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Introduction

Real estate as an asset class depicts a considerable investment vehicle for private and institutional investors. Primarily thanks to their nature as a real asset, investments in properties reveal different features compared to conventional assets like stocks and bonds. In particular, real estate investments are characterized by low correlations with equity markets, stable cash-flows overtime and a distinctive risk/return structure (Schätz, 2011). However, these investments suffer from several disadvantages, such as illiquidity, high tax-burden and asymmetry of information. Unlike stocks or bonds, neither the market volume nor the spectrum of the international real estate market has been developed to a sufficient extent up to now.
In the recent years, however, we have observed an ongoing expansion of securitised real estate. Investors are nowadays faced with a wide range of products related to real estate investments. Besides the conventional investment in direct real estate, investors also have the opportunity to invest in several forms of indirect real estate, such as real estate mutual funds, listed real estate companies and Real Estate Investment Trusts. On a general basis, these instruments have the advantage of giving investors an exposure to the housing market similar to that of direct real estate investments, while limiting the drawbacks stated above. The listing on stock exchanges ensures that prices are calculated in real time and favours transparency, while the division into shares reduces the minimum investment amounts and, by implication, the market entrance barriers for potential investors. As a result, listed real estate provides an easier way for investors – in particular for private investors – to participate in the development of the real estate sector.

The role that securitized real estate could play inside a multi-asset portfolio has been the object of numerous studies since the mid 70 's, when those instruments (in particular the Real Estate Investment Trusts - REITs) began to spread predominantly within the main financial markets, capturing the attention of retail and institutional investors (Author, year). Early studies into the impact of REITs on multi-asset portfolios suggested that there was no significant difference between the performances of a portfolio of stocks without REITs compared to one that included REITs. Kuhle (1987) examined the effect of including indirect real estate into a portfolio of common stocks and concluded that REITs do not add significant increases in Sharpe performance. Hudson-Wilson (2001) showed that REITs underperformed both bonds and stocks on a risk/return basis over the period from 1987 to 2000. Mueller, et al. (1994) showed that REITs were only a valuable addition to the mixed-asset portfolio for the 1976-1980 and 1990-1993 time periods but not for the 1980-1990 sub-period due to the high positive correlation that REITs showed with stocks. However, there are an increasing number of studies that provide significant evidence that the inclusion of REITs in a multi-asset portfolio can both

reduce risk in higher risk/return portfolios and enhance returns in lower risk/return portfolios (Mueller et al (1994), Lee and Stevenson (2007)). Lee and Stevenson (2005) found that REITs consistently provide diversification benefits to the mixed-asset portfolio and that these benefits tend to increase as the investment horizon is extended. In addition, Ibbotson Associates, on behalf of NAREIT (NAREIT, 2002) found that the inclusion of REITs into a well-diversified stock and bond portfolio could have enhanced returns by up to 0.8% annually over the period from 1972 to 2001 and by 1.3% annually for the years 1992-2001.

Nonetheless, none of the previous studies mentioned examined the magnitude and the type of benefits indirect vehicles offer to the mixed-asset portfolio, i.e. whether they are a return enhancer, diversifier, or both. It is in this framework that we want to position our work. To examine this issue we will make use of two methodologies. First, following the approach suggested by Wong, Tong and Keow (2012) and relying on Markowitz (1952) portfolio theory, the study will try to investigate some of the hypothesis previously stated, such as the correlation of indirect real estate vehicles to other asset classes and the effect of indirect real estate on the efficient frontier of an already existing portfolio. Then, ascertained some of the limitations of Markowitz's model, we will examine the type of benefits indirect vehicles offer to the mixed-asset portfolio using the method suggested by Liang and McIntosh (1999), which decomposes the overall risk adjusted benefits of an investment to an existing portfolio into its diversification benefits and return benefits. As we will see, in such a way we will be able to estimate the marginal benefits that are unrelated to the allocation to the additional investment (i.e. the specific weight of the allocation to real estate assets).

The work will be set out as follows. The first section will provide an analysis of indirect real estate investments and of the main instruments available to investors. First, we will concentrate on the instruments under Italian law (closed real estate mutual funds and SIIQs) and then, ascertained their inadequacy for the purposes of our work, we will shift our focus on the European market, studying the instruments under non-Italian law to which we could have access.

In the second part, we will review the portfolio theory of Markowitz (1952) and analyse the reference literature concerning the role of real estate inside a multi-asset portfolio. In particular, we will study the integration characteristics of listed real estate, the properties of real estate risk-return profile and the optimal allocation size to real estate in a long-term and low-risk portfolio.

Finally, in the last chapter we will apply the theoretical notions investigated in the previous sections. Therefore, we will provide a case study in which we develop the approach of Wong, Tong and Keow (2012) and Liang and McIntosh (1999) to study the benefits of indirect real estate to the alternative asset classes and to a benchmark multi asset portfolio. To implement such analysis, we will take into account three asset classes (bond, equity, real estate), each represented by one or more financial series covering the period from September 2003 till January 2016. As we will underline in the following parts, the instrument we will choose as proxy for the indirect real estate investment is the Real Estate Investment Trust, which has the best features (in terms of market capitalization and length of the time series) for the purposes of our study. In addition, rather than simply analysing the benefits of securitized real estate over the entire time period under investigation, we will examine the evolving behaviour of the benefits of real estate to the mixed-asset portfolio by breaking the data down into three sub-periods.

1. Real estate investment

When we talk about real estate investment, we usually refer to the purchase of a property to realize gains through rents income or capital appreciation. For a long time in fact, direct purchase of properties was the conventional way of investing. For several years, however, thanks to globalization and the growing internationalisation and integration of capital markets, with American and British markets as reference points, other types of investment have grown. Such investments aim to solve some of the problems related to direct real estate investments, in particular the high unit value of goods and their limited liquidity.

After having described direct real estate investments and the relevant characteristics of real estate goods and markets, we will analyse the types of indirect real estate investment available to investors, focusing on the instruments under the Italian law and later on instruments under non-Italian law.

The objective of the chapter is to illustrate the economic and technical features that characterize real estate goods and markets, in order to have a guide for the following empirical and thematic analysis. Whatever analysis, could be related to the appraisal of the value of the real estate or to the diversification role of this type of investment in portfolio dynamics requires a good knowledge of the characteristics of real estate goods and of the markets in which those goods are traded. Without this descriptive part would be difficult to understand the benefits of indirect vehicles that will be analysed in the following chapters.

1.1 Direct real estate investments

1.1.1 Real estate: goods and markets

The characteristics of real estate properties derive from the nature of the goods, from investor needs and from the legal system they belong to. Taking as reference works those realized by Hoesli and Morri (2010) and Smith, Rosen and Fallis (1988), we can attach to real estate goods nine essential characteristics; some of them could seem too obvious, but they became very important if we consider the financial characteristics of a real estate investment.

1. *Immobility*

Most of the construction cannot be moved, if we do not incur in high transportation costs. Even if this characteristic could seem so easy, it has a very important consequence: since the assets

is impossible to move, the local economy assumes a fundamental role in relation to the value of the real estate considered. Depending on the economic activity that occurs in a specific property, a relevant change in the local economy would produce a crucial change in the function of the asset. An example could be the reconversion of shipyard into touristic places and villages.

2. *Indestructible ground*

Lands are indestructible but sometimes they could not be used anymore to build properties. Classical examples are the impossibility to build a real estate where a structural failure of the lands happened or where the ground is polluted. However, lands do not vanish in terms of geographic space, but they simply became unsuitable to build properties. Even if lands are strong (indestructible), their values could fluctuate a lot. Just think at the so-called "ghost town", where the offer of lands is huge but the request is scarce, so that the value of the spaces becomes almost paltry.

3. *Heterogeneity*

By definitions, two real estate goods cannot be equal among each other. Let us think for example at two plot of lands; they can be similar in terms of particles of soul, or geographical positions, but most of the time they differ in terms of purpose (residential, commercial, industrial, etc.), dimensions, positioning, accessibility and so on. If we compare real estate goods and movable goods (interpreted as securities, financial assets), we can immediately understand the difficulty in controlling the heterogeneity of real estate. Indeed, a low amount of goods are securitized and traded inside mature, efficient, transparent and well organized markets within which the securitization ensure the fungibility of titles. Understood that problem, we can notice how much attributes and characteristics are necessary to characterize a real estate good; however, most of them are difficult ore estimate or too much related to personal valuations (to give an insight, think for example at the quality of the location or at the maintenance level of a property).

4. *Location*

This characteristic comes from the immobility of the lands and constructions. According to academics (see Dubin and Sung (1990))[1] of real estate investments, it represents a fundamental element in determining the value of a property. The quality of the location is mainly linked to the accessibility to schools, shops, hospital and works for residential real estate (see Gat

[1] They use non-nested tests to determine what features of the neighbourhood contribute most to explain the distribution of housing prices. The results show that demographic and socio-economic characteristics of the population are more relevant to the quality of services.

(1996))[2]; for commercial real estate, crucial is the accessibility for clients, workers and suppliers. Verified that, we can understand how huge can be the impact of a decision taken near a property or a land: a change can originate positive and negative externalities.

5. *Long-term investment*

Real estate investment can be classified long-term investments for three reasons: indestructibility of lands (and long lifetime of buildings), investors' purposes and judicial system. The first reason is clear but the others need to be clarified. Referring to investors' needs and purposes, we can mention for example private citizens that buy houses or firms that buy places to run their own activities. In both cases, these long-term horizon investors buy goods with the perspective of using them. Other investors instead, buy real estate assets only with the goal of investment with a long-term horizon; we can mention for example pension funds or insurance companies that most of the time run a buy & hold investment strategy. Regarding the effect of the judicial system on the long-term feature of these investments, we can cite for example the case of some systems in which stamp duties on capital gain are used, often regressive in relation to the duration time of the ownership. About the Italian situation, the distorting effect is often induced by high costs of trades (in terms of taxes, stamp duties, etc.) or by the presence of a relevant taxation on real estate that does not encourage a purchase with an investment perspective and does not incentivize the turnover of real estate goods.

6. *High unit value*

Most of real estate assets has a substantial unit value, so that an investor needs to have a lot of money to run an investment. The recourse to credit limits the effect of this characteristic, even if most of the time it is necessary a relevant amount of equity. The situation is so different with respect to financial markets, where an investor has the possibility to speculate also with a little amount of money. We will see later other solutions, like the acquisition of shares of real estate companies listed on the financial markets or the purchase of shares of real estate mutual funds. Further solution is timeshare, an ownership model whereby many customers own allotments of usage in the same property. With opportunities to rent out their allotted time each year, and eventually sell their timeshare in the future, many investors look at purchasing their timeshare as an investment, rather than just a holiday property.

[2] He studies the determinants of house prices in Tel Aviv's metropolitan area, showing that the quality of the neighbourhood and the accessibility to the workplace approximately explain 75 percent of the total variability in house prices.

7. *Illiquidity*

The illiquidity or low liquidity of a real estate asset means that it will take a lot of time to sell it at its market value. According to Crosby and McAllister (2004), in the UK the average time between the decision to sell a commercial real estate and the effective sale it is about ten months, while in Italy is about 8 months (on average). However, this time interval varies in relation to real estate market cycle: shorter in positive phases, longer in bad economic trends. Moreover, as the authors observe, there is a trade-of between the time to complete the trade and the amount of the trade: it is possible to quicken the sale of the good if the seller accepts a lower amount. Taking into consideration what we have previously stated about real estate goods, we can understand how the illiquidity derives from their high unit values, from their high transaction costs and from their heterogeneity; these features clearly do not contribute to create fungible real estate goods. An in-depth analysis is necessary to realize the link between the illiquidity and the long-term characteristic of the real estate investments. As we have noticed, investors' purposes and judicial systems let the investors to adopt buy&hold strategies that do not contribute to create and increase market liquidity. Bu we can also assume that is the absence of liquidity that brings the investors to adopt long-term horizons, so that the causal relationship between the two characteristics is not always clear. If the markets were liquid, probably some investors would engage more frequently into arbitrages and they would not maintain the real estate assets on long-term horizons.

8. High level of debt

This characteristic comes from the high unit value of real estate assets and from their feature of being a good collateral. Most of the cases, investors do not have enough liquidity to buy a real estate only with their own capital, so that they decide to finance part of the assets with debt. However, they can decide to use debt also in the case they have enough capital, pursuing a precise financial plan. To give an insight, this could be the case of a private investors that decide to finance part of the acquisition with debt, using the remaining personal capital to invest in financial assets with a return higher than the cost of debt. On the opposite part, the lender could finance a great part of this type of deal, since its exposure is covered by the value of the collateral (in Italy, the maximum amount that the lender could give, the so called Loan To Value, is 80%). If the borrower fails, the sponsor could sell the good (through a specific judicial procedure) and recover all or part of the amount lent.

The level of debt varies inside the European countries. In Italy, the purchase of a house trough debt (bank) has developed only after the entry of the Euro, remaining a lower level than other western developed countries.

9. *Home as a fundamental need*

Concerning this topic, Hoesli and Morri (2010, p. 15) in their work say that "*man needs a house to be part of the social environment*". For this reason, state interventions on housing sector are in large numbers and they try to limit the abuses on weaklings and to give a home to the majority of the population. They could be good interventions, but their cumulated effects are not neutral, and they could interfere among market dynamics. In Italy for example, through the so-called "Piano Casa"[3], new instruments and ways to intervene and stimulate the housing market and the construction industry have been introduced during the 2009 (but their effects are still uncertain). Some examples are the project financing and the development of an integrated system of real estate funds with the financial participation of regions and local bodies.

Besides real estate characteristics', the markets in which these goods are traded possess some features that are important to analyse. Indeed, these six elements we are going to deal with have a relevant impact when examining financial aspects related to real estate investments.

1. *Absence of a centralized market*

Real estate markets, contrary to stock exchanges that are fully centralized and electronic (nowadays only few local trading pits remain), are decentralized. It does not exist a national real estate market; goods are traded on micro markets that are generally defined by the type of good exchanged and by the geographical zone. Therefore, we find for example a commercial real estate market for offices in Milan, or a market for holiday houses in Sardinia. Given this microenvironment, local knowledges are fundamental for decision process. It is difficult to invest in region or goods in which the investor does not know the specific features, so it necessary to incur in additional costs given by the professional advice of a specialist of local market. The advice does not come free, but it allows reducing the problem of asymmetric information, that is the fact that the buyer and the seller do not have the same level and quality of information in order to take the correct decision. This situation is even more problematic in the case of international real estate investment; contrary to an investment in shares, where an Italian buyer can easily access to information and invest for example in Japanese stocks, a direct investment in offices in Tokyo is more difficult to implement.

2. *Low transparency level*

[3] Prime Ministerial Decree of 16 July 2009 ("Piano nazionale di edilizia abitativa"), published on the O.G. the 19th of August 2009, produced as a result of the Decree-Law 112 of June 2008 "Manovra finanziaria 2009".

In real estate markets, it is very difficult to obtain all the information that are necessary to construct an index for the evolution of prices. Trade prices and some information are available (like year of construction, the dimension of the building etc.), but other fundamental information remain difficult to collect without a direct inspection. It is very difficult for example to get knowledge about the state of maintenance, quality of construction and position, but these are fundamental information to ensure that the index for the evolution of prices is correct and not falsified by qualitative differences of the goods exchanged in the market.

3. Markets in disequilibrium

In real estate markets coexist demand and supply for the space market and demand and supply for real estate goods (asset market for investment). The demand for spaces derives from economic growth for commercial areas and offices. For residential real estate, the demand depends from demographic evolution and wages. The offer is essentially rigid, since it cannot react rapidly to change in the demand; the productive cycle takes time, so it is not possible to build new spaces whenever the demand increase, and the markets would be in disequilibrium with an excess request. On the other hand, in the case of a falling demand, spaces would not be destroyed and the market would be again in disequilibrium (with an excess supply). Therefore, real estate markets are often in disequilibrium: the misalignment between demand and supply is a fundamental characteristic of this market. The investment markets depends on the space market: rent is a fundamental element in determining real estate prices, together with present and future interest rate and forecasts of economic growth. Changes in space market are often amplified on asset market. Indeed, an increase in rents depends on a greater demand of spaces by firms and families that, in turn, is related to a better conjuncture, lower interest rate and good economic outlook. In this case, prices could rise a lot, pushing the realization of new constructions. It is also possible that prices in real estate markets change without a variation on space market. To give an insight, we can imagine a change in the profitability of other investment asset classes, especially bonds and shares, that can trigger a change in the appeal of the real estate market (and so a change in prices).

As we have seen, the relationship between space market and asset market is quite complex, and it has captured also the attention of academics. Interesting is the work of Di Pasquale and Wheaton (1996). In their study, Di Pasquale and Wheaton present a simple analytic framework that divides the real estate market into two markets: the market for real estate space and the market for real estate assets. After describing the size and characteristics of flows and stocks in the U.S. real estate market, they demonstrate the important connections between the space and asset markets. They stress how these real estate markets are affected by the nation's macro

economy and financial markets, tracing out the impacts resulting from various exogenous shocks on rents, asset prices, construction and the stock of real estate.

4. *Strong government presence*

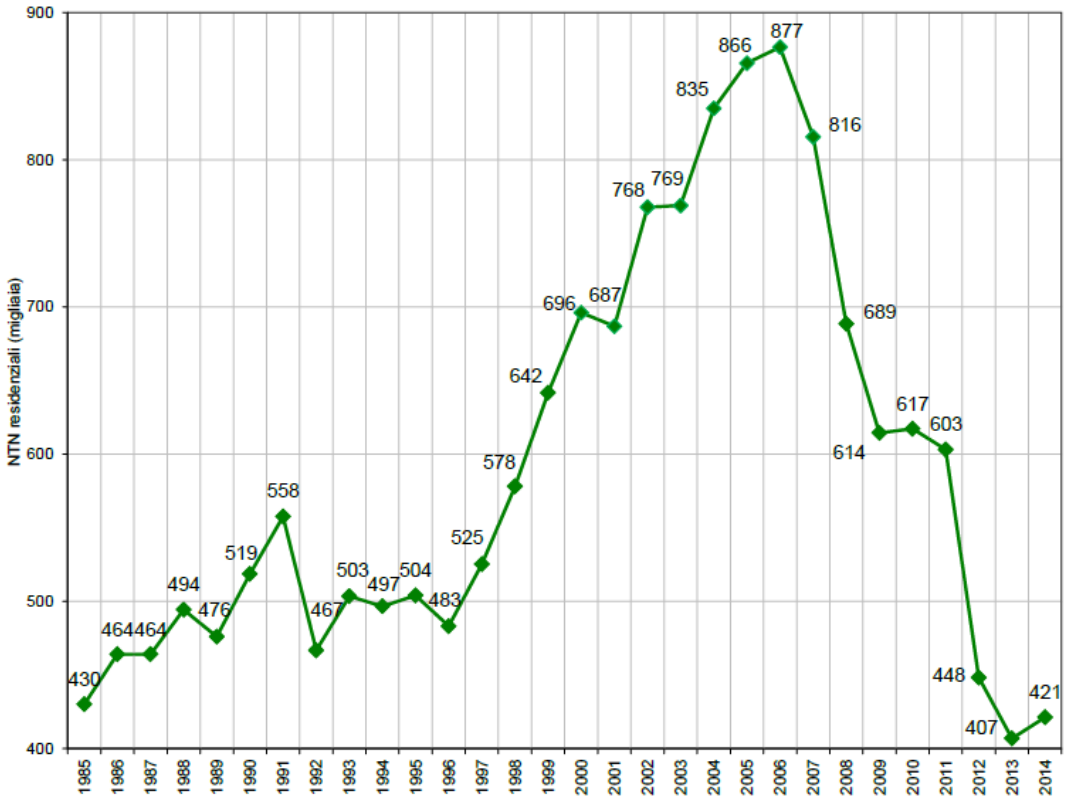
Government presence in real estate market is huge. Beyond its role as regulator (rule on rents level, on use of spaces, etc.) and as a very important real estate owner (buildings, infrastructures, residential and instrumental real estate), the state has a crucial role on taxation of this market. In Italy, like in other European countries, the taxation on real estate is composed by taxes on income, on properties, on deeds of transfer and on rent contracts. This system of taxation differs among the subjects involved (firms, families, self-employed) and among the type of goods (home or industrial building).

5. *Limited number of transactions*

Investors' needs, together with the high unit value and the significant transaction costs determine a low number of transactions inside this market. It is difficult to correctly estimate the number of transactions, even if there exist a quite sufficient number of information, especially for the residential real estate market. Indeed, this market is characterized by a great supply and a lower unit value with respect to the commercial ones, so that the number of trades is higher. The Italian market follows this trend. In Italy from 2000, the "Osservatorio Mercato Immobiliare" (OMI) of the Revenue Agency gives statistics about stock, volume and trade prices of the different type of real estate on a national basis. The OMI uses an indicator called Number of Transactions Normalized (NTN) that gives the number of transactions weighted by the effective portion of property that is the object of the trade. To give some figures, this indicator of the volume of trade was 845.051 in 2006, at the end of an extraordinary positive cycle of the sector. From 2007, the situation has changed a lot and in 2014, the NTN was about 421.336 (for the residential real estate, see Figures 1 and 2). Looking at Figure 2, we can understand how negative has been the situation for this economic sector: from 2007 till 2013 there was a continuous and sometimes severe reduction of transaction and real estate prices, with peak above 25 % for transactions and 6% for the quotes.

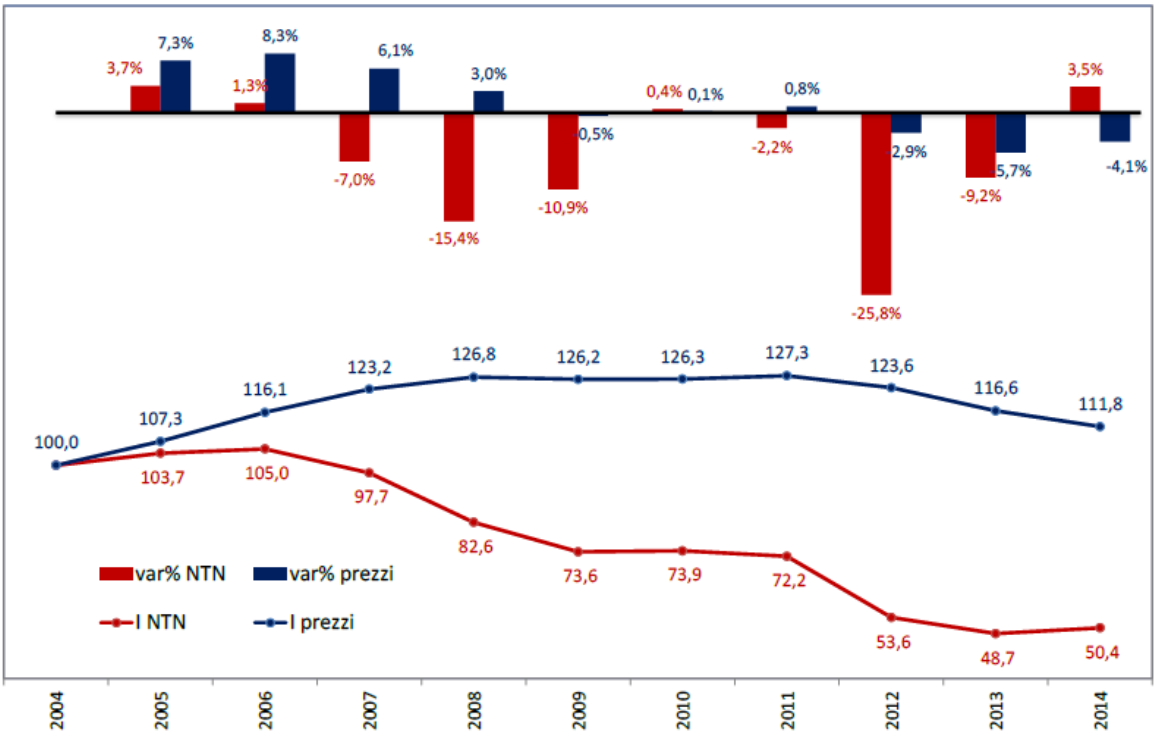
Compared to the residential market, the commercial (asset) market has a little value. In 2014, the volume of trades for the commercial sector was 25.753 NTN, only the 6,1% of the volume realized in the residential sector. Looking at Figure 3, we can see how the dynamic of the index is similar to the residential one, with a decline started in 2006 and a weak recovery started in the second half of 2013.

Figure 1 - NTN evolution (thousands) for the residential market (1985-2014)



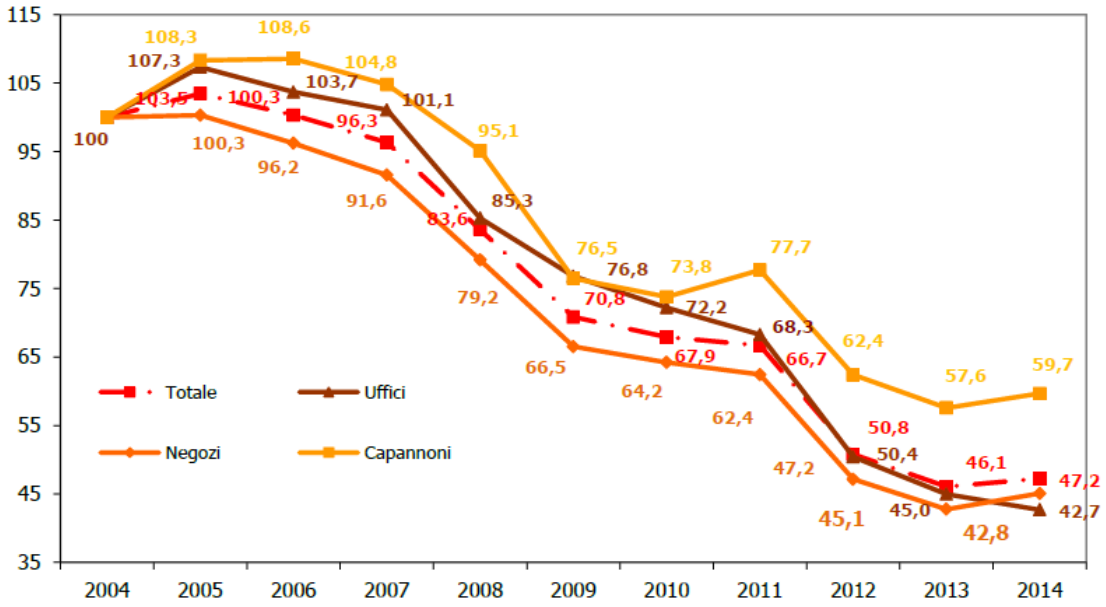
Source: Osservatorio Mercato Immobiliare of the Revenue Agency.

