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AN ANALYSIS OF THE BRAZILIAN REITs: THE IMPACT OF PROPERTY-TYPE DIVERSIFICATION AND PROPERTY CONTROL OVER PERFORMANCE

SÃO PAULO

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Abstract

During the last 10 years, indirect real estate investments have greatly evolved in Brazil through Fundos de Investimento Imobiliário (FIIs); many new trusts have been released on the market as an option for investment, and management strategies have become more important to achieve better and more competitive performance. To contribute to the literature about the Brazilian indirect real estate market, this paper studies the impact of property-type diversification strategies and property control on the performance of Fundos de Investimento Imobiliário (FIIs), which are the Brazilian version of REITs. The period between 2002 and early 2016 was analysed, and information was collected about 110 FIIs, which composed an overall set of information configured as a dynamic data panel sample. We used a regression model in which the performance of FII, measured by Jensen's Alpha indicator, is explained according to the diversification and control of properties. The quantitative analysis suggests that both property-type diversification and full property control positively impact performance of FIIs.

The paper seeks to analyse management strategies applied to FIIs and to motivate further research regarding indirect real estate investment in Brazil.

Keywords: Fundos de Investmento Imobiliário (FIIs), Diversification Strategy, Control, Brazilian Real Estate Market, Performance.

Sumário Executivo

A estrutura para Fundos de Investimento Imobiliário (FIIs) foi implementada no Brasil em 1993. Desde então, esta segmentação de investimento não só passou por modificações em sua legislação mas também passou a ter um maior número de FIIs atuando no mercado, o que elevou a importância dos mesmos no mercado financeiro Brasileiro. Com o aumento da sua importância, a gestão apropriada de FIIs também se tornou mais relevante para manter ou melhorar a competitividade dos fundos como alternativa de investimento. Frente à necessidade de uma gestão mais eficiente, as estratégias envolvendo estruturação de FIIs e manutenção das carteiras imobiliárias demandam mais atenção para que gestores mantenham a performance competitiva.

Uma breve análise dos FIIs publicamente transacionados demonstra que em sua maioria eles possuem carteiras imobiliárias especializadas quanto ao tipo de imóvel (comercial, industrial, hotel, etc.) e que em geral os FIIs não possuem total controle dos imóveis que os integram. Frente a tais observações, o estudo em questão buscou analisar como a performance de FIIs é impactada segundo:

1- Estratégia de diversificação por tipo de imóvel. Se os FIIs que diversificam a carteira imobiliária impactam mais positivamente a performance do que os especializados em um tipo de imóvel;
2- Grau de controle dos imóveis. Se FIIs que adotam total controle de seus imóveis impactam mais positivamente a performance do que FIIs que não possuem total controle.

Com base nos resultados decorrentes do presente estudo, gestores de FIIs poderão tomar decisões ainda mais fundamentadas para melhorar ou criar carteiras imobiliárias. A análise de diversificação por tipo de imóvel, apesar de bem abordada internacionalmente, ainda pode gerar dúvidas quanto à qual escolha tomar - diversificar ou especializar - e o estudo focado na contextualização brasileira pode caracterizar melhor as condições estratégicas para FIIs. No que diz respeito aos tipos de imóveis de portfolios imobiliários, existem defesas fundamentadas tanto para seguir com estratégia de diversificação como para especializar. A estratégia de diversificação é coerente com a *Modern Portfolio Theory* (MPT), ou Teoria do Portfólio, já a estratégia de especialização é economicamente lógica, uma vez que pode gerar redução de custos de gestão.

O estudo do grau de controle que fundos imobiliários possuem sobre seus imóveis pode demostrar resultados específicos para o setor, uma vez que ter a totalidade, e não apenas a maioria, de um edifício pode significar uma melhor performance e menores conflitos de interesse disseminados pela estrutura corporativa dos fundos imobiliários. O tópico "controle" é bem debatido em finanças, porém no que diz respeito à fundos imobiliários, a maioria dos estudos foca nos potenciais conflitos e problemas que se originam devido ao nível de controle exercido entre *shareholders* e gestores. O estudo em questão foca na relação de controle entre gestores e imóvel.

Para alcançar os objetivos propostos, foram coletados, entre os anos de 2002 e início de 2016, dados referentes a cerca de 130 FIIs publicamente transacionados. Estas informações compuseram uma amostragem em painel dinâmico e sua finalidade foi dar base para uma regressão linear múltipla onde a performance dos FIIs poderia ser explicada em função da diversificação por tipo de imóvel e do grau de controle sobre os imóveis. Como medida de performance foi adotado o indicador alpha de Jensen, e para caracterizar a diversificação por tipo de imóvel e grau de controle foram utilizadas variáveis dummy. Assim sendo, o estudo configura-se como uma análise quantitativa.

Os resultados obtidos demonstram que os fundos imobiliários brasileiros se favorecerão mais da adoção de uma estratégia de diversificação por tipo de imóvel e do total controle sobre os ativos da carteira imobiliária. O resultados basicamente sugerem que talvez seja melhor que FIIs especializados em um tipo de imóvel diversifiquem a carteira e que FIIs que não possuem total controle dos imóveis busquem essa totalidade.

O estudo também gera margem para maiores pesquisas como diversificação por região, além de indicar que análises qualitativas dos tópicos propostos possam ser mais complementares aos resultados gerados. Assim sendo, a dissertação demonstra grande aplicabilidade e possibilidade de maior exploração, valorizando o contexto do mercado imobiliário brasileiro.

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Summary

1 Introduction

During the last decade, Brazilian real estate investment trusts (Brazilian REITs), called Fundos de Investimento Imobiliário (FIIs), have become well-known and popular options for investment in the Brazilian market. As a consequence of their popularity, many new trusts have arisen, and with them, the quality of Brazilian REIT management has begun to have greater importance to sustain trusts as good investment alternatives. This research studied two types of strategies in the Brazilian context that concern REIT managers:

- the first strategy is the property-type[1] diversification regarding the property portfolio of REITs; and
- the second strategy is the level of control over or ownership of the buildings that are part of the trust, i.e., the property control of REITs.

The structure for real estate investment trusts (REITs) in Brazil was first implemented in 1993. This structure can be considered relatively new compared to the U.S.'s structure, and although the REIT Market in Brazil is considered very small when compared to those in North America, Europe and Asia, it has undergone significant evolution over the last 10 years. Appendix A provides detailed data regarding the size of real estate markets worldwide, and Appendix B shows the historical size evolution of Brazilian REITs and US-REIT markets.

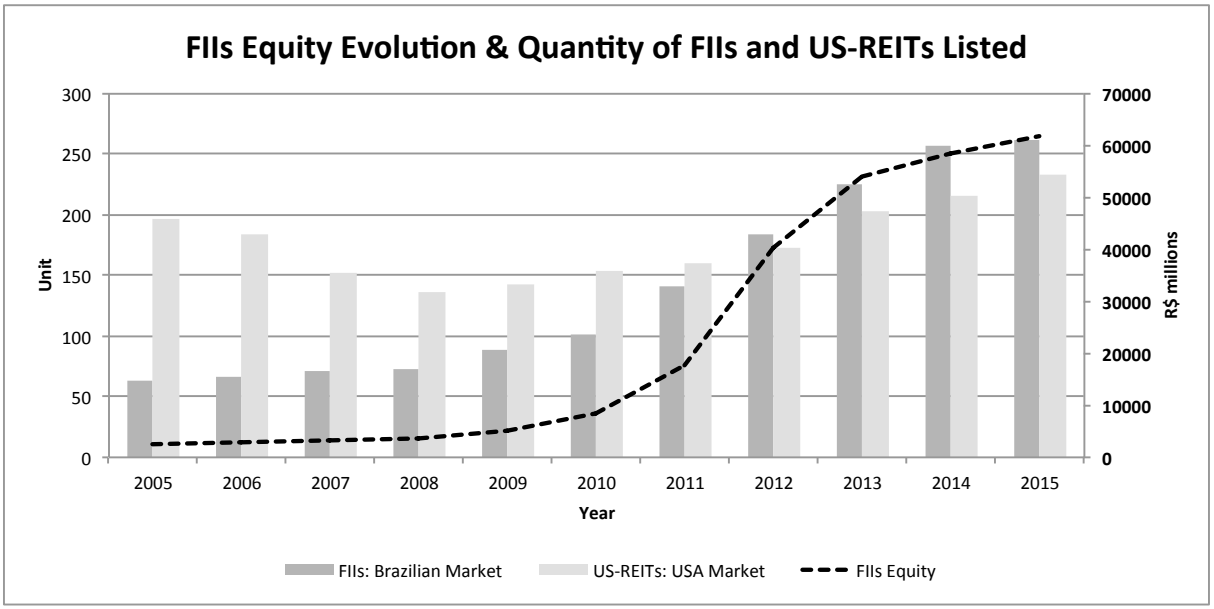
In February 2015, the stock exchange of São Paulo, BM&FBOVESPA[2], had approximately 130 publicly traded Fundos de Investimento Imobiliário (FIIs), whereas more than half, approximately 67%, had initial public offerings (IPOs) between 2010 and 2015. As Figure 1 illustrates, the number of Brazilian REITs quadrupled in the last 10 years, and with this increase, the market volume also grew. After the subprime crisis, which occurred between 2009 and 2015, the equity market value expanded by approximately 1,100% (CVM[3], 2016).

The scenario evolution of FIIs has shown that, although Brazil is currently experiencing both a political crisis and an economic crisis, FIIs are an important investment alternative. Fonseca (2012) explained that their economic importance arises from the organization of the sector,

[1] Property type examples are commercial/office, industrial, retail and hotel/lodging.
[2] BM&FBOVESPA – Brazilian Stock Exchange
[3] Comissão de Valores Mobiliários (CVM) – Brazilian entity responsible for FIIs

similar to a true market in which developers, brokers, managers, wealth and job creation exist. The study of Brazilian REITs must continue to evolve because the importance of proper management of their assets increases along with the relevance of REITs in the Brazilian financial market (GUIMARÃES, 2013). Therefore, the present research seeks to expand Brazilian REIT analysis by contextualizing the importance of two management strategies, i.e., property-type diversification and property control, over the performance of REITs.

Figure 1 - FIIs Equity Evolution & Quantity of FIIs & US-REITs: 2005 to 2015



Source: CVM and NAREIT, 2016.

The first strategy examined, i.e., whether to diversify or to specialize the portfolio of buildings according to property type, was previously analysed in the international context, and there have been many articles examining property-type diversification strategies for REITs (ANDERSON et al. 2015, CHONG et al. 2012, RO and ZIOBROWSKI 2011; BOER et al. 2005; BYRNE and LEE 2003; CAPOZZA and LEE 1995). These articles have drawn different conclusions and have debated the pros and cons of focused and diversified REITs; however, overall, recent results have shown that returns increase with property diversification.

The second management strategy studied is the level of control over (ownership of) the buildings that compose the property portfolio of Brazilian REITs. Although the literature has discussed the importance of the corporate structure behind REIT management, such as corporate governance, dividend politics, agency costs and institutional ownership (BROCKMAN et al. 2014; GHOSH and SUN 2014; DEVOS et al. 2013; CAMPBELL et al. 2011; EROL and TIRTIROGLU 2011; DOLDE and KNOPF 2010), not much research exists regarding having as much control as possible over the buildings that composes a REIT's portfolio. However, it is possible to expect that, by having full control over these buildings, trusts could improve performance by avoiding conflicts of interest with third parties and perhaps agency problems inside the REIT's corporate structure. Therefore, this research also intends to comprehend whether Brazilian REITs – FIIs – that have total control over/ownership of their properties have a management advantage, reflected in their performance, compared to REITs that do not.

To verify how important the diversification strategy and the level of control are for REIT management, this study proposes a regression model using a dynamic data panel sample, in which an indicator of performance, Jensen's Alpha, is explained by property-type diversification and property control strategies. By analysing the period between 2002 and early 2016, I collected a data sample regarding 110 FIIs publicly listed on São Paulo Stock Exchange, BM&FBOVESPA, and I applied this sample to run an analysis and obtain results.

I hope that the outcomes of this paper might help REIT managers to improve the conditions of their building portfolios and to reflect on the strategies chosen to guide their funds' profiles.

On the following pages, the discussion is divided into a contextualization of FIIs, a literature review on REIT diversification and control strategies, a description of the data under analysis, the methodology applied, and finally the exposition of results and conclusions.

2 Fundos de Investimento Imobiliário & Literature Review

Real estate investment trusts are broadly known worldwide. However, countries and regions have their peculiarities, and the real estate market is subject to such peculiarities. In this section, Fundos de Investimento Imobiliário (FIIs) are contextualized, and a literature review of previous studies of REITs is presented.

First, the differences between Brazilian REITs and US-REITs are discussed, and then, some of the main laws regulating the FII market are summarized. Subsequently, the property-type diversification strategy is explained, and a literature review about this topic helps to formulate the first hypothesis of this research. After covering the diversification issue, property control is explained in the context of FIIs, and finally, the second hypothesis is formulated.

The review seeks to understand the types of peculiarities that REIT investment encounters and how the topics of property-type diversification and property control were approached in the past. Once the research hypotheses are described, the subsequent topic explains the data obtained to run an empirical analysis.

