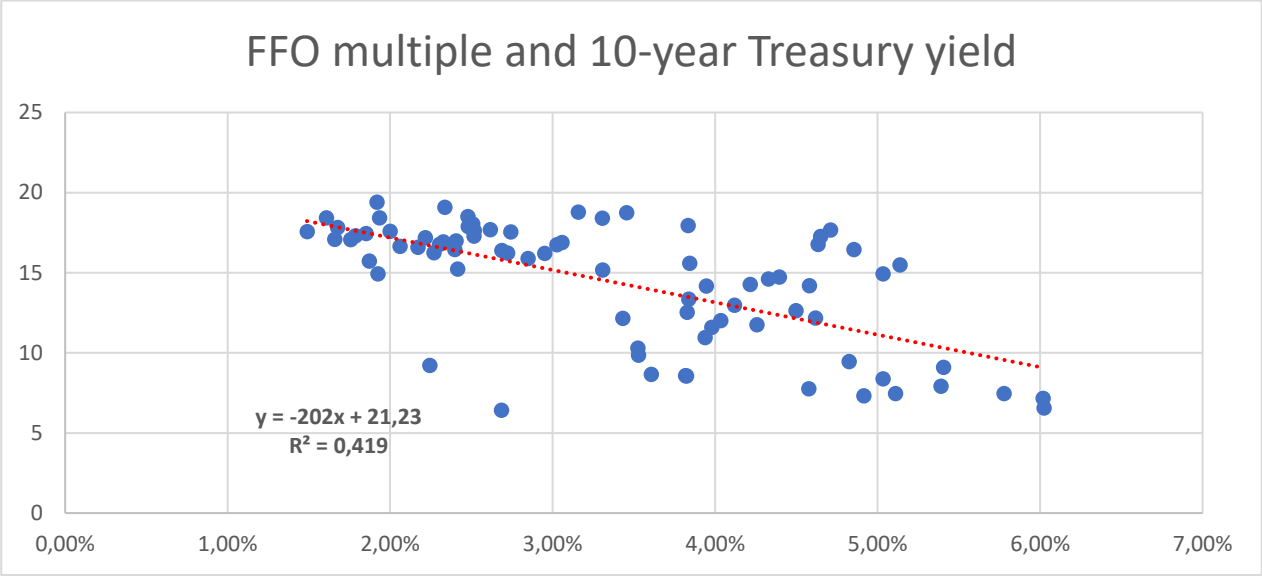



## Appendix 2 - REITs as a inflation hedge

| | All Equity REITs Dividend Paid Out Growth % | Inflation |
|---|---|---|
| 2001 | 1,98% | 2,83% |
| 2002 | 6,25% | 1,59% |
| 2003 | 2,24% | 2,27% |
| 2004 | 13,22% | 2,68% |
| 2005 | 10,08% | 3,39% |
| 2006 | -0,08% | 3,23% |
| 2007 | 5,94% | 2,85% |
| 2008 | -1,54% | 3,84% |
| 2009 | -38,10% | -0,36% |
| 2010 | 15,61% | 1,64% |
| 2011 | 25,93% | 3,16% |
| 2012 | 24,10% | 2,07% |
| 2013 | 17,96% | 1,46% |
| 2014 | 32,50% | 1,62% |
| 2015 | 16,99% | 0,12% |
| 2016 | 16,72% | 1,26% |
| 2017 | -0,31% | 2,13% |
| 2018 | 6,04% | 2,44% |
| 2019 | 1,81% | 1,81% |
| Average | 8,28% | 2,11% |