Figure 2 - Prince index and trade index (NTN) evolution (2004-2014)



Source: Osservatorio Mercato Immobiliare of the Revenue Agency.

Figure 3 - NTN evolution for commercial real estate (2004-2014)



Source: Osservatorio Mercato Immobiliare of the Revenue Agency.

1.1.2 Direct investments characteristics

After having analysed the relevant characteristics of real estate goods and markets, we can study which are the characteristics of a direct real estate investment. Clearly, an in-depth analysis of a direct investment it is not the goal of this work and it would require a different and complete analysis. Our purpose is to provide some features that will be useful for later comparison with indirect investments, and to stress the potential advantages that the indirect vehicles could offer to investors.

Direct real estate investments represents the traditional way of investing in real estate market. The ownership of real estate goods entails various benefits, for example to provide a good diversification of a portfolio containing only financial assets (see for example Lee (2003)), to allow the investor to directly control the strategy and the management of the portfolio of goods, to obtain stable cash flows and to beat the inflation in the long-term (see Ibbotson and Siegel (1983) and Bond and Seiler (1998)). Taking into consideration institutional investors, this type of investment usually allows them not pay taxes on profits generated. However, as we have previously stated analysing the characteristics of real estate goods and markets, direct investments involve numerous drawbacks. To recall some of them, we can mention the high unit value that, together with the heterogeneity of properties, makes the real estate portfolios often maintain a considerable share of diversifiable risk. In addition, direct investments are

characterized by a low liquidity and the sale of a property requires on average several months. Moreover, there are quite large problem of asymmetry of information. To give an example, we can imagine an investor that wants to diversify geographically his portfolio, so he decides to buy an apartment in New York City. In the case of international investments, usually the buyer has a smaller amount of information, both in terms of the property (the object of the investment), both regarding the likely evolution of the real estate market. Finally, both for local and for international investments, the huge management effort required for the entire life cycle of the investment should not be underestimated. It concerns mainly the technical aspects of buildings, ordinary and extraordinary maintenance costs (damages, services, Capex etc.) and portfolio strategy to implement. If we want to examine in depth the theme of risk (studied for example by Brown and Matysiak (2000))[4], we can distinguish seven categories of risk to which direct real estate investments are subject:

- *Market risk*:;
- *Environmental risks;*
- *Construction risk;*
- *Legislative risk;*
- *Liquidity risk;*
- *Management risk;*
- *Financial risk;*

These risks, typical of a specific good or of the market in which the properties are located, can be partially or even completely diversified by an appropriate geographical and asset-type diversification.

To conclude, let us summarize which are the main benefits and the disadvantages of a direct real estate investment (Figure 4).

[4] In their analysis, they estimate that approximately 30% of the risk of a real estate investment can be eliminated with a portfolio of five properties and the marginal reduction of risk is null over 30 assets: the risk that remain is around 60% of the original non-diversified portfolio. Therefore, we can understand how much resources are necessary to construct a well-diversified portfolio of real properties.

Figure 4 – Benefits and disadvantages of direct real estate investments

Benefits of direct real estate investment	Disadvantages of direct real estate investment
Stable cash-flows overtime	Low liquidity
Low correlation with stocks and bonds	High tax burden
Ability to beat inflation in the long-term	Low transparency and problem of asymmetry of information
Possibility to implement a geographical and asset-type diversification	Huge amount of money necessary to implement a well-diversified portfolio
Possibility to directly control the investment	High management costs and substantial effort needed to manage the investment

Source: Personal elaboration.

1.2. Indirect real estate investments

Now, let us examine what are the vehicles in the market for an indirect real estate investment. After having described on a general basis which are the main advantages of these type of vehicles, we will focus on the instruments that made up the Italian real estate market financialized, and then we will move to the non-Italian law instruments, with a focus on the European market.

The instruments we are going to analyse provide for an investment through vehicles or funds holding real estate portfolios or considering to make real estate investments. In this case, we talk of indirect investment because investors, rather than buying direct properties, acquire shares of a fund (or shares of real estate companies) that holds real estate. On a general basis, the indirect investment has the advantage of giving investors an exposure to the housing market similar to that of direct real estate investments, while limiting information asymmetries (aligning the interests of management with those of investors). In addition, since the investor holds a share of a well-diversified portfolio, the indirect investment enables to reduce the exposure to the diversifiable risk. There is also the advantage of benefiting from the effect of leverage even for investors who do not necessarily have the ability to obtain funds directly from banks or other financial institutions. However, these vehicles are not without flaws. Among the more relevant, we can mention the higher correlation with stocks and bonds (due to the listing),

the lower ability to beat inflation in the long-term and the liquidity that often depends on the presence of a buyer and on the bid-ask spread that in some cases may also reduce the opportunity to invest.

Legal structures of vehicles used are different in each judicial system but can be traced to two main structures: real estate mutual funds and shares of real estate companies. We can summarize in Figure 5 which are the relevant benefits and disadvantages of these type of indirect real estate investments.

Figure 5 - Benefits and disadvantages of indirect real estate investments

Benefits of indirect real estate investment	Disadvantages of indirect real estate investment
Exposure to the housing market similar to that of direct real estate investments	Higher correlations with stocks and bonds
Low asymmetry of information and the advantages of professional management	Lower ability to beat inflation in the long-term
Higher liquidity with respect to a direct investment	The liquidity depends on the presence of a buyer (closed-ended funds)
More bargaining power than a direct purchase of properties	The liquidity in the financial markets is less than expected (low number of transactions and low turnover)
Reduced exposure to the diversifiable risk	The bid-ask spread in some cases can greatly reduce the opportunity to invest
Low amount of money needed to invest	Little market compared to the direct one
Opportunity to benefit from the leverage effect	The potential risks of debt and leverage
Lower tax burden with respect to a direct investment	
Lower management costs compared to a direct investment thanks to economies of scale	

Source: Personal elaboration

As we can see from Figure 6, the global listed real estate markets have experience a very rapid growth in recent years, both in terms of operating companies that increased from 535 to 979 units (83% increase), both in terms of equity value that grew from 776 billion of dollars to 2,599 billion of dollars (235% increase).

Figure 6 - Growth of the Global Listed Real Estate Markets

Source: CBRE Clarion Securities – Personal elaboration

1.2.1 Instruments under Italian Law

At this point, we will study which are the instruments that made up the Italian market for indirect real estate investment. First, we will concentrate on closed real estate mutual funds that represents the most used instruments inside the Italian market, then we will analyse the other instrument used by market participant, the SIIQs, which were recently introduced by the Italian legislator.

1.2.1.1 Real estate mutual funds

1.2.1.1.1 Main features

The Consolidated Law on financial intermediation (TUF)[5] defines the mutual fund as an "independent pool of assets, collected through one or more emission of units, pertaining to a plurality of participants and managed on a collective basis in the interest of the participants". Every mutual fund or branch of mutual fund constitutes an "independent and autonomous capital, distinct from the holdings of the asset management company and of any participant". The fund reply to the obligation undertaken only with its own assets[6].

Then, the mutual fund is an autonomous capital without legal personality that is characterized by the division in shares of equal unit value, the subscription by plurality of subjects and the

[5] See sec.1, para. 1, lettera j), of Legislative Decree No 58 of 24 February of 1998 (Consolidated Law on financial intermediation - TUF), as modified by sec. 32 of Legislative Decree No 78 of 31 May 2010, then passed into law with the Law No 122 of 30 July 2010.

[6] See sec. 36, para. 6, of Legislative Decree No 58 of 24 February of 1998 (Consolidated Law on financial intermediation - TUF), as modified by sec. 32 of Legislative Decree No 78 of 31 May 2010, then passed into law with the Law No 122 of 30 July 2010

presence of a financial intermediary (the Asset Management Company - AMC) that manages the asset independently and in the interest of the subscribers complying with a specific investment policy. Mutual funds are Undertakings for Collective Investment in Transferable Securities (UCITS[7]) through which the collective fund management is realized.

Real estate mutual funds are mutual funds mostly or exclusively specialized on real estate investment. Real estate funds invest assets not less than two-thirds in real estate, real estate rights, shareholdings in real estate companies[8] and shares of other (also foreign) real estate mutual funds, so that also funds of funds are permitted. Real estate mutual funds cannot carry out direct construction activity, so this job is given to third party through a specific contract. In addition, the assets of the fund can not be invested, directly or through controlled companies[9]:

- to an extent greater than a third into a single property having unitary urbanistic and functional characteristics:
- to an extent greater than 10% of the fund's assets in real estate companies carrying out construction activities.

The capital of the fund has to be invested in real estate assets for a percentage between 66,67 % (predominant investment) and 100% (exclusive investment). The two thirds measure is reduced to 50 % if at least the 20% of the total value of the fund is invested in financial instruments representing securitization of real estate assets, rights or credit granted by real estate mortgage. These investment limits has to be reached by following 24 months to the operational beginning (48 months for funds that deal with social housing).

In order to improve the flexibility and liquidity of the fund, it is possible to invest the exceeding part of the capital in listed and not listed financial instruments, bank deposits, credits, credit instruments and other asset with a market and a certain definable value (periodicity at least biannual). They represents residual investments and in practice, they consist of securities and liquidity[10]. It follows that the assets of the fund are characterized by a low liquidity and a long-term investment horizon.

[7] The acronym Ucits (Undertakings for Collective Investment in Transferable Securities) refers to the Directive 2009/65/CE of the European Parliament, published on January 13, 2009, (c.p. Ucits IV). That directive, which has brought new changes to previous directives of the European Parliament, known as Ucits III and published on January 21, 2002 (2001/107/CE, c.p. Manager Directive and 2001/108/CE, c.p. Product Directive.) and which in turn had constituted a major update of Directive 85/611/CEE (c.p. Ucits I), identifies collective investment undertakings , mutual funds and Sicav, which invest primarily in securities according with the provisions of the institutional framework.

[8] Section 12-bis, para. 2 of Ministerial Decree No 228 of 24 May 1999, thus included by Ministerial Decree No 47 of 31 January 2003.

[9] Title V, ch. III, section IV, art. 3.2 of the Provision of the Bank of Italy of 14 April 2005.

[10] According to the Report on the Italian real estate mutual fund made by Assogestioni, on December 2014 the assets of the funds were distributed as follows: 88% real estate and real estate rights, 6% securities (financial instruments), 4% liquidity and 2% other activities.

Among the peculiarity of the real estate mutual funds there is the possibility to carry out operations in potential conflict of interest, which in turn is prohibited to classic mutual funds; for this reason, this important theme will be deepened in chapter 1.2.1.1.4. In addition, the possibility to use debt corroborate the unique nature of real estate mutual funds among the class of closed funds and asset management in general. Debt entails cost and benefits that have to be properly identified, measured and managed (see chapter 1.2.1.1.7).

The holding period of these funds must be consistent with the nature of the investments and it cannot be in any case greater than the AMC's life that established it. The law states that the minimum maturity of the fund is 10 years and the maximum is 50 years. When maturity is attained, assets are distributed as provided in the prospectus. In some instances, Fund Rules[11] could also consider an extension of the life (not greater than three years) to conclude the divestment of the assets; it is sufficient that the AMC updates the Bank of Italy and the Consob with the justification for the extension, so that it is not necessary the prior authorization of the supervisory authorities. Recently a new law[12] has introduced a special further extension for Italian retail funds; this delay, with a maximum length of two years, reacted to a situation that emerged during the 2014, as requested by professionals of real estate industry. According to that measure, the AMC could change fund rules and memorandum to set the possibility of an increase of fund's life, with the only task of correctly divest all the assets. The extension had to be approved by a shareholders meeting with the approving vote of the absolute majority of the participants. During the deferment, the management activity was aimed only to the conclusion of the divestment activity. The management fee was reduced to one third of the previous one (initially stated in the fund rules) and the performance fee was removed during that period.

The Asset Management Company receives some commissions from the fund:

- *fixed management fee*: it represents the remuneration of the AMC for the management activity and it is computed on the Net Asset Value (NAV) or on the Gross Asset Value (GAV) of the fund;
- *over performance fee*: it is an incentive fee that the AMC receives if the performance of the fund overtake the benchmark performance stated in the fund rules.

[11] Fund Regulation, drafted by the AMC and submitted for approval by the Bank of Italy, is the document that explain the mandate of the underwriters in respect of the AMC and defines key aspects of operation and management (identification sheet, product features and operating conditions). For its editing, the AMC must be guided by the principles laid down in general terms by the legislature at title V, chapter I, sec. II of the Provision of the Bank of Italy of 14 April 2005.

[12] See sec. 22, para. from 5-bis to 5 nonies of the 2014 Competitiveness Act) passed with Law 116/2014.

In order to evaluate the assets of the fund, the AMC makes use of independent specialists appointed by the Board of Directors that carry out the appraisal of direct and indirect real estate investment. These evaluations are used in the mandatory financial reports, the half-yearly financial report and the annual report and every time a fairness opinion is necessary when the AMC decides to sell an asset.

The independent experts are natural person or legal entities that must ensure objectivity and independence in the evaluation, even if the responsibility remains with the AMC. The Bank of Italy[13] regulates the procedure and the standards adopted in the evaluation of the real estate.

Fund rules control the investment relationship to the fund and they must be approved by the Bank of Italy[14]. Recently, reserved and speculative real estate funds have lost the obligation of the approval of the Fund Rules by the BoI[15].

The authorities that control real estate funds are the Bank of Italy (BoI) and the Consob (the Italian Commission for corporations and stock exchanges). The BoI is in charge for containment of risk taking, the stability of property and the sound and correct management of intermediaries. The Consob is competent with regard to the transparency and fairness of behaviours[16].

The custody of financial instruments and liquidity of a mutual fund it is entrusted (delegated) to the custodian bank that also conducts control activities[17]. In the matter in question, it ascertains the legitimacy of issuing and reimbursement of shares, the accuracy of the evaluation of shares' values and it also verifies the compliance of the operations realized to fund rules and regulations.

The endowment of the fund is collected through one or more emission of shares (with an equal unit value) according to the procedures established in the fund rules. In the case of a public offer, shares must be signed within 24 months from the publication of the prospectus, otherwise within 24 months from the approval date of the fund rules by the Bank of Italy. As usual, the deposits related to signed shares must be carried out by the deadline fixed in the fund rules. In

[13] On the suitability of the appraisal process of real estate goods, see the Provision of the Bank of Italy of the 14 of April 2005, the joint Communication of the Bank of Italy and of the Consob of 29 July 2010, the joint Regulation of Bank of Italy and Consob of 29 October 2007 and the Assogestioni Guidelines published on 27 of May 2010.

[14] To analyze general drafting criteria and contents of the Fund Rules (for retail, reserved and speculative funds), see the Provision of the Bank of Italy of the 14 of April 2005 ("Regolamento sulla gestione collettiva del risparmio della Banca d'Italia").

[15] See sec.32 of Legislative Decree No 78 of 31 May 2010 (passed with Law No 122 of 30 july 2010) and sec.8, para. 9 of Legislative Decree No 70 of May 2011 ("Decreto Sviluppo" passed with Law No 106 of 12 July 2011). On that issue, see also the Provision of the Bank of Italy of 3 February 2011, contained inside the Supervisory Newsletter No 2 of February 2011.

[16] See sec.5 of legislative decree No 58 of 24 february of 1998 (Consolidated Law on Financial Instruments - TUF).

[17] See sec. 35 and sec. 38 of legislative decree No 58 of 24 february of 1998 (Consolidated Law on Financial Instruments - TUF).

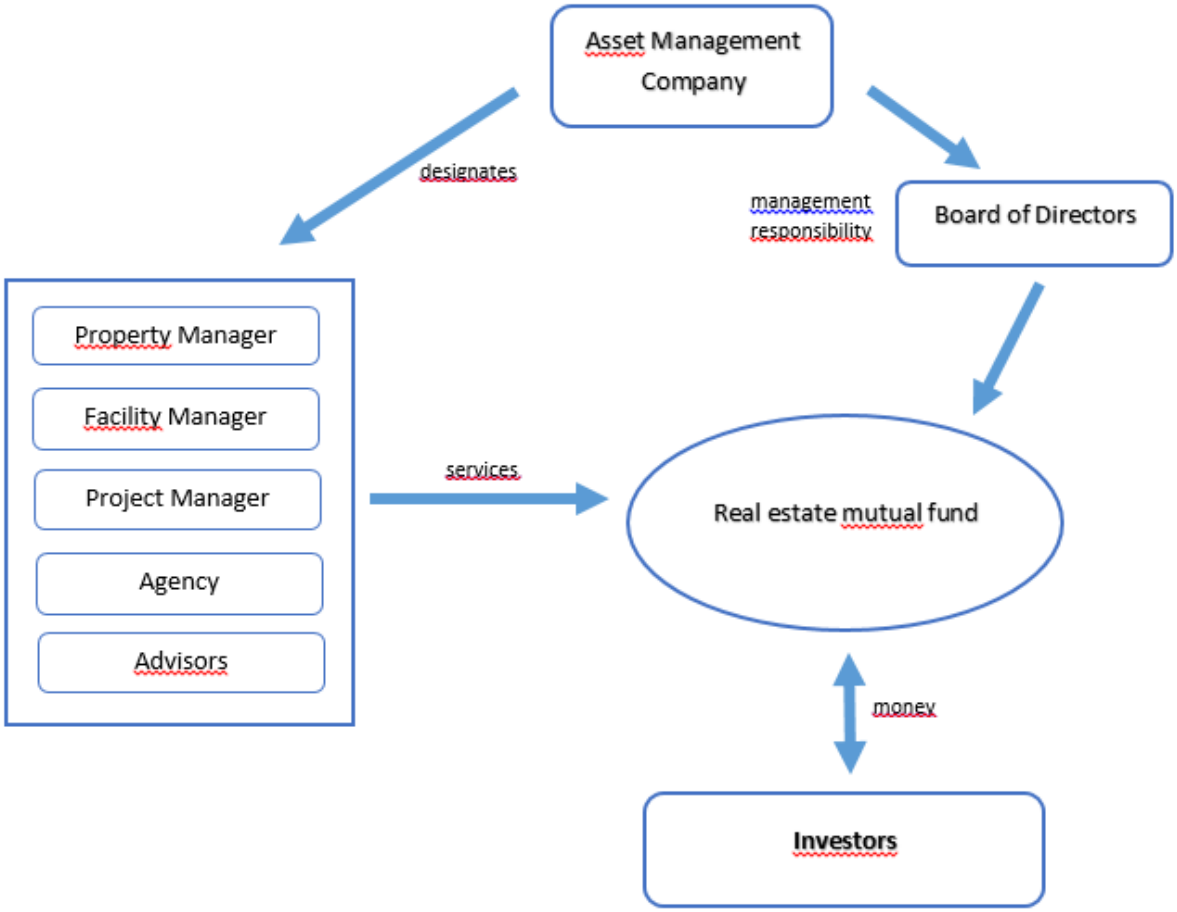
the fund reserved to qualified investors instead, the deposits can be done in one or more solutions according to the investment opportunity founded by the AMC (*drawdown* procedure).

With reference to governance of funds (see Figure 7 for subjects involved in management of the fund), competent authorities settle rules of conduct that aim to limit AMCs' activities, in order to protect profits of subscribers and transparency of operations. Subscribers' meeting may approve on a change of the investment policies, on application for admission to listing of the shares on a regulated market and on the replacement of the Asset Management Company. Shareholders' meeting of reserved funds may also decide on additional matters stated in the fund rules but it cannot approve on the investment choices of the fund. Subscribers' meeting decide by absolute majority and with the favourable vote of the subscribers that represents at least the 30% of the outstanding shares.

Fund rules often provide for the establishment of subscribers' committees (or advisory committees), which may include both funds' participants and third parties with proved experience in real estate business, financial sector, tax area, economic and judicial sector. According to the consultation Document of the Bank of Italy of 16 May 2010 ("Modifiche al regolamento sulla gestione collettiva del risparmio in materia di approvazione dei regolamenti dei fondi e dei comitati dei partecipanti"), the regulatory framework admits wide independence to AMCs in defining the role of the subscribers' committees in the case of reserved and speculative funds. However, such committees should not affect the management autonomy of the AMC; the AMC should take into consideration committee's deliberations but it responsible for the autonomy exercised in the investment-management process. Especially, the BoI has proposed the acknowledgment only of the following powers to subscribers' committees:

- *information power* regarding the evolution of the fund and of the investment made;
- *advisory powers* (to express with non-binding and non-mandatory advices) on specific choices of the AMC different from those related to single investment operation (such as fund duration, early liquidation of the fund, fund rules changes, substitution of the AMC, business plans, etc.);
- power to express *binding advices* only on operations involving conflicts of interest.

Figure 7 - Subjects involved in the management of the fund



Source: Hoesli and Morri (2010), personal elaboration

1.2.1.1.2 Legal framework

In Italy, real estate funds have a very recent history. They have been introduced with the Law number 86 of 25 January 1994 and they have assumed during the following years a growing dimension in terms of numbers and Asset Under Management (AUM). However, the current reference source of law on the general framework of the funds is represented by articles 34-42 of the Legislative Decree number 58 of 4 February 1998 ("Consolidated law on financial intermediation" - TUF). The TUF connected within a single discipline the provisions that previously regulated separately open-ended mutual funds[18], closed mutual funds[19] and real estate mutual funds[20]. The reference regulatory framework has evolved during the years, thanks also to the contamination with other systems and more developed financial centre, and the types

[18] Law No 77 of 23 March 1983.
[19] Law No 344 of 14 August 1993.
[20] Legislative Decree No 406 of 26 September 1995, passed into Law No 503 of 29 November 1995.

of real estate mutual funds has expanded in terms of investments undertaken, type of subscribers and financial leverage used to achieve different levels of risk and reward.

The actual regulation is substantially different from the original one, both in terms of contents and form. Among the most relevant regulatory news we can find:

- the establishment of real estate funds with public[21] and mixed[22] contributions, which laid the legal basis of the first comprehensive project of valuation and dissolution of public real estate assets;
- changes to existing regulations of real estate funds, mainly regarding the presence of the assembly of the subscribers[23] and the management of possible situation of conflict of interest[24];
- the introduction of semi-closed funds with reopening of subscriptions[25];
- the extension to private investors of the possibility to establish contribution funds[26];
- greater possibility to use debt[27];
- numerous changes to the tax regime.

Recently, the Ministerial Decree n. 30 of March 5, 2015 adopted by the Ministry of Economy and Finance (MEF) has introduced several innovations regarding management of the funds and the role of independent experts, in order to improve the efficiency and the transparency of the instrument.

The regulation of AMC that manages the fund is entrusted mainly to secondary legislation (Ministerial Decree, Provision of the Bank of Italy and Rules of the Consob), which defines the activities of the AMC, the limits of intervention, as well as the obligations to investors and supervisory authorities[28].

On the legitimacy of operations in conflict of interest, however, the legislator has delegated to the Ministry of Economy and Finance the identification of precautions to be observed concerning the assessment of the goods object of the supply in conflict of interest. According to the sec. 17 of Ministerial Decree number 228 of 24 May 2009, "The goods in conflict of interest acquired or sold by the fund should be the subject of an appraisal report made by experts

[21] Legislative Decree No 406 of 26 September 1995, passed into Law No 503 of 29 November 1995.
[22] Law No 410 of 23 November 2001.
[23] Sec. 41-bis, para, 7 of Law No 326 of 24 November 2003 and sec. 3, para. 124 of Law No 350 of 24 December 2003.
[24] Law No 410 of 23 November 2001 and Law No 326 of 24 November 2003.
[25] Law No 410 of 23 November 2001.
[26] Law No 410 of 23 November 2001.
[27] Law No 410 of 23 November 2001 and Law No 326 of 24 November 2003.
[28] See the Regulation on the collective management of savings issued by the Bank of Italy the 14 of April 2005.

having the requirements provided by law." Further notions on the management of the conflict of interest will be given in chapter 1.2.1.1.4.

1.2.1.1.3 Types and characteristics of real estate mutual funds

Within the Italian legal order, it is possible to classify real estate funds on the basis of the following criteria:

- procedures for the establishment of the fund:
    - ordinary funds:
        - closed;
        - semi-closed funds (with the reopening of subscriptions);
    - contribution funds:
        - public;
        - private;
        - mixed;
- type of investors they aim to:
    - retail;
    - reserved;
    - speculative.

If we take into account the way in which the holdings of the funds are established, we can identify two different types of real estate funds: *ordinary funds* (collection funds) and *contribution funds*. Ordinary funds collect money from investors, which subscribe shares through the placing operation, and then they carry out the investments (so they are quite simple in their functioning). The AMC shows to potential investors an investment plan already well established in which there are purchase contracts (concerning real estate assets which will come in fund assets once found the financial resources) already concluded. Usually it is not possible to detect an historic return of the investments since there is not an already existing property (capital). In contribution real estate fund instead, the underwriting takes place by means of provision of real estate properties, real estate property rights, shareholdings of real estate companies and shares of real estate mutual funds. The capital is awarded before the placement of shares. Real estate operations (identification of the portfolio to give, due diligence and provision of properties against issue of shares) precede the financial ones. The underwriting procedures of the shares through provision of properties is delegated to the regulatory autonomy of funds. The AMC could freely choose whether to set up a complete contribution fund or a

partial contribution funds; in the first case the endowment is made only by real estate assets, whereas in the second case is made by real estate properties and deposits of money.