2.1 Fundos de Investimento Imobiliário (FIIs) & US-REITs

Within capital markets, many types of investment vehicles/products exist. As Hudson-Wilson et al. (2005) explained, in the case of real estate, there are basically four financial structures of investments: i) private commercial real estate equity; ii) private commercial real estate debt; iii) public real estate equity – REITs or real estate operating companies (REOCs); and iv) public commercial real estate debt. In the USA, a famous alternative is the REIT, which offers investors an indirect form to invest in real estate. In Brazil, Fundos de Investimento Imobiliário (FIIs) are the equivalent to US-REITs, and although they have some specific differences, both markets have laws and legislation qualifying and regulating their operability. In the North American case, the legislation is in accordance with the Real Estate Investment Trust Act of 1960, which prevails in the USA, whereas in Brazil, it is according to Law No. 8668 / 1993 from Rule 205 / 1994 from Comissão de Valores Mobiliários (CVM).

Some important characteristics to emphasize and that are common to both cases, FIIs and US-REITs, are that they have tax exemptions, it is not mandatory that they be publicly traded on

the stock exchange, and there are no legal restrictions regarding the use of leverage. Differences between the two cases are that US-REITs cannot have fewer than 100 stockholders and that 5 or fewer stockholders cannot hold more than 50% of the shares, whereas for FIIs, there is the need for a minimum of 50 stockholders, and they cannot hold more than 10% of the shares. In terms of mandatory distribution, US-REITs must deliver 90% of the operational profit, they have no specific rules for net capital gain distribution, and the timing is annual, whereas FIIs must return 95% of the operational profit and 95% of the net capital gain, and they have biannual timing. Appendix C provides a summary comparing the main characteristics of FIIs and US-REITs.

In addition to legislation characteristics, it is very important to determine and understand the types of REITs that each country offers. In the USA, there are 3 main types of REITs, and in Brazil, there are 4 types. As Cosentino and Alencar (2011) explained in their paper, in the USA, there are equity REITs, mortgage REITs and hybrid REITs. An equity REIT is characterized by owning the property and operating/exploiting it to produce income (rents). Mortgages REITs arise when the trust works with real estate financing (mortgages, for example), invests in other REITs or buys securitized assets. Regarding hybrid REITs, they are a mixture of equity and mortgage REITs.

Guimarães (2013) reported the 4 types of FIIs, which are *FII de Imóvel*, *FII de Renda Fixa*, *FII de Renda Variável* and *FII Multiclasse*. The *FII de Imóvel* or, as it is also called in Brazil, "*FII de Tijolo*" is the Brazilian version of equity REITs, and its objective is to own and operate real estate income. *FII de Renda Fixa* and *FII de Renda Variável* are similar to mortgage REITs; however, each of them has specific attributes, and they are popularly called "*FII de Papel*" or "*FII de FIIs*". Finally, the *FII Multiclasse* combines two or three types of those mentioned before, and it is the Brazilian version of hybrid REITs. As illustrated, there are similarities between the USA and Brazil when classifying REITs.

The economic status of the two countries is different when the issue is the REIT industry. Gabriel (2014) emphasized that the variances between the Brazilian and American markets in terms of financial systems, capital markets, structure, market size, and maturity, as well as regulations and macroeconomics aspects, have consequences for the contrast between Brazilian REITs and US-REITs in performance analysis. The numbers regarding the size of both markets alone can suggest discrepancies. Taking the North American REITs as an

example, according to NAREIT[4] (2016), these REITs registered a market capitalization of US$ 938.8 billion in 2015, with 233 REITs publicly listed and negotiated, whereas in the same year, the Brazilian REIT market composed a total net equity value of R$ 61.7 billion, with 261 trusts listed at CVM[5]; however, the actual number of trusts publicly traded was lower. In the beginning of 2016, approximately half of the FIIs (129) were publicly traded at BM&FBOVESPA[6].

Cosentino and Alencar (2011) analysed the differences between FIIs and US-REITs and concluded that the Brazilian REITs still needed to mature as an investment alternative, and although they were growing, their liquidity was not the same as that of the North American REITs. However, as the Brazilian Real Estate market evolves, Brazilian REITs are predicted to have a greater presence as a mechanism for investors interested in the real estate sector.

Unger and Karvel (1991) reported that there are several reasons to invest in real estate. According to them, direct real estate investments provide advantages, such as i) the protection of asset purchasing power through appreciation in value; ii) the ability to increase profits through leverage or the use of borrowed money; iii) the tax sheltering of income through the depreciation of buildings; iv) optimum cash flow after taxes; v) opportunities for management control; and vi) the price of ownership.

However, these advantages apply for direct real estate investment. When an investor chooses the indirect alternative, REITs, for example, he or she might face something slightly different.

According to Brounen and Koning (2012), REITs provide investors a liquid way of investing in diversified portfolios of commercial real estate, and they create an attractive legal structure for real estate companies, although the listed entities experience operations and policy restrictions. Pagliari et al. (2005) compared indirect and direct real estate investments and found that, historically, REITs exceeded the returns on private real estate equities and were favoured by individual/small investors, while large institutional players still preferred private real estate investment.

[4] National Association of Real Estate Investment Trusts (NAREIT)
[5] Comissão de Valores Mobiliários (CVM) – Brazilian entity responsible for FIIs
[6] BM&FBOVESPA – Brazilian Stock Exchange

Similar to other industries, real estate investments are highly conditioned to regional and legal restrictions. Each country has its own peculiarities. Brounen and Koning (2012), through their REIT history review, showed the importance of establishing the correct conditions to develop a sizeable REIT industry. According to them, lobbying organizations and coinciding financial deregulations are essential to REIT market growth, not only in the USA, but also abroad.

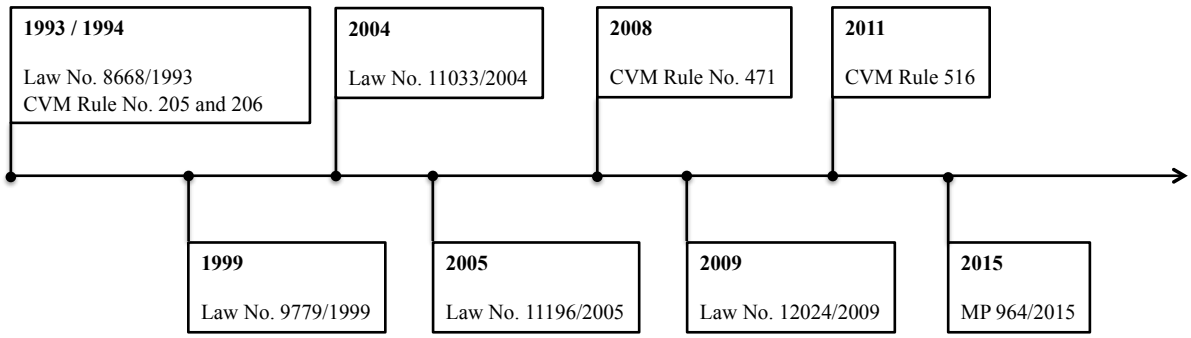
Considering these peculiarities between FIIs and US-REITs, it is important to continue global analysis of real estate investments; however, for each country, closer study is important for comprehending market standards and to facilitate a proper business strategy that could best suits a region or country.

Next, a summary of the history of FII legislation evolution is presented.

2.2 Fundos de Investimento Imobiliário – History and Laws

The structure for Fundos de Investimento Imobiliário (FIIs) – the Brazilian REITs – was first implemented in 1993 through Law No. 8668 during the presidency of Itamar Franco. This law not only organized the configuration to have resources raised through the securities distribution system targeting real estate investments but also established Comissão de Valores Mobiliários (CVM) as the entity that authorizes, inspects and regulates the organization, operation and administration of Brazilian REITs. With Law No. 8668, the Brazilian indirect real estate investment market underwent its first steps and experienced changes during subsequent years. Figure 2 represents a timeline synthesizing the regulatory changes that affected the Brazilian REIT structure.

Figure 2 - Timeline: Brazilian REIT Regulatory Changes



Similar to those in the USA, the Brazilian REITs have a tax structure with incentives, and as Figure 2 shows, after 1993, there were many laws that complemented and improved upon Law No. 8668/1993 and that promoted the tax incentives for Brazilian REITs. From these laws, it is possible to conclude that three instances represented a great change for the FII market.

The first change occurred in 2005, when Law No. 11196/2005 basically promoted, if specific conditions were obeyed, a tax exemption for the dividends paid to Brazilian REIT shareholders. This law had an important impact on the popularity of FIIs, and as Gabriel (2014) mentioned in association with the current economic context, it helped in the developing of the Brazilian REIT market.

The second moment was in 2008, when CVM Rule No. 472, which regulates the organization, operation, administration, public securities distribution offerings and disclosure of information regarding Brazilian REITs, was renewed. Gabriel (2014) reported that this rule was a historical mark for FIIs because it expanded the possibilities of diversifying the assets that could be part of the trust's portfolio, such as mortgage bills, shares from other trusts and real estate credit bonds. With CVM Rule No. 472, the mortgage REITs in Brazil gained strength.

Finally, the third event occurred in 2009 through Law No. 12024/2009, which regulated the tax exemption benefits for Brazilian Mortgages REITs, *FIIs de Papel* and *FIIs de FIIs*.

During the years following 2009, the total equity and quantity of FIIs increased substantially in the market. The laws implemented in the first decade of the 21st century were important for helping the development of the Brazilian REIT market, which was still young and relatively small compared to the USA market but had great potential.

However, in 2015, through MP 694/2015[7], the Brazilian government started to study a reconfiguration of the taxation applied to Brazilian REITs. Politicians are hoping to approve an increase in taxes that could damage the current tax-exempt status of Brazilian REITs, which, exactly like in the case of US-REITs, is a relevant aspect to promote and strengthen Brazil's indirect real estate market. If MP 694/2015 is completely approved, then it could

[7] MP 694/2015 – Provisional Measure No. 694 (*Medida Provisória nº 694*) of 30 September 2015.

represent a change in the development of Brazilian REITs; the demand for them could decrease, and the challenges in managing them and improving their performance would likely increase.

Next, property-type diversification and property control are explained in greater depth, and a literature review regarding each of them is presented to help to formulate hypotheses for the present research.

2.3 Property-Type Diversification

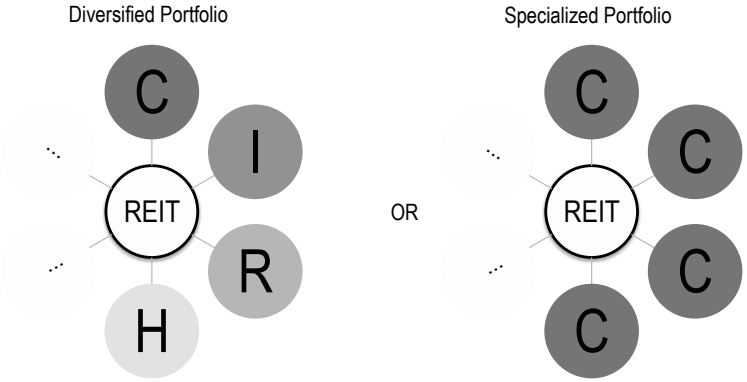
Diversification strategy is a topic that is broadly discussed in the literature. A diversified firm is active in multiple businesses or markets. Consequently, a firm's level of diversification is one of the main concepts characterizing its corporate level strategy. (FURRER, 2011)

Classifying the level of diversification in a firm is not a straightforward process. As Furrer (2011) explained, there are basically three dimensions to represent the diversification strategy: geography, product market and vertical integration. Therefore, the overall diversification level of a firm derives from the extent of its diversification in these dimensions.

In this study, the diversification analysis targets the product market dimension of REITs. In this sense, what is meant by property-type diversification is that a REIT can target multiple types of properties to compose its portfolio, or it can focus on only one type or one property.

The property type is classified according to the real estate market segment that the building concept seeks to reach, such as commercial / office, industrial, retail, hotel / lodging, residential or healthcare. Figure 3 illustrates diversified and focused property portfolios in the context of REITs.

Figure 3 - Property-type diversification: Diversified & Specialized Property Portfolios



Note: Property type examples are commercial/office (C), industrial (I), retail (R) and hotel/lodging (H).

The following study analyses the property-type diversification of Brazilian REIT portfolios and whether it is better to have a diversified or focused property portfolio.

Chong et al. (2012) explained that, in the USA, less than 10% of equity REITs are classified as diversified, and there is a predominance of REITs specializing in a single property type. As will be discussed in greater detail in the following pages, the same predominance is observed with Brazilian REITs. Most of them seek to focus on a single property type.

2.4 Literature Review: Property-type Specialization Vs. Diversification

In any business, the chosen strategy is what managers might believe to be the reasoning that will help to achieve an expected result or objective. If it is assumed that the objective of a firm is the best performance and value, then there is a debate regarding what concerns the efficiency of specialization or the diversification strategy.

According to Berger and Ofek (1995), theoretical arguments have suggested that diversification has both value-enhancing and value-reducing effects. However, in their research, they analysed the effects of diversification on firm value, and the results actually showed a negative relationship. In contrast, Lang and Stulz (1994) studied whether the market evaluation of a firm correlates with its diversification degree; however, they found no evidence that diversification does or does not benefit firms on average. According to these authors, if diversified firms differ from specialized firms only because diversification

improves performance, then diversified firms are expected have more value than comparable portfolios of specialized companies.

The real estate market has its owns peculiarities, and by analysing this market, one should expect a REIT to be like a firm in the sense that it will sell returns according to its tenants' rental payments to use a certain property. To achieve better returns, REITs can increase their portfolio size by acquiring more buildings, and they can adopt strategies to diversify the types of properties or can focus on only one type.However, regarding what concerns the efficiency of each strategy, previous studies have shown that this particular industry can present different results.