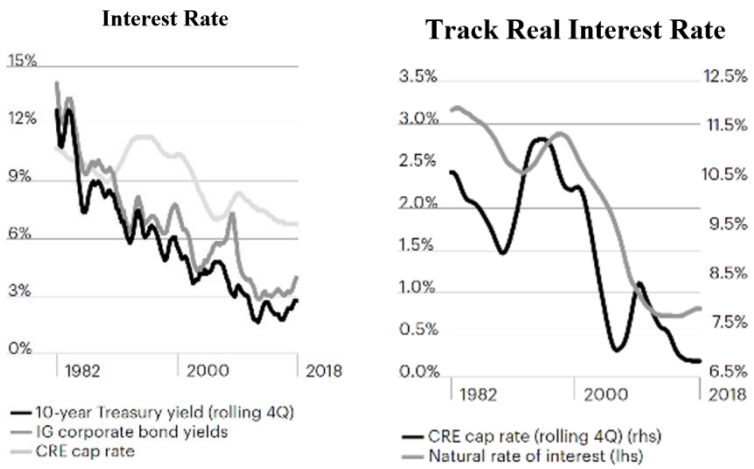
Source: NAREIT

## Appendix 3 - Negative correlation between FFO multiple and 10-year Treasury




Source: NAREIT T-Tracker

*Appendix 4 - Strict Relationship between real interest rate and cap rate*




Source: FS Investment, Bloomberg, CoStar, FRED

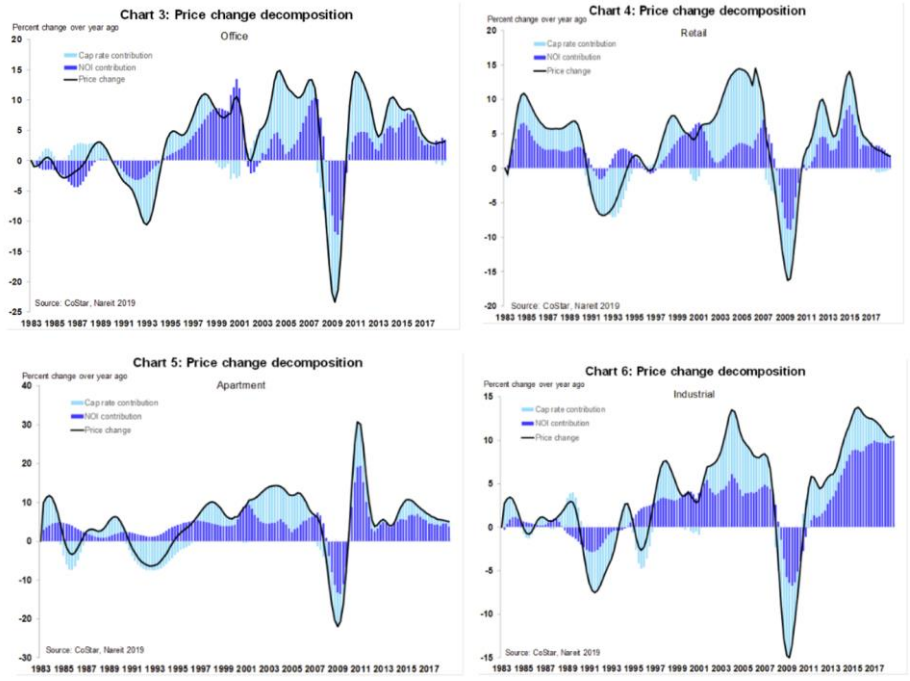
## Appendix 5 - REITs sectors showed record lows during the Great Recession

**REITs Sectors Total Return Plummeted during The Great Recession**

| | All equity REITs | Office | Residential | Industrial | Retail | Lodging/Resort | Helthcare |
|---|---|---|---|---|---|---|---|
| mar-08 | 6,2 | 1,9 | 6,3 | 8,8 | 9,7 | -2,0 | 10,5 |
| apr-08 | 5,9 | 10,0 | 2,9 | 5,7 | 6,0 | 6,0 | 6,6 |
| mag-08 | 0,8 | 1,4 | 1,0 | 0,3 | -1,5 | 1,0 | -2,3 |
| giu-08 | -10,9 | -10,5 | -10,1 | -12,7 | -11,2 | -20,6 | -8,7 |
| lug-08 | 3,5 | 6,0 | 11,6 | -6,3 | -1,9 | -9,0 | 11,9 |
| ago-08 | 2,2 | 4,8 | -1,2 | -9,3 | 4,1 | 8,5 | 0,9 |
| set-08 | -0,2 | -7,7 | 2,2 | -0,5 | -1,1 | -6,4 | 7,7 |
| ott-08 | -31,7 | -31,8 | -26,7 | -56,2 | -36,8 | -33,4 | -22,0 |
| nov-08 | -23,1 | -25,2 | -15,1 | -41,6 | -28,5 | -25,3 | -25,5 |
| dic-08 | 16,4 | 17,6 | 3,0 | 70,5 | 18,9 | 10,7 | 27,7 |
| gen-09 | -17,3 | -18,9 | -15,3 | -26,6 | -19,5 | -22,2 | -13,9 |
| feb-09 | -20,8 | -16,6 | -24,2 | -30,9 | -21,8 | -28,0 | -18,8 |
| mar-09 | 4,1 | -1,1 | 10,0 | 14,6 | 0,8 | 10,3 | 3,2 |