Regarding the nature of the subject who gives the assets, we can identify two different type of funds:

- funds with *private contributions*, which can be also mixed as long as public stockholding is less than 51% of the portfolio;
- funds with *public contributions*, which can be also mixed as long as public stockholding is more than 51% of the portfolio.

In public contribution funds, those who provide the assets, with the only exception of the Ministry of Economy and Finance, should not control the AMC. The contributions may be carried out in conflict of interest without limits, but the prohibition of operations in conflict of interests for managers, auditors and executive director remains. Within 18 months by the last contribution, it must be sold to third parties at least the 60% of total shares issued.

The appraisal of assets to be lent assumes a fundamental relevance and it is well disciplined:

- if the assets transferred are not traded on a regulated market, the fund must acquire a specific appraisal report (which should not have a data earlier to 30 days from the signing of the deed) made by independent experts. In order to avoid a placement at a premium, the value confirmed by the appraisal report should not be less than the value of the shares issued against the contribution;
- it is also necessary an assessment of a financial intermediary which must ascertain if the compatibility and the profitability of the assets transferred are coherent with the management and investment policies stated in the documents concerning the solicitation to investment. This assessment can be made also by the same independent expertise which carries out the appraisal report of the assets, provided that it satisfies the mandatory professional requirements.

The appraisal report of the independent expertise and the report of the financial intermediary reduce the possibility of collusion between the AMC and those who contribute to the fund; in this way, the legislator tries to protect the other subscribers of the fund that may be at a disadvantage.

Contribution funds present a series of benefits for those who provide the assets. It is possible to take advantage of specialized managerial skills in real estate sector, avoiding the maintenance costs of a direct ownership of assets, minimizing management costs and benefiting of a favourable tax regime. Those who confer the goods has the possibility to convert real estate

assets into liquidity and shares that can be easily transferred to third parties. The knowledge of the technical characteristics and of the historical yield of the portfolio conferred simplifies the estimate of the expected performance of the contribution fund. The investor can evaluate ex ante the characteristics of the real estate portfolio, together with expected risks and performance.

The second distinction we are going to analyse is between closed and flexible funds. Classic ordinary real estate funds are *closed-end funds* thanks to the characteristics of a real estate investment that is little liquid. The subscription of the shares takes place at the time of constitution of the fund and the right to reimbursement is recognized to participants only at maturity. During the life of the fund pro quota reimbursement are admitted in the case of a partial divestment of properties made by the AMC, as we have already seen. So, a close-ended fund is similar to a private equity investment, with an investor who engages in a fund that has already purchased the properties (*seeded fund*) or that will use the money to invest in real estate (*blind pool fund*).

In *semi-closed funds*[29] (also called flexible funds) instead, the refund of the shares may happen also in the case of new emissions and the shares are liquidated at the Net Asset Value; this option, introduced with the approval of the Parliament, has the objective of increasing the liquidity of the fund. In these funds the capital is collected through more than one emission of shares at predetermined dates, the so called subscription windows (not continuously like in open-end funds[30]). The early reimbursement to participants takes place in the limit of the new resources raised and taking into account the possibility (for unlisted funds) to resort to debt (up to the limit of 10% of fund value). If the amount of money necessary to satisfy the request of early reimbursement is more than the resources raised through new emissions and debt, the refunds take place proportionally according to the financial memorandum. In the case of further emissions, it is not possible to proceed to new issues until the recall[31] of financial commitment of previous emission has been realized. Semi-closed funds lend a greater flexibility to

[29] Introduced with the Ministerial Decree No 47 of 31 January 2003.

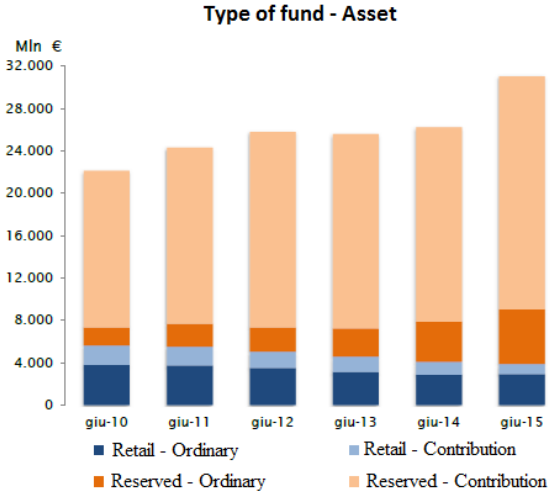
[30] Real estate open-ended funds are already a reality in some EU countries, but not yet in Italy where, on the other hand, they have closed or semi-closed legal structures. In Italy, the market for this type of fund has to be created from the basis since current legislation does not allow their establishment. According to Maffei (the director of real estate sector and welfare at Assogestioni), in the future there would be a coexistence of the two forms (closed and open-ended), rather than a transformation or disappearance of those closed, since "they address different targets". In her opinion, “closed fund are more suitable for institutional and long-term investors, while open ones respond better to the needs of retail investors.

[31] The recall of financial commitment is the situation in which the subscribers have to pay all the money related to previously subscribed shares. According to the Report on the Italian real estate mutual fund made by Assogestioni and IPD, on June 2015, the majority of reserved funds (193 on 238) was in *drawdown* (namely the AMC requests the partial recall of money due to the fund based on the investment opportunity that occurs). In addition, they provide for the possibility to re-open the subscriptions through further emission of shares. Instead, only four of 24 retail funds provided for this possibility.

investment operations that can be separated in time; in addition, they introduce an alternative way to the listing in secondary markets in order to redeem the shares of subscribers. However, fund rules have to predetermine and indicate the conditions and procedure through which it is possible to make purchase and provision of goods, both in deployment and following stage of the fund.

The last classification of the funds, according to the regulations, can be based on the type of investors they aim to. The fund can be oriented to the entirety of the investors without any specification on the nature and/or legal characteristics (*retail funds*), or it can be reserved to qualified investors (*reserved funds* and *speculative funds*) such as banks, insurance companies, pension funds, natural or legal entities (also institution) that possess specific experience and skills in operations with financial instruments[32].

Figure 8 - Retail and reserved funds



Source: Scenari Immobiliari (2015 Report)

As we can see from Figure 8, the weight of reserved funds has grown noticeably with respect to retail funds[33]. The origins of the distinction between retail funds and private funds can be found in the more technical and professional skills of institutional investors, according to which reserved funds can disregard some of prudential limits established for retail funds. For example, the legislator does not require the publication of the prospectus and the listing. The shares of reserved funds cannot be sold, repaid or re-sold to subjects different from those indicated in the fund rules.

A first consequence of this distinction has been the increase of the degree of specialization of reserved funds in terms of asset allocation, with the aim of ensuring higher returns: they have the possibility of concentrating investment on more risky and more profitable operations. In contrast, retail funds are obligated under law to pursue strategies of diversification of investments, in order to limit the risk and protect investors.

The last category is represented by real estate speculative funds[34] that constitute a special type as indicated by high performance goals and by the possibility to ignore many of the rules provided for real estate ordinary funds. The main innovative aspects concern certainly the

[32] See sec. 1, para. 1, letter h) of Ministerial Decree No 228 of 24 May 1999, which defines the qualified investors.
[33] According to the Report on the Italian real estate mutual funds made by Assogestioni and IPD, on June 2015 reserved funds represented the 82% of the total real estate asset value, while the retail ones the 8%.
[34] They were introduced in Italy by the Ministerial Decree No 228 of 24 May 1999 and later modified by the Ministerial Decree No 256 of 14 October 2005.

absence of a debt limit and the possibility to implement operation in conflict of interest until a value equal to the 100% of the total value of the fund[35] (they have no limits regarding the provision of a single high-unit value property). In addition, they can also invest in assets other than those admitted under Italian legislation for real estate funds (e.g. commodities, precious metals, derivative products), although remains the obligation of prevalence (at least two-thirds) of the real estate investment. It is thus clear a substantial difference compared to reserved real estate funds: while the latter can operate disregarding only the limits prescribed by the Bank of Italy on containment of risk, hedge funds can also ignore the provisions on the prudential composition of the fund's assets. Real estate speculative funds must call for a minimum initial investment of at least 500,000 euro per share and they can not exceed 200 participants. They also cannot be the subject of solicitation to invest.

At the end, among the different types of funds we can mention the regulatory provision of *guaranteed real estate funds* and *funds of real estate funds*, although at the moment there are no concrete examples of such types.

Guaranteed real estate funds are present in the legislation[36] for several years and they are characterized by the fact that they guarantee to investors the restitution of capital invested or the recognition of a minimum return. Still remains the obligation for the Fund to meet the prudential rules and criteria on containment and fractionation of risk as provided by the Bank of Italy.

Funds of real estate funds represent the latest innovation under the various types of real estate funds. In fact, thanks to a wider interpretation of existing legislation, the Ministry of Economy and Finance[37] declared as eligible assets of real estate funds not only direct but also indirect real estate assets like shares of real estate mutual funds (Italian or foreign), SICAV of Luxembourg, publicly traded real estate companies (SIIQ) or Real Estate Investment Trusts.

Instead of considering the classification suggested by the law, if we take into consideration the investment style (Figure 9), real estate funds can be classified into four categories according to different (growing) combinations of risk and reward:

- *core fund* are characterized by a low profile of risk and reward, with a stable income return in time. This is due by the investment into sizable and mature markets (for

[35] Still remains the general prohibition to invest the asset of the fund into goods directly or indirectly supplied or conferred by managers, auditors and executive directors.

[36] Introduced by the Ministerial Decree No 47 of 31 January 2003.

[37] This was the answer to a question made by the Italian Association of Asset Management Companies ('Assogestioni') in February 2008.

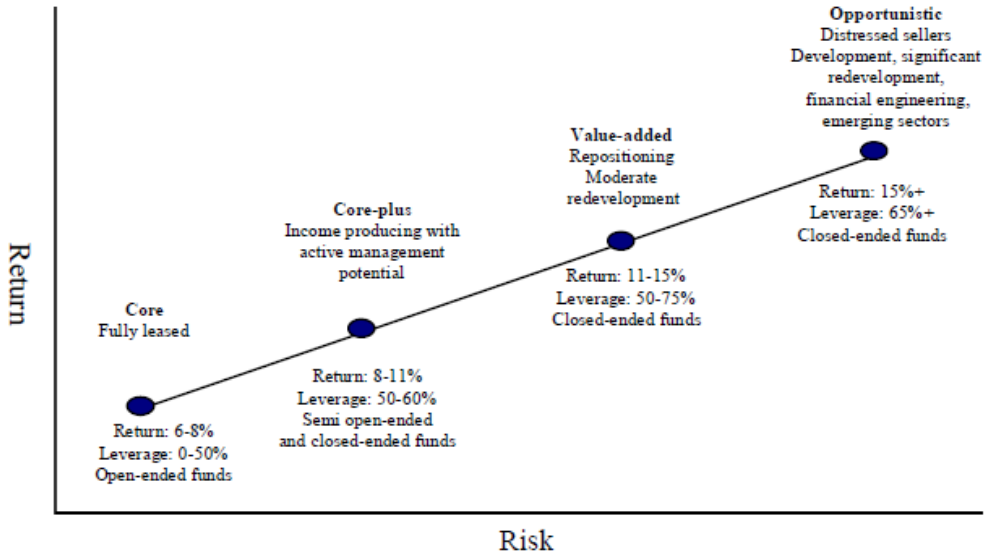
example Rome and Milan), into property income with long rent contracts and reliable tenants. In addition, the use of financial leverage is restrained;

- *core plus* fund present an higher risk-reward profile. They invest in property income with an aggressive management style (to give an example, the vacancy rate is higher since the properties are almost all for rent) and an increased borrowing;
- *valued added* fund are characterized by an even higher risk and the total yield is given by a combination of income return and capital growth. Most of the time assets require restructuring or a change of intended use. The use of financial leverage is greater than previous categories;
- *opportunistic fund* are characterized by a substantial risk and the expected return are mainly determined by capital return. The leverage is very high and investments concern distressed assets, development and splitting up operations.

To conclude, if we take into account the way in which funds distribute returns to subscribers (profits realized net of unrealized gains), we can identify three type of funds:

- funds that distribute profits:
- funds that collect profits;
- funds that collect profits in the first years and then they distribute the gains realized.

Figure 9 – Investment style of funds



Source: CBRE Global Investors Management

1.2.1.1.4 Operations in conflict of interest

The study of possible situation of conflict of interest is particularly important when we deal with real estate mutual funds and in particular with those characterized by contributions. As previously stated, the legislator together with supervisory authorities tries to protect the subscribers that are in a disadvantaged situation of informational asymmetry.

The risk of possible collusion between the AMC and those who provide goods to the fund is of relevant interest when the one who contribute is a member of the AMC or a group company belonging to the same parent company of the AMC. Such situation is possible since real estate funds may disregard the general rule for closed funds that prohibits transactions involving conflicts of interest. Thus, operations involving as counterparties members of the AMC or group company are allowed (the general prohibition for managers, auditors and executive director remains)[38]. In order to avoid that the fund is established only for instrumental purposes and with objectives far from asset management, specific limits are well specified.

Non-reserved real estate funds with shares whose value is less than 250.000 Euro can make operations in conflict of interest with members of the AMC or with firms belonging to the same group within the following limits:

a) the value of the single good subject to sale, purchase or contribution in conflict of interest must not exceed the 10% of the value of the fund; such precautionary measure promotes the diversification of investments and helps to reduce the risk of the portfolio. The total amount of operations realized directly or indirectly with members of the AMC may not exceed the 40% of the value of the fund. The sum of all the operations realized directly or indirectly with members of the AMC and subjects belonging to the same group must not the 60% of the value of the fund;
b) after the first issue of shares, the value of the single good subject to sale, purchase or contribution and (in any case) the total amount of the operations realized (directly or indirectly) with members of the AMC and with subjects belonging to the group, may not exceed the 10% of the value of the fund on an annual basis. This limit aims to reduce the risk of realisation of operations in conflict of interest after the issue of shares which are characterized (by nature) by a low secondary liquidity.
c) real estate goods that are purchased, sold or conferred in conflict of interest must be appraised by an independent expertise;

[38] To deepen the management policy of conflict of interest, see the Joint Regulations of the Bank of Italy and of the Consob of 29 October 2007. To study the limits to the operations in conflict of interest see the Ministerial Decree No 228 of 24 May 1999.

d) the subject which conferred to the fund must follow some *lock-in provisions*:
    i. fund's shares subscribed against contribution in conflict of interest must be held in amount not less than 30% of the value of the underwriting;
    ii. the minimum holding period from the date of subscription is 2 years (later they can be sold without restrictions).

   Therefore, for the first two years of the fund, the subject that conferred shares the economic results with the other subscribers (fund rules determine how this commitment should be respected);
e) the financial intermediary, which has to ascertain the compatibility and profitability of the provisions to fund's investment policies, should not belong to the same group of the subject that confers;
f) the resolution of the AMC's administrative board must demonstrate the interest (attractiveness) of the fund and of the subscribers to the operation; moreover, the resolution must be combined with the approving opinion of the control body.

Real estate funds whose shares have value equal or greater to 250.000 Euros (so including also speculative funds), must respect only the limits contained in letters c), d), e), f) when they carry out operations in conflict of interest with AMC's members or companies belonging to the same group.

Real estate funds reserved to qualified investors may implement operations in conflict of interest with AMC's members or companies belonging to the same group respecting only the limits of letters d), e) and f).

1.2.1.1.5 Tax regime

The tax arrangements applicable to real estate funds established according to sect. 37 of the TUF and those set up with public contribution according to sect. 14-bis of Law No 86[39] of 25 January 1994 have been frequently and significant changed over the past few years. The tax regime introduced by Decree-Law No 351 of 25 September 2001 provided for the imposition of a replacement tax of 1% computed on fund's assets. However, as a result of changes in sec. 41-bis of Decree-Law No 269 of 30 September 2003, with effect from 1 January 2004, the 1%

[39] Law abrogated by sec. 214 of the Legislative Decree No 58 of 24February 1998, with the exception of sections 14-bis and 15.

wealth tax[40] computed on the net book value of the funds is no longer due. Instead, the taxation takes place on investors upon perception of the proceeds. Real estate funds are not subject to corporate tax (IRES) neither to IRAP, the Italian (regional) tax on production activity. It follows that incomes from ownership and sale of properties (rents and capital gains) and from shareholdings in fund and real estate companies are not taxed. In addition, withholding taxes and replacement taxes on incomes (interests, dividends and capital gains) of financial instruments (bank deposit, bonds etc.) are not applied.

The taxation on shareholders[41] depends on the nature of the subscriber and on the shareholding percentage. In particular:

- a withholding tax of 20% on income received at the time of distribution of proceeds or redemption of shares is applied to institutional investors[42] specifically indicated by sec. 32, para. 3 of Decree-Law No 78 of 31 May 2010 (State government, public authorities, OICR, banks, insurance companies, etc.) and to subjects that own a shareholding less than 5% of the assets of the fund;
- the income is allocated directly to investors that own (directly or indirectly) a shareholding greater than 5% (qualified investor). The income annually earned by the fund contributes to total income of each participant on a proportional basis (according to the shareholding), regardless of actual collection. Moreover, they have to pay (*una tantum*) a replacement tax of the income taxes in the amount of 5% of the average value of the shares owned.

Regarding the VAT, the AMC is a taxable subject regarding the tax for the sale of goods and professional services supplied to real estate funds established by itself. Specific provisions aimed at facilitating the recovery of any excess VAT credit for the purchase of properties

[40] Sec.82, para. 17-21-bis of Law No 133 of 6 August 2008 has reintroduced the 1% wealth tax for real estate funds with a very low number of participants (the so called family funds). However, this tax is due only from those funds for which there is no listing of certificates or with a total asset value less than 400 million euros. The purpose of the reintroduction of the 1% tax has to be sought in the legislator's intention to penalize the use of real estate fund for the sole purpose of avoiding taxation. However, this tax is not without criticism: taking the net asset value (NAV) as the basis for the computation of the amount due, it encourages investors to enter into balance sheet as many debts as possible, thus promoting a great use of leverage.

[41] See the following sections regarding taxation of income earned by participants:
sec. 7 of Decree-Law No 351 of 25 September 2011;
sec. 32 of Decree-Law No 78 of 31 May 2010;
sec. 67 and 68 of Decree of the President of the Italian Republic of 22 December 1986;
sec. 5,6 and 7 of Decree-Law No 461 of 21 November 1997.
For the transitional taxation regime of income earned by participants:
sec. 41-bis, para. 11 and 12 of Decree-Law No 269 of September 2003;
sec. 32, para. 7-bis of Decree-Law No 78 of May 2010.

[42] Sec. 32, para. 3 of Decree-Law 78 of May 2010 defines the institutional investors according to Italian law.

attributable to the fund and its maintenance costs were provided by Decree-Law No 351 of 25 September 2001. In particular, sec.8, paragraph 1, of the Decree-Law, levelling the properties constituting the assets of the fund and their maintenance costs to amortizable goods, allowed to claim a refund of the annual VAT, also for period less than a year if some conditions[43] are met.

1.2.1.1.6 Shares and discount on NAV

The application for listing on a regulated market is mandatory for retail funds with a unit value of shares lower than 25.000 Euro; on the contrary, for reserved funds there is no listing commitment, since the aim of the rule is to protect and facilitate small savers and investors.
The application for admission to trading of the shares must be made by the AMC within 24 months from the closing of the offer. The term, rather long, allows the fulfilment of the investment program avoiding that the fund presents itself to the listing with excessive liquidity.
Shares of real estate closed funds are traded in a segment of the Electronic Market for Investment Vehicles (MIV), which is the regulated market of *Borsa Italiana* devoted to investment vehicles. As we have already seen in the previous chapters, the listing on the electronic regulated market increases, at least in a theoretical way, the secondary liquidity of the investment, simplifying the sales of shares. However, it must be noted that the funds are typically priced at a discount to the value expressed by the Net Asset Value and the trades are quite moderate[44] (see Figure 11). According to the Report on the Italian real estate mutual fund made by Assogestioni and IPD, on June 2015 the total discount on retail funds was about 43%, larger than last year (see also Figure 10 to make a comparison with other listed investment vehicles).
The values of the NAV and the prices are almost always misaligned, since the NAV of the quota is the result of a biannual evaluation, whereas the stock price of share is the result of daily trading (so it depends on supply and demand). The difference between these two values, defined as discount[45]-to-NAV, is computed as:

$$Discount = \frac{NAV - price}{NAV}$$

where:

[43] See sec.38-bis of Decree of the President of the Italian Republic No 633 of December 1972.
[44] To examine in depth, see also Biasin, Giacomini and Quaranta (2010).
[45] Or Premium-to-NAV, even if it rarely happens.

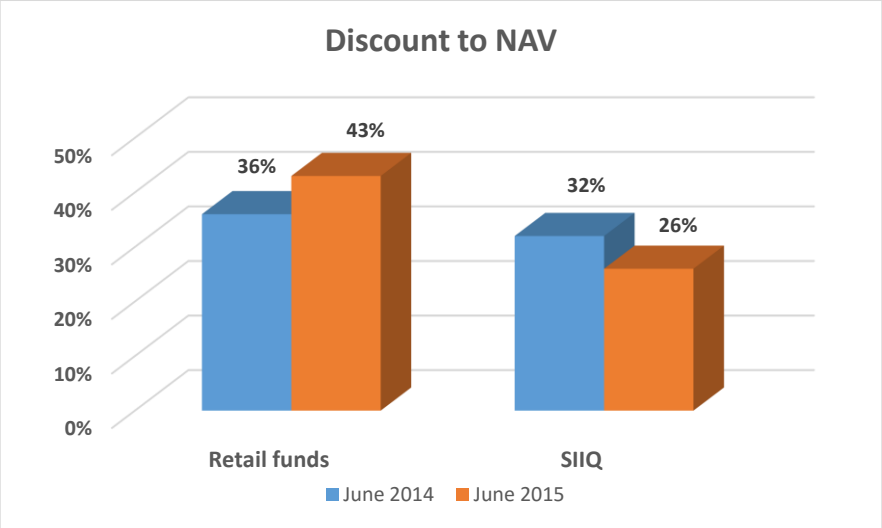
- NAV = pro quota NAV
- price = stock price of the quota

The discount[46]-to-NAV is a phenomenon widely studied in literature (see for example Morri and Benedetto, (2009)); however, no study has come to robust conclusions valid in all markets and all historical periods. Among the main causes, we can report the capital gain tax liabilities, leverage, liquidity, diversification, management fees, errors of assessment and the market sentiments. Regarding the Italian case, the most significant variables can be summarized as follows:

- the composition of assets (the higher the percentage of assets invested in properties, the lower the discount);
- the participation of institutional investors (the higher the proportion of the fund held by institutional investors, the lower the discount);
- the liquidity of shares;
- the type of fund (contribution funds, ceteris paribus, are traded at lower discounts);
- residual life (funds closer to maturity have lesser discounts);
- management fees (funds with higher fees have a lower discount);
- market views about the evaluations carried out by the independent experts;
- lack of coverage by analysts;
- the average discount of the sector (used as a proxy of market sentiment).

[46] The discount of closed-end funds is a good measure of the 'fear-level' in the market, widening out in times of trouble as investors run for the exit, and narrowing in bull markets when increased demand for funds' shares compresses the discount.

Figure 10 – Discount to NAV in the Italian market



Source: personal elaboration on Scenari Immobiliari data (2015 Report)

However, although it does not emerge directly from empirical studies, the main cause of the discount in the Italian market is the low volume of trade, that is the lack of liquidity of shares which does not allow the immediate ability to divest large capitals, preventing a chance to large investors and mutual fund managers to use these financial instruments as significant components in the strategic choices of asset allocation. We can see in Figure 11 how low is the trade volume of the listed closed end funds compared to other financial instruments (like ETFs for example).

Figure 11 – Trade volume

TRADING

SHARES	JAN-DEC 2014		JAN-DEC 2015		DEC 2015	
	Trades Number	Turnover eur m	Trades Number	Turnover eur m	Trades Number	Turnover eur m
MTA Domestic	63 840 255	702 356.2	69 167 140	792 006.9	4 734 279	47 171.5
of which STAR	4 906 481	18 485.5	5 687 038	22 683.8	354 772	1 143.4
MTA Foreign	2 357 529	19 699.2	1 448 397	11 094.8	82 040	568.7
of which STAR	43 367	342.0	92 869	753.1	3 453	30.2
MIV Invest. Companies	64 266	88.0	36 412	94.2	1 214	2.8
MTA International	186 611	1 285.3	222 714	1 599.8	14 732	100.8
AIM Italia - MAC	112 854	325.7	258 233	760.8	12 796	36.4
Total	**66 561 515**	**723 754.4**	**71 132 896**	**805 556.5**	**4 845 061**	**47 880.1**
FTSE MIB Shares						
% Shares Total	74.7%	91.3%	71.5%	89.8%	70.9%	88.3%

OTHER INSTRUMENTS	JAN-DEC 2014		JAN-DEC 2015		DEC 2015	
	Trades Number	Turnover eur m	Trades Number	Turnover eur m	Trades Number	Turnover eur m
SeDex	2 382 078	24 661.1	3 166 093	33 638.2	215 951	2 341.1
Warrant	66 623	63.4	91 172	106.7	17 056	20.6
MIV Closed End Funds	79 775	300.9	60 395	186.5	4 868	15.3
ETF	2 325 990	66 298.2	2 734 792	81 979.0	180 212	6 380.6
ETC	745 697	7 407.6	2 186 950	22 310.7	188 282	1 570.2
OICR Open	-	-	479	56.0	36	1.5
ETF Plus	**3 071 687**	**73 705.8**	**4 922 221**	**104 345.8**	**368 530**	**7 952.3**
Convertible Bonds	13 601	171.3	6 111	63.1	210	1.4
Subscription rights	1 217 266	2 685.3	282 057	1 006.1	10 573	4.4
Mot - Government Bonds	3 603 636	302 295.9	3 371 414	255 783.2	200 908	14 732.6
Mot - Bonds	592 255	9 951.3	510 710	9 107.5	54 634	789.1
Mot - Eurobonds and ABSs	613 188	10 851.4	735 253	12 366.0	46 762	693.4
ExtraMOT	80 289	6 053.9	55 907	3 890.3	3 987	247.4
Fixed Income Total	**4 889 368**	**329 152.5**	**4 673 284**	**281 147.0**	**306 291**	**16 462.5**

Fonte: Borsa Italiana Spa – Monthly Update December 2015

1.2.1.1.7 The use of debt

The option of using a high degree of leverage strongly differentiates real estate funds from other asset management instruments. This option is granted thanks to the nature of the investments that are real and not financial; physical investments tend to preserve the value of capital in medium and long-term horizon, offering the opportunity to obtain periodical cash flows.