Ro and Ziobrowski (2009) examined how property focus or diversification influenced the value of U.S equity REITs from 1997 to 2006. According to them, REITs present a strong tendency to seek one particular property type. Through their analysis, by adopting CAPM and a Fama-French three-factor model with momentum, they concluded that there was no evidence of superior performance associated with specialized REITs. It was actually verified, although without a statistically significant margin, that diversified REITs somewhat outperform specialized ones. Ro and Ziobrowski (2009) also concluded that specialized REITs presented higher market risk than diversified REITs. A few years later, Chong et al. (2012), in contrast, reported that the arguments in favour of a focused strategy are that that the REIT managers should have better understanding and knowledge of specialist markets and sectors, and lower costs in monitoring and analysing more markets could be attained. Hence, although the idea of focus can appear inconsistent with portfolio theory and diversification, economically, it might make sense.

The latest article in which Anderson et al. (2015) analysed the property-type diversification of REITs and their operating performance showed a positive impact of diversification on returns due to shielding against property-type specific risk. Nevertheless, Anderson et al. (2015) also concluded that, despite superior performance, buying diversified REITs instead of specialized REITs is not a profitable strategy. Although more related to performance analysis, the results obtained by Anderson et al. (2015) are drivers of the study of how diversification strategy impacts Brazilian REIT performance.

Therefore, according to the latest international literature, it is possible to consider that diversification has a positive impact on REITs by achieving better performance

(ANDERSON et al., 2015). A similar result should be expected for the case of Brazilian REITs; thus, the first hypothesis (H1) of this research is presented:

(H1) FIIs that apply a diversification strategy outperform FIIs that are specialized.

For the present research, the analysis seeks to verify whether adopting a property-type diversification strategy more positively impacts the FII performance than applying a strategy focused on one type of property.

2.5 Property Control

REITs are companies organized to structure and raise resources to own and operate income-producing real estate.

Brazilian REITs have an internal corporate structure that basically contemplates a relationship between the REIT shareholders and its managers. As Basu et al. (2016) noted, there has been a great focus on studying the separation of ownership from control/power and the conflicts of interest between shareholders and managers in the context of the firm. Brockman et al. (2014) explained that REIT structure usually relies on a management team and an advisory team. According to these authors, third parties hired to execute the job sometimes compose these teams, and this situation can occasionally lead to agency problems, self-dealing and conflicts of interest.

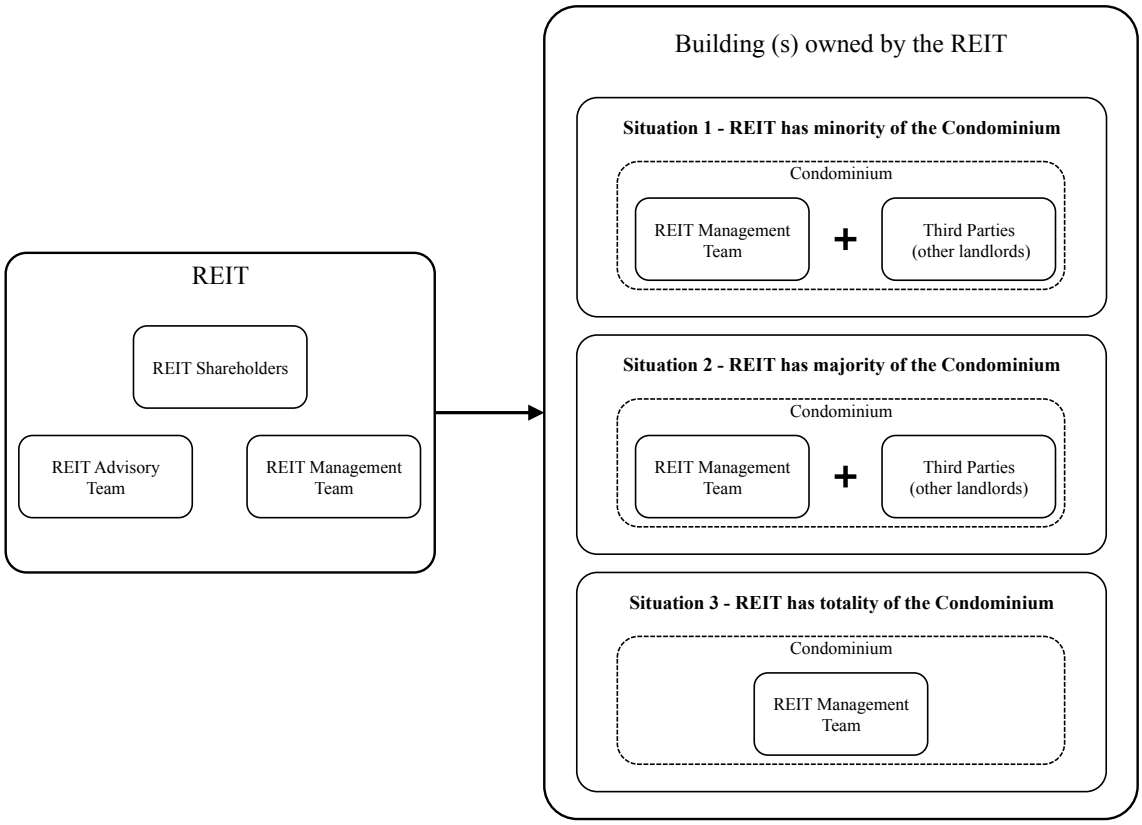
Because REITs that own properties must address building management and operation, there could be a third "organizational structure" that affects the overall REIT administration. This third structure consists of the relationship between the REIT management team and the building's condominium.

Brazilian legislation, in accordance with Law No. 4591/1964, stipulates that every building or group of buildings that is destined for residential or non-residential use and with one or more floors constructed as separate units from each other must constitute each unit as an autonomous property. Additionally, according to Law No. 4591/1964, the landlords of each unit are subjected to and responsible for a condominium agreement and for internal regulation that organizes the use and management of the building.

Some of the condominium agreement duties are i) to classify what are common and private areas; ii) to stipulate how to use the infrastructure, services and common spaces of the building; iii) to stipulate how to choose the trustee and specify his or her attributes and responsibilities; and iv) to stipulates rules and standards to manage, operate and maintain the building.

Like in a firm, when a shareholder has the majority of shares, the landlord of a building can have the majority of the condominium, according to the number of units that he or she has, and he or she gains control of the decisions made for the common health of the building management and operation. Basically, the control of the condominium is a reflection of the number of units that are concentrated with one specific landlord. In this sense, REITs sometimes concentrate a small fraction of a building's units (less than 50%), a majority of building's units (more than 50%) and the totality of building's units (100%). Figure 4 represents a synthesized corporate structure of REITs, adding the relationship with condominium(s) to it.

Figure 4 - A REIT's corporate structure with Condominium conditions



Although REITs can obtain control of condominiums if they have the majority of it, the total control of the building is not guaranteed. Third parties that also share the building areas, but do not have any influence on the condominium decisions, still have control over the units that belong to them, which indicates that they could make decisions regarding their units that could affect the entire building and that the condominium would not be able to stop them because of each landlord's rights. The condominium majority does not guarantee avoiding potential shocks and conflicts of interests with other landlords, but by having the totality of it, i.e., by having all of the building under the control of one landlord, potential problems with third parties are prevented, which is the interesting reason to analyse whether REITs with full control of the building perform better than REITs without full control.

When the issue is control, it appears that the more that one has, the better that it is. However, REIT managers will not always be able to guarantee property control, and sometimes, it is necessary to gradually increase control. When a REIT achieves the majority of a condominium, should it attempt to acquire the totality, or is a majority sufficient to sustain performance? This work paper seeks to understand whether, in terms of REIT performance, having total control of its assets is better than not having total control. Measuring a variable such as control is usually not simple, and for Brazilian REITs, it is no different. The present research was able to access some control indicators; but, as better explained in the Data section, it was necessary to determine certain assumptions to enable the results and conclusion.

2.6 Literature Review: REITs Control and Ownership

When the issue of discussion is the level of control that a REIT has over its properties, not much can be found within articles and academic analyses. Howton et al. (2012) reported that prior research on the impact of REIT ownership on property performance was limited and inconclusive, which is why the study of this topic might be relevant. For some Brazilian REITs, it is common to have only a percentage or some floors of a building integrated into its portfolio, as previously mentioned. This condition raises questions. Does 100% control of a building matter to REIT performance? Do REITs that have less than 100% of a real estate asset present worst results?

The literature about ownership and control has been well explored in the context of the firm, which Boukouras (2011), Lozano et al. (2015) and Basu et al. (2016) recently discussed.

As Boukouras (2011) commented, in a firm owned by shareholders that have professional managers controlling their operations, the associated agency costs and the corporate mechanisms to decrease them are popular topics involving ownership and control discussions. In research by Lazano et al. (2015), the authors explored the problem between minority and majority shareholders, leading to a U-shaped relationship between ownership concentration and firm value. Basu et al. (2016) explored blockholder-level measures of power and their consequences for firm value, as well as how multiple blockholders could demonstrate significant differences between ownership and power.

According to Howton et al. (2012), the long horizon of REITs might lead them to focus more intensively on operations as a source of value creation. The idea of REITs becoming more efficient in terms of performance because of their management operations enhances the importance of understanding whether the degree of control that REITs have over their properties is relevant.

Although limited to a specific niche of the real estate industry, i.e., the hotel business in the USA, Howton et al. (2012) compared performance between REIT-owned properties and non-REIT-owned properties, concluding that REIT ownership favourably impacts the performance of the properties.

The second hypothesis of the present research considers the importance of having 100% control of the building(s) composing the REIT portfolio. Because research about this topic is scarce, to approach the subject and formulate a coherent hypothesis, an alternative approach is to verify the problems that managers can avoid by having 100% control of a building. Because 100% control of properties basically means not having a partner sharing some decisions and interfering in the property, it is possible to assume that full control/ownership helps the REIT manager to prevent conflicts of interests with potential partners and to prevent potential agency problems in the corporate structure of the REIT. Therefore, the second hypothesis (H2) formulated for the present research is

(H2) FIIs with 100% ownership of their buildings outperform FIIs that do not fully own their properties.

The following analysis seeks to verify whether having total control more positively impacts the FII performance than not having total control.

On subsequent pages, the information gathered to compose the data in this study is discussed, and the methodology adopted is formulated and explained to verify hypotheses 1 (H1) and 2 (H2) empirically.

3 Data

The current research has two main problems being targeted, as described in the Introduction and Literature review sections of this paper. To analyse these issues, the number of FIIs that had their stocks commercialized at the Brazilian Stock Exchange BM&FBOVESPA by February 2016 was first validated, which totalled 129. Then, through the use of the Bloomberg platform, data on the closing price of the share (in BRL), the total number of outstanding shares (in millions), the fund net asset value (BRL/share) and the total gross return of Brazilian REITs with information available were collected for the period between January 2002 and February 2016. From these preliminary data, it was possible to estimate the age and market capitalization value of each REIT.

To analyse and classify the property-type diversification and the level of property control for each Brazilian REIT, IPO prospects and reports were gathered from the BM&FBOVESPA's web page.

After all of these data were consolidated, the total number of Brazilian REITs to be analysed decreased from 129 to 110. Not every REIT could be classified according to the property-type diversification and the level of property control because their reports and prospects were limited or were not available at the BM&FBOVESPA. Additionally, not every REIT had the variables collected from Bloomberg available. Appendix G and H show a list of the 110 Brazilian REITs that could be classified and that had information available.

As it is better described in the following pages, part of the methodology adopted in this research used the CAPM model, which requires benchmarks for market returns and risk-free assets. As benchmarks, three indices are applied monthly: i) the IBOV index, which is supposed to gauge the average performance of the Brazilian stock market; ii) the IMOB index, representing the direct real estate investment performance from the Brazilian market; and iii) the IFIX index, characterizing the indirect real estate investment performance from the Brazilian market. To represent a risk-free asset, the reference interest rates are applied from swaps PréXDI, and for the present paper, the PREDI30 Index was chosen from the Brazilian market. All four of the indices were obtained from the Bloomberg platform like the other research variables.

Before describing the research methodology, the following pages provide more detail about the benchmarks, variables and assumptions to run the analysis and to obtain the conclusions.

3.1 Benchmarks

The methodology proposed for this research, as better detailed on subsequent pages, relies on the use of market indices as benchmarks. Because the objective of this research is to analyse the characteristics of Brazilian REITs among themselves and not with other types of investments, three different market indexes were chosen as guiding parameters to create scenarios to interpret the behaviour of Brazilian REITs' diversification and control characteristics.

The market indices chosen to integrate this research were the IBOV, the IMOB and the IFIX.

The IBOV index, or the BOVESPA Index, began publication in 1968 and is one of the most important market indicators in Brazil. This index seeks to express the average performance of the Brazilian stock market.