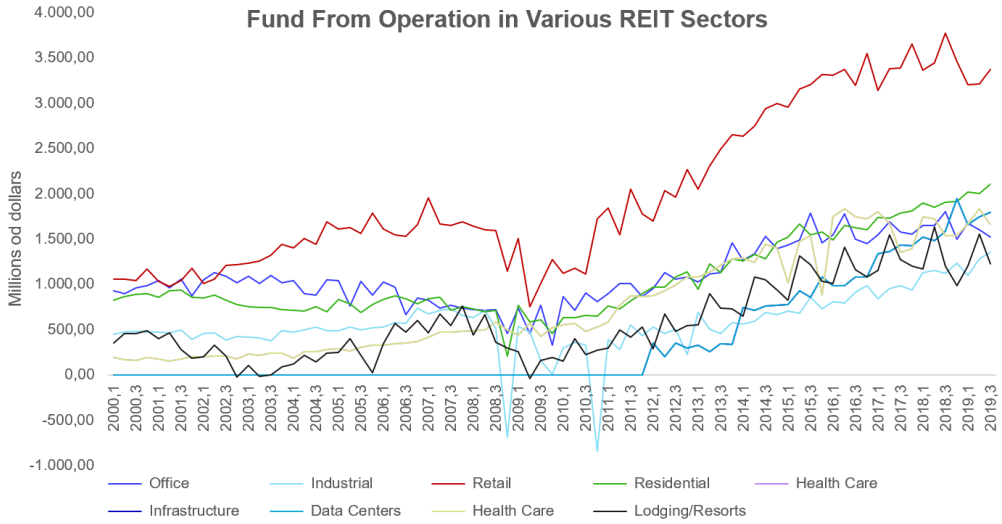
Source: NAREIT

## Appendix 6 - Various REIT sectors price growth decomposition



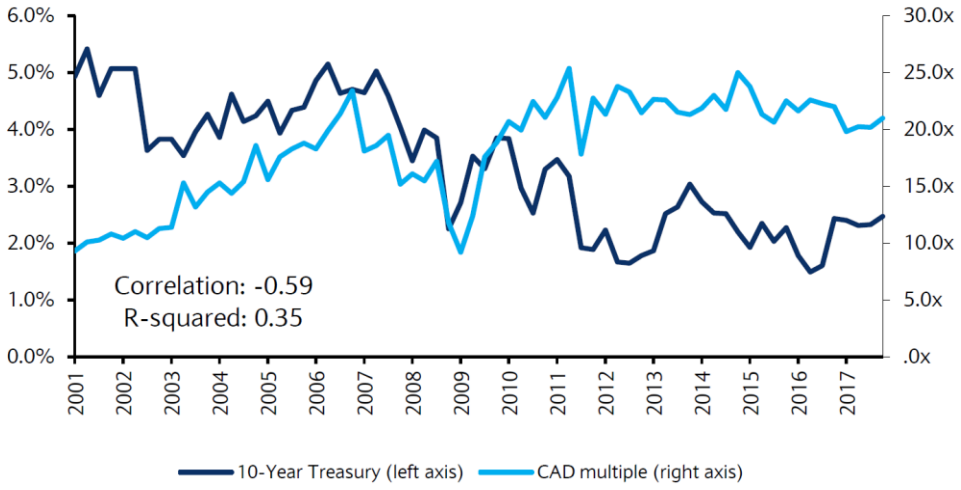

Source: NAREIT Research, (Schnure, 2019b)