On one side real estate are ideal assets to exploit financial leverage in a medium/long-term horizon, on the other side the efficiency (practicality) in real estate industry relies significantly on the availability and on the cost of bank credit.

Italian real estate mutual funds can borrow until the 60% of the value of real estate properties, real estate property rights, shareholdings of real estate companies and shares of real estate mutual funds and until the 20% of the value of other goods (residual investment). These loans can be used also for development operations of properties already contained in the fund, like a change of intended use or the splitting up of the real estate. Non-listed real estate fund can borrow also to make prepayments to subscribers. In doing so they have to follow the already mentioned limits and the maximum amount is 10% of the value of the fund.

Residual investments normally consist of securities and liquidity and they do not have the appropriate characteristics to exploit leverage. Going into debt to make prepayments is carried out with a target that is very different from the optimization of the financial structure. This kind of indebtedness has only a residual characteristic, since reimbursement has to rely mainly on financial resources collected with new issues of shares. Definitively, the use of leverage must be based on the performance of real estate investments, with the possibility of reaching a degree of leverage of 60% (computed as the ratio between financial debt and the value of assets[47]).

Speculative real estate funds can use a degree of leverage higher than the 60% of the value of real estate assets (*exclusive or prevailing investment*) and greater than the 20% of other goods (*residual investment*).

Italian real estate funds may resort to any form of loan excluding the collection of funds from the public through the issuance of debt securities. Fund rules can provide for some restrictions[48]. Maximum percentages of debt allowed by law apply to current values of the properties at establishment or over the life of the fund. Therefore, real estate market's trend influence financial policies and choices of the AMC and the regulatory limits on loans. In order to reduce

[47] I considered like degree of leverage the ratio between financial debt and activities, making reference to the language used in practice and to the concept of Loan To Value. From a more formal point of view, the degree of leverage is computed as the ratio between debt and equity or, alternatively, to the ratio between assets and net worth.

[48] According to the Report on the Italian real estate mutual fund made by Assogestioni and IPD, on November 2015, reserved funds and contribution funds were the fund that use more financial leverage.

this pro-cyclical effect, the Bank of Italy proposed to apply the percentages allowed to the lower between purchase cost (or contribution value) and fair value of real estate[49].

Fair value of properties is relevant to determine the value of the fund over its life. This value is equal to the sum of the market values of the single properties, taking into account the prices suggested by independent experts. When they compute the market value, they do not consider the inclusion in a specific portfolio and they hypnotize that the purchase price is paid totally and in cash at the appraisal date[50].

The contribution value of the properties, which is significant upon establishment of the contribution fund, it is determined by discounting (through a discount applied to the market value) the market value of the properties, in order to take into consideration the complete transfer of a portfolio of properties. The size of the discount value, usually around 15%, depend on the characteristics and on the risk/reward profile of the portfolio conferred to the fund. The contribution value is equal to the market value only in the case of provision of a single property, since there is not a complete transfer of a portfolio of goods.

Limits to debt can be overtaken, for example because of a devaluation of the assets in the portfolio or a refund of shares following the sale of goods not encumbered by debt. The maximum level of debt may also be exceeded when the independent expertise does the assessment and the market value estimated is not sufficient to comply with the limits. Such no-compliance risks are part of the risks faced by the AMC, which have to be identified, measured and governed as part of company risk management[51].

Fund Rules should specify the maximum level of debt that the real estate fund can take on, always taking as a reference the total net value. The *prospectus* contains detailed information on the liabilities of the fund, especially on total amount, due date, cost, warranties and debt repayment plan.

We can ascertain from Figure 12 which are the main benefits and the costs of leverage which has to be properly identified, measured and managed by the Asset Management Company.

[49] To deepen see the Document of the Bank of Italy of 16 March 2010 ("Modifiche al regolamento sulla gestione collettiva del risparmio in materia di approvazione dei regolamenti dei fondi e dei comitati dei partecipanti"). In addition, see AIAF (2011) for a debate on the proposals of the Bank of Italy.

[50] See Title V, Chapter 4 of the Provision of the Bank of Italy of 14 April 2005.

[51] Risk management of the real estate AMC has to deal with both the risks of AMC and the risks of the assets under management. See Giannotti (2010) and Rinaldi (2011) to deepen this issue. According to the research realised by Rinaldi and the Bank of Italy, in June 2009, funds with a Probability of Default greater than 20% were 22 (on a total amount of 232), while in June 2010 they were 9 (on 281). The reason for the improvement lies in deleveraging of funds (in particular development funds).

Figure 12 – Benefits and Risks of leverage for real estate mutual funds

Benefits of leverage	Risks of leverage
Increased return for the subscribers of shares	Increase in the Probability of Default of the fund
More than proportional increase in the value of the shares following an increase in property values	Increase of the expected volatility of free cash flows available to subscribers
Reduction of the weighted average cost of capital	Great effort needed to check the balance of cash flows incoming and outgoing
Reduction of the tax base for the computation of the 1% wealth tax	Amplified effect of rent or contractual changes on levered cash flows
Availability of additional financial resources for maintenance services and Capex	Compliance to covenants requested by banks
Increase in the volume of investments - portfolio diversification and economies of scale	Higher interest rate sensitivity of financial structure
Reduction of the degree of leverage of the subject that confers the assets	Increase in the risk of funds providing a periodic distribution of dividends

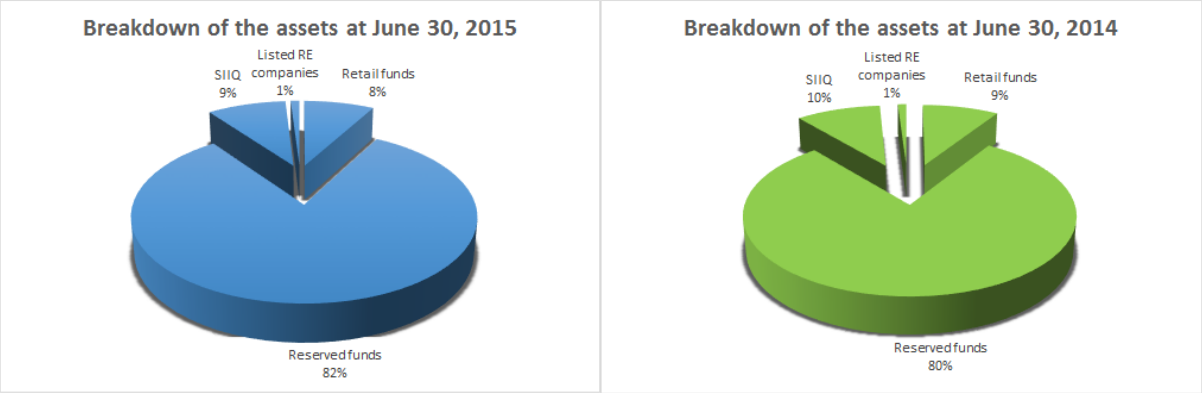
Source: personal elaboration

1.2.1.1.8 Some additional data on the Italian Market

In order to evaluate the Italian market of real estate mutual funds we need to resort to the data supplied by Assogestioni (the Italian Association of asset management companies) and Scenari Immobiliari (Independent Institute of studies and research). It is important to remember that the data relating to real estate reserved funds are the result of estimates, as these funds are not subject to the mandatory publication of the annual financial reports.

Among the Italian market for indirect real estate investments, real estate mutual funds represents a real estate endowment of about 53 billion of euro, depicting the 90% of the market. If we look at Figure 13, we can study the breakdown of the value of the real estate assets that belongs to indirect instruments in Italy at the date of June 30, 2015, compared to that of June 30, 2014.

Figure 13 – Value of real estate assets



Source: personal elaboration on Scenari Immobiliari's Data

In 2015 the Net Asset Value of the real estate funds grows by more than ten percent (10.3 %) than the previous year and active funds has risen to 400[52]. However, it should be noted that there have been many funds (like small "family" funds) who have arrived to maturity throughout the year and the phenomenon is going to last even two years. In figure 14, we can analyse some further balance sheet data regarding the industry and the real estate funds in particular.

Figure 14 – Balance sheet data

Description	Reserved funds *	Retail funds	SIIQ	Listed RE companies	Total industry
Total assets	nd	5,3	6,4	2,6	na
- of which real estate assets	48,5	4,5	5,5	0,6	59,1
Leverage	nd	1,4	3,6	1,8	na
NAV	44,1	3,9	2,8	0,8	51,6

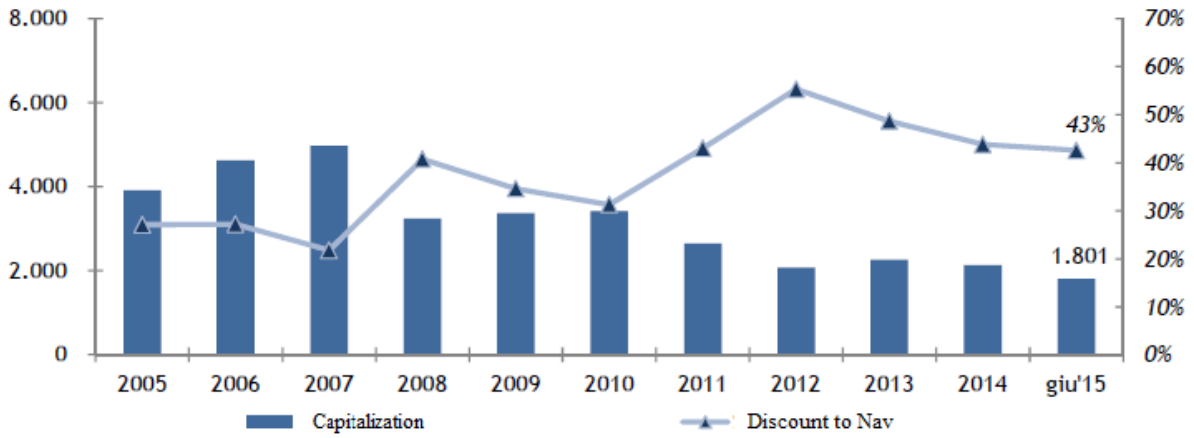
***** estimate of Scenari Immobiliari. The most representative companies, listed on the Milan Stock Exchange and included within the FTSE Italy real estate (Aedes immobiliare Spa, Spa, Spa property development real estate company Equities Brioschi, Gabetti Prelios Spa, Spa, rehabilitation) have been analysed.
Source: personal elaboration on Scenari Immobiliari's data.

We have already seen in Figure 8 (page 29) which is the division of the market between private funds and retail funds; in June 2015 the offer of real estate funds is composed by 91% of reserved funds and 9% of retail funds to 9%. In the first half of 2015, eight new funds, all addressed to qualified investors, become operating; seven are contribution funds and only one is an ordinary fund. The average duration is 20 years.

[52] Estimate made by Scenari Immobiliari (2015 Report)

Market capitalisation, in contrast to the amount of assets, can be studied only for retail funds for which the listing is mandatory. In June 2015, retail funds had a market capitalization of 1.8 billion euro, sharply down compared to the previous year's value (2.5 billion).

Figure 15 – Retail funds: market capitalization and discount to Nav (2005 – 2015) – millions of euro



Source: Scenari Immobiliari (2015 Report)

Given the availability of informations, a deeper analysis of the retail funds can be made. Some of the most important data regarding the 26 listed funds, like the amount of real estate asset, the duration and the discount to NAV are summarized in Figure 16 and in the Appendix 1 at the end of the chapter.

In the first half of 2015 retail funds were represented altogether from 26 products, of which one approved in February 2015 the final account settlement and another is currently into liquidation, having previously dismissed the entire estate. Of the remaining 24 funds still fully operational, we can highlights as follows:

- the AMCs that actually manage retail funds are 13, one less than the previous year as a result of the merger by incorporation of Sgr Polaris Real Estate and Beni Stabili Gestioni into Investire Sgr;
- tunds actually listed and operating on the stock exchange are 24, in line with the previous year;
- the average time to maturity of the funds is around 3 years;
- real estate assets of retail funds at June 30, 2015 amount to about 4.5 billion euros, a decrease of about 16 percent compared with the first half of 2014. This decrease is

attributable to the depreciation of the real estate made by independent experts and the process of disposal of properties by closing funds.

- long term debt lowered from about 1.8 billion in the first half to 1.2 billion euros in June 30, 2015. Also in this case the reduction of about 31 percent over the previous year is ascribable to the liquidation process ongoing for many retail funds.
- the degree of use of leverage, that is the ratio between how much debt the fund used and how it could potentially borrow, amounts to 55.7%, decrease compared to the prior year;
- the Nav stopped at about 3.9 billion euros in June 30, 2015, a reduction of about 11 percent compared with the results for the first half of 2014;
- the discount to Nav was about 46 percent on average, compared to 36 percent for the first half of 2014.
- the number of trades on the MIV amounted to only 60.395 trades during the 2015 (see Figure 11)

Figure 16 – Italian listed real estate mutual funds

Fund name	Time to maturity (years)	Discount to NAV	Leverage (assets/NAV)	Loan to Value (funding received '15/ assets)
Alpha Immobiliare	15	71%	1,2	14%
Amundi Re Europa	1	59%	1,3	31%
Amundi Re Italia	6	61%	1,5	36%
Atlantic 1	1	26%	2,4	59%
Atlantic 2	3	40%	1,8	45%
Beta (1) Immobiliare	2	42%	1,4	0%
BNL Portfolio Immobiliare	1	47%	1	0%
Delta Immobiliare	2	60%	1,1	12%
Dolomit (in liquidazione)	/	/	/	/
Estense Grande Distribuzione	1	30%	1,4	30%
Europa Immobiliare N. 1	2	55%	1,3	/
Immobiliare Dinamico	5	70%	1,4	38%
Investietico	3	44%	1,2	/
Immobilium 2001	5	57%	1	2%
Invest Real Security	1	50%	1,2	14%
Mediolanum Re (A and B class)	6	54% (A class), 50% (B class)	1	0%
Obelisco	3	67%	1,8	44%
Olinda Fondo Shops (in liquidazione)	NaN	/	/	/
Opi - Opportunità Italia	7	/	1	0%
Polis	0	58%	1,1	6%
Risparmio Immobiliare Uno Energia	3	-34%	4,6	/
Securfondo	2	49%	1	0%
Socrate	2	57%	1,2	16%
Tecla Fondo Uffici	2	50%	1,8	45%
Unicredito Immobiliare Uno	2	42%	1	0%
Valore Immobiliare Globale	4	45%	1	0%
Mean	**3,03**	**48%**	**1,45**	**18,70%**

Source: personal elaboration on Borsa Italiana data

1.2.1.2 Publicly traded real estate companies – SIIQ

1.2.1.2.1 Main features

An investment in real estate companies allows investors attracted by a long-term horizon, by a stable dividend yield and a potential revaluation of assets in the portfolio to benefit from investment in real estate assets, bearing a lower risk than a direct investment.

In the different legal systems the indirect investment has been favoured by tax breaks, generally through transparency[53] or the low taxation of investment vehicles that have particular characteristics: the Real Estate Investment Trust (REITs)[54]. Although each national regulation provides for different rules, REITs can be defined as real estate investment company that primarily conducts real estate investment activity and which are characterized by a transparent system of taxation and by the obligation of distributing most of the profits in the form of dividends that will be taxed at the end-investor's level.

In Italy the scheme was introduced by the 2007 Financial Law[55] with the "Società di Investimento Immobiliare Quotate" (from now on SIIQ), which represent tax-advantaged vehicles compared to a normal property company. They are basically listed real estate companies, specialized in the field of rents, which can benefit from tax breaks respecting certain requirements set by the law. In particular, they have the option of adopting a taxation system characterized by the fiscal transparency, whereby incomes from rental activities are not subjected to IRES[56] and IRAP[57] at company level; incomes are directly and completely taxed at shareholders' level in the form of withholding taxes (for entrepreneurs) or as normal taxes (for other subjects). In the same way are also processed the dividends received from investments in other SIIQs.

The purpose of the discipline of SIIQs is the promotion and development of the Italian real estate market, trying to increase its transparency and competitiveness vis-à-vis other European countries in terms of ability to attract capital for real estate investment. The SIIQs can favour an enlargement of the listed real estate industry and a growth in the number and size of the

[53] In general a regime of fiscal transparency is a system of company taxation that allows to allocate profits or losses to each member (based on personal rate), in proportion to the ownership share.

[54] This type of legal structure was born in the 1960s in the United States and grew in almost all advanced countries, most recently in France in 2003, in the United Kingdom, Germany and Italy in 2007, in Spain in 2009. The name is retained to indicate vehicles with such characteristics even in other jurisdictions. See pag. XX for futher informations.

[55] Section 1, para. 119-141 of Law No 296 of 27 December 2006.

[56] Poportional tax on corporate income, established by Legislative Decree No 344 of 12 December 2003.

[57] Regional tax on productive activities established by Legislative Decree No 446 of 15 December 1997.

players who work according to transparency and efficiency criteria comparable to more developed markets.
However, as we will see in chapter 1.2.1.1.8, in Italy, unlike other countries, they did not have a great development because of regulatory-related inflexibilities.

1.2.1.2.2 Legal framework

Legislation on SIIQs is still quite limited given their recent introduction: the reference discipline is represented by section 1, paragraphs 119-141 of law No 296 of 27 December 2006 (2007 Financial Law), partially amended by section 1, paragraph 374 of law No 244 of 24 December 2007 (2008 Financial Law).
The regulatory framework is completed by Implementation Decree No 174 of 7 September 2007 of the Ministry of Economy and Finance[58] and by the Provision of the Director of the Income Revenue Authority of 28 November 2007, which established the arrangements for the exercise of the option for the special regime[59].
With regard to the requirements for listing on regulated markets in Italy, the relevant legislation is currently constituted by the Regulations of the Organized Markets and Managed by Borsa Italiana SpA. The rules were decided through discussion by the Assembly of Borsa Italiana on January 15 2009, approved by Consob on 25 March 2009 by resolution No. 16848 and entered into force on 22 June 2009.
Recently, changes made by section 20 of Decree-Law No 33 of September 12, 2014 ("Decreto Sblocca Italia") aim, on the one hand, to promote the simplification and, on the other, levelling the playing field of Italian players in the sector with that of other countries.
Some innovations intervene on the principles of the legislation, trying to harmonize it with that of other countries; other measures introduced by the 2014 "Decreto Sblocca Italia" tend to facilitate access for the special regime provided for SIIQ and level out the tax laws of SIIQ to that of real estate funds, creating a symmetry between the two instruments.

Substantially all legislation concerns ownership structure, subjective, statutory and objective requirements in order to be eligible for the special regime[60] introduced with the 2007 Financial

[58] Issued pursuant to sec. 1, para. 141 of Law No 296 of 27 December 2006.
[59] In accordance with sec. 1. Para. 120 of Law No 296 of 27 December 2006.
[60] Sec.1, para. 1, letter e) of Ministry of Economy and Finance (MEF) Decree No 174 of 7 September 2007 defines special regime as the system of exemption of both business income and value of production arising from the rental activity from IRES and IRAP taxes.

Law. The requirements, as provided by the regulations before the changes introduced by 2014 Decree, are divided as follows.

1. *Subjective requirements*[61]

The company must be established in the form of joint-stock company, must be resident for tax purposes[62] within the territory of the Italian State and its shares have to be traded on regulated exchanges. Regarding the concept of residence[63], it is important to remember that it has to be interpreted from a fiscal perspective. According to the news of the 2014 Decree (before this intervention the situation was unclear), inside the category of "companies resident in the national territory" can be covered even the permanent organizations of foreign companies with homologous corporate form of Italian limited company, but listed in other Member States of the European Union[64]. Regarding the listing[65] requirement, it is sufficient that the SIIQ is listed on Italian regulated markets or one foreign market identified by Ministry of Economy and Finance among those that "allow a proper exchange of informations"[66] (the so called white list). These requirements must be fulfilled at the beginning of the tax year in which the company wants to make use of this special scheme[67]. Borsa Italiana provides for two ways of admission to listing:

- listing on any segment of the Mercato Telematico Azionario (MTA) based on ordinary rules (so without meeting the limits established for the REIC);
- listing on the appropriate segment of the Expandi market according to a specific discipline of listing[68] for Real Estate Investment Company (REIC), among which we can include the SIIQs.

Regulation of the REIC, approved by the Consob, defines some requirements for SIIQs shares' admission to listing of SIIQ. Specifically, with regard to investments and limits to the concentration of risk, it is required that[69]:

- the company does not invest, directly or through subsidiaries, more than a third of its assets into a single property with unitary urban and functional characteristics;

[61] Sec. 1, para. 119 of Law No 296 of 27 December 2006.
[62] Change introduced by sec. 1, para. 374, letter a), number1) of Law No 244 of 24 December 2007.
[63] Sec. 73, para. 3 of the Italian Consolidated Law on Income Tax (TUIR) adopted with Decree of the President of the Italian Republic No 917 of 22 December 1986.
[64] To these subjects a substitutive tax (20%) of IRES and IRAP is imposed on incomes arising from the rental activity of the permanent organization
[65] Following the changes introduced by sec.1, para. 374, letter a), number 2) of law No 244 of 24 December 2007.
[66] See sec. 168-bis, para. 1 of TUIR, as added by sec.1, para. 83, letter n) of law No 244 of 24 December 2007.
[67] Sec. 2, para. 2 of MEF Decree No 174 of 7 September 2007.
[68] Part 2, Title 2.2, chapter 12 of Borsa Italiana Regulation of 22 June 2009.
[69] Sec. 2.2.39, para. 1 of Borsa Italiana Regulation of 22 June 2009.

- revenues from a single tenant or tenants belonging to the same group do not exceed 20% of the total revenues from the rent activity.

About shares it is required instead that[70]:

- the predictable minimum capitalization is at least 40 million euro;
- there is sufficient diffusion, which is assumed when the shares are distributed among professional investors and/or non-professional investors for at least 35% of the capital represented by the category.

The joint-stock company which carries out mainly the activities of rents and listed on Italian regulated markets before the entry into force of that Market Regulation or listed on regulated markets of European Union Member States shall not comply with those capitalization limit.

2. Objective requirements[71]

The application of the special scheme is subject to the condition that the company carries out mainly the activities of rents. The decree establishing the SIIQs defines the rental activity as[72]:

- rent activity of real estate properties owned by way of direct ownership, usufruct, other real estate rights and leasing contracts;
- ownership of shareholdings in other SIIQ or SIINQ[73] constituting financial assets in accordance with international accounting standards;
- rent activity arising from development (direct construction and renovation) of properties.

The rental activity is believed to turn prevailing when asset and profit parameters[74] are respected:

- real estate assets directly owned, or through other rights and/or according to leasing contracts and ownership of shareholdings in other SIIQ or SIINQ constituting financial assets must represent at least 80% of the assets[75] (asset test);

[70] Sec. 2.2.41, para. 1 of Borsa Italiana Regulation of 22 June 2009.
[71] Sec. 1, para. 119 and para. 121 of Law No 296 of 27 December 2006.
[72] Sec.1, para.1, letter c) of MEF Decree No 174 of 7 September 2007.
[73] Real estate companies not listed.
[74] Sec. 1, para. 121 of Law No 296 of 27 December 2007.
[75] In the calculation of the assets we do not take into account: cash, the value of assets or rights on properties used as headquarters of SIIQ, financing to group companies, credits arising from the free-tax activities, including VAT credits. See sec. 6, para. 2 of MEF Decree No 174 of 7 September 2007.
According to the news introduced by the sec. 20 of Legislative Decree No 33 of 12 September 2014 ("Sblocca Italia" Decree), it is also possible to include among the relevant activities, in order to encourage permeability between funds and SIIQ, the shares held in reserved real estate funds and the proceeds from them.

$$\frac{Leased\ properties^{*}}{Total\ activities} \geq 80\%$$

* taking into account also the value of shareholdings in other SIIQs and SIINQs.

- revenues from rents and dividends received from shareholdings into SIIQ and SIINQ should represent at least 80% of positive components of the income statement[76] (profit test).

$$\frac{Revenues\ from\ rents\ and\ dividends}{Positive\ components\ of\ income\ statement} \geq 80$$

3. Statutory requirements[77]

The company must specify inside the statute the rules adopted with regard to investments, limits in terms of concentration and counterparty risk and maximum use of leverage allowed (individual and group level). In addition, it must report the compliance with these rules in the infra-annual financial statements and inside the management report regarding company situation. Unlike the regulations that govern real estate funds, SIIQs' regulation does not provide for precise benchmarks regarding the compliance with the above mentioned requirements, except what is required by Regulation of Borsa Italiana for admission to a stock exchange.