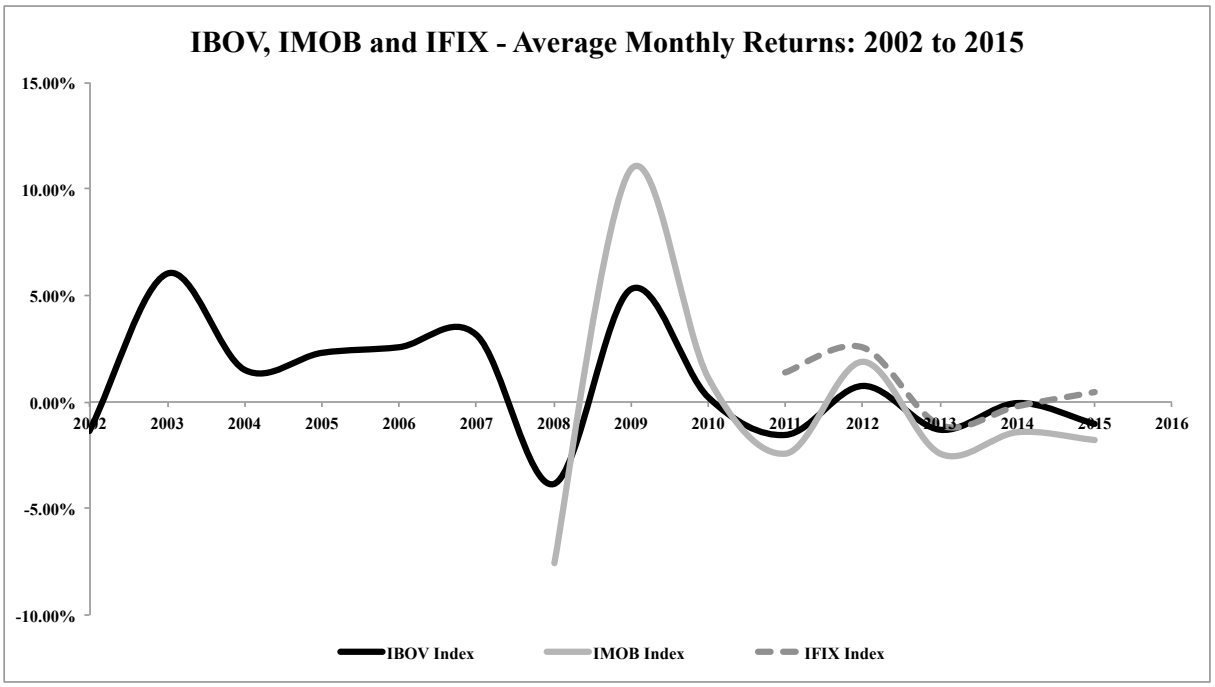
The IMOB index, according to the Bloomberg platform, released its first numbers in 2008, and as BM&FBOVESPA describes, it is an indicator of performance specific to the Brazilian real estate sector, encompassing real estate intermediation and the civil engineering and construction industries, as well as the wider real estate exploitation subsectors.

Different from the IMOB index, the IFIX index came to the market as an indicator of average performance specific to Brazilian REITs that are publicly traded at BM&FBOVESPA. Its historical data began in 2011, making the index relatively young. Figure 5 shows a chart comparing the historical evolution of the average monthly returns of each index from 2002 to 2015.

As is well known, there are two ways of investing in real estate: directly or indirectly. Direct real estate investment involves buying a property or a piece of property and owning buildings, either individually or through investment groups. Property companies are examples of institutions that directly invest in real estate, which usually involves an enormous amount of capital. The indirect alternative to investing in real estate consists of acquiring shares of real estate funds, US-REITs, for example, or real estate companies, and it is much more accessible than the first option. Because many civil engineering and property companies compose the

IMOB index, it is possible to assume that it is an indicator of the direct real estate investment market. Regarding the IFIX, due to its composition of Brazilian REITs, it can be interpreted as an index of the indirect real estate investment market. Appendixes I and J show the companies and funds that constitute the IMOB and IFIX indices.

Figure 5 - IBOV, IMOB, IFIX - Average Monthly Returns



Source: Bloomberg, 2016.

The choice of IBOV, IMOB and IFIX as benchmarks to analyse Brazilian REIT behaviour indicates comparisons to the Brazilian stock market, Brazilian direct real estate investment market and Brazilian indirect real estate investment market, respectively. In this manner, the results are presented according to three scenarios. From Figure 5, it is possible to visualize similar behaviour among the three indices, especially between IBOV and IMOB. Due to this resemblance, similar results are expected among the three scenarios. However, each scenario will also contemplate a different time period of analysis because the dates on which each index began to be computed are different, which could reflect diverse outcomes among the 3 scenarios.

3.2 Variables

To integrate the overall analysis, the present study has six main variables that compose Equation 2, which is described at the Methodology chapter. These variables are divided in three types, namely the dependent variable, the control variables and the explanatory variables. Together the control and explanatory variables are the regression independent variables.

3.2.1 Dependent Variable

Jensen's Alpha. This is a variable that was not obtained through historical data but was calculated according to the CAPM model described on page 34. Jensen's Alpha is a variable that is applied to understand the historical performance of an asset, stock or portfolio (BERK and DEMARZO, 2014). Its interpretation is basically as follows: i) if Jensen's Alpha is greater than zero, then the asset performed better than expected during the regression period; ii) if Jensen's Alpha is equal to zero, then the asset performed as well as expected; and iii) if Jensen's Alpha is less than zero, then the asset performed worse than expected.

3.2.2 Control Variables

The control variables were chosen to better characterize Brazilian REITs. The variables of Age, Net Asset Value and Market Capitalization were selected as part of the main regression to have their effects separated from the effects that property-type diversification and property control might have.

Age. This variable represents the age of the Brazilian REIT and is reported in months. It was considered as the time that the fund presented gross returns computed on the Bloomberg Platform. Ambrose and Linneman (1998) analysed the differences between old REITs and new REITs, providing some intelligence on how the age characterizes the REIT. When valuating properties, usually one concern is the age of the building; for example, the hedonic methodology uses the age of a property as a quality variable, among other factors, to construct housing price indices (CASE et al. 1991). Because it is a value that can represent time experience and can be understood as a quality variable, it is interesting to associate age with the REIT performance.

Net Asset Value. The net asset value (NAV) is a number that represents the trust, in this case, the FII, value per share. It is the result of subtraction from the total value of the assets of its liabilities divided by the total number of outstanding shares. As Barkham and Ward (1999) observed, the value of the property company shares is associated with the performance of the real estate market. For the case of Brazilian REITs, the NAV can be a good measurement of net equity, and in this paper, it will be correlated with performance as a control variable. The fund net asset value collected from the Bloomberg database is an outcome expressed in BRL per share.

Market Capitalization. Not only the net asset value but also the market capitalization (MCap) variable is applied as a control variable in the main regression equation. Clayton and Mackinnon (2003) analysed REIT returns and explained that the market capitalization (REIT size) is an important dimension for investors. They ran an analysis using the MCap to create size-based REIT portfolios, and they hypothesized that market cap could be a variable relevant to REIT volatility. In the present study, the market capitalization, which is the product of the last price of the share multiplied by the number of outstanding shares and which is reported in millions of BRL, was selected as an alternative to represent the Brazilian REIT size and to be correlated with performance. Similar to the NAV, the MCap somewhat reflects the FIIs market value. However, because the MCap, if divided by the total number of outstanding shares, is a result of how much the market would pay for the REIT, it is also associated with future expectations.

3.2.3 Explanatory Variables

The explanatory variables are two dummy variables selected to compose the main regression, and they are the most important factors of study in the present research. Each of these variables seeks to describe how property-type diversification and property control impacts Jensen's Alpha, in other words, the performance of Brazilian REITs.

As Anderson et al. (2015) explained, the prior literature could not reach a consensus regarding how to measure property-type diversification, and scholars analysed it according to three different criteria for robustness proposes. One of these criteria was a binary approach or, in other words, the use of dummy variables. For the present research, due to time and information limitations, this same approach, binary variables, was chosen to illustrate the property-type diversification and the level of property control of Brazilian REITs.

Property-type Diversification. The dummy variable for diversification, represented by D_{DIV}, is obtained by analysing the types of properties that compose the Brazilian REIT. If the existence of more than one type is identified from commercial, logistics/industrial, residential, retail and hotel properties, then the trust is considered to be diversified, and the attributed value for the dummy variable is 1. In contrast, if the Brazilian REIT is composed by only one type of property, indicating that it is a specialized trust, then the attributed value is 0.

Property Control. The dummy variable for level of control, represented by $D_{CONTROL}$, is classified by reviewing whether the building(s) that are part of the property portfolio are 100% controlled/owned by the real estate trust. In this manner, the value for this dummy is 1 if there is 100% control of all of the buildings in the property portfolio and 0 if at least one building is not 100% controlled.

To determine how each fund is classified according to diversification degree and property control, their composition was checked using the IPO prospects, which also contain information about the strategies adopted and sought by the FIIs. In addition, reports released by the FIIs indicating their properties and how much is owned by the trust are also exploited to complement as much as possible the classification regarding diversification and control.

The next subtopic explains some limitations and assumptions considered and adapted for this research.

3.3 Assumptions

The real estate information arrangement in Brazil is not as accessible as that in the USA, which limits the coverage of the survey. During the development of this research, it was necessary to make some assumptions to facilitate the application of the methodology.

To analyse the diversification and control characteristics of Brazilian REITs and their influence on performance, it was necessary to assume that these variables did not change with time. For example, after analysing the documentation that led to classifying a Brazilian REIT as diversified or not and has having full control of its properties, it was assumed that this condition was the same for all periods of analysis. This simplification excluded the capacity that Brazilian REITs have to change their portfolio characteristics from the study. It was an

assumption that was needed because the disposal of information did not allow for monitoring all of the changes that each Brazilian REIT portfolio underwent with time.

Another assumption was that Brazilian mortgages REITs, the "*FIIs de FIIs*" and "*FIIs de Papel*", were classified as diversified according to property type and were classified as trusts without control over buildings in which that indirectly invested. These specific Brazilian REITs could be taken apart from the regression model; however, because they are a relevant number, it was decided to maintain them in the analysis. Nevertheless, in the Results section, scenarios are presented in which these Brazilian mortgage REITs were excluded from the main regression as well.

Due to the limitations of the information, one important variable for REIT performance was not considered in the analysis. The Brazilian REIT management costs could not be part of the main regression as a control variable because it was not possible to access a sample that would provide these values for each trust and for each period of time.

Although the assumptions were driven by limitations in obtaining information, they are points for improvement that further research could explore. Next, the research methodology is detailed, and the results are presented.

4 Methodology

In this section, the methodology for comprehending how the property-type diversification strategy and level of control over buildings influence the performance of Brazilian REITs is described. To empirically verify the hypothesis, the descriptive statistic around the Jensen's Alpha historical value is analysed according to the FIIs classification by diversification and control, called the portfolio approach. Then, a regression model using panel data sample to verify how diversification and control explained Jensen's Alpha, the measurement of performance that was adopted, in association with the FII is run.

The first step for applying the desired valuation is the calculation of the Jensen's Alpha variable for each FII. The method for obtaining this variable is a cross-section regression analysis according to the CAPM model. Equation (1) for this regression is shown below:

$$\textbf{(1)} \qquad \mathbf{R_{i,t} - R_{f,t} = a_i + b_i(R_{m,t} - R_{f,t}) + \varepsilon_{i,t}}$$

The excess return of the FII stock relative to the risk free rate ($R_{i,t} - R_{f,t}$) is the dependent variable (Y), while the independent variable (X) is the excess return of the market relative to the risk free rate ($R_{m,t} - R_{f,t}$). From this model, for each FII, "a" is the intercept, in other words, Jensen's Alpha, and "b" is the Beta.

The FII returns, $R_{i,t}$, come from the difference in percentages between the FII total gross return from period "t" and period "t-1" ($grossret_{(t)}$ / $grossret_{(t-1)}$ -1).

As mentioned in the Data section, the PREDI30 Index represents the risk-free assets, and there are three indicators that can illustrate market returns: the IBOV, IMOB and IFIX indices. As previously explained, they were chosen to benchmark the FIIs and to perform a more complete analysis, instead of using only one index for benchmarking, Betas and Jensen's Alphas are obtained for the three indices, providing three scenarios.

Additionally, because the data from Brazilian REITs do not have the same historical amount as the US-REIT data and to take full advantage of it, the regression represented by equation

(1) contemplates a period of 24 months associated with a rolling window method, which is applied to obtain a historical set of Alphas and Betas for each FII. The final result is a panel data sample in which, for the 110 FIIs, there will be "x" number of Alphas and Betas registered for as many months as the data allow. Since some FIIs are older than others, an unbalanced panel data set is expected. This criterion, although it might present some biases, is adopted to maintain a relevant statistical sample for the regression model.

After the Jensen's Alpha for each FII was calculated, a portfolio approach was applied to understand how FIIs with diversification and full control strategies performed in past years at the Brazilian market. This analysis consists of a comparison of the mean Jensen's Alpha among four categories of portfolios, one composed only of FIIs that are property-type diversified, another only by FIIs focused on one type of property, a third by FIIs with full control over their properties and the last by FIIs without full control of their properties.

Results from the portfolio approach should provide an initial understanding of the diversification and full control strategies behind FIIs, and they are discussed on page 42.