## Appendix 7 - Various REITs sectors FFO trend



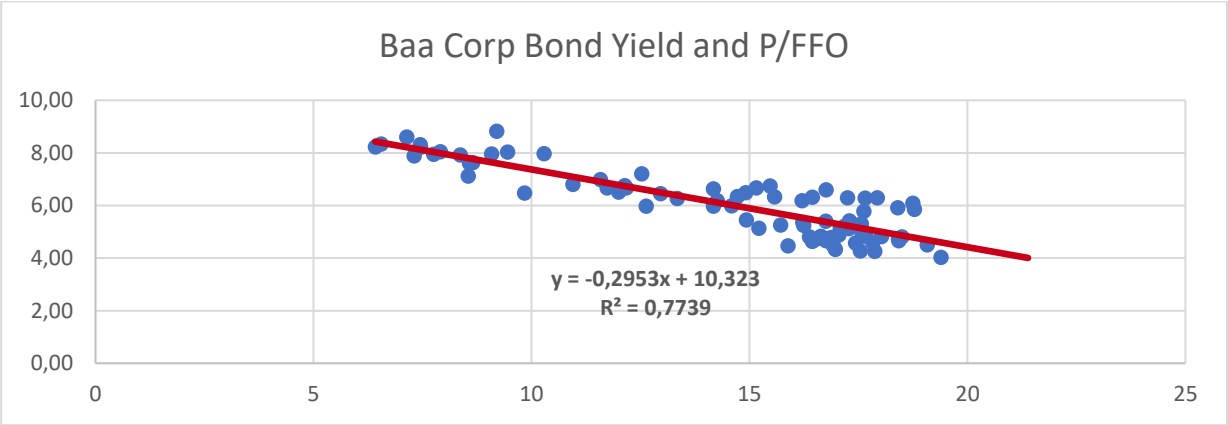

Source: NAREIT T-Tracker

## Appendix 8 - Negative correlation between REITs CAD multiples and 10-year Treasury yield




Source: Barclays, Bloomberg

## Appendix 9 - Strong negative correlation between P/FFO and Corporate bond yields




Source: NAREIT T-Tracker, Bloomberg

## Appendix 10 - Regression analysis: Leverage is negative correlated with REITs stock price

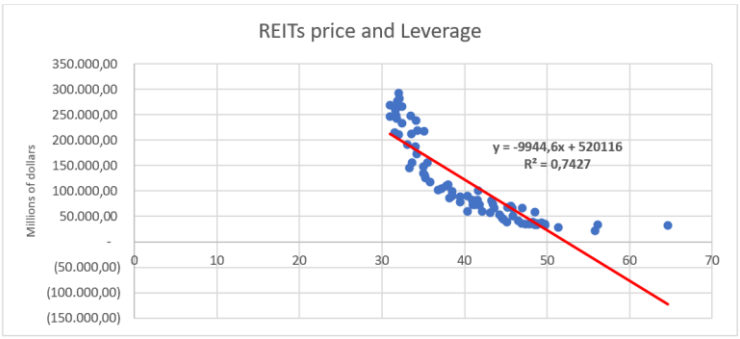
SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0,861804 |
| R Square | 0,742705 |
| Adjusted F | 0,73932 |
| Standard I | 42005,58 |
| Observatio | 78 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *ignificance F* |
|---|---|---|---|---|---|
| Regressio | 1 | 3,87E+11 | 3,87E+11 | 219,3813 | 4,16E-24 |
| Residual | 76 | 1,34E+11 | 1,76E+09 | | |
| Total | 77 | 5,21E+11 | | | |

| | *Coefficient* | *andard Err* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *ower 95.0%* | *Jpper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 520116,1 | 27468,17 | 18,93523 | 1,68E-30 | 465408,5 | 574823,7 | 465408,5 | 574823,7 |
| X Variable | -9944,55 | 671,4062 | -14,8115 | 4,16E-24 | -11281,8 | -8607,33 | -11281,8 | -8607,33 |




Source: NAREIT T-Tracker

## Appendix 11 - Regression Analysis: NOI shows a significant negative correlation with REITs debt ratio

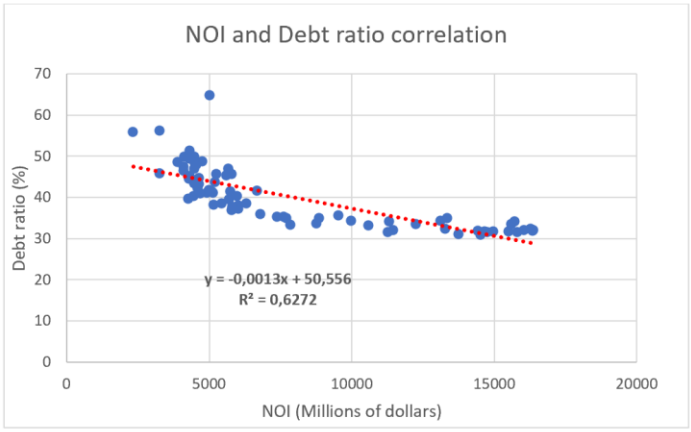
SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0,79194 |
| R Square | 0,627168 |
| Adjusted F | 0,622326 |
| Standard I | 2624,965 |
| Observati | 79 |