4. Ownership structure[78]

The company must fulfil the following conditions:

- none shareholder shall hold, directly or indirectly, more than 60%[79] of the voting rights at ordinary shareholders ' meeting and more than 60% of the rights to participate to profits of SIIQ. This limit to the concentration of the controlling interest, known as the "control requirement", must always be respected;
- at least 25%[80] of the shares must be held by shareholders who do not possess, directly or indirectly, at the time of the exercise of the option for the special regime, more than 2% of the voting rights at ordinary shareholders ' meetings and more than 2% of the rights to share

[76] We exclude from the calculation of the percentage the increases related to buildings under construction allocated to rent and capital gains from any fair value evaluation of the property for rent. See sec. 6, para. 3 and 4 of MEF Decree No 174 of 7 September 2007.
[77] Sec. 3, para. 1 and 2 of MEF Decree No 174 of 7 September 2007.
[78] Sec.1, para. 119 of Law No 296 of 27 December 2006.
[79] Before the news introduced by the sec. 20 of Legislative Decree No 33 of 12 September 2014 ("Sblocca Italia" Decree), this limit was equal to 51%.
[80] Before the news introduce by the sec. 20 of Legislative Decree No 33 of 12 September 2014 ("Sblocca Italia" Decree), this limit was equal to 35%.

corporate profits. This requirement for sufficient diffusion and division of share capital, known as "free float requirement" must be fulfilled solely upon exercise of the option. Adequate diffusion of shares among investors is realized even when the shares owned by mutual funds, pension funds and social security funds exceed 2%. In effect, the investments made by these subjects provide a sufficient diffusion of the shares among the public.

1.2.1.2.3 Effects of adoption of the special regime

The exercise of the option for the special scheme for the SIIQ allows the exemption of income arising from rent activity form IRES and IRAP taxes. In addition, incomes related to dividends received from investments in other SIIQs are exempt from IRES[81]. When dividends are distributed, these incomes are directly and completely taxed at shareholders' level[82] in the form of withholding taxes (for entrepreneurs) or as normal taxes (for other subjects).

The income deriving from the exercise of activities other than real estate rents, including capital gains related to the sale of properties or arising from shareholdings in other SIIQs, is instead taxed according to ordinary rules (IRES and IRAP). Taxable income will be taxed both at the company level, both at the final investor's level.

This system of tax advantages, however, requires a series of obligations by the company:

- distribution of at least 70% of net income[83] ;
- the evaluation[84] at fair value of goods allocated to rent activity at the time of the adoption of the new regime;
- the obligation to keep separate accounts in order to distinguish the events related to the management exempt from taxes from those related to the taxable operations[85];
- 50% distribution requirement of capital gains realized on real estate properties leased and on investments in real estate funds and qualified SIIQ, SIINQ (within 2 years after the achievement)[86].

[81] Sec. 1, para. 131 of Law No 296 of 27 December 2006.
[82] Sec.1, para. 131,134, 135 and 136 of Law No 296 of 27 December 2006.
[83] Before the news introduced by the sec. 20 of Legislative Decree No 33 of 12 September 2014 ("Sblocca Italia" Decree), this limit was equal to 85%, according to sec.1, para.123 of Law No 296 of 27 December 2006. The aim pursued by fixing a high percentage of profit distribution is that the dividend is as close as possible to the net incomes of real estate, making investments in these instruments as close to direct investment.
[84] Sec. 4, para. 1 and 3 of MEF Decree No 174 of 7 September 2007. The capital gains arising from the comparison between fair values and costs fiscally recognized are subjected to a 20% substitutive tax.
[85] Sec.1, para. 121 of Law No 296 of 27 December 2006.
[86] News introduced by the sec. 20 of Legislative Decree No 33 of 12 September 2014 ("Sblocca Italia" Decree).

1.2.1.2.4 Causes of suspension of the special scheme

The loss of one or more requirements for the adoption of the special regime entails leaving the regime itself, even if there are some exceptions. More precisely, the causes that produce the suspension from the scheme, with effect from the same period in which they occur, are the following:

- the loss of the residence, for tax purposes, in the Italian territory;
- the loss of the legal status of joint-stock company;
- revocation of admission to listing on regulated markets;
- overrun by a shareholder of the threshold of 60 % of ownership, directly or indirectly, of voting rights at ordinary shareholders ' meetings and of the rights to participate to profits of SIIQ;
- failure to comply with the obligation of distributing at least the 70% of the net profit available, resulting from the lease activity[87].

The failure to comply with the so-called objective requirements, that is asset and profit parameters to ensure that the lease activities can be considered prevalent, is a further cause for suspension of the special regime. For this reason, failure to meet in two consecutive fiscal years by one of the conditions of prevalence, determines the definitive termination of the special scheme and the application of the ordinary rules. In addition, failure to comply, even for a single tax year, of both parameters of prevalence, will result in automatic loss of the special regime with effect from the same period.

On the contrary, the following events do no constitute cause of suspension of the regime:

- the temporary suspension of listing;
- failure to meet the requirement of an adequate diffusion and division of share capital, that must be fulfilled solely upon exercise of the option as it is not directly controllable from SIIQ;
- the merger, division and sale or transfer of company or business units into which the SIIQ participates, which do not entail the loss of the special scheme per se.

The loss of the special regime involves a number of statutory and tax consequences, the most important of which can be summarized as follows:

- loss of status of SIIQ;

[87] Se.1, para. 124 of Law No 296 of 27 December 2006.

- termination of the obligation of distributing at least the 70% of the net profit available, resulting from the lease activity;
- termination of the obligation to keep separate accounts in order to distinguish the events related to the management exempt from taxes from those related to the taxable operations;
- reinstatement of the ordinary rules of taxation for IRES and IRAP;
- non-applicability of statutory and regulatory requirements.

1.2.1.2.5 SIIQ and real estate mutual funds

Despite SIIQs meet a similar requirement to that of real estate funds, allowing investors to benefit from an indirect real estate investment, they shall not constitute an overlap to funds: the two investment vehicles have some substantial differences that can be summarized as follows.

1. *Legal status*. Real estate funds are CIUs[88] while SIIQs are commercial companies that carry out business activities. This implies that real estate funds benefit from the favourable tax regime (exemption from IRES and IRAP and taxation on shareholders) regardless of their characteristics and specialization, allowing them to easily operate with trading and development strategies. On the contrary, SIIQs can exploit the preferential tax regime only if they focus on the rent activity inside the real estate market segment, thus being very specialized. In addition, the special regime applies only to the incomes of the exempt operations, while income from non-exempt operations (such as capital gains from the sale of assets or from shareholdings in other SIIQs) are taxed according to ordinary rules.
2. *Supervision*. Since real estate funds are CIUs aimed at management of public asset, they shall be subject to a strict regime of authorizations and controls by different entities (the Bank of Italy, the Consob, the custodian bank) that supervise asset composition, investments and concentration of risk. In addition, supervision is twofold, both from the side of the AMC, both on the side of the fund. On the contrary, the SIIQs are subject only to information supervision by Consob as listed companies and to prudential supervision established by regulations of the Ministry of Economy and Finance.
3. *Financial structure*. The two vehicles have a different ability to use debt. While real estate funds (except those speculative) have a debt constraint equal to 60% of the value

[88] As highlighted by sec. 20, para. 119-bis of Legislative Decree No 33 of 12 September 2014 ("Sblocca Italia" Decree).

of the real estate assets, for SIIQ there is no limit. As a result, financial risk and volatility of returns of the two instruments can be very different from each other.

4. *Governance*. Inside the SIIQ, the governance is typical of joint-stock companies with direct election of directors by the shareholders. On the contrary, real estate funds combine the governance of the AMC as limited liability companies, with fund's own governance through which the shareholders may influence the management only in indirect way through the assembly of shareholders and the Advisory Committee. The meeting of participants may approve, among other things, the replacement of the AMC that govern the fund, the change of the investment policy as well as the application for admission to listing of fund's share. The Advisory Committee expresses opinions, sometimes with a veto, about specific transactions, such as the acquisition or sale of assets of significant value.
5. *Investor protection*. Real estate funds, as "an independent and autonomous capital, distinct from the holdings of the asset management company and of any participant"[89], cannot be tackled nor by creditors of AMC who established them, nor by creditors of the shareholders. The SIIQs, by contrast, are not characterized by the separation of assets, so this implies that actions by the creditors of the company are allowed.
6. *Non-resident investors.* There is a different treatment of incomes distributed by real estate funds and SIIQs towards non-resident investors. For the former, as CIUs, there is a regime of exemption from withholding tax, while to the latter will be applied a withholding taxes. Therefore, for such subjects the investment is not fiscally transparent.
7. *Provision of real estate assets by private investors.* Contributions to the funds are subject to overall legal transcription fees of 3% while the same tax for the provision to SIIQs is fixed at € 168.
8. *Compulsory listing.* Real estate mutual funds are obliged to request admission to listing on a regulated market only when the value of the unit value of shares is less than 25000€ and the shares are addressed to retail investors. On the contrary, the listing is always compulsory for SIIQs. It is however important to remember how the listing, which should ensure greater liquidity, is not a sufficient condition to ensure that the investment is actually liquid. Historically, the Italian stock market was characterised by small companies and with low free float, all problems that the current SIIQs' model does not seem to fully resolve.

[89] Sec. 36, para. 6 of the Consolidated Law on Finance (TUF).

In conclusion, given the structural difference between the two instruments, we can assume that for a certain category of professional investors, real estate funds, especially in the form of reserved funds, will continue to be preferred among the category of indirect real estate vehicles. For other types of investors (such as long term or retail investors), the structure and regulatory restrictions relating to the distribution of profits of SIIQs, could lead such investors to privilege this second instrument. SIIQs instead, with all the risks involved in stock investment, should ensure income streams secured by the obligation to distribution of profit, a greater liquidity (with the possibility of rapid disinvestments) and the hope that the new regime of SIIQ may reduce the risk of significant variances, in the short term, between the value of the shares and the NAV, which now represents, for many retail funds, one of the most critical elements.

1.2.1.1.8 Some additional data on the Italian Market

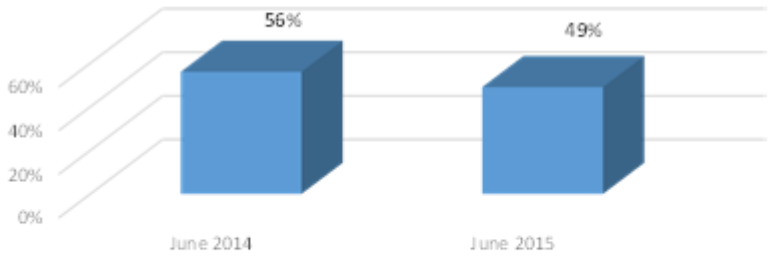
Among the Italian market for indirect real estate investments, SIIQs represents a real estate endowment of about 5.5 billion of euro, depicting the 9% of the market.
At June 30, 2015, publicly listed real estate companies in the form is SIIQs were two:

- Igd Siiq Spa;
- Beni Stabili Siiq Spa:

The main balance sheet highlights, compared to June 30, 2014 can be summarized as follows:

- real estate assets of SIIQs at June 30, 2015 amount to about 5.5 billion euros, a decrease of about 3.5% percent compared with the 2014 data (see Figure 15);
- long term debt amount to 2.7 billion of euro, with a reduction of about 13% compared with the 2014 data;
- the Net Asset Value amounted to 2.8 billion of euro, an increase of about 8 percent from 2014.

Figure 17 - Loan to value of SIIQs

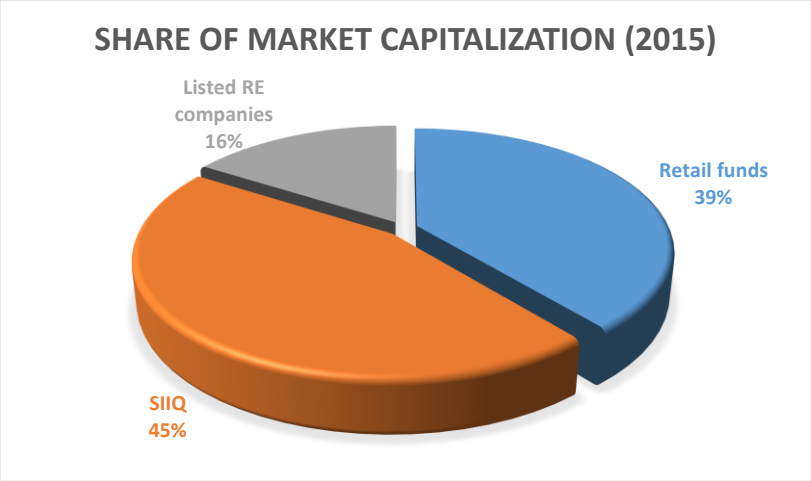


Source: personal elaboration on Borsa Italiana and Scenari Immobiliari data at June 2015

- the average Loan-to-Value is 49%, down from the 56% of the 2014;

- If we consider market capitalization data instead of real estate endowment, at June 30, 2015, SIIQ represents 45% of the total market capitalization of listed real estate vehicles, while in 2014 they represented only the 35% of the total market capitalization (see Figure 18).

Figure 18 – Share of capitalization

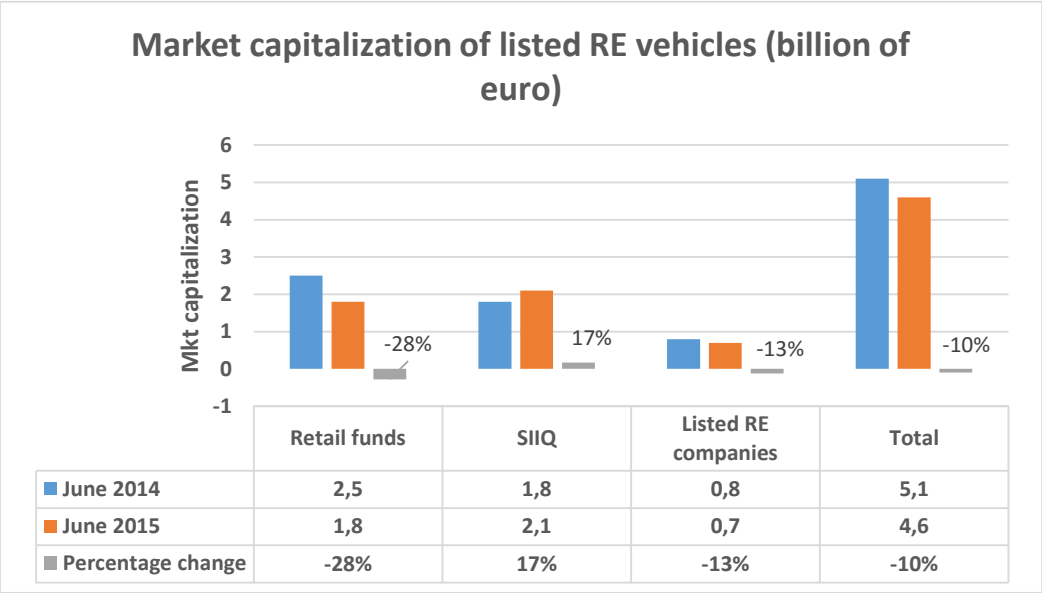


Source: personal elaboration on Borsa Italiana and Scenari Immobiliari data at June 2015

The main capitalization highlights are the following (see Figure 19):

- total capitalization of the SIIQs amount to 2.1 billion of euro, with an increment of about 17% compared to 2014 data;
- the average discount-to-Nav is equal to 26%, down from the 32% value of the previous years;

Figure 19 – Capitalization of listed real estate vehicles



	Retail funds	SIIQ	Listed RE companies	Total
June 2014	2,5	1,8	0,8	5,1
June 2015	1,8	2,1	0,7	4,6
Percentage change	-28%	17%	-13%	-10%

Source:Personal elaboration on Borsa Italiana and Scenari Immobiliari data at June 2015.

1.2.1.3 Final thoughts on instruments under Italian law

Analysed the main instruments available within the Italian market, we need to verify whether, given their characteristics, they can be used for the purposes of our work. As mentioned earlier, our goal, once studied the main vehicles and what suggested by the literature in terms of portfolio management and real estate investments, is to verify whether the indirect real estate investment (listed) allows improving the risk/return trade-off of a hypothetical multi-asset portfolio consisting of equities and bonds.

However the analysis conducted so far leads to negative conclusions.

Let us start first by real estate funds. As we have seen from the graphs (see Figure 13), real estate funds, on a general basis, represent currently the main tool available in the Italian market. However, neither the reserved funds nor that retail may be used. The former, albeit very interesting in terms of asset size, of number (always rising due to new issuing) and duration, cannot be used because there are no official data concerning the composition and evolution of assets, on borrowing, on returns, etc.. The data presented up to now are the result of an estimate made by Scenari Immobiliari on a sample of funds reserved to qualified investors (representing about 30 percent of the total Nav estimated by Scenari Immobiliari) and do not represent official data of the companies (they have no obligation to publish the financial statements. The latter instead, given the availability of historical prices of at least 10 years and all the information previously mentioned, would seem appropriate for the purposes of our work. However, as we have ascertained from the analysis performed (see also Appendix 1 and Figure 16), they are few, they have low capitalisation and low liquidity (given the low trade volumes) and most importantly, they have an average time to maturity of 3.5 years, too little for the medium-long term investment horizon that we want to consider.

At this stage, the choice would seem to fall back on SIIQs, the Italian version of Real Etate Investment Trusts that on June 30, 2015, represents 45% of total market capitalization of listed vehicles for indirect real estate investment. However, there is a fundamental problem: currently in Italy there are only two SIIQs (Igd Siiq spa and Beni Stabili Siiq spa.), which have low capitalization and don't have a track record of historical prices relevant that can be used for our work, since the SIIQ regime has joined the Italian market by only a few years and the response by the operators of the sector has proved to be slow. In addition, even more relevant, as we have highlighted over the previous chapters, the Italian stock market of real estate investment is significantly underdeveloped, taking into consideration the potential market and compared to

European and non-European markets that are more mature and advanced., There are only 36 real estate securities listed on Borsa Italiana at 30 June 2015, 24 real estate closed-end funds listed on MIV and 12 companies, of which 2 SIIQ, listed on MTA and AIM Italia segments. Even more important, the fact that their capitalization, amounting to 5 billion, represents only 1% of the market capitalization.

Ascertained the inadequacy of the instruments so far analysed, we need to shift our focus on the European market in order to complete our work. Therefore, we are going to study briefly, which are the instruments under non-Italian law to which we could have access. The aim of the chapter is to carry out an overview of the most important instruments, to highlight the most suitable vehicle for performing our portfolio simulation.

1.2.2 Instruments under non-Italian Law

There are two main vehicles in Europe for an indirect real estate investment: real estate investment funds and listed real estate companies. As we have already seen in the last part regarding vehicles under Italian-law, with these instruments, not only does the investor take a position in the real estate market, he also acquires different risk/return structures, which may vary according to the instrument being used. In this part, we will analyse REITs and real estate funds of the main European markets, under the aspects of market structure and performance. The aim of this chapter is not an in depth analysis of all the characteristics of the vehicles in each country that will require a lot of effort, but is to provide some useful information that will justify the choice of the proxy for the regression of the last part of my work. Inside my description I decided not to consider real estate Exchange Traded Funds (ETFs)[90] which, currently, represents a marginal market compared to the two instruments mentioned above.

1.2.2.1 Real estate funds

Regarding closed real estate mutual funds, it is not necessary to give other details, as the instruments described in the chapter devoted to instruments under Italian law are almost

[90] This does not mean that, in future, given the low fees and international diversification opportunities, volumes on ETFs will increase and eventually surpass those of most used vehicles such as closed mutual funds.

identical in other legal systems, given the standardization of such investment vehicles. A system diffused in Europe but currently not present in Italy is that of open-ended real estate mutual funds (in Italy we only have closed and semi-closed real estate mutual funds), to whom I should devote some attentions .

Like the closed ones, an open-ended real estate fund is a mutual fund that invests assets mainly in securities offered by public real estate companies that offers all the advantages of funds, as the diversification or the experience of professional and the possibility of investing in real estate enterprises and obtaining their high yields even to small investors. Open-ended real estate funds are regulated at national level by fund-specific regulations but they have some common characteristics that can be summarized as follows[91]:

- They are redeemable at the request of unit/shareholder;
- They are allowed to invest directly or indirectly through participations in real estates and / or in shares / units of other open-ended real estate funds;
- They comply among others with well-defined rules concerning risk diversification, net asset value calculation and subscription and redemption rules.

Regarding the first characteristics (which is the relevant one that distinguishes open from closed one), it is useful to make some thoughts. In effect, the transformation of an asset with a low level of liquidity into a liquid investment entails some problems that cannot be neglected. An open-ended fund must ensure a certain level of liquidity to holders of shares; since the sale of properties can take several months, the fund should implement a mechanism allowing anyway the refund. A first solution is to repay the shares only once the properties have been sold; however, this solution is not optimal since the sale of the assets is motivated by the need to reimburse the shares and not by a specific investment decision, so that it could be implemented at the expense of other investors. A second solution is to maintain a high level of liquidity to meet demands for repayment; given the low profitability of monetary investment in the short term, there will be however a negative impact on fund performance. A third solution is to resort to additional borrowing to address liquidity needs; this solution may raise concerns, since the leverage is used only to create liquidity, without taking into consideration the performance profile and the risk profile that would change inevitably. A final solution is to find a buyer whenever an investor wishes to dispose of the shares (match-to-match liquidity); even this solution entails disadvantages, since it may be difficult to find a buyer, especially depending on the stage of the real estate cycle. In addition, it could also be a significant gap between the

[91] According to the European Fund Classification made by European Fund and Asset Management Association (EFAMA, 2008).

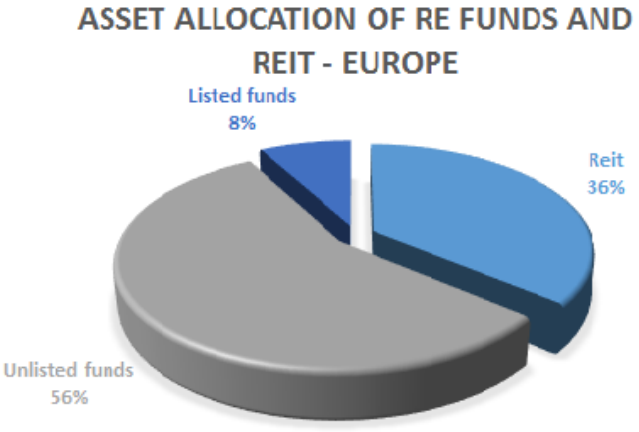
purchase price and the sale price of a share (the so called bid-ask spread), which in some cases can greatly reduce the opportunity to invest.

According to Mattarocci and Pekdemir (2015), "problems with these types of instruments justify the current tendency toward more liquid instruments like Real Estate Investment Trusts".

1.2.2.1.1 Main European markets and performances

The real estate fund market in Europe is very competitive, even compared to other types of funds, and Europe as a whole is one of the leading real estate fund markets in the world, with United Kingdom, Germany, Luxembourg and the Netherlands as the most developed European real estate fund markets (Galiniene and Bumelyte (2011)). The fund and REIT report published by Scenari Immobiliari showed that the number of operating funds went up in 2014 to 1364, and the NAV reached the amount of 444 billion euros, a market share in terms of assets of 64% (see Figure 20). Germany continues to hold the more consistent total assets, followed by UK, Holland and Italy. Compared to previous years, there was a more homogeneous growth, because the asset expansion was due to a moderate increase in all countries and not to a substantial development in some countries in the face of a stagnant trend or downward in others. The funds characterized by the largest structures are typically the German one, with six funds, and the Dutch one, with assets in excess of two billion euros. In the past, there has been an alignment of markets with a NAV value very close between German, France, Switzerland and Luxembourg funds, despite the considerable differences in the number of companies operating and the structural setting of the market. Italy is characterized by the smallest funds' structures with an average market capitalization of 107 million euros. The market trend for funds in different countries is influenced by a variety of factors, such as changes in economic and local real estate, the policy of acquisitions and disposals of individual companies, the life stage of the funds and the market entry of new instruments. Luxembourg, Switzerland and France represent countries whose funds have the best trend. In Luxembourg, even though some difficulties in

Figure 20 - Asset allocation in Europe (2014)



Source: personal elaboration on Scenari Immobiliari data (2015 Report)

2009, the fund sector has experienced a steady and particularly high growth. Switzerland has seen a real collapse in 2007, when the yield fell for the first time below zero, due to a reorganization of the fund sector and the impact of the US economic crisis. Starting from the year following, the performance came back positive, albeit at much lower levels than at the beginning of the decade. The years 2011–2012 showed a downward trend while 2013 saw a strong recovery. France is the only country to have maintained a fairly constant trend.
In the last nine years, the mean performance of European real estate funds has progressively reduced; it has passed from a mean return of 5.8% to a mean return of 1.3%.
But as emerged by the real estate funds report by Scenari Immobiliari, each country has had a different trend depending on its economic characteristics and their real estate market features.
Regarding the year 2014, the average return of European funds is slightly increased over the previous year, around 2.8 percent, with a tendency towards greater homogeneity. It is rare to find vehicles with negative performance. The higher yield continues to characterize the French Scpi funds followed by Opci and property trust in England. The other countries are placed around the European average, with some slight difference upwards or downwards, with the exception of Germany, with above-average returns for the funds reserved and negative for the open funds. The Italy shows a yield less than average, but an improvement from last year.

However, it is not necessary to dwell on further analysis and considerations. As we can see from Figure 21, the majority or real estate funds in Europe (at least 60% in terms of number and 62% in terms of Nav), it is made by funds reserved to qualified investors and not listed on exchanges. As noted above for the Italian market, these tools may not be used in our work given the lack of official data available.