After a primary overview of the portfolio analysis, the methodology consists of a regression model with panel data sample, which is grouped by FIIs, and the time period is monthly. The equation for this regression model has as a dependent variable (Y), the Jensen's Alpha, while the independent variables (X) are the age, fund net asset value and market capitalization of the FIIs, as well as two dummies (binomial variables) representing whether the FII is diversified and whether there is 100% control of the buildings within its portfolio. The equation for this model is represented by equation (2).

$$\textbf{(2)}\ \mathbf{Alpha_{i,t} = \beta_0 + \beta_1\, ln(Age)_{i,t} + \beta_2\, ln(NAV)_{i,t} + \beta_3\, ln(MCap)_{i,t} + \beta_4\, Alpha_{i,t-1} + \delta_1(D_{DIV})_{i,t} + \delta_2(D_{CONTROL})_{i,t} + u_{i,t} + \varepsilon_{i,t}}$$

The regression was estimated using instrumental variables (IVs) and two-stage least squares (2SLS) for panel-data models. A random effects estimator was adopted for time and entities. As shown in Equation (2), the variable $Alpha_{i,t-1}$ represents the lagged Jensen's Alpha and is an endogenous variable. Because of the CAPM model being associated with a rolling window

method, the Jansen's Alpha obtained for period "t" had a strong correlation with the Jensen's Alpha of period "t-1". This characteristic configured the data set as a dynamic panel and justified a regression using an instrumental variable (IVs), which in this case was the Jensen's Alpha lagged twice ($Alpha_{i,t-2}$).

Finally, by analysing the results from the regression model with a dynamic panel data sample represented by equation (2), it is possible to understand how property-type diversification and property control affect the Jensen's Alpha and how relevant they are for FII managers to improve this measurement of performance.

The next section contemplates the results obtained by the described methodology.

5 Results

In this section, a summary is presented of the descriptive statistics regarding the data panel set and the results obtained after categorizing the Brazilian REITs according to diversification and control of properties. Thereafter, an analysis of the values that encompass the Jensen's Alpha obtained through the CAPM methodology for the three different benchmarks (the IBOV, IMOB and IFIX indices) is presented. Before discussing the regression model, the Jensen's Alpha is also analysed according to portfolio categorization, and finally, the results of the regression model are displayed to explain the importance of the property-type diversification and level of control within the REIT performance.

As previously mentioned, together, all of the information for the regression analysis composes a data panel sample with 5,858 observations, which is grouped by a total of 110 FIIs (i = 1, 2,…, 110). The Brazilian REITs have information for many time periods, and for each of them, the number of periods under analysis can range from 8 to 140 months. This situation shows that the panel data are unbalanced; however, it does not restrain the regression model. Table 1 on the following page shows a summary of descriptive statistics from the data panel set.

Table 1 - Descriptive Statistics – Period between July 2004 and February 2016

Variable	Mean	Std. Dev.	Minimum	Maximum	Observations
price	484.45	829.23	0.11	11810.00	N= 5858
shares	6.71	20.34	0	323.01	
grossret	869.95	1580.44	0.52	13828.78	
nav	498.11	857.66	0.33	11631.75	
mcap	222.34	661.66	0	29241.45	
age	45.24	34.69	2	170.00	
Panel Variable: FIIs (i= 1, 2,…, 110)					
Time Variable: month (t= 1, 2,…, 140)					
Obs: Unbalanved Data Panel					
Analysed Period: July 2004 to February 2016					

Notes: The data set is panel data in which the panel ID variable (groups) is the FIIs-BR (i = 1, 2,…, 110), and the time variable is the monthly date (t = 1, 2,…, 140). The variable "price" is the closing price of the share; "share" is the total number of outstanding shares (in millions); "grossret" is the total gross return index; "nav" is the fund net asset value (BRL/share); "mcap" is the market capitalization (millions of BRL); and "age" is the age of the FII (in months); For each FII, the variables "price", "shares", "grossret", "nav", "mcap" and "age" have monthly observations.

To complete the summarized information from Table 1, Table 2 shows the correlation matrix between the variables. It is important to note that the correlation value for the control variables age, fund net asset value and market capitalization, as justified in the Methodology section, is low, and the correlation among them does not exceed 0.15, which among them shows that they can be considered independent variables.

Table 2 - Correlation Matrix - Net Asset Value, Market Capitalization and Age

Correlation Matrix	*NAV*	*Mcap*	*Age*
NAV	1.0000		
Mcap	0.1365	1.0000	
Age	0.1472	0.0733	1.0000

Note: Independent variables: net asset value (NAV), market capitalization (MCap) and age.

The regression also has dummy variables representing the property-type diversification and the level of control of Brazilian REITs over their properties. They are the most important variables to be analysed for the purpose of this research, and the values that contemplate them were obtained according to IPO prospects and reports from each FII, as mentioned in the Methodology section. The review of these documents allowed for their classification, and of 110 funds, 43 were diversified, and 38 had 100% control of their buildings, as shown in Table 3. Since approximately 60% (67 trusts) of the analysed FII were not diversified, this first number suggests that, in Brazil, there is a preference to seek specialization strategies. This penchant might occur because a focused strategy allows for fewer costs of monitoring and analysing markets, as well as having managers with better understanding and knowledge of a specific sector. (CHONG et al, 2012).

Regarding the level of control, nearly 35% (38 trusts) of the analysed FIIs own 100% of the properties that compose their portfolios. In addition, 87% (33 trusts) of these FIIs specialize in one type of property. One might conclude that, although 100% control could be desired, it is not the predominant strategy, and if it is adopted, then it probably adheres to a specialization scheme.

Table 3 - FIIs Categorization: Property-type Diversification & Property Control

Ddiv \ Dcontrol	0 (Without full Control)	1 (With full Control)	
0 (Focused)	34	33	67
1 (Diversified)	38	5	43
	72	38	110

Notes: In addition to the data panel set, “Ddiv” is the dummy variable for diversification, which has value of 1 if the FII is diversified and 0 if it is not; “Dcontrol” is the dummy variable for control, which has value of 1 if the FII has full control of properties and 0 if it does not;
Each of the 110 FIIs has one respective value for “Ddiv” and “Dcontrot”; however, these values do not vary with time.

Next, the outcomes provided by the application of the CAPM model benchmarked with each of the three different indices – IBOV, IMOB and IFIX – are discussed, and the results are analysed from the portfolio approach perspective.

5.1 Jensen's Alphas Benchmarked with IBOV, IMOB and IFIX

As previously explained, the Jensen's Alphas were obtained through the application of a CAPM model for a time period of 24 months and by executing a rolling window approach to create a historical sample of Alphas for each FII. Since some FIIs are not sufficiently old to provide a CAPM regression for 24 months, the number of FIIs for the following results decreased from 110 to 99 trusts. Table 4 presents the average monthly Jensen's Alphas obtained for these 99 trusts, according to each index used as a benchmark.

Table 4 - Summary from CAPM Results – Monthly Average Values

	SCENARIO 1 Benchmarked with IBOV		SCENARIO 2 Benchmarked with IMOB		SCENARIO 3 Benchmarked with IFIX	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Ri (per month)	0.42%	6.36%	0.31%	6.22%	-0.30%	6.09%
FII Excess Return (per month)	-0.46%	7.24%	-0.70%	7.04%	-2.04%	6.42%
Market Excess Return (per month)	-1.38%	6.55%	-1.79%	7.53%	-2.04%	3.43%
Beta	0.3789	0.2709	0.2915	0.2691	0.8404	0.5622
Alpha	0.0067	0.0377	0.0069	0.0389	0.0031	0.0456
Age (months)	62.5	31.6	63.4	32.2	63.5	33.7
Time Period	July 2006 to February 2016		February 2010 to February 2016		February 2013 to February 2016	
Total Observations	3783		3545		2632	
Number of FIIs	99		99		99	

Note: Results shows the monthly average values of FII return (Ri), FII excess return and market's excess return. The Alpha variable represents Jensen's Alpha, and its interpretation compared to the benchmark is as follows: i) if Jensen's Alpha is greater zero, then the asset performed better than expected during the regression period; ii) if Jensen's Alpha is equal to zero, then the asset performed as well as expected; and iii) if Jensen's Alpha is less than zero, then the asset performed worse than expected.

The first index, IBOV, represents the broad market on the stock exchange and contemplates a time period analysis between July 2006 and February 2016, while IMOB and IFIX are more specific, where IMOB is an index for the direct Brazilian real estate market, and IFIX is an index representing FIIs. The benchmark considering the IMOB index contemplates a time period analysis between February 2010 and February 2016, and the IFIX index contemplates an analysis between February 2013 and February 2016. The change in the time period analysis for each index was due to the time that they have been available to the market. IMOB was first calculated in 2008, and IFIX obtained its first numbers in 2011. Although the time periods of each scenario slightly changed, some comparisons were possible to perform. As can be observed in Table 4, the average alphas from scenarios 1 and 2 were very close, almost the same, at 0.67% and 0.69% monthly, respectively. However, the average alpha from scenario 3 was smaller and closer to zero than that from the other scenarios because IFIX, as mentioned before, is an index composed of a portfolio of FIIs; for this reason, it is natural that the average alpha from all 99 of the FIIs analysed approximates more closely to zero than the other scenarios. The Security Market Line (SML), which can be originated by adopting the IFIX index to represent market returns, will basically characterize the risk of the Brazilian REIT market. As Berk and Demarzo (2014) explained, the alpha from the CAPM model can be interpreted as a risk-adjusted measurement of the stock historical performance, and it is the distance at which the security is placed, above or below, the SML. In this manner, the average alpha for all 99 of the FIIs benchmarked with an index composed by FIIs, such as IFIX, should not represent high risks, and the distance to the SML should be small. Additionally, according to Berk and Demarzo (2014), the beta of a stock/security is the expected percentage variation in its return given a one percent change in the market's return. Basically, for betas equal to 1, the stock/security behaves similarly to the market; in other words, the security moves 1% for each 1% move in the market. If the beta is less than 1, then it indicates that the security is less volatile than the market, and if the beta is greater than 1, then the security is more volatile. Therefore, scenario 3 indicates that the overall average beta of the FIIs, approximately 0.84, shows that they are less volatile than the IFIX index; however, the value is very close to 1, indicating that they behave in almost the same way as the index. In contrast, for scenarios 1 and 2, the betas are less than 1; in fact, they are less than 0.4, which indicates that the FIIs in general are less volatile than the benchmarks: the IBOV and IMOB indices. In this manner, FIIs tend to be less sensitive to systematic risk.

However, these conclusions are limited to formal CAPM assumptions, which, according to Berk and Demarzo (2014), are that i) investors are fully rational; ii) there is symmetry of information and homogenous expectations; iii) there are no market imperfections; and iv) the sale and purchase of securities at competitive market prices and borrowing and lending at the risk-free interest rate are possible.

Continuing with a closer analysis, if a group division is created to simulate portfolios of FII strategy types in which diversified FIIs are separate from those with specialized strategies and FIIs with full control are separated from those without it, then the results lead to an interpretation of strategy performance. Table 5 summarizes the statistical results for the average Jensen's Alpha according to the portfolio division and each scenario: 1, 2 and 3. Appendix D, E and F contain detailed outcomes from the CAPM model for each scenario.

Table 5 - Jensen's Alpha Mean Value according to Scenario and Portfolio type

	PORTFOLIO 1	PORTFOLIO 2	PORTFOLIO 3	PORTFOLIO 4
Portfolio / Scenario	FII with Diversification Strategy (36 trusts)	FII with Specialization Strategy (63 trusts)	FII with 100% control (61 trusts)	FII without 100% control (38 trusts)
SCENARIO 1 July 2006 to February 2016 Benchmanrked with IBOV index (Over all Brazilian Stock Market)	0.0027	0.0086	0.0068	0.0067
SCENARIO 2 February 2010 to February 2016 Benchmanrked with IMOB index (Direct Real Estate Market)	0.0041	0.0081	0.0062	0.0073
SCENARIO 3 February 2013 to February 2016 Benchmanrked with IFIX index (Indirect Real Estate Market)	-0.0010	0.0050	0.0003	0.0050

Note: The Jensen's Alpha mean values are according to monthly observations. They are the monthly average value for the analyzed time period of each scenario.

Considering the average Jensen's Alphas from Table 4, which summarizes the universe of all 99 FIIs under analysis, and comparing them to the average Alphas sorted by strategy criteria in Table 5, the results show that, for all scenarios, with the IBOV, IMOB and IFIX indices, the portfolio of FIIs with a focused strategy (63 trusts) returns average Jensen's Alphas greater than the average values for all 99 FIIs. This comparison indicates that FIIs that applied

a focused strategy outperformed property-type diversified FIIs during the period of analysis of each scenario.

When the analysis targets the situation of having full control or not of the properties, the results show that, for scenarios 2 and 3, the portfolios of FIIs without total control over the buildings outperform the FIIs with total control in the analysed period. Scenario 1, in contrast, shows the opposite; however, the average Alpha values between portfolio 3 and 4 are very close, although portfolio 3 presents a slightly higher value (0.0068 vs. 0.0067).

These are preliminary results, suggesting that having a focused FII in Brazil could be better than having a diversified FII. It is also a preliminary result showing that 100% control of the properties is not a strategy that overcomes a lack of full control.

However, it is not yet possible to affirm that diversification and full control strategies have negative effects on performance. Next, the outcome from the regression model presents information for a more accurate conclusion.

5.2 Regression Results

The regression methodology had three approaches that were determined according to the origin of the Jensen's Alpha value. As previously described, Jensen's Alpha was calculated according to three different benchmarks: the IBOV index, the IMOB index and the IFIX index. Therefore, the three different benchmarks create three scenarios for the regression methodology, and Table 6 presents the set of results for the regression model proposed in this paper.