ANOVA

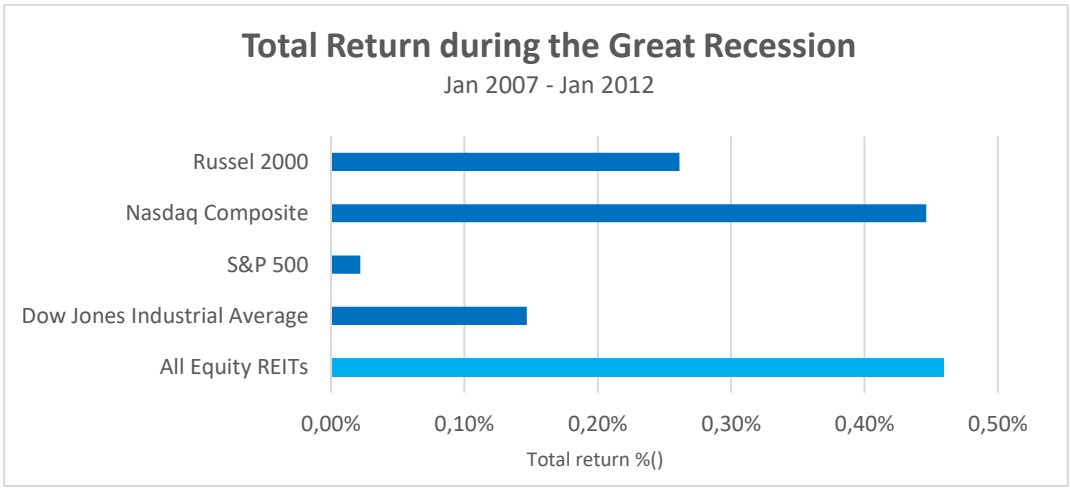
| | *df* | *SS* | *MS* | *F* | *ignificance F* |
|---|---|---|---|---|---|
| Regressio | 1 | 8,93E+08 | 8,93E+08 | 129,5276 | 3,62E-18 |
| Residual | 77 | 5,31E+08 | 6890442 | | |
| Total | 78 | 1,42E+09 | | | |

| | *Coefficient* | *andard Er* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *ower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 26822,72 | 1695,432 | 15,82058 | 6,59E-26 | 23446,69 | 30198,76 | 23446,69 | 30198,76 |
| X Variable | -472,873 | 41,54923 | -11,381 | 3,62E-18 | -555,608 | -390,137 | -555,608 | -390,137 |



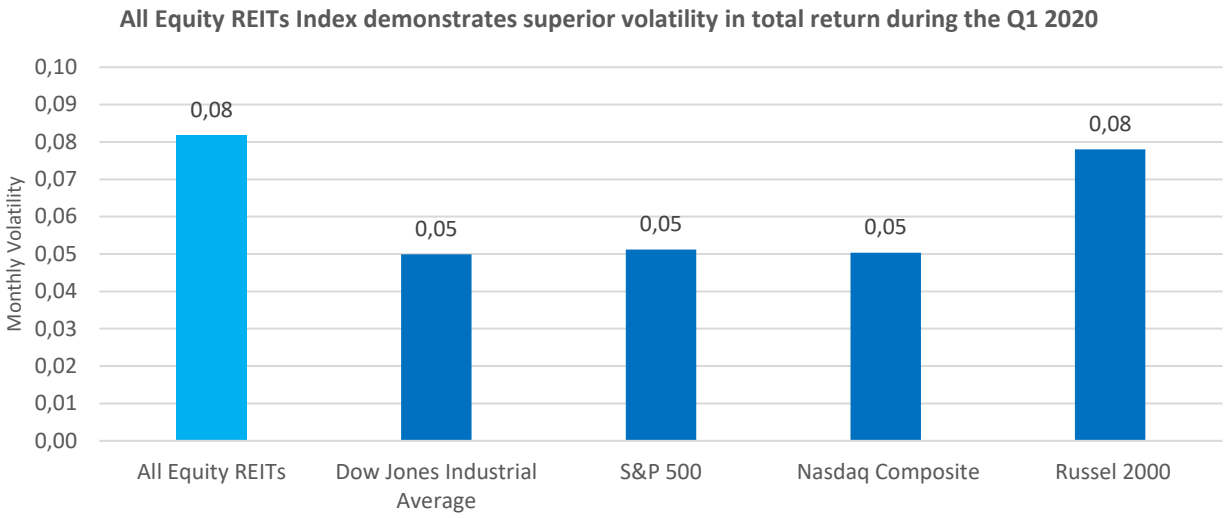

Source: NAREIT T-Tracker

## Appendix 12 - Great Recession: REITs average total returns vs other major indexes




Source: NAREIT, Bloomberg

## Appendix 13 - COVID-19: REITs volatility vs major other indexes




Source: NAREIT, Bloomberg