Figure 21 - Assets of European real estate funds (millions of euro)

Paese	Quotaz.	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*
Gran Bretagna		10.143	10.428	12.142	16.598	24.000	44.825	60.294	42.795	36.503	26.075	37.089	40.684	46.858	53.418	77.358	92.000
Numero Puts	*No*	*26*	*27*	*25*	*25*	*33*	*53*	*60*	*62*	*63*	*61*	*67*	*65*	*68*	*63*	*58*	*60*
Germania		48.824	47.825	55.800	85.500	85.322	94.991	82.011	89.621	83.660	92.368	84.740	77.616	77.282	81.121	80.696	76.000
N. fondi aperti	*No*	*17*	*17*	*19*	*20*	*28*	*29*	*31*	*39*	*42*	*40*	*41*	*39*	*35*	*34*	*32*	*29*
Germania		6.387	8.778	11.726	13.485	14.400	16.188	18.325	19.547	19.856	16.280	17.800	20.550	25.030	29.500	48.800	60.000
N. fondi riservati	*No*	*41*	*49*	*60*	*75*	*86*	*93*	*101*	*106*	*119*	*110*	*115*	*115*	*120*	*125*	*156*	*170*
Francia (Scpi)		11.840	11.260	10.783	10.520	11.512	13.240	15.000	17.229	17.414	18.944	22.315	24.840	27.230	29.980	32.870	36.000
Numero fondi	*No*	*248*	*227*	*225*	*143*	*137*	*133*	*128*	*126*	*130*	*132*	*138*	*155*	*150*	*157*	*162*	*165*
Francia (Opci)		-	-	-	-	-	-	-	104	500	7.467	9.817	20.013	27.050	28.500	35.120	42.000
Numero fondi	*No*	-	-	-	-	-	-	-	*4*	*28*	*80*	*96*	*175*	*195*	*205*	*210*	*220*
Spagna		1.216	1.488	2.099	2.830	4.378	6.477	8.678	8.586	8.177	6.351	6.075	4.486	1.607	1.352	326	100
Numero fondi	*No*	*5*	*7*	*9*	*8*	*7*	*6*	*6*	*9*	*9*	*7*	*7*	*6*	*4*	*4*	*2*	*1*
Svizzera		15.443	17.600	20.318	18.385	18.785	9.136	7.924	9.149	15.524	14.454	17.339	20.592	23.000	26.887	31.883	30.000
Numero fondi	*Si*	*31*	*25*	*20*	*18*	*19*	*15*	*15*	*17*	*22*	*20*	*20*	*27*	*30*	*31*	*27*	*27*
Olanda		73.618	80.510	84.120	84.740	85.554	85.012	84.108	86.701	78.551	52.382	61.072	62.980	58.673	60.345	60.907	62.500
Numero fondi	*Misti*	*17*	*22*	*25*	*25*	*25*	*28*	*30*	*32*	*31*	*29*	*30*	*30*	*30*	*30*	*30*	*30*
Lussemburgo		790	2.530	2.816	3.101	3.130	6.712	8.053	16.943	21.382	19.615	19.895	23.083	25.357	28.405	32.565	35.500
Numero fondi	*Misti*	*6*	*18*	*18*	*20*	*22*	*33*	*64*	*95*	*129*	*146*	*171*	*212*	*230*	*244*	*302*	*330*
Italia		-	2.438	3.236	4.048	7.782	13.002	19.360	23.940	27.000	31.200	34.000	36.100	37.000	39.000	43.500	48.200
Numero fondi	*Misti*	-	*7*	*13*	*17*	*29*	*58*	*155*	*186*	*238*	*270*	*305*	*312*	*358*	*365*	*385*	*402*
Totale Nav		168.261	182.857	203.040	239.207	254.863	289.583	303.753	314.615	308.567	285.136	310.142	330.944	349.087	378.508	444.025	482.300
Totale numero fondi		*143*	*399*	*414*	*351*	*386*	*448*	*590*	*676*	*811*	*895*	*990*	*1.136*	*1.220*	*1.258*	*1.364*	*1.434*

* estimate
Source: Scenari Immobiliari (2015 Report)

1.2.2.2 Real Estate Investment Trusts

In many European countries, real estate companies have modified their financial structure and tax position by adopting a legal form based on REITs (Real Estate Investment Trusts), which originated in the US[92], to meet the growing demand from investors for tax efficient real estate investment vehicles. According to Goetzmann and Ibbotson (1990, p.67), REITs were traditionally considered as an "*appetizing investment for the lower standard deviation and the low correlation with other asset classes in a portfolio*". Dates of introduction of the Reit regime in major European countries are presented below while the Appendix (2) at the end of the chapter summarises the features of main REIT regimes in Europe.

In the UK, there were already available vehicles for indirect real estate investment with a corporate or capital structure, from limited partnerships (LPs) to the UK Property Unit Trusts (either in the authorized and not authorized form), the Jersey offshore Unit Trust (JPUT) usually reserved to qualified investors, the corporate form itself with the Irish offshore open-ended investment companies. On 22 March 2006, the Finance Law, by the British government, confirmed the creation of UK REITs, and first vehicles were exchanged on 1 January 2007.

[92] This type of legal structure was born in the 1960s in the United States and grew in almost all advanced countries, most recently in France in 2003, in the United Kingdom in 2006, Germany and Italy in 2007, in Spain in 2009. The name is retained to indicate vehicles with such characteristics even in other jurisdictions.

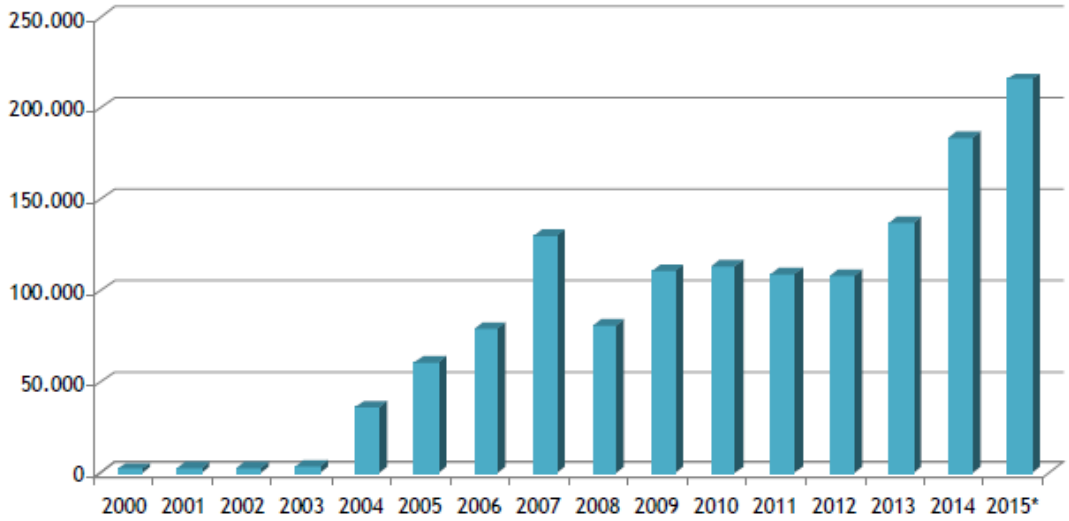
In France, Société immobiliers cotées Investment Corporation (SIIC) was introduced by the Finance Law 2003 and then amended in 2004 (SIIC2) and 2005 (SIIC3).
In Germany, Finanzstandort Initiative Deutschland (IFD) has proposed a regulatory scheme for the G-REIT. As in the case of the French SIIC, the unlisted subsidiaries can request the status of G-REIT if they meet all the requirements except for the listing. Unlike the English discipline, there are not present restrictions regarding the financial structure.
In Finland, REITs were established in 2010, when 'the tax exemption law' was passed by the Finnish parliament. Together with the 'Law on Real Estate Funds' it enables the existence of tax efficient residential REITs.
REITs were introduced in Bulgaria in 2004 with the Special Purpose Investment Companies Act. They are pass-through entities for corporate income tax purposes (i.e., they are not subject to corporate income tax), but are subject to numerous restrictions
The 2013 Finance Act contained provisions for creating the REIT structure in Ireland.
A legislation on REITs was approved in other countries such as Spain and Lithuania where, however, the market is still not operational because some legislative questions must be solved.
Finally, as regards Belgium, in July 2014 was approved a legislative change that introduced the Sir[93], regulated real estate companies. It is an evolution of the Sicafi, as the new regulatory framework is best suited to the development of real estate business.

1.2.2.2.1 Main European markets and performances

The 2014 marked an acceleration in the growth of capitalization of the European Reit, an increase of nearly 34 percent over the previous year and more than 40 percent compared to 2007 tips; all countries show an improving trend, with double-digit increases almost everywhere (see Figure 22).

[93] For a long time Belgian public SICAFI's have been requesting legal framework changes to modernise the regime and to incorporate European and international tendencies. (EPRA, 2011). Unlike the Sicafi, the activity is focused on the development, as well as on the management properties.

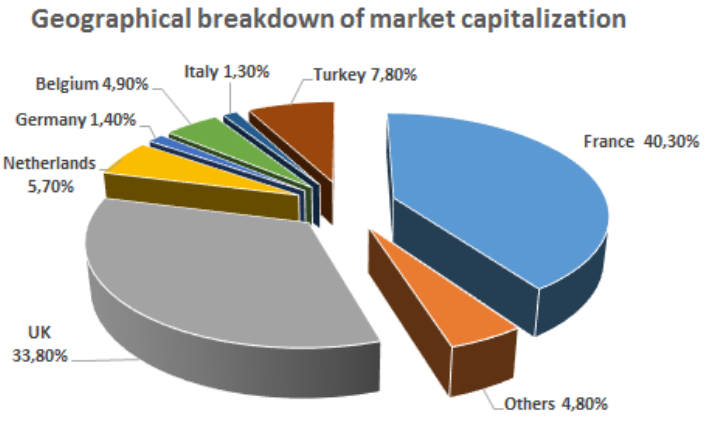
Figure 22 – Market capitalization trend (2000 - 2015) – Millions of euro (Europe total)



* estimate
Source: Scenari Immobiliari (2015 Report)

Even the asset endowment soared, as the increased liquidity in the markets and easier access to credit has allowed a significant increase in the volume of investments. It is estimated a total amount of asset of almost three hundred billion, representing nearly 16 percent of the total global Reits asset. The positive trend was attributable to a number of factors, such as the better performance of stock exchanges, the strengthening of most important companies, the increased the level of liquidity, the departure of the instrument in a growing number of countries and the continuing legislative updates that makes Reits increasingly attractive for investors and companies. The weight of the European instruments on world market capitalization is around 15 percent. The highest capitalisation continues to belong to France, which in 2014 marked a substantial increase after several years of uncertainty (see Figure 23). However, the gap with Britain is undergoing gradual reduction, where the sector is enduring rapid development thanks to the introduction of a large number of new vehicles. Also Belgium shows an evolution under this aspect. In Belgium, the number of operational vehicles is increasing, due to the

Figure 23 - European market capitalization (December 2014)



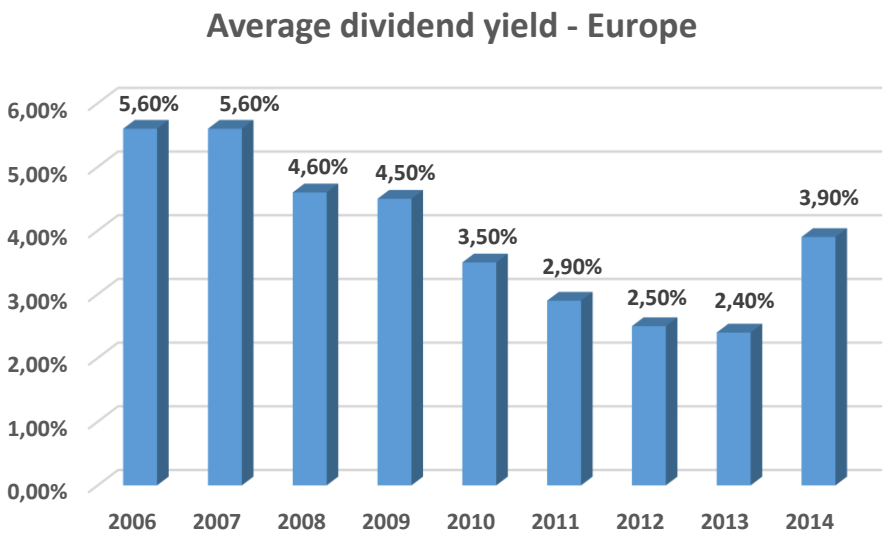
Source: personal elaboration on Scenari Immobiliari data (2015 Report)

recent law that proposes the transformation of the SICAFIs. In the Netherlands instead, the sector continues to be stagnant, because of merger and incorporation processes that have progressively reduced the number of companies operating. A further evolution is expected in this country as the Netherlands approved a legislative amendment aimed at aligning the FBIs with European REITs. Even in Germany capitalization has increased, but the number of REITs is stable, amounting to only four units. In this country, the growing interest by institutional investors finds a barrier in the legislation still constraining the development of the market into question.

The 2014 marked the turning point as regards performance that, in the main markets, rose from 2.5 to 3.9 percent. The ranking is led by Holland (where, however, the presence of a limited number of companies makes the result scarcely comparable with other countries), followed by France, Belgium and Britain. According to Mattarocci (2012, p.125), "*REITs return trend in each one of the European countries shows a direct relation with the local real estate markets trends*". Figure 24 shows the average dividend yield of European REITs in 2014.

Recent years have seen a substantial turnover of buildings because of merger processes and streamline of assets, in order to sell properties barely strategic and improving the quality of the portfolios. Finally, with respect to real estate funds, REITs have a greater propensity to cross-border investments, which led to a better diversification inside the portfolios.

Figure 24 – Average dividend yield of European Reit



Source: personal elaboration on Scenari Immobiliari data (2015 Report)

What we have discuss before lead us to choose European REITs as the financial instrument to be added within our portfolio analysis. By selecting an index representative of the European market, we will overcome the limitations encountered in the Italian market in terms of market capitalization (the weight of European instruments on world market capitalization is around 15 percent and they represent the most capitalized vehicles among the listed European instruments) and of number of titles and length of time series that can be utilized.

In the next chapter, we will review the literature on portfolio management and real estate assets, while in the last chapter we will perform a portfolio analysis.

Appendix 1 – Analysis of Italian listed real estate mutual funds

Fund name	Asset Management Company	Fund type	Real estate assets (mln of €)	Original maturity	New maturity following the deferment of the Board	Deadline "post grazia"	Time to maturity (years)	Discount to NAV	Leverage (assets/ NAV)	Loan to Value (funding received '15/ assets)
Alpha Immobiliare	IDeA FIM IT Sgr Spa	Retail -Qual. Investors - Public contribution	371,65	27/06/2015	27/06/2030	/	15	71%	1,2	14%
Amundi Re Europa	Amundi RE Italia Sgr S.p.a.	Retail - Qual. Investors - Ordinary	138,9	31/12/2016	/	/	1	59%	1,3	31%
Amundi Re Italia	Amundi RE Italia Sgr S.p.a.	Retail - Qual. Investors - Ordinary	178,4	31/12/2016	31/12/2021	31/12/2019	6	61%	1,5	36%
Atlantic 1	IDeA FIM IT Sgr Spa	Retail - Qual. Investors - Private contribution	574,6	31/12/2013	31/12/2016	/	1	26%	2,4	59%
Atlantic 2	IDeA FIM IT Sgr Spa	Retail - Qual. Investors - Private contribution	177,74	30/06/2012	31/12/2018	/	3	40%	1,8	45%
Beta (1) Immobiliare	IDeA FIM IT Sgr Spa	Retail -Qual. Investors - Public contribution	57,8	18/02/2012	31/12/2017	18/02/2015	2	42%	1,4	0%
BNL Portfolio Immobiliare	BNP Paribas REIM SG	Retail - Qual. Investors - Ordinary	104,4	31/12/2010	31/12/2013	31/12/2016	1	47%	1	0%
Delta Immobiliare	IDeA FIM IT Sgr Spa	Retail - Qual. Investors - Ordinary	206,02	31/12/2014	/	31/12/2017	2	60%	1,1	12%
Dolomit (in liquidazione)	Castello SGR	Retail - Qual. Investors - Ordinary	All the assets were sold during the 2013	31/12/2013	Current expiration date: till the end of the settlement	/	/	/	/	/

Fund name	Asset Management Company	Fund type	Real estate assets (mln of €)	Original maturity	New maturity following the deferment of the Board	Deadline "post grazia"	Time to maturity (years)	Discount to NAV	Leverage (assets/ NAV)	Loan to Value (funding received '15/ assets)
Estense Grande Distribuzione	BNP Paribas REIM SG	Retail - Qual. Investors - Ordinary	108,7	31/12/2013	/	31/12/2016	1	30%	1,4	30%
Europa Immobiliare N. 1	Vegagest SGR	Retail - Qual. Investors - Ordinary	221,738	31/12/2015	31/12/2017	/	2	55%	1,3	/
Immobiliare Dinamico	BNP Paribas REIM SG	Retail - Ordinary	313,7	20/04/2020	/	/	5	70%	1,4	38%
Investietico	Aedes Bpm Real Esta	Retail - Qual. Investors - Ordinary	169	31/12/2012	31/12/2015	31/12/2018	3	44%	1,2	/
Immobilium 2001	Investire Sgr Spa	Retail - Ordinary	87,8	31/12/2017	/	31/12/2020	5	57%	1	2%
Invest Real Security	Investire Sgr Spa	Retail - Ordinary	108,7	31/12/2013	/	31/12/2016	1	50%	1,2	14%
Mediolanum Re (A and B class)	Mediolanum Gestione Fondi SGR p.A.	Retail - Ordinary	283,14	31/12/2021	/	/	6	54% (A class), 50% (B class)	1	0%
Obelisco	Investire Sgr Spa	Retail - Ordinary	185,2	31/12/2015	/	31/12/2018	3	67%	1,8	44%
Olinda Fondo Shops (in liquidazione)	Prelios SGR S.p.A.	Retail - Qual. Investors - Private contribution	All the assets were sold during the 2014	31/12/2011	31/12/2014	Settlement ended 25/02/2015	NaN	/	/	/
Opi - Opportunità Italia	Torre SGR S.p.A.	Retail - Ordinary	56,4	31/12/2022	/	/	7	/	1	0%
Polis	Polis Fondi S.G.R.p.A	Retail - Qual. Investors - Ordinary	241,2	31/12/2012	31/12/2015	/	0	58%	1,1	6%

Fund name	Asset Management Company	Fund type	Real estate assets (mln of €)	Original maturity	New maturity following the deferment of the Board	Deadline "post grazia"	Time to maturity (years)	Discount to NAV	Leverage (assets/ NAV)	Loan to Value (funding received '15/ assets)
Risparmio Immobiliare Uno Energia	PensPlan Invest Sgr	Retail - Qual. Investors - Ordinary	136,9	31/12/2018	/	/	3	-34%	4,6	/
Securfondo	Investire Sgr Spa	Retail - Ordinary	97,7	31/12/2014	/	31/12/2017	2	49%	1	0%
Socrate	Fabrica Immobiliare S	Retail - Ordinary	131,8	31/12/2017	/	/	2	57%	1,2	16%
Tecla Fondo Uffici	Prelios SGR S.p.A.	Retail - Qual. Investors - Private contribution	256,2	31/12/2011	31/12/2017	31/12/2014	2	50%	1,8	45%
Unicredito Immobiliare Uno	Torre SGR S.p.A.	Retail - Qual. Investors - Ordinary	256,2	31/12/2014	/	31/12/2017	2	42%	1	0%
Valore Immobiliare Globale	Castello SGR	Retail - Qual. Investors - Ordinary	55	31/12/2014	31/12/2019	/	4	45%	1	0%
Mean							**3,03**	**48%**	**1,45**	**18,70%**

Source: personal elaboration on Borsa Italiana data.

Appendix 2 - Main features of REIT regimes in Europe

Feature	German REIT	French SIIC	Dutch FBI	UK Reit
Legal form	AG (stock corporation) with seat and management in Germany and obligatory listing within EU/EEA.	Any company with a share capital divided into shares. Additional restrictions (not applying to SIIC sub of a SIIC): i) listing in France and ii) minimum share capital of €15 million.	NV, BV (limited liability company) or FGR (mutual fund) or a comparable entity within the EU.	Closed ended company, listed on a "recognised" exchange.
Investors' requirements	No investor must hold more than 10% of voting rights. At least 15% of shares must be held by investors who own less than 3% of voting rights.	No investor or affiliated group of investors may own more than 60%. Upon election for SIIC regime 15% of the shares owned by investors with max 2% interest.	Various shareholders' restrictions apply for tax purposes. Simplified restriction apply for listed FBIs.	Must not be a "close" company.
Activity test	At least 75% of the assets must comprise real estate which meets the qualifying criteria and at least 75% of gross income must come from letting such real state assets. Prohibition of real estate trading (= turnover of more than 50% of average real estate holdings within a 5 year period).	(French) real estate; non qualifying activities are allowed to a certain extent, however subject to standard CIT rate.	Only passive investments; project development for own portfolio within a taxable FBI subsidiary.	Must have at least 75% of its income and assets in qualifying profit rental business ('PRB'). Development is permitted for investment purposes. Owner occupied property does not count as PRB.
Leverage limits	55% of real estate value.	No specific leverage restrictions (however, regular thin capitalisation restrictions impact level of distribution obligations).	60% of fiscal book value properties; 20% for all other investments.	No restriction, but tax charge if finance cover is less than a ratio of 1.25.
Distribution obligation	At least 90% of net annual income. 50% of capital gains included.	85% of the net rental income, 50% of capital gains and 100% of dividends from lower-tier SIIC subsidiaries.	Applicable to full profit; however, capital gains neutralised in tax free reserves.	90% of income profits of PRB (after deducting finance costs and capital allowances). No obligation to distribute capital gains.

Feature	German REIT	French SIIC	Dutch FBI	UK Reit
Tax treatment fund	Full exemption from corporate income tax as well as local trade tax.	Exempt from CIT with respect to qualifying income; regular CIT treatment with respect to nonqualifying income. Additional 20% levy on distributions to 10% or more exempt/low taxed shareholders.	Corporate income tax at a rate of 0%. Capital gains may be added to a tax free reinvestment reserve.	Qualifying income and gains of PRB (UK and indirectly held non-UK) are tax exempt. Charge on development if sold within a 3 year period. Residual business taxed in usual way. Tax charge in REIT if distribution made to corporate shareholder holding 10% or more.
Treaty application	As the G-REIT is subject to corporate income tax (although at a rate of 0%), in general, the G-REIT can make use of bilateral tax treaties.	In general a SIIC can make use of bilateral tax treaties.	As the FBI is subject to corporate income tax (although at a rate of 0%), in general, the FBI can make use of bilateral tax treaties.	Treaties should apply in the usual way, as REIT is taxable.
Withholding tax treatment	Dividend distributions are subject to 25% withholding tax (reduced to 15 or 10% under tax treaties).	25% to nonresident shareholders and 0% to resident shareholders (see also extra levy above).	Dividend distributions are subject to 15% withholding tax. Distributions from the reinvestment reserve can be made free from dividend withholding tax.	22% withholding, subject to treaty relief.
Conversion charge regime	Until December 31, 2009 only 50% of capital gains which are realised through conversion into G-REIT or a transfer of real estate to a G-REIT are taxable ('exit tax privilege'), subject to restrictions.	Latent capital gains are taxed at 16.5% upon election for the regime. Same rate applies to capital gains on sales of properties by standard corporations to SIICs (holding period of 5 years). Reduced rate to sellers extended to December 2008.	No special favourable regime.	Charge of 2% on market value (to allow a step-up in base).

Source: Loyens & Loeff (2007) – Personal elaboration

2. Real estate asset class and modern portfolio theory

In this chapter, we will analyse the role of real estate investment in the diversification of a portfolio of different asset classes. This issue is of great importance in managing portfolios of both retail investors and institutional investors that must be also optimize taking into account legal and regulatory constraints. After making a recall of the basic concepts of portfolio theory of Markowitz (1952), we will review the reference literature on the role of real estate investment in the diversification of multi asset portfolios.

2.1 Markowitz Portfolio Theory

To evaluate the role that real estate investment can play with the purpose of diversifying and improving the efficient frontier, we resort to the portfolio theory of Markowitz (1952) which deals with the allocation of resources in an uncertain universe. The theory seeks to identify, among the possible combinations between assets or asset classes, those that must be discharged and those that might reasonably be adopted. This theory provides not only the combinations of assets available and that can be implemented, but also the optimal combination for a given investor. The latter choice depends on the investor's risk appetite, which may decide to invest in a certain combination of asset (low risk-return) where another decides to invest in a different combination (with increased risk-return), although both combinations are efficient choices in terms of mean-variance criterion.

The basic principle governing Markowitz's theory is that in order to build an efficient portfolio it is necessary to identify a combination of titles to minimize risk and maximize overall return by compensating for asynchronous trends of individual assets. To make that happen, the assets that made up the portfolio should be uncorrelated or, at least, not perfectly correlated.

Markowitz's portfolio theory is based on the following fundamental assumptions:

- Investors are risk adverse and they want to maximize the final wealth;
- There is a unique period of investment;
- Transaction costs and taxes are null and the assets are perfectly divisible;
- Expected value and standard deviations are the crucial parameters that guide the choice of the investors;
- The market is perfectly competitive.

To solve an issue of resource allocation in the context of portfolio theory, we should have the following information:

- Average return of every asset (or asset class);
- Risk of every asset (or asset class);
- Degree of correlation among the return of every couple of assets (or asset classes).

The ex-post return on a stock, measured on a period T, can be expressed as :

$$\frac{P(t+T) - P(t) + D(T)}{P(t)}$$

where P (t) and P (t + T) are market prices in the moments t and t + T and D (T) is the dividend approved by the issuer. The assumption of the equation assumes that the dividend D (T) is perceived on the instant T and is not reinvested, that transaction costs are zero, that there are no withholding taxes on dividends and, finally, that T is the time of evaluation.
The ex-ante return instead, is the one estimated at the beginning of the investment period T. Given that for shares the variables P (t + T) and D (T) are not known with certainty, in order to quantify the ex-ante expected return it is necessary to make predictions about their future value. The classic approach considers R (T), evaluated ex-ante, as a random variable characterized by an average value (μ), which measures the expected return on the title, a level of variance (σ^2) assumed as a measure of uncertainty and a probability distribution that statistically identifies the prices generating process.