Table 6 - Regression Outcomes - 99 FIIs

MODEL: $Alpha_{i,t} = \beta_0 + \beta_1 \ln(Age)_{i,t} + \beta_2 \ln(NAV)_{i,t} + \beta_3 \ln(MCap)_{i,t} + \beta_4 Alpha_{i,t-1} + \delta_1(D_{DIV})_{i,t} + \delta_2(D_{CONTROL})_{i,t} + u_{i,t} + \varepsilon_{i,t}$

VARIABLES	SCENARIO 1 IBOV Index	SCENARIO 2 IMOB Index	SCENARIO 3 IFIX Index
Alpha (t-1)	0.957459*** (143.54)	0.958304*** (93.77)	0.905349*** (57.42)
ln(Nav)	-0.000110** (-2.00)	0.000032 (0.24)	-0.000033 (-0.35)
ln(Mcap)	0.000182* (1.91)	0.000120 (1.25)	0.000298** (2.46)
ln(Age)	-0.000179 (-0.60)	0.000087 (0.16)	0.000040 (0.13)
Ddiv	0.000308 (1.45)	0.000418 (0.98)	0.000036 (0.10)
Dcontrol	0.000471** (2.02)	0.000359 (0.72)	0.000272 (1.24)
Constant	-0.000186 (-0.16)	-0.001796 (-1.12)	-0.001740 (-1.39)
Observations	3,585	3,347	2,434
R-Square	0.953	0.946	0.9392
Number of REITs	99	99	99

z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Regression results of Jensen's Alpha (Alpha) for the measurements of age, fund net asset value (NAV), market capitalization (Mcap), diversification strategy (D_{DIV}) and control level ($D_{CONTROL}$). The variable D_{DIV} has a value of 1 if it is a diversified strategy and a value of 0 if it is a focused strategy. Similarly, $D_{CONTROL}$ has a value of 1 if there is full control of property and 0 if there is not.
The standard errors were estimated according to bootstrap methods.
STATA considers a minimum of 4 observations per group. Two REITs could not fit this criterion and were excluded from the regression. This way the actual total number of REITs under analysis is 97.

The information shown in Table 6 suggests that diversification strategy has positive effects on the Jensen's Alpha value; in other words, it improves performance. The constant δ_1 associated with the diversification strategy in the regression model has a positive value for the three scenarios. Its values are 0.000308, 0.000418 and 0.000036 for the IBOV index, the IMOB index and the IFIX index, respectively.

These results indicate that property-type diversification increases and positively impacts FII performance. Since the regression model uses a dummy variable to represent property-type

diversification, its value is 1 when the case is for diversification, indicating a performance upgrade according to the δ_1 values shown in Table 6. If it was the case for a focused strategy, then the variable "D_{DIV}" would be 0, and there would be no increase in the performance. However, the outcomes show irrelevant statistical results associated with a property-type diversification strategy since the p-values do not achieve more than 90% of statistical reliability for the three case scenarios. This conclusion is consistent with Anderson et al. (2015), who found positive implications of diversification; however, the results from the present analysis are not in accordance with the vantages that Chong et al. (2012) expressed about specialization strategy, which include a better understanding and knowledge of specialist markets and sectors and lower costs of monitoring and analysing more markets. In the Brazilian case, the outcomes from the regression model are not sufficient to ignore that the factors mentioned by Chong et al. (2012) could have a large impact on the performance of FIIs to an extent that specializing in one type of property could positively impact performance.

When analysing the results from the impact of property control on performance, the numbers suggest an expected outcome. The hypothesis that full control over the buildings that integrate the property portfolio of FIIs positively impacts its performance could be verified for Scenario 1, in which constant δ_2, which is associated with the control strategy, has a value of 0.000471 and a statistical relevance of more than 95%. This outcome justifies having the totality of a building, i.e., full control, to increase the FII performance. In the cases of Scenarios 2 and 3, the hypothesis could not be verified due to a lack of statistical importance; nevertheless, it is possible to visualize a positive impact on performance when FIIs have full control over their buildings because the constant δ_2 has positive values of 0.000359 and 0.000272 for the IMOB and IFIX indices, respectively.

The good expectation concerning full control positively impacting an FII performance occurs because problems originating from conflicts between an FII managers and third parties would not exist. However, in the Brazilian case, the statistical results actually show a lack of relevance for the two scenarios, as Table 6 indicates. These conditions could be justified because there are advantages for FII performance when third parties share the property. The relationship interaction could actually motivate competitive behaviour that would cause FII managers to operate more efficiently and with greater professionalism, which could drive the FII towards better results.

Up to this point, the analysed FIIs included the "*FIIs de Papel*", the Brazilian REITs that are not equity trusts but that invest in other FIIs or real estate securities. As described in the Assumptions section, these FIIs were classified as property-type diversified and as not having full control of their properties. They were included during the analysis because they are significant in the market. However, this assumption could have prejudiced the objective of this research, which concerns property-type diversification and property control. As an alternative to this assumption, Table 7 presents the results of the regression model excluding the "*FIIs de Papel*". Previously, 99 trusts were analysed, and now, the number decreased to 80 FIIs.

The results from Table 7 lead to almost the same conclusion as that from Table 6's results. The difference was that, for Scenario 1, the property-type diversification presents a positive impact on performance when excluding "*FIIs de Papel*" from the analysis, surpassing the impacts from a focused strategy and showing statistical relevance. This change is important because it shows that, property-type diversification impacts FII performance more positively than specialization.

Considering the results from Tables 6 and 7, the regression model, however, did not sustain hypotheses 1 and 2 for scenarios 2 and 3 due to the statistical outcomes, but for scenario 1, both hypotheses were sustained when excluding the "*FIIs de Papel*". Although not all scenarios resulted in statistically relevant conclusions, this research still more closely approximated what was expected, which is a positive impact of diversification and full control of properties on an FII performance.

Table 7 - Regression Outcomes excluding "*FIIs de Papel*" - 80 FIIs

MODEL: $Alpha_{i,t} = \beta_0 + \beta_1 \ln(Age)_{i,t} + \beta_2 \ln(NAV)_{i,t} + \beta_3 \ln(MCap)_{i,t} + \beta_4 Alpha_{i,t-1} + \delta_1(D_{DIV})_{i,t} + \delta_2(D_{CONTROL})_{i,t} + u_{i,t} + \varepsilon_{i,t}$

VARIABLES	SCENARIO 1 IBOV Index	SCENARIO 2 IMOB Index	SCENARIO 3 IFIX Index
Alpha (t-1)	0.957125*** (169.6)	0.957557*** (76.80)	0.904849*** (46.77)
ln(Nav)	-0.000134** (-2.36)	0.000006 (0.04)	-0.000093 (-1.13)
ln(Mcap)	0.000218** (2.35)	0.000154 (1.23)	0.000345* (1.94)
ln(Age)	-0.000214 (-0.67)	0.000112 (0.16)	0.000090 (0.25)
Ddiv	0.000471* (1.71)	0.000485 (1.06)	-0.000008 (-0.02)
Dcontrol	0.000451* (1.73)	0.000365 (0.71)	0.000354 (0.97)
Constant	-0.000085 (-0.06)	-0.001929 (-0.97)	-0.001895 (-1.21)
Observations	3,135	2,897	2,044
R-Square	0.9527	0.9457	0.9396
Number of REITs	80	80	80

z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Regression results of the Jensen's Alpha (Alpha) of measurements of age, fund net asset value (NAV), market capitalization (Mcap), diversification strategy (D_{DIV}) and level of control ($D_{CONTROL}$). The variable D_{DIV} has a value of 1 if it is a diversified strategy and a value of 0 if it is a focused strategy. Similarly, $D_{CONTROL}$ has a value of 1 if there is full control of the property and 0 if there is not.
The standard errors were estimated according to bootstrap methods.
STATA considers a minimum of 4 observations per group. One REIT could not fit this criterion and was excluded from the regression. This way the actual total number of REITs under analysis is 79.

Regarding the methodology adopted, an important fact to consider is that the model presents a high R-squared value. For the three scenarios examined and for the conditions in Tables 6 and 7, the R-squared is greater than 0.90, indicating that the dependent variable, Jensen's Alpha, has more than 90% of its value explained by the proposed model, in which the explanatory variables are the lagged Jensen's Alpha ($Alpha_{i,t-1}$), age, the fund net asset value, market capitalization and the dummies for property-type diversification and property control. Lemmon et al. (2008) indicated that corporate capital structures can be unexpectedly persistent and explained how important it is to account for lagged effects in empirical

specifications. For the present study, the lagged effect within the Jensen's Alpha value enlightens its importance, as indicated by its p-values in Tables 6 and 7. Only the lagged Jensen's Alpha ("$Alpha_{i,t-1}$") variable is relevant for the three scenarios analysed.

The market capitalization variable ("Mcap") also shows relevant explanatory conditions but only for scenarios 1 and 3. Regarding the net asset value ("Nav"), its impact on Jensen's Alpha is relevant only according to scenario 1. This valuation might suggest a review of the methodology to render it more accurate to the subject of analysis since the explanatory side of the regression equation seems to be highly concentrated on the lagged Jensen's Alpha ($Alpha_{i,t-1}$).

The overall analysis of the present research explores the FII market in Brazil in greater detail, providing the literature with more information and motivating additional research around this topic.

6 Conclusion

As proposed in the introduction, the present research examined the impact of (1) property-type diversification and (2) property control on an FII performance.

Similarly, in Anderson et al. (2015), the analysis suggested that, in Brazil, the FIIs that adopt diversification strategies should expect a positive impact on their performance. Additionally, the analysis of the level of property control shows relevance when correlated with FII performance, and there has been very little literature focused on this subject. The results obtained through the methodology adopted in this paper demonstrated positive impacts of total property control on FII performance, suggesting that not having to share the property with third parties is more beneficial.

The overall research also suggests that the study of FII property-type diversification and property control deserves a more accurate model/methodology to provide better outcomes. The CAPM model has some limitations and can be improved by the Fama-French factor model. The conditions of information restricted the methodology, and future studies could improve the financial measurements of performance.

Additionally, due to data limitations, many assumptions were considered, and market conditions and future studies should consider these limitations. For example, adding FII management costs as an explanatory variable to performance, which was not possible to include in the present research because of difficulties in accessing it, could improve the analysis. Further studies should also exclude the Brazilian Mortgages REITs ("*FIIs de Papel*" or "*FIIs de FIIs*") from the examined data and focus on only Brazilian Equity REITs, the "*FIIs de Imóvel*" or "*FII de Tijolo*", because the topics of property-type diversification and property control better suit their market context, and in the present research, this segregation was not undertaken at the beginning but was only adapted as a new scenario for the regression model. Further research could also analyse diversification according to the region and could be added to the explanatory variables that affect FII performance.

A major limitation of this paper was the condition of classifying and quantifying the property-type diversification and property control. The analysis relied on dummy variables as measurements of diversification and control, and it is important to more deeply examine the

quantification of these two variables. One recommendation is to apply the Herfindahl-Hirschman Index as an alternative to quantify diversification and property control. This change could enable interpretations of U-shaped relationships between property-type diversification and FII performance, as well as property control and performance.

Another extension of the work could be qualitative studies of Brazilian REITs. Management mechanisms and their impacts can be very sensitive and can differ according to each specific case scenario, and qualitative studies could examine real cases to emphasize the advantages of property-type diversification or property specialization. Each strategy ends up presenting pros and cons, and each FII can present different solutions to manage these factors.

Qualitative studies could also be very important for analysing property control issues as well. This topic could apply to very specific situations if intensively analysed. The interaction between a REIT's corporate structure and a building's condominium can present specific issues and conflicts that a qualitative study could explore better.

Finally, this research approaches the Brazilian REITs market and provides intriguing results, although with some restrictions. Further research could improve the analysis and explore property-type diversification and property control in greater detail. The Brazilian REITs market is relatively young; however, with its development, it is important to understand Brazilian market conditions better and how indirect real estate investments can be improved.

7 References

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8 Appendix A: REIT Market Size by Country

Table 8 - REIT market size by country

Europe	Sector Summary Market Cap (EUR€m)
Belgium	8,054
Bulgaria	400
France	113,125
Germany	38,01
Greece	1,873
Ireland	1,448
Italy	5,52
Netherlands	28,145
Spain	46,336
Turkey	6,697
UK	201,959
Total	**451,567**

Africa	Sector Summary Market Cap (EUR€m)
South Africa	51,404

North America	Sector Summary Market Cap (EUR€m)
Canada	58,825
United States	827,676
Total	**886,501**

Asia	Sector Summary Market Cap (EUR€m)
Australia	100,455
Hong kong	26,064
Japan	277,835
Malaysia	32,308
New Zealand	3,71
Singapore	104,708
South Korea	1,364
Taiwan	2,615
Thailand	8,079
Total	**557,138**

Source: EPRA - Global Real Estate Survey 2015

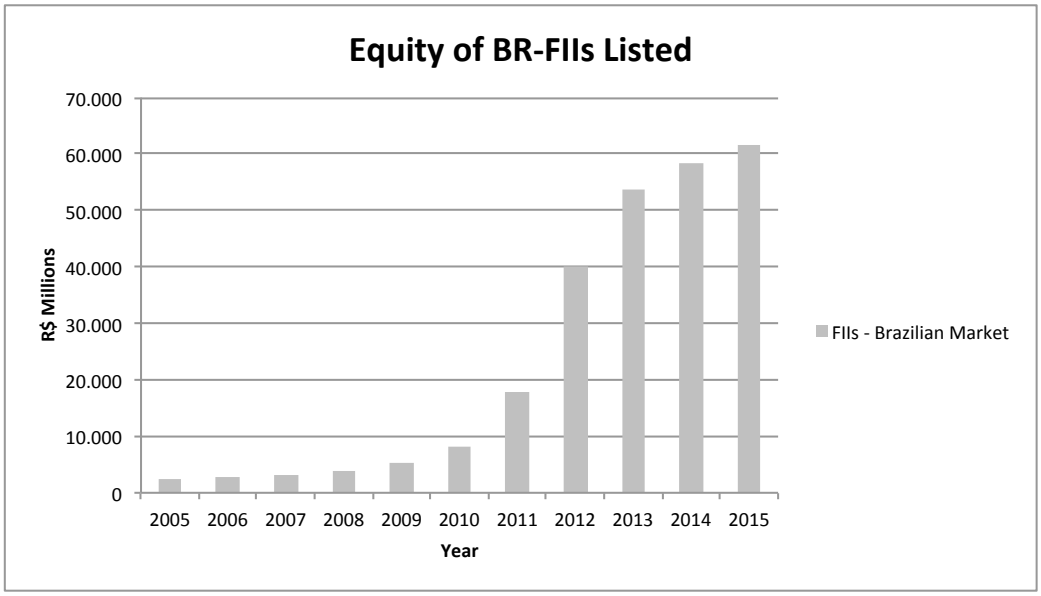
South America	Sector Summary Net Equity (EUR€m)
Brazil	15,582

South America	Sector Summary Net Equity (BRLm)
Brazil	61,703

Source: CVM - Comissão de Valores Mobiliários 2015.