Formally, the expected return is defined by the following formula:

$$\mu = E\,[R_T] = \sum_{i=1}^{n} R_i * p(R_i)$$

where $p(R_i)$ is the probability that the expected return for title i-th is R_i. In order to be estimated, this equation requires the estimation of $p(R_i)$, which can be obtained from the models of time series analysis. Having a sample of N observations in the form of historical return series, the arithmetic mean of the observations can therefore be considered as a reliable estimator of the expected return μ.

The expected return is therefore in this hypothesis defined by the relationship:

$$\mu_i = E\,[R_T] = \frac{1}{N}\sum_{j=1}^{N} R_i(j)$$

In the context of modern portfolio theory, a financial asset is considered much riskier the higher is the likelihood that future returns are dispersed from the average estimated value. A valid statistical measure of this effect is the variance, defined as the sum of the squared deviations from the mean, weighted by their probability of occurring and expressed by the following relationship:

$$\sigma^2 = Var\ (R_T) = \sum_{i=1}^{n} (R_i - \mu)^2 * p(R_i)$$

The function σ^2, assumed as a reliable estimate of the financial risk of the title, is evaluated using statistical models. Considering the sample variance as a reliable estimate of the variance of the whole population and designated with N the number of available observations, the risk of a financial asset can be computed using the following formula:

$$\sigma^2 = Var\ (R_T) = \frac{1}{N-1} \sum_{j=1}^{N} [R_{i(j)} - \mu]^2$$

A further fundamental assumption of Markowitz's world concerns the probability distribution on which the mechanism of returns formation is based, which is assumed Gaussian. This means considering that prices are generated by a random process that expresses an expected average value equal to μ and a variance σ^2. This assumption is very useful since normally distributed random variables are described in a comprehensive manner by the first two moments, mean and variance.

If we hypothesize to deal with two assets, return ad variance of a portfolio are given by the following equations:

$$\mu_p = E(R_p) = x_1 E(R_1) + x_2 E(R_2)$$

$$\sigma_p^2 = Var\ (R_p) = x_1^2\ \sigma_1^2 + x_2^2 \sigma_2^2 + 2 x_1 x_2 \sigma_{1\,2}$$

Where:

- $E(R_p)$ = expected return of the portfolio
- x_i = weight of asset *i*
- $E(R_i)$= expected return of asset *i*
- σ_p^2 = variance of portfolio returns
- σ_i^2 = variance of returns of asset *i*
- $\sigma_{1\,2}$ = covariance of returns of asset *1* and *2*

The covariance ($\sigma_{1\,2}$) is given by the following equation:

$\sigma_{1\,2} = \rho_{1\,2}\,\sigma_1\,\sigma_2$

where:

- $\rho_{1\,2}$ = correlation coefficient among asset *1* and *2*
- σ_i = standard deviation of returns of asset *i*

If we want to generalize to the case of N assets, the reference equations become:

$$E(R_p) = \sum_{i=1}^{N} x_i\,E(R_i)$$

$$\sigma_p^2 = \sum_{i=1}^{N} x_i^2\,\sigma_i^2 + 2\sum_{i=1}^{N} x_i \sum_{j=1}^{N} x_j\ \sigma_{i\,j}$$

for $i < j$

Therefore, we deal with two parameters: on one side the average returns of assets, on the other side the risk of assets defined as the variance of the return.

The return of the total portfolio corresponds to the weighted average of the returns of the assets contained inside the portfolio. On the contrary, most of the time, the risk of the portfolio is lower than the risk of the single assets and it does not coincide with the average of them, thanks to the diversification benefit which depends on the degree of correlation among the assets considered. The risk of a portfolio composed of two assets corresponds to the weighted average of the risks only if the returns of the two assets are perfectly positively correlated (taking as a reference the equations previously developed, this correspond to a coefficient $\rho_{1\,2} = +1$). In reality, correlation coefficients of returns are very rarely equal or near to +1: more the correlation moves away from value +1, more the portfolio risk is reduced (the essence of the diversification principle). The intuition is that increases and reductions, so positive and negative returns of the different assets, tend to cancel out since they do not operate simultaneously. Depending on the degree of correlation, the risk of a portfolio may also be lower than the less risky assets it contains: the risk of a portfolio composed of two assets can even be null if the correlation between the returns of two assets is perfectly negative ($\rho_{1\,2} = -1$).

The problem of portfolio optimization is to find the combination of assets that allows minimizing the risk of the portfolio for a given performance defined as target return[94].

[94] It is also possible to maximize portfolio return for given (target) level of risk. However, this optimization process is more difficult from a mathematical point of view.

Therefore, if we generalize to the case of N assets, the equations for the optimization problem are the following:

$$\text{Min } \sigma_p^2$$

Subject to constraints:

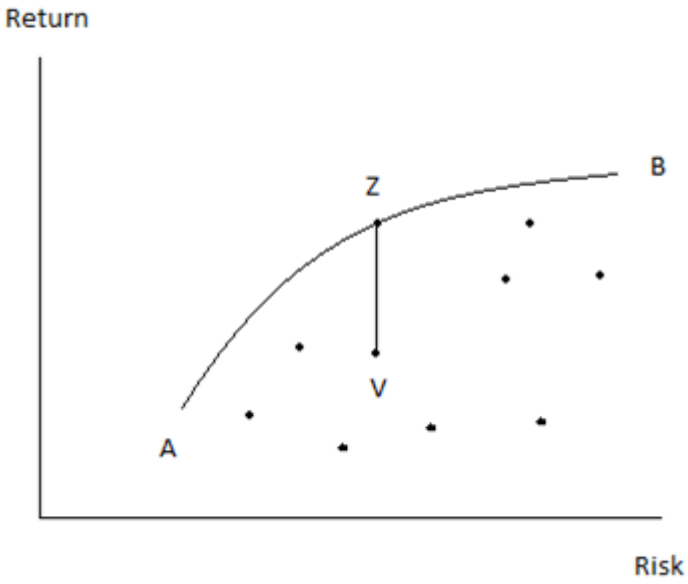
$$\sum_{i=1}^{N} x_i \, E(R_i) = E\left(R_p^*\right)$$

$$\sum_{i=1}^{N} x_i = 1$$

where $E\left(R_p^*\right)$ = target return for portfolio P.

The first constraint indicates that we are trying to achieve a certain return (the target return): so we tries to minimize the risk of the portfolio given this target return. The second constraints instead indicates that the entire wealth (and only that) has to be invested (so financing is not admitted at this stage, but investors are unconstrained in their portfolio formation and can long and short the assets). In order to obtain all the possible combinations of assets, we have to solve the equations given different target returns and consequently we obtain all the efficient combinations according to the mean-variance criterion. The set of possible combinations can be represented graphically by the arch of a parabola. If we look at Figure 25, all the efficient combinations are on the arch AB. The combinations represented by points are not efficient according to mean-variance criterion. The point V for example is not efficient since it is possible to find a combination of assets with a higher return while not assuming any additional risk (point Z on the arch AB).

Figure 25 - Set of possible combinations

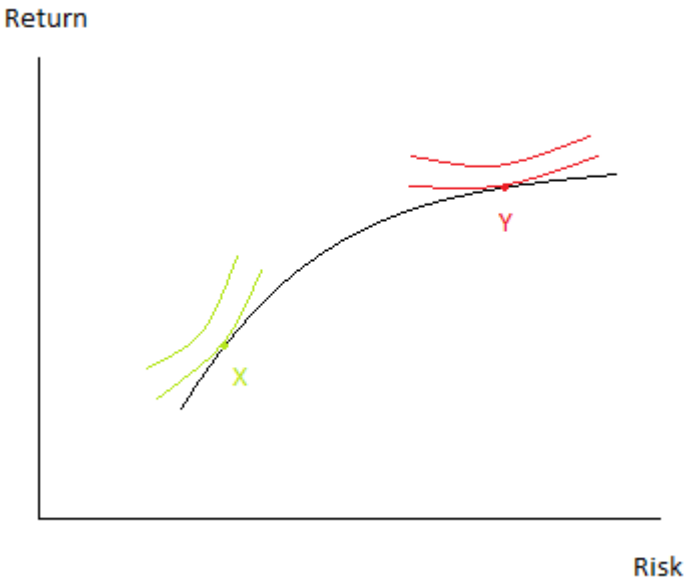


Source: personal elaboration

Portfolio theory not only provides all the possible adoptable combinations of assets, but also the optimal (and obviously efficient) combination for a given investor. The choice of the

optimal portfolio depends on the risk propensity that can be represented by indifference curves, where each indicates a degree of satisfaction. The term *indifference* suggests that the investor is indifferent to the choice of a point on a given curve, since they all give the same level of satisfaction. However, by definition not all the curves give the same level of satisfaction, so the investor wishes to be on the leftmost and topmost curve in the plane. The optimal portfolio for a given investor is on the tangency point between the indifference curve and the efficient frontier.

Figure 26 - Investors' preferences



Source: personal elaboration

At a given level of risk, the investors prefer the portfolio with the highest return (preferences exhibit non-satiation); at a given level of return, they choose the portfolio characterized by the lower risk (we refer to risk-adverse investors, as we have previously stated). It follows that indifference curves will always be convex and with a positive slope, but the slope will be more or less pronounced depending on the degree of risk aversion: the higher it is, the stronger the slope, indicating that an investor calls for higher yields anytime risk increases. Therefore, if we look at Figure 26 we can understand the behaviour of two different type of investors: a risk adverse investor (represented by the green curves) will choose portfolio X, while a more risk lover investor (represented by the red curves) will prefer portfolio Y.

2.2 Literature review

This dissertation lies in the stream of literature that examines the role of real estate in diversified asset portfolios. This literature is based on the Modern Portfolio Theory framework of Markowitz (1952) to examine the benefit of holding real estate (both direct and securitized in the form of REITs) in mixed asset portfolios. As we will see, most of the studies is concentrated on the analysis of US and UK markets, which are the most developed financial markets. Throughout all the works, the securitized instruments taken into consideration are the Real Estate Investment Trusts (from now on REITs), which are widespread used across the world.
This part of the dissertation would be divided into three paragraphs in order to classify the relevant works developed according to the theme treated:

- integration characteristic of listed real estate;
- real estate risk-return and diversification properties;
- optimal allocation size of real estate in a long-term and low-risk portfolio.

2.2.1 Integration characteristic of listed real estate: properties or general stocks dominate real estate equities?

The issue of whether real estate equities are dominated by properties or general stocks has been a crucial theme to all the literature pertaining to REITs and listed real estate instruments. Concerning this topic, Schätz (2011, p.5) in his work says that "*previous studies reach inconsistent results which are largely dependent on the selected method, market or sample*". In this context in effect, the literature on integration characteristics of listed real estate, which we can divide into three main clusters, is primarily focused on US markets using REIT data (see Liu and Mei (1992), Karolyi and Sanders (1998), and Ling et al. (2000)).
According to the studies developed by the authors of the first cluster, in the process analysed can be detected high correlations of securitised real estate to common stocks. To give some examples, Li and Wang (1995) conduct a multifactor asset pricing (MAP) model and find that the US REIT market is integrated with the general stock market. Oppenheimer and Grissom (1998) use frequency space correlations and come to the same conclusion, according to which US REITs show significant co-movement with stock market indices. Moreover, by using regressions, Quan and Titman (1999) detect significant relations between stock returns and changes in property values and rents in 17 different countries. This finding is additionally confirmed by the analysis of Ling and Naranjo (1999), who examine whether commercial real

estate markets are integrated with equity markets. Using multifactor asset pricing (MAP) models, the authors find that the risk premium of the market for exchange-traded real estate companies is integrated with the equity market. In addition, they note that the degree of integration has significantly increased during the 1990s.

The second cluster of studies, which is mostly concentrated on the path overtime of correlations, find that correlation between direct real estate and securitised real estate have increased over time (see Gosh et al. (1996) for the US market). Clayton and MacKinnon (2001) examine the sample between 1978 and 1998 for the US market by the use of a multi-factor approach. Although direct real estate does not contribute to the explanation of REIT returns over the entire sample, the study shows time-varying results concerning the link between REITs, direct real estate and financial assets, that is a very important finding also for studies more recently developed. Nevertheless, they also find increasing correlations among direct and indirect real estate. Hoesli and Serrano (2007), who analyse the relationships between securitised real estate, stocks, bonds and direct real estate in 16 economies, also detect time-varying correlations, reveal decreasing regression betas over time, indicating that the influence of the financial assets on securitised real estate has become less important in recent years. However, also in their analysis stock market and bonds still explain a significant fraction of the variance of securitised real estate. As this does not apply to direct real estate, the results suggest that securitised real estate is driven by stocks and bonds rather than by their underlying property markets.

Nevertheless, a third cluster of more recent studies contradicts the results outlined above and indicates that real estate securities behave more like properties than like general stocks in the long run (see Pagliari et al. (2005), Westerheide (2006), Tsai et al. (2007) or Morawski et al. (2008)). These findings point to the opportunities for investors to combine the advantages of listed real estate with those of direct property investments and have remarkable implications with respect to asset allocation in a multi-asset portfolio.

As there is still no undisputed evidence concerning this question, neither provided by studies that address the pre-modern REIT era before the early 1990s nor by those that address the modern REIT era, it is important to stress also the work developed by Schätz (2011). His work contributes to the literature by analysing this issue through a different and alternative approach (in the same body of literature we can mention also Pavlov and Wachter (2011) and Hoesli and Oikarinen (2012)). For the purposes of the examination, Schätz analyses the real estate markets in the United States and the United Kingdom in the period since 1992. Instead of dealing with the conventional procedure of exclusively focusing on the three financial market indices (real estate equities, direct real estate and general stocks), the author decides to follow the approach

of taking into account the macroeconomic environment in each country. As real estate markets are considered cyclical in nature, the consideration of the macro economy avoids the ignoring of information resulting from the business environment and thus the impact of the cyclical trend. From a statistical point of view, he uses a vector error correction framework and variance decompositions and in both economies he consistently find a significantly stronger linkage among real estate assets compared to the linkage among the examined equity assets. The real estate equity markets are therefore predominantly driven by the progress of the underlying properties, which can therefore still be interpreted as the key driver of listed real estate in the long run. According to Schätz (2011, p.27) findings , long-term investments in listed real estate not only provide opportunities for portfolio diversification, but additionally "*allow the combination of advantages of both real estate assets, including benefits in terms of liquidity, transparency and management*". As a result, even if the issue is still undisputed in the literature, investments in real estate equities can still be classified as an alternative investment and therefore still represent a favourable tool in terms of asset allocation, in particular for institutional and long-term investors.

2.2.2 Diversification benefits of real estate

The benefits of both direct and listed real estate with respect to diversification in a multi- asset portfolio have been discussed in various studies. However, it is important to start analysing the properties of real estate return distributions, which are fundamental for the portfolio manager as they provide key inputs into the assets allocation process.

Lizieri and Ward (2001) review the literature on return distributions and return generating processes of physical and financial real estate investment in the U.S. and the UK. Much of the existing research has focused on testing for normality in real estate returns. Generally, normality is rejected in terms of skewness and kurtosis both domestically and internationally for the securitized market (Lizieri and Satchell (1997), Seiler, Webb and Myer (1999)). However, the indirect market does not exhibit a high degree of autocorrelation (as the real market does). Lizieri et. al. (1998) employ a threshold autoregressive (TAR) model to conclude that a regime-switching models is superior to a linear model as a representation of indirect market returns in the U.S. and the U.K. Their results show that in lower interest environments indirect real estate returns follow a mean reverting process around a positive trend while they oscillate randomly around a falling trend when rates are high. Lizieri and Ward (2000) find that out of a number of alternatives – extreme value, error function, logistic and Student's t – the logistic distribution provides the best fit to U.K. securitized real estate returns.

As we have discussed before in paragraph 2.1 (Markowitz Portfolio Theory), the impact of an asset on portfolio risk and return can be to either reduce risk while delivering the same return or by increasing return at the same level of risk. Early studies into the impact of REITs on multi-asset portfolios suggested that there was no significant difference between the performances of a portfolio of common stocks without REITs and one that included REITs (Kuhle (1987)). However, there are an increasing number of studies that provide significant evidence that the inclusion of REITs in a multi-asset portfolio can both reduce risk in higher risk/return portfolios and enhance returns in lower risk/return portfolios (Mueller et al (2003), Lee and Stevenson (2007)). Diversification benefits of real estate are also considered in Kallberg and Liu (1996). Using a mean-variance efficient framework, the analysis suggests that a 9% allocation to real estate is optimal in a portfolio including stocks, bonds and cash. Grauer and Hakansson (1995) find strong gains from adding real estate to a dynamically managed portfolio of stock and bonds. Chandrashekaran (1999) explores the time-series behaviour of U.S. REIT returns and uses conditioning on lagged returns to devise a dynamic asset allocation strategy including REITs, which yields significant diversification benefits. Lee and Stevenson (2007) also find evidence that including REITs in a multi-asset portfolio consistently provides diversification benefits over different investment horizons and efficient portfolios includes substantial allocations to REITs, with optimal weights increasing over longer investment horizons. His findings would appear to be complementary to research about relationship between listed and direct markets mentioned before, where longer time horizons show a closer relationship between the markets. Evidence from the study by Bond and Glascock (2006) on European real estate securities suggests that REITs have historically acted as low beta investments with counter-cyclical properties. For instance, during the 1990s real estate securities lagged the stock market during the equity bull market and then outperformed the stock market post the “dotcom” crash of the early 2000s. Lee (2003) presents evidence that supports this trend, as REITs were found to act as a relatively good diversifier of risk during periods of financial distress. Baum (2006) also assesses the performance characteristics and diversification benefits of the direct and unlisted indirect property markets of UK, US, Germany and Netherlands. He finds that in the UK and the US, unlisted indirect property has been a good diversifier against bonds and equities. Correlations of indirect unlisted vehicles against equities and bonds are very similar to the results obtained testing the correlation of direct property returns against returns from equities and bonds. The similarity in results occurs due to the high correlation in both the UK and US markets between the returns from unlisted indirect vehicles and direct property. At the end, author’s analysis strongly indicates that assembling a portfolio of securitized investments should enable investors to capture the performance and diversification characteristics of the

direct market. Sa-Aadu, Shilling, and Tiwari (2010) examine the performance of real estate in mixed asset portfolios in a conditional asset pricing framework and find that real estate is one of two asset classes that deliver portfolio gains during bad times, that is when investors really care about returns.

In term of effects of real estate assets on the efficient frontier, we can mention the work developed by Hoesli and Morri (2010), which examine the US market for the period 1985-2006. They find that securitized real estate has a little positive marginal impact on the bottom part of the frontier, while it enables to obtain a strong benefit on the upper part of the frontier. Another approach toward this topic that it is important to highlight is the one recently developed by Boudry, deRoos, and Ukhov (2014). They study the diversification benefits of REIT preferred and common stock using a completely different technique: they employ a utility-based framework. Their motivation for employing a utility-based approach to examine diversification is twofold. First, they stress that investors face constraints so that they cannot short all assets or borrow at the risk free rate as the portfolio optimization process suggests (this means that standard metrics of diversification benefits, such as Sharpe Ratios, are no longer valid measures of utility maximization). Second, using the standard Markowitz framework typically employed in the prior literature, they point out that it is unclear that REITs provide any diversification benefits to investors when they are given anything but a very restricted set of assets to invest in. Taking the view of a long run investor, they conduct the analysis using data from 1992 to 2012. They examine optimal mean-variance portfolios of investors with different levels of risk aversion given access to different classes of assets and they establish that REIT preferred and common stock provides significant diversification benefits to investors. REIT common stock helps low risk aversion investors attain portfolios with higher returns, while REIT preferred stock helps high risk aversion investors by providing a venue for risk reduction.

To conclude and to give some figures, Ibbotson Associates, on behalf of NAREIT[95] (NAREIT, 2002) found that the inclusion of REITs in a well-diversified stock and bond portfolio could have enhanced returns by up to 0.8% annually over the period from 1972 to 2001 and by 1.3% annually for the years 1992 to 2001.

2.2.3 Optimal allocation size

[95] The National Association of Real Estate Investment Trusts is the worldwide representative voice for REITs and publicly traded real estate companies with an interest in U.S. real estate and capital markets.

Studies carried out during the 2000's have shown that securitized real estate has outperformed the direct real estate market with as much as up to 500 basis points on an annual basis during the 80's and 90's and real estate has outperformed many other asset classes with a higher risk-adjusted return (Steinert and Crowe, 2001). Suárez (2009) studies the main characteristics of the large indirect investment vehicles taking the form of listed companies and real estate investment funds in Europe. The result highlights that listed real estate companies in the UK have outperformed the other vehicles and investment in real estate stocks produced a 2.5% higher return than investment in funds or direct investment.

Research conducted in the area of diversification during the 80's and 90's suggest an allocation to real estate around 10% - 20% in a mixed-asset portfolio, depending on the peculiarities of the real estate instrument taken into account (Fogler (1984), Firstinberg, Ross and Zisler (1988)). Webb, Curcio and Rubens (1988) advocate for larger allocations in real estate, suggesting that a full two-thirds of the investor's portfolio should be allocated to real estate. Gilberto (1992) instead, using mean-variance analysis, declares that optimal portfolio allocation to real estate should be between 5% and 10% of total assets. Mueller and Mueller (2003) states that the favourable returns and less volatility make private and public real estate a popular investment among investors especially during downturns in the economy. They conclude that there is opportunity for institutional investors to vary from their targets of allocating 5-10% of their portfolios to real estate. In addition, they find that the correlations between the two real estate assets were near zero. This implies that private and public real estate can provide diversification benefits when coexisting in a mixed-asset portfolio. In conclusion, they argue that unconstrained theoretical allocations to real estate in excess of an astonishing 50% are optimal. Ibbotson Associates (2003), which study the benefits of including real estate assets as a core portfolio holding, conclude that a 20% allocation to REITs increases expected portfolio returns at most risk levels by 50 basis points, while at the same time reducing portfolio risk to make the portfolio more efficiently allocated. Interesting is the work developed by Goodman (2003), according to which REITs are a better option in the portfolio choice of individual investors even when the family home is considered as an asset. His analysis shows that portfolios with 10% to 20% allocations to REITs historically have generally been able to achieve higher average annual returns, with no increase in volatility, compared to portfolios without REITs. This holds also for homeowners with one-third or two-thirds of their wealth invested in their house. According to the author, the findings are attributable to the low correlation between changes in house prices and the returns to real estate stocks, together with the historically competitive returns on real estate stocks relative to other financial assets.

If we shift our focus on institutional investors, Steinert and Crowe (2001) states that the allocation to real estate among them has been kept at low rates of around 5% for the years between 1980-2000. Consequently, one can assume that real estate as an asset class is not growing as an attractive investment choice among institutional investors, with regard taken to both direct real estate and indirect real estate. According to Hartzell, Hekman, and Miles (1986) for example, pension funds have over 96% of their investments in stocks and bonds. They obtain data from an open-ended institutional manager of pension fund real estate investments for the period 1973–1983. In the opinion of Ennis and Burik (1991), in 1990, 54% of all pension funds owned no real estate assets and Defined Contributions pension plans[96] had only 1%. Those pension funds that did hold real estate assets had only 3.5% of total assets in this category. Using the Capital Asset Pricing Model (CAPM) to determine the appropriate percentage for real estate assets, the authors find that 10% to 15% should be allocated to these assets in an efficient portfolio. Chun, Ciochetti, and Shilling (2000) use Compustat data on 938 firms' pension assets and pension benefit obligations (PBOs) from 1988 to 1997. The results of their study indicate that an appropriate asset allocation to equity REITs in a pension fund depends on the funding status of the plan, with overfunded plans tending to hold more real estate than those that are underfunded. Craft (2005) relies on the asset-liability framework used by Chun, Ciochetti, and Shilling (2000) to explore why there is not a higher percentage of real estate assets incorporate pension funds. His empirical results indicate that for a pension fund that is fully funded, asset allocations to private real estate should be 13% and to REITs, 15%. For pension funds that are underfunded, his results show a smaller percentage for private real estate and the same percentage for REITs. Sa-Aadu, Shilling, and Tiwari (2010) find that both real estate assets and alternative investments have gains in a poor economy and/or a volatile economy. Their results indicate that risk-adverse investors should overweight real estate, alternative investments, and government bonds in a bad economy because they act as a hedge when there are unexpected shocks to the portfolio. These same assets classes should also be included in portfolios during good economic conditions. They argue that there are differences in returns across these asset classes and that real estate offers different diversification and hedging properties than alternative investments, as suggested by Peyton and Lotito (see Lee

[96] In the United States, 26 U.S.C. specifies a defined contribution plan as a "plan which provides for an individual account for each participant and for benefits based solely on the amount contributed to the participant's account, and any income, expenses, gains and losses, and any forfeitures of accounts of other participants which may be allocated to such participant's account". While Defined Contribution plans are sometimes referred to as pensions, they are not. The word "pension" is defined as "a fixed amount, other than wages, paid at regular intervals to a person or to the person's surviving dependents in consideration of past services".

(2010), pag.1). In addition, they stress that real estate assets appear to be underweighted in pension fund portfolios.

Studied the relevant topics of Markowitz's portfolio theory and analysed the literature concerning the role of real estate in mixed asset portfolios, in the following chapter we will perform a portfolio analysis with the purpose of testing the effect of the inclusion of listed real estate (in the form of Real Estate Investment Trusts) inside a multi-asset portfolio.