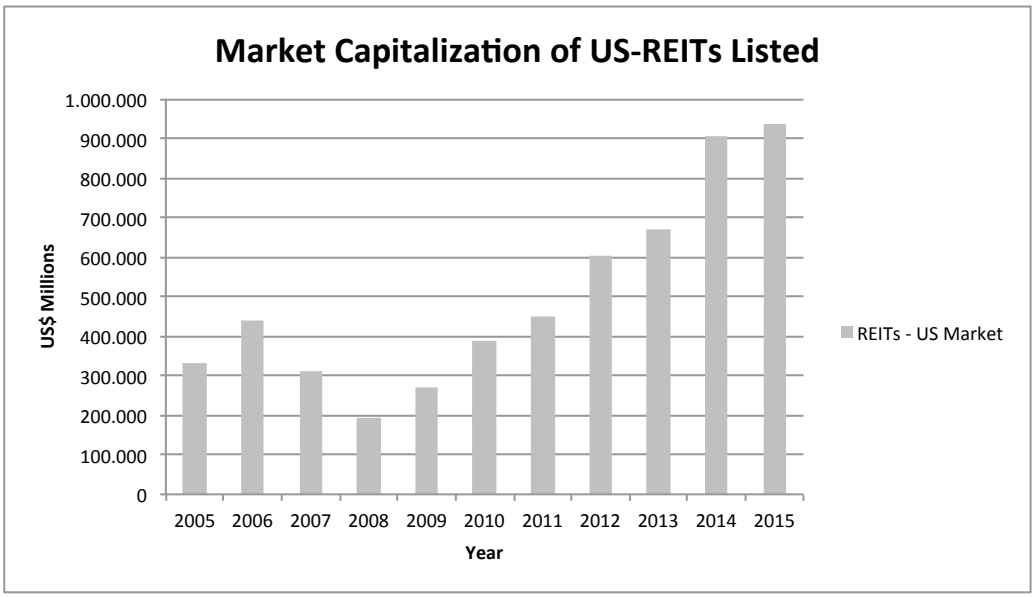
9 Appendix B: Size evolution of BR-FIIs and US-REITs

Figure 6 - Size evolution of FIIs (BRL million): 2005 to 2015



Source: CVM, 2016.

Figure 7 - Size evolution of US REITs (US$ millions): 2005 to 2015



Source: NAREIT, 2016.

10 Appendix C: FIIs and US-REITs characteristics

Table 9 - Main Characteristics of FIIs and US-REITs

General Information		
Country:	Brazil	United Estates
Nomenclature:	Fundo de Investimento Imobiliário	Real Estate Investment Trust
Acronym:	FII-BR	US-REIT
Enacted Year:	1993	1960
Citation (Legislation e Regulations)	Federal Law 8.668/93, amended by Federal Law 9.779/99, and regulated by Rulings (ICVM) 206/94 and 472/08	"Internal Revenue Code"
REIT type:	Fund Type	Corporate Type
Requirements		
Key Requirements	- Must be approved by the Brazilian Securities Commission (CVM) - Managed by a financial institution - Subscriptions for units must be registered with the CVM	Entities must file Form 1120-REIT with the Internal Revenue Service.
Legal Form	Fund (Contractual agreement between investors and fund manager)	Any legal US entity taxable as a domestic corporation.
Minimun Initial/Share Capital	No	No
Unit holder / Shareholder Requirements	- Construction companie, or any of the other parts, may not hold more than 25% interest in an FII - At least 50 investors and none can hold more than 10% of shares from the FII individually	- At least 100 shareholders. - Five or fewer individuals or foundations may not hold more than 50% of the shares. - No restriction on foreign shareholders.
Listing Mandatory	No	No
Restrictions on activities / investments	The minimum real estate investment was previously set at 75% of an FII's total assets, although this requirement has been revoked by ICVM 472/08 effective from December 03, 2008. New regulations set out a list of authorised investments	- At least 75% of its assets must be real estate, government securities or cash - 75% asset test and 75% and 95% income tests. - Cannot own more than 10% of another corporation's stock, other than in another REIT or a taxable REIT subsidiary (ownership of a 100% owned 'qualified REIT' subsidiary is ignored). - No more than 5% of the value of its assets can be represented by securities of any one issuer, other than another REIT or a taxable REIT subsidiary (ownership of a 100% owned 'qualified REIT'subsidiary is ignored). - Cannot own more 25% of its assets in securities of one or more taxable REIT subsidiaries.
Leverage	No leverage restrictions applicable	No legal restrictions
Profit distribution obligations		
Operative income	At least 95% of income arising on a cash basis	At least 90% of its taxable ordinary income.
Capital gains	At least 95% of capital gains arising on a cash basis	Not required to distribute.
Timing	Every six months	Annually.
Sanctions		
Penalties / loss of status rules	Loss of tax exemption	- Various penalties. - Possible loss of REIT status.
Tax treatment at the level of REIT		
Current income	- Income from real estate activities is tax-exempt - Income from other activities is subject to withholding Income tax	Tax-exempt to extent distributed.
Capital gains	Capital gains are treated as income from real estate activities and therefore tax-exempt	Tax-exempt to extent distributed.
Withholding tax	Withholding tax suffered by the FII may be set against tax on distribution to investors	- no refund of foreign withholding tax. - It can use a foreign tax as deduction.
Conversion into REIT status	N/A	- 'Built-in gains' are taxable. - Exemption is possible if assets held for ten years.
Registration duties	Municipal real estate transfer tax (ITBI) applicable.	Transfer tax.
Tax treatment at the unit holder's level		
Domestic unit holder / shareholder		
Corporate unit holder / shareholder	- Withholding income tax at 20% on distributions from the FII or capital gains on the disposals of units in the FII.	Income, capital gains, and return of capital distributions are taxed at a rate of 35%.
Individual unit holder / shareholder	- Withholding income tax at 20% on distributions from the FII or capital gains on the disposals of units in the FII. Income may be exempt from withholding tax if special conditions are met.	- Capital gain dividends are taxed at the maximum 23.8% rate. - Return of capital is tax- deferred.
Withholding tax	- Corporate unit holders may credit for withholding tax applied by the FII on distributions.	N/A
Foreign unit holder / shareholder		
Corporate unit holder / shareholder	- Withholding tax at 20% as a general rule. - Withholding tax at 15% on income, providing some conditions are met. - Capital gains at 0%, providing some conditions are met.	- 30% on income dividends. - 35% on capital gain dividends. - 10% on return of capital.
Individual unit holder / shareholder	- Withholding tax at 20% as a general rule. - Withholding tax at 15% on income, providing some conditions are met. - Capital gains at 0%, providing some conditions are met.	- 30% on income dividends. - 35% on capital gain dividends. - 10% on return of capital.
Withholding tax	Questionable whether tax treaty relief available.	Tax treaty relief available.
Tax treatment of foreign REIT and its domestic unit holders / shareholder		
Foreign REIT	Taxed with 15% withholding tax on income and capital gains.	Generally 30% withholding tax.
Corporate unit holder / shareholder	Income and capital gains arising to a corporate unit holder taxed at 34% (40%-45% if the beneficiary is a financial institution, insurance or related company).	- Dividend distributions are taxed at a rate of 35%. - Return of capital is tax deferred.
Individual unit holder / shareholder	Income and capital gains arising to an individual unit holder taxed at rates from 7.5% to 27.5%.	- Dividends are generally taxed at a maximum 23.8% rate if foreign REIT is not a 'PFIC'. - Return of capital is tax-deferred.

Source: EPRA – Global REIT Survey 2015

11 Appendix D: CAPM outcomes according to Portfolio type – IBOV Index

Table 10 - Portfolio Analysis: July 2006 to February 2016 (IBOV Index)

SCENARIO 1: Benchmanrked with IBOV index (Over all Brazilian Stock Market)				
	FII with Diversification Strategy		FII with Specification Strategy	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Ri (per month)	0.46%	6.65%	0.40%	6.22%
FII Excess Return (per month)	-0.36%	7.49%	-0.50%	7.13%
Market Excess Return (per month)	-1.34%	6.57%	-1.40%	6.54%
Beta	0.3803	0.2483	0.3782	0.2806
Alpha	0.0027	0.0203	0.0086	0.0433
Age (months)	58.6	30.3	64.3	32.0
Total Observations =	1183		2600	
Number of FIIs =	36		63	

	FII with 100% control		FII without 100% control	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Ri (per month)	0.44%	5.87%	0.40%	6.71%
FII Excess Return (per month)	-0.37%	6.96%	-0.52%	7.45%
Market Excess Return (per month)	-1.27%	6.55%	-1.47%	6.55%
Beta	0.3977	0.2427	0.3645	0.2899
Alpha	0.0068	0.0215	0.0067	0.0465
Age (months)	68.4	34.3	58.0	28.5
Total Observations =	1643		2140	
Number of FIIs =	38		61	

Note: Results shows the monthly average values of FII return (Ri), FII excess return and market's excess return. The Alpha variable represents Jensen's Alpha, and its interpretation compared to the benchmark is as follows: i) if Jensen's Alpha is greater zero, then the asset performed better than expected during the regression period; ii) if Jensen's Alpha is equal to zero, then the asset performed as well as expected; and iii) if Jensen's Alpha is less than zero, then the asset performed worse than expected.

12 Appendix E: CAPM outcomes according to Portfolio type – IMOB Index

Table 11 - Portfolio Analysis: February 2010 to February 2016 (IMOB Index)

SCENARIO 2: Benchmanrked with IMOB index (Direct Real Estate Market)				
	FII with Diversification Strategy		FII with Specification Strategy	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Ri (per month)	0.33%	6.54%	0.30%	6.08%
FII Excess Return (per month)	-0.66%	7.30%	-0.71%	6.92%
Market Excess Return (per month)	-1.79%	7.56%	-1.79%	7.52%
Beta	0.2978	0.2347	0.2887	0.2832
Alpha	0.0041	0.0213	0.0081	0.0445
Age (months)	59.9	31.0	65.0	32.6
Total Observations =	1097		2448	
Number of FIIs =	36		63	
	FII with 100% control		FII without 100% control	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Ri (per month)	0.33%	5.94%	0.30%	6.43%
FII Excess Return (per month)	-0.60%	6.95%	-0.77%	7.11%
Market Excess Return (per month)	-1.66%	7.54%	-1.89%	7.53%
Beta	0.3084	0.2590	0.2786	0.2760
Alpha	0.0062	0.0212	0.0073	0.0482
Age (months)	70.1	34.7	58.3	29.2
Total Observations =	1536		2009	
Number of FIIs =	38		61	

Note: Results shows the monthly average values of FII return (Ri), FII excess return and market's excess return. The Alpha variable represents Jensen's Alpha, and its interpretation compared to the benchmark is as follows: i) if Jensen's Alpha is greater zero, then the asset performed better than expected during the regression period; ii) if Jensen's Alpha is equal to zero, then the asset performed as well as expected; and iii) if Jensen's Alpha is less than zero, then the asset performed worse than expected.

13 Appendix F: CAPM outcomes according to Portfolio type – IFIX Index

Table 12 - Portfolio Analysis: February 2013 to February 2016 (IFIX Index)

SCENARIO 3: Benchmanrked with IFIX index (Indirect Real Estate Market)				
	FII with Diversification Strategy		FII with Specification Strategy	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Ri (per month)	-0.26%	6.12%	-0.32%	6.07%
FII Excess Return (per month)	-1.92%	6.48%	-2.10%	6.38%
Market Excess Return (per month)	-1.95%	3.41%	-2.09%	3.45%
Beta	0.8087	0.4325	0.8555	0.6142
Alpha	-0.0010	0.0131	0.0050	0.0547
Age (months)	59.0	32.1	65.7	34.3
Total Observations =	852		1780	
Number of FIIs =	36		63	
	FII with 100% control		FII without 100% control	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Ri (per month)	-0.50%	5.57%	-0.17%	6.42%
FII Excess Return (per month)	-2.29%	5.98%	-1.87%	6.70%
Market Excess Return (per month)	-2.12%	3.48%	-1.98%	3.40%
Beta	0.9310	0.3336	0.7770	0.6705
Alpha	0.0003	0.0129	0.0050	0.0584
Age (months)	71.0	36.9	58.2	30.3
Total Observations =	1083		1549	
Number of FIIs =	38		61	

Note: Results shows the monthly average values of FII return (Ri), FII excess return and market's excess return. The Alpha variable represents Jensen's Alpha, and its interpretation compared to the benchmark is as follows: i) if Jensen's Alpha is greater zero, then the asset performed better than expected during the regression period; ii) if Jensen's Alpha is equal to zero, then the asset performed as well as expected; and iii) if Jensen's Alpha is less than zero, then the asset performed worse than expected.

14 Appendix G: List of 110 FIIs under analysis (Part 1)

Table 13 - List of 110 FIIs that are part of this research (Part 1)

Brazilian REITs			
Name	**BM&FBOVESPA's code**	**Bloomberg's reference**	**Classified as Mortgages REIT (Yes or No)**
FII A Branca	FPAB11	FPAB11 BZ Equity	NO
FII Abc Imob	ABCP11	ABCP11 BZ Equity	NO
FII Absoluto	BPFF11	BPFF11 BZ Equity	YES
FII Aesapar	AEFI11	AEFI11 BZ Equity	NO
FII AG Caixa	AGCX11	AGCX11 BZ Equity	NO
FII Almirant	FAMB11B	FAMB11B BZ Equity	NO
FII Ancar Ic	ANCR11B	ANCR11B BZ Equity	NO
FII Anh Educ	FAED11B	FAED11B BZ Equity	NO
FII Aquilla	AQLL11	AQLL11 BZ Equity	NO
FII B Varejo	BVAR11	BVAR11 BZ Equity	NO
FII Banrisul	BNFS11	BNFS11 BZ Equity	NO
FII BB Corp	BBRC11	BBRC11 BZ Equity	NO
FII BB Prgii	BBPO11	BBPO11 BZ Equity	NO
FII BB Progr	BBFI11B	BBFI11B BZ Equity	NO
FII BB R Pap	RNDP11	RNDP11 BZ Equity	YES
FII Bc Ffii	BCFF11B	BCFF11B BZ Equity	YES
FII Bc Fund	BRCR11	BRCR11 BZ Equity	NO
FII Bcia	BCIA11	BCIA11 BZ Equity	YES
FII Bees Cri	BCRI11	BCRI11 BZ Equity	YES
FII Bm Thera	THRA11	THRA11 BZ Equity	NO
FII Bmbrc Lc	BMLC11B	BMLC11B BZ Equity	NO
FII C Branco	CBOP11	CBOP11 BZ Equity	NO
FII C Jardim	BBVJ11	BBVJ11 BZ Equity	NO
FII C Textil	CTXT11	CTXT11 BZ Equity	NO
FII Campusfl	FCFL11B	FCFL11B BZ Equity	NO
FII Capi Sec	CPTS11B	CPTS11B BZ Equity	YES
FII Cenesp	CNES11B	CNES11B BZ Equity	NO
FII Ceo Ccp	CEOC11B	CEOC11B BZ Equity	NO
FII Crianca	HCRI11B	HCRI11B BZ Equity	NO
FII CSHG Cri	HGCR11	HGCR11 BZ Equity	YES
FII CSHG Log	HGLG11	HGLG11 BZ Equity	NO
FII Cshgjhsf	HGJH11	HGJH11 BZ Equity	NO
FII Cshgshop	HGBS11	HGBS11 BZ Equity	NO
FII Cx Cedae	CXCE11B	CXCE11B BZ Equity	NO
FII Cx Rbrav	CXRI11	CXRI11 BZ Equity	YES
FII Cx Trx	CXTL11	CXTL11 BZ Equity	NO
FII D Pedro	PQDP11	PQDP11 BZ Equity	NO
FII Domo	DOMC11	DOMC11 BZ Equity	NO
FII Dovel	DOVL11B	DOVL11B BZ Equity	NO
FII Eldorado	ELDO11B	ELDO11B BZ Equity	NO
FII Europar	EURO11	EURO11 BZ Equity	NO
FII Excellen	FEXC11	FEXC11 BZ Equity	YES
FII Fator Ve	VRTA11	VRTA11 BZ Equity	YES
FII Fatorfix	FIXX11	FIXX11 BZ Equity	YES
FII Floripa	FLRP11B	FLRP11B BZ Equity	NO
FII Galeria	EDGA11B	EDGA11B BZ Equity	NO
FII Gavea	GVFF11	GVFF11 BZ Equity	NO
FII Gen Shop	FIGS11	FIGS11 BZ Equity	NO
FII Gwi Log	GWIC11	GWIC11 BZ Equity	NO
FII Gwi Ri	GWIR11	GWIR11 BZ Equity	NO
FII HG Real	HGRE11	HGRE11 BZ Equity	NO
FII Higienop	SHPH11	SHPH11 BZ Equity	NO
FII Hotel Mx	HTMX11B	HTMX11B BZ Equity	NO
FII Indl BR	FIIB11	FIIB11 BZ Equity	NO
FII JHSF Fbv	RBBV11	RBBV11 BZ Equity	NO
FII Jpp Capi	JPPC11	JPPC11 BZ Equity	NO
FII Js Real	JSRE11	JSRE11 BZ Equity	YES

Note: The Mortgages REITs in Brazil are known as "*FIIs de Papel*" or "*FIIs de FIIs*". They were classified according to information obtained at BM&FBOVESP website, as it is explained at the Data section of this research.

15 Appendix H: List of 110 FIIs under analysis (Part 2)

Table 14 - List of 110 FIIs that are part of this research (Part 2)

Brazilian REITs			
Name	**BM&FBOVESPA's code**	**Bloomberg's reference**	**Classified as Mortgages REIT (Yes or No)**
FII Kii Real	KNRE11	KNRE11 BZ Equity	NO
FII Kinea	KNRI11	KNRI11 BZ Equity	NO
FII Kinea Ri	KNCR11	KNCR11 BZ Equity	YES
FII Lateres	LATR11B	LATR11B BZ Equity	NO
FII Lci Prem	FLCI11	FLCI11 BZ Equity	YES
FII Lourdes	NSLU11B	NSLU11B BZ Equity	NO
FII Louveira	GRLV11	GRLV11 BZ Equity	NO
FII Max Ret	MAXR11B	MAXR11B BZ Equity	NO
FII Maxi Ren	MXRF11	MXRF11 BZ Equity	YES
FII Memorial	FMOF11	FMOF11 BZ Equity	NO
FII Merc BR	MBRF11	MBRF11 BZ Equity	NO
FII Merito I	MFII11	MFII11 BZ Equity	NO
FII Mtgestao	DRIT11B	DRIT11B BZ Equity	NO
FII Nch Bra	NCHB11B	NCHB11B BZ Equity	YES
FII Olimpia	VLOL11	VLOL11 BZ Equity	NO
FII Opportun	FTCE11B	FTCE11B BZ Equity	NO
FII Ourinves	EDFO11B	EDFO11B BZ Equity	NO
FII P Vargas	PRSV11	PRSV11 BZ Equity	NO
FII Panamby	PABY11	PABY11 BZ Equity	NO
FII Personal	PRSN11B	PRSN11B BZ Equity	YES
FII Polo Cri	PORD11	PORD11 BZ Equity	YES
FII Polo I	PLRI11	PLRI11 BZ Equity	YES
FII Rb Cap I	FIIP11B	FIIP11B BZ Equity	NO
FII Rb Gsb I	RBGS11	RBGS11 BZ Equity	NO
FII Rb II	RBRD11	RBRD11 BZ Equity	NO
FII Rbprime1	RBPR11	RBPR11 BZ Equity	NO
FII Rbprime2 - Senior	RBPD11	RBPD11 BZ Equity	NO
FII Rbresid2	RBDS11	RBDS11 BZ Equity	NO
FII Rd Escri	RDES11	RDES11 BZ Equity	NO
FII Reit Riv	REIT11B	REIT11B BZ Equity	YES
FII Riob Rc	FFCI11	FFCI11 BZ Equity	NO
FII Riobcri2	RBVO11	RBVO11 BZ Equity	YES
FII Riobrcib	RBCB11	RBCB11 BZ Equity	YES
FII Rionegro	RNGO11	RNGO11 BZ Equity	NO
FII S F Lima	FLMA11	FLMA11 BZ Equity	NO
FII Sant Age	SAAG11	SAAG11 BZ Equity	NO
FII Scp	SCPF11	SCPF11 BZ Equity	NO
FII Sdi Log	SDIL11	SDIL11 BZ Equity	NO
FII Shopjsul	JRDM11B	JRDM11B BZ Equity	NO
FII SP Downt	SPTW11	SPTW11 BZ Equity	NO
FII Tboffice	TBOF11	TBOF11 BZ Equity	NO
FII The One	ONEF11	ONEF11 BZ Equity	NO
FII Torre Al	ALMI11B	ALMI11B BZ Equity	NO
FII Torre no	TRNT11B	TRNT11B BZ Equity	NO
FII Trx Log	TRXL11	TRXL11 BZ Equity	NO
FII Trxe Cor	XTED11	XTED11 BZ Equity	NO
FII V Parque	FVPQ11	FVPQ11 BZ Equity	NO
FII Vbi 4440	FVBI11B	FVBI11B BZ Equity	NO
FII Vidanova	FIVN11	FIVN11 BZ Equity	NO
FII W Plaza	WPLZ11B	WPLZ11B BZ Equity	NO
FII Wm Rbcap	WMRB11B	WMRB11B BZ Equity	YES
FII Xp Gaia	XPGA11	XPGA11 BZ Equity	YES
FII Xp Macae	XPCM11	XPCM11 BZ Equity	NO

Note: The Mortgages REITs in Brazil are known as “FIIs de Papel” or “FIIs de FIIs”. They were classified according to information obtained at BM&FBOVESP website, as it is explained at the Data section of this research.

16 Appendix I: Composition of the IMOB Index

Table 15 - Composition of the IMOB index

Companies that composes the IMOB index

Code	Name
MULT3	MULTIPLAN
CYRE3	CYRELA REALT
DIRR3	DIRECIONAL
EVEN3	EVEN
EZTC3	EZTEC
GFSA3	GAFISA
MRVE3	MRV
PDGR3	PDG REALT
RSID3	ROSSI RESID
ALSC3	ALIANSCE
BRML3	BR MALLS PAR
BRPR3	BR PROPERT
IGTA3	IGUATEMI
TCSA3	TECNISA

Source: BM&FBOVESPA, 2016

17 Appendix J: Composition of the IFIX Index

Table 16 - Composition of the IFIX Index

Brazilian REITs that composes the IFIX Index

Code	Name	Code	Name
AEFI11	FII AESAPAR	HGLG11	FII CSHG LOG
AGCX11	FII AG CAIXA	HGRE11	FII HG REAL
ALMI11B	FII TORRE AL	HTMX11B	FII HOTEL MX
BBFI11B	FII BB PROGR	JRDM11B	FII SHOPJSUL
BBPO11	FII BB PRGII	JSRE11	FII JS REAL
BBRC11	FII BB CORP	KNCR11	FII KINEA RI
BBVJ11	FII C JARDIM	KNRI11	FII KINEA
BCFF11B	FII BC FFII	MAXR11B	FII MAX RET
BMLC11B	FII BMBRC LC	MBRF11	FII MERC BR
BPFF11	FII ABSOLUTO	MXRF11	FII MAXI REN
BRCR11	FII BC FUND	NSLU11B	FII LOURDES
CBOP11	FII C BRANCO	ONEF11	FII THE ONE
CEOC11B	FII CEO CCP	PQDP11	FII D PEDRO
CNES11B	FII CENESP	PRSV11	FII P VARGAS
CPTS11B	FII CAPI SEC	RBBV11	FII JHSF FBV
CTXT11	FII C TEXTIL	RBGS11	FII RB GSB I
CXCE11B	FII CX CEDAE	RBRD11	FII RB II
DOMC11	FII DOMO	RBVO11	FII RIOBCRI2
EDGA11B	FII GALERIA	RDES11	FII RD ESCRI
FAED11B	FII ANH EDUC	RNDP11	FII BB R PAP
FAMB11B	FII ALMIRANT	RNGO11	FII RIONEGRO
FCFL11B	FII CAMPUSFL	SAAG11	FII SANT AGE
FEXC11B	FII EXCELLEN	SDIL11	FII SDI LOG
FFCI11	FII RIOB RC	SHPH11	FII HIGIENOP
FIGS11	FII GEN SHOP	SPTW11	FII SP DOWNT
FIIB11	FII INDL BR	TBOF11	FII TBOFFICE
FIIP11B	FII RB CAP I	THRA11B	FII BM THERA
FIXX11	FII FATORFIX	TRNT11B	FII TORRE NO
FLMA11	FII S F LIMA	TRXL11	FII TRX LOG
FPAB11	FII A BRANCA	VLOL11	FII OLIMPIA
FVBI11B	FII VBI 4440	VRTA11	FII FATOR VE
HCRI11B	FII CRIANCA	WPLZ11B	FII W PLAZA
HGBS11	FII CSHGSHOP	XPCM11	FII XP MACAE
HGCR11	FII CSHG CRI	XPGA11	FII XP GAIA
HGJH11	FII CSHGJHSF	XTED11	FII TRXE COR

Source: BM&FBOVESPA, 2016.