3. The case study

A number of studies have examined the allocation to REITs in the mixed-asset portfolio. However, few have explicitly examined what are the benefits REITs offer to the traditional mixed-asset portfolio made by stocks and bonds, i.e. whether REITs are a return enhancer, diversifier, or both. To examine this issue we will make use of two methodologies. First, following the approach suggested by Wong, Tong and Keow (2012), the study will try to investigate some of the hypothesis previously stated in the literature review, such as the correlation of REITs to other asset classes and the effect of indirect real estate on the efficient frontier of an already existing portfolio. In order to do this, we will compare the efficient frontiers of Markowitz's portfolio theory: the first made only by equities and bonds, the second composed by equities, bonds and indirect real estate. Then, ascertained some of the limitations of Markowitz's model, we will examine the role of real estate asset class using the method suggested by Liang and McIntosh (1999), which decomposes the overall risk adjusted benefits of an investment to an existing portfolio into its diversification benefits and return benefits.
In order to develop our analysis we will take into account three asset classes, each represented by one or more financial series (focused on the European market), covering the period from September 2003 till January 2016.

3.1 Data set

The period we will conduct the analysis on ranges from September 2003 to January 2016, which is mainly the period where academic research in the topic lacks research. In other words it hasn't been conducted that many studies on the period 2003-2015 within the topic of mixed asset portfolios and real estate, compared to the 80's and 90's where lots of studies and research have been completed on. The sample size is divided separately into three time periods to adequately analyse and observe if there are any differences in the performance of the various time periods when compared to the total overall period. The sub-samples considered are the following and to each of them we attached a name that refers to their time positioning with respect to the Global financial crisis of 2008[97]:

- 2003 - 2007: pre-crisis period;

[97] To issue the three different sub-samples we referred to the classification of the stages of the crisis suggested by Elliot (2011). The goal is not to analyse causes and consequences of the financial crisis. The three sub-periods are used to verify the results obtained in the full sample. The names attached to the sub-samples are meant to give an immediate intuition of the characteristics of the reference period (growth period, crisis period, recovery period).

- 2007 - 2011: during-crisis period;
- 2011 - 2016: post-crisis period.

The data set considered in the experiment includes the historical total returns of the following financial series[98]:

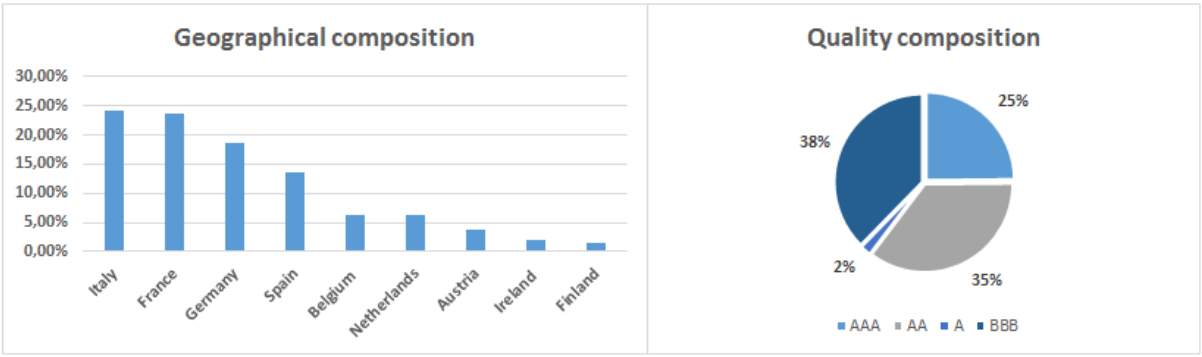
- the Ftse Global Government Bonds E-Zone 10+ years maturity total return index;
- the Iboxx Euro Corporate Bonds All Maturities total return index;
- the Euro Stoxx 50 equity index;
- the Ftse Mib index;
- the Euronext REIT Europe index.

The first two financial series we deal with are representative of the fixed-income asset class. The Ftse Global Government Bonds E-Zone 10+ years index measures the performance of fixed-rate, local currency, investment grade sovereign bonds. It consists of the Eurozone participating countries that meet specific criteria for market size, credit quality, and barriers-to-entry - like those of the World Government Bond Index (WGBI). The purpose of the index is to measure the average performance that holders of the relevant types of bonds experience over time. This is achieved by creating a representative portfolio of bonds, and measuring their performance. At the end of each month the constituents of the portfolio are reviewed and bonds may be removed or added to the index portfolio. It is assumed that any rebalancing does not have a cost. The index is a total return index that takes into account the price changes and interest accrual and payments of each bond. We can see from Figure 27 which is the geographical and quality composition of the index. Italy, France and Germany are the main countries represented, while the main bond qualities are BBB and AAA[99].

[98] Stocks, bonds and REITs historical monthly returns data are taken from Thomson Reuters Datastream Professional data base.

[99] Index quality is defined to be the rating assigned by Standard and Poor's Financial Services LLC ("S&P") when it exists. If a bond is not rated by S&P but it is rated by Moody's Investor Service, Inc ("Moody's"), the S&P equivalent of the Moody's rating is assigned.

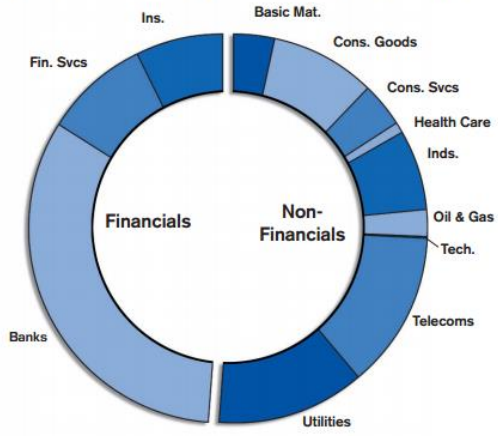
Figure 27- Geographical and quality composition of the index



Source: personal elaboration on FTSE Russel data.

The second index considered is the Markit Iboxx Euro Corporate Bonds All Maturities total return index that provide a benchmark for the European corporate fixed income markets. It represents the investment grade fixed-income universe for Euro-denominated bonds. It is based on multi-source pricing and re-balanced at the end of each month to ensure that constituent selection represents the opportunity set. As we can see from Figure 28, the sector composition of the index is diversified and it represents well the investment universe of European corporate bonds.

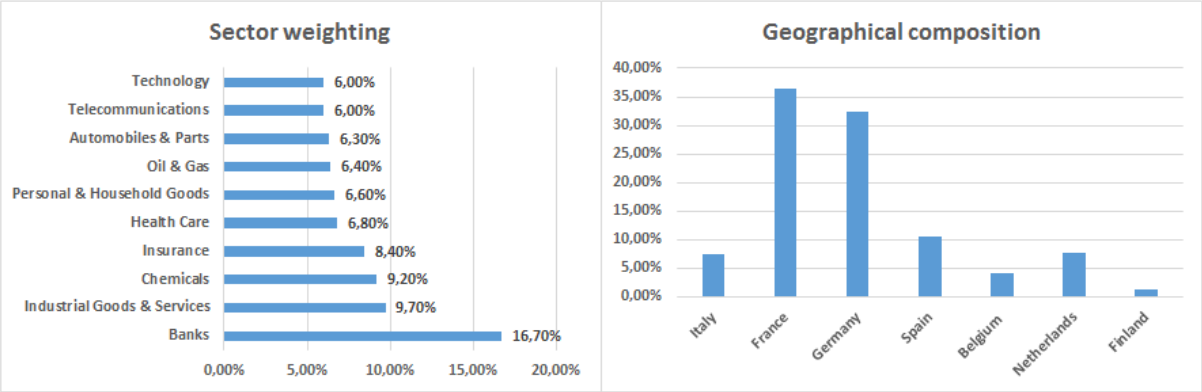
Figure 28 - Sector composition Iboxx Euro Corporate



Source: Markit Iboxx Indices

The equity asset class is represented by two equity indices. The first is the Euro Stoxx 50 total return Index which represents the performance of the 50 largest companies among the 19 supersectors in terms of free-float market capitalization in 12 Eurozone countries. These countries include Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. The index has a fixed number of components and captures about 60% of the free-float market cap of the Euro Stoxx Total Market Index (TMI). In Figure 29 we can analyse the sector weighting and the geographical composition of the index.

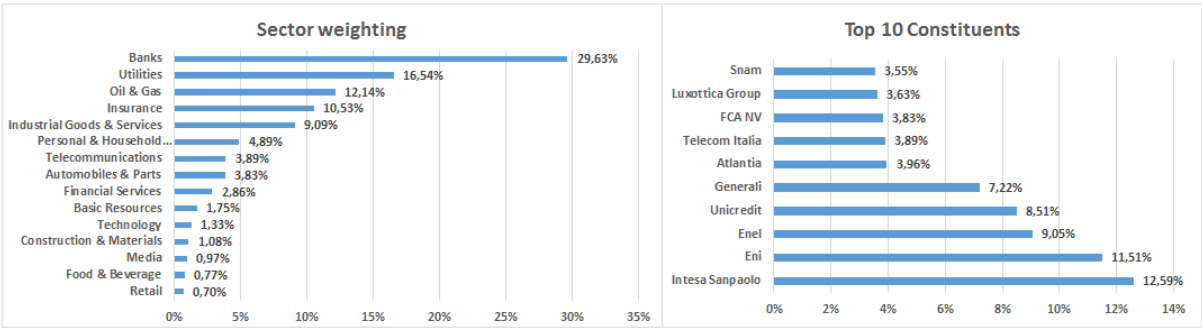
Figure 29 - EURO STOXX 50 Index composition



Source: personal elaboration on Stoxx data

The second equity index considered in the analysis is the Ftse Mib Index, which is the primary benchmark index for the Italian equity market and represents the large cap component of the FTSE Italia All-Share Index. Capturing approximately 80% of the domestic market capitalisation, the index measures the performance of the 40 most liquid and capitalised Italian shares and seeks to replicate the broad sector weights of the Italian stock market. Stocks are free-float weighted to ensure that only the investable opportunity set is included within the index. Figure 30 depicts sector weighting and the top constituents of the index.

Figure 30 – FTSE MIB Index sector weighting and top constituents

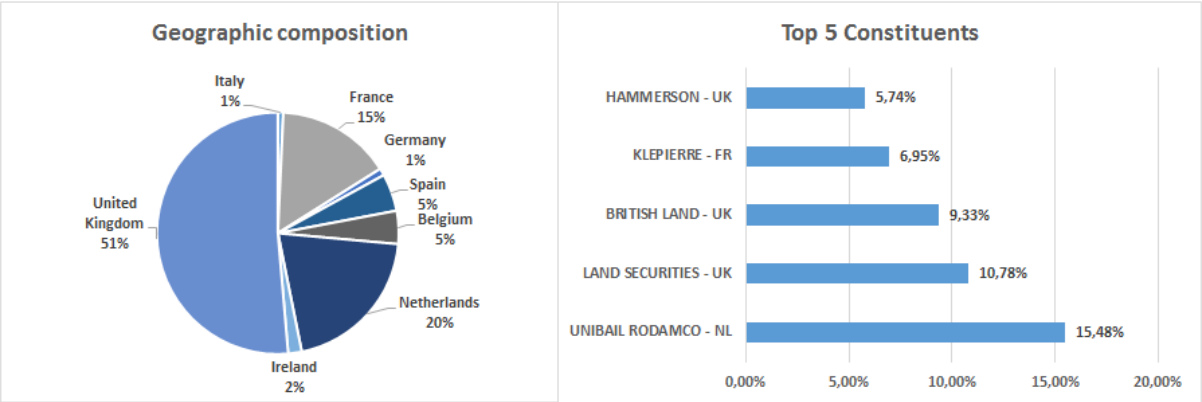


Source: personal elaboration on FTSE Russel data.

The last index considered in the analysis is the Euronext Ieif REIT Europe Index, which is the proxy used to represent the object of the analysis, the real estate asset class in indirect form. The index selects companies whose market capitalization is more than 0.4% of the Universe (property companies listed on European regulated markets that have opted for a tax-transparency regime) with a minimum free float of 20% and with a minimum daily average turnover representing 0.2%. Stocks are screened to ensure liquidity and free float weighted to ensure that the index is investable. As we can see from Figure 31, the geographical composition

of the index represent very well the instruments and the markets we mentioned in the earlier chapter, with United Kingdom, Netherlands and France as the main markets.

Figure 31 - Euronext IEIF REIT Europe Index composition



Source: personal elaboration on Euronext data.

The key summary statistics for the data sub-periods are shown in Figure 32.

The full sample analysis shows that during the entire sample period, REITs offered an average monthly return of 0.943% compared to 0.604% and 0.364% for government bond and corporate bond and to 0.604% and 0.345 for the two equity series. Moreover, even if real estate asset class showed the higher average returns, its volatility was not so high compared to other risky asset classes as Eurostoxx and Ftse Mib. The same results hold also for two of the sub-periods considered, the one previous the global financial crisis and the one related to the post-crisis period. In both periods, the REITs offered higher returns compared to stocks and bonds, confirming the findings of Steinert and Crowe (2001) and Suárez (2009) among others. On the contrary, during the period that covers the crisis (2007-2011), REIT's returns were negative, but still better that the other two riskier benchmark considered.

If we evaluate the standard deviation of the returns, we can denote that REIT's average monthly volatility has been higher relative to government bond indices but in line compared to the equity asset classes. Only in the pre-crisis period REIT has been the riskier asset class, but it has also been the best performer compared to all the indices, supporting the findings of Bond and Glascock (2006) on the European market mentioned in chapter 2.2.2. Concerning performance, Buyan, Kuhle, Ikromov and Chiemeke (2014, p.106) in their work say that "*It is the time when the real estate market had one of its best times in the history of USA and Europe. So, not surprisingly, REITs significantly outperform bonds and stocks*".

Figure 32 - Summary statistics for the data sub-periods

Full sample: 2003-2016	Gbond	Cbond	Stoxx	Mib	Reit
Avg. monthly return	0,604	0,364	0,604	0,345	0,943
Avg. monthly volatility	2,328	1,123	4,890	5,764	5,478
Correlation with Reit	0,196	0,507	0,684	0,658	1,000

Pre-crisis: 2003-2007	Gbond	Cbond	Stoxx	Mib	Reit
Avg. monthly return	0,456	0,291	1,463	1,267	1,821
Avg. monthly volatility	1,723	0,687	2,620	2,621	4,174
Correlation with Reit	0,252	0,272	0,332	0,375	1,000

During crisis: 2007-2011	Gbond	Cbond	Stoxx	Mib	Reit
Avg. monthly return	0,272	0,288	-0,745	-1,317	-0,600
Avg. monthly volatility	2,368	1,537	6,639	7,664	7,314
Correlation with Reit	-0,026	0,550	0,756	0,780	1,000

Post-crisis: 2011-2016	Gbond	Cbond	Stoxx	Mib	Reit
Avg. monthly return	1,080	0,512	1,111	1,104	1,625
Avg. monthly volatility	2,736	0,975	4,312	5,537	4,054
Correlation with Reit	0,496	0,584	0,681	0,493	1,000

Source: personal elaboration on Thomson Reuters Datastream Professional data.

One of the major issues in REIT research is the pattern of correlation in returns between REITs and other asset classes. As we have already stated, it is the correlation of returns between the different asset classes within an investment portfolio that subsequently determine the degree of diversification benefits achieved within that investment portfolio comprising of different asset classes (Maginn, Tuttle, Pinti and McLeavey (2007)). If we look at the correlation coefficients in Figure 32, we can denote that the correlation of REIT has been high with stock indices compared to bonds, confirming the results of Clayton and Mackinnon (2003), Lee, et al. (2008) and Imperiale (2006) among others. Real estate also showed a much stronger correlation with corporate bonds (0.507) than government bonds (0.196), supporting the findings of Sanders (1998). There were also substantial changes in the correlation between REITs and the other asset classes before and after the financial crisis. In particular, the correlation of REITs with government bonds increased a lot from 0.252 (pre-crisis) to 0.496 (post-crisis), while the correlation of REIT with corporate bonds remained relatively steady, confirming the findings of Sanders (1998). In contrast with the findings of Ghosh, et al. (1996) and Clayton and Mackinnon (2001 and 2003), the correlation of REITs with stocks has not shown a U-shape over the sample period. Conversely, the correlation coefficient on the returns of real estate and stocks has increased over time, from values equal to 0.332 and 0.375 for the pre-crisis period

to values 0.681 and 0.493 in the post-crisis period, with a peak during the period that covers the crisis. Data on correlations support also the results of Imperiale (2006), according to which the low REIT correlation in some periods underscores the ability of real estate indirect instruments to be combined with the other asset classes into portfolios that reduce risk without unduly limiting the portfolio returns.

3.2 Methodologies

3.2.1 First methodology: efficient frontiers analysis

The mean-variance approach in optimal portfolio allocation is a widely used method that investors and institutional fund managers apply in constructing portfolios with multiple assets. The purpose of applying this method is to create an efficient diversified portfolio that can improve return while minimizing risk levels. This optimization technique can be applied within an asset class by increasing the number of securities from that asset class. It also can be attained by incorporating multiple asset classes and including different securities from different asset classes. Traditionally, stocks and bonds are utilized in forming optimal portfolios. Investors, including institutional players, have examined various types of assets to combine together to achieve the optimal portfolio. Among those, REITs have been an alternative type of investment considered for portfolio inclusion since 1980.

Markowitz's mean-variance optimization approach referred to the mathematical process of calculating the range of weights to be assigned to different asset classes within an investment portfolio in order to achieve maximum expected return for a given level of risk, or the minimum risk for a given expected return (Markowitz (1952)). As we have seen in chapter 2, any portfolio that achieves the highest level of return at a given level of risk is called an efficient portfolio and the set of all possible efficient portfolios is known as the efficient frontier. A rational investor would therefore choose portfolios along the efficient frontier (Markowitz, 1952).

The inputs needed to compute the asset weights using the mean-variance optimization approach include the assets' expected returns, the expected standard deviations and the variance-covariance matrix of the expected returns between the different assets. There are different approaches to recover them, such as sample moments, rolling methods or the use of an economic model for the evaluation of expected returns (like the Capital Asset Pricing Model). Even if it has some drawbacks, the one we will consider is the sample moment approach. We assume that all the hypothesis of Markowitz are satisfied and we impose a further technical

assumption: the best one-step-ahead forecast is given by the sample moment of the observed returns (namely the expectations for the next period are just the same of today). The latter assumption and the Markowitz hypothesis imply that the returns are identically and independently distributed as a Multivariate Normal. Therefore, what we need is just the mean and the variance obtained from the sample estimators, as we have seen in paragraph 2.1.

In order to examine the role played by real estate investment in portfolio diversification we will compare two efficient frontiers, as suggested by Wong, Tong and Keow (2012):

- the first frontier will be composed only by the first four indices, so the benchmarks representing bond and equity asset classes;
- the second frontier will be made by all the asset classes considered, including also the real estate investment.

To draw further studies, the efficient frontiers developed with the quantitative approach will be compared with a benchmark. This benchmark (from now on BMK in the analysis) is a classic portfolio divided among bonds and stocks in equal measure. In our study, it is an equally weighted portfolio divided among the four base asset classes considered: government bond, corporate bond, Eurostoxx and Ftse Mib. The portfolio obtained is in this way equally divided between equities and fixed income securities and it tries to simulate a 50/50[100] allocation that does not compromise the real estate asset class as an investment opportunity.
In addition, with the inputs (means and covariances) estimated, we will compute two other important portfolios, the Global Minimum Variance (GMV) and the Maximum Trade-off (TAN) through which we can evaluate the unconstrained EF. The global minimum-variance portfolio is the leftmost point of the mean-variance efficient frontier, so it represents the starting point of the EF and the portfolio with the lowest level of risk that can be achieved: portfolio returns below the GMV portfolio are inefficient. This portfolio is a solution of the following minimum problem:

$$\min_{w} w'\Sigma w$$

$$w'\iota = 1$$

where w is the vector of portfolio weights, Σ is the variance-covariance matrix of the assets, and ι is an appropriately-sized vector of ones. We do not put any further constraints on the problem, in particular, short sales are allowed here. The Maximum Trade-off (TAN) is the

[100] This allocation is very close to the one definend by Doeswijk, Lam and Swinkels (2014) in their evaluation of the Global Multi-Asset Market Portfolio.

portfolio that maximises the Sharpe ratio. Portfolio weights can be obtained as a solution of the following maximum problem:

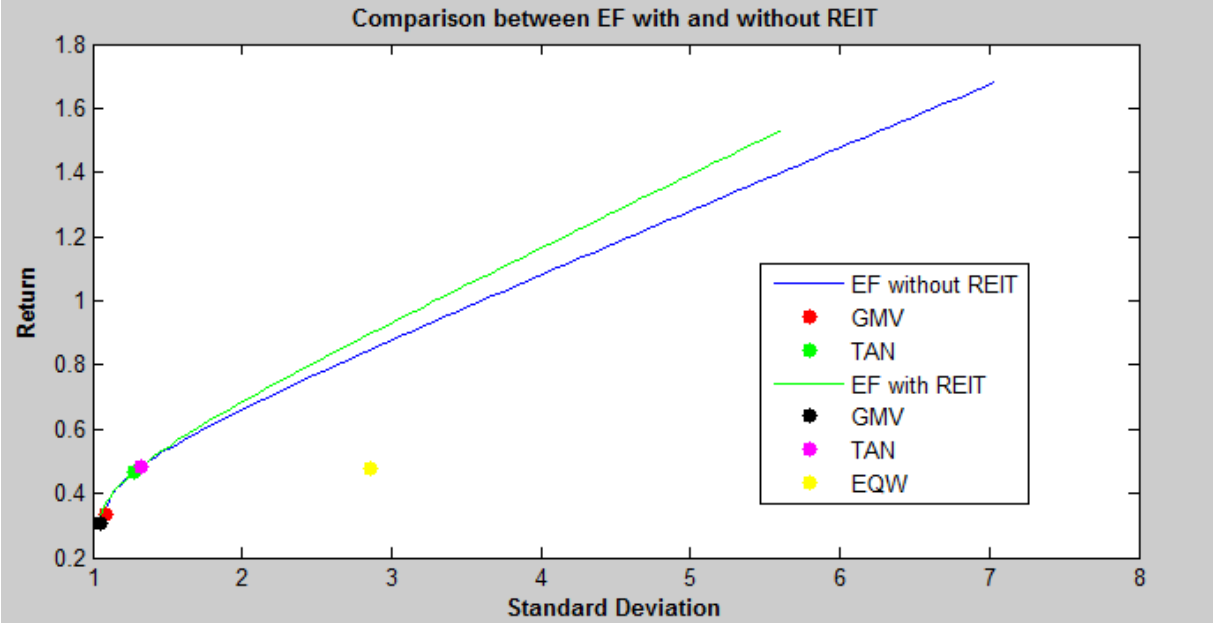
$$\max_{w} \frac{w'r}{\sqrt{w'\Sigma w}}$$
$$w'\iota = 1$$

where w is the vector of portfolio weights, Σ is the variance-covariance matrix of the assets, ι is an appropriately-sized vector of ones and r is the vector of returns.

3.2.1.1 Results of the first methodology

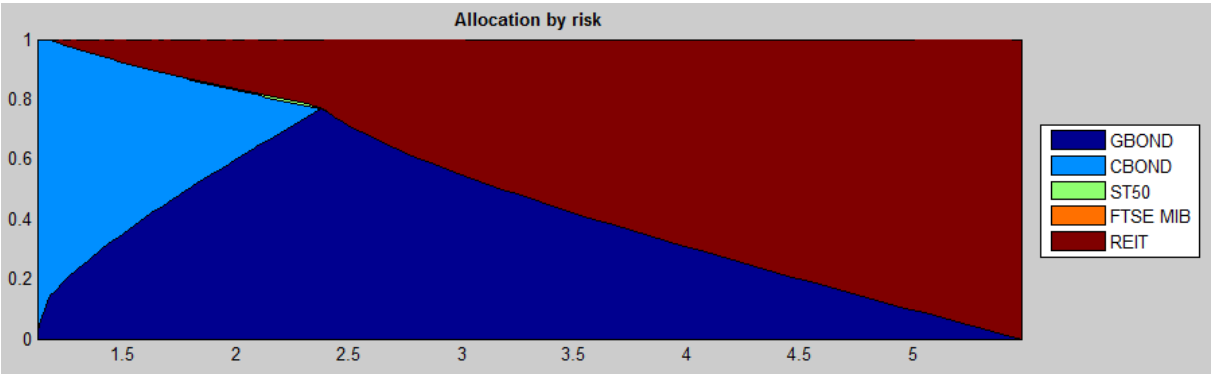
Given the previous results (Figure 32) that real estate asset class is not perfectly correlated with the asset classes of the equities and government bonds (the correlation coefficient is less than 1), Brueggeman and Fisher (2008) and Gibson (2008) highlighted that reduction in the risk levels and even some degree of financial performance improvement in portfolios made up of different combination of these asset classes will be possible. Figure 33 below shows the computed efficient frontiers for the two different investment portfolios issued in the full sample period. The efficient frontier made only by the first four asset classes is called "EF without REIT" while the efficient frontier that consider also the real estate asset class is called "EF with REIT". The figure clearly shows that the 5-asset portfolio dominates the 4-asset portfolio in all the range of risk considered. More specifically, the inclusion of the real estate asset class into a multi-asset portfolio that consist of equity and government bond asset classes help that portfolio to reduce its volatility or risk levels while at the same time increases its average monthly return. The effect is greater in the upper part of the efficient frontier, namely indirect real estate investment allows to reach a higher degree of return in riskier portfolios confirming the findings of Hoesli and Morri (2010), Mueller et al (2003), Lee and Stevenson (2007). Therefore, we can say that the effect of the indirect real estate investment is marginally positive in the lower part of the efficient frontier, but it produces a strong benefit if we move on the right side of the efficient frontier, contrary to what stated by Kuhle (1987). This issue emerges also from the analysis of Figure 34 concerning the optimal weights of asset classes in efficient portfolios. As we can denote, the allocation to real estate asset class increases progressively moving towards the right side of the efficient frontier, i.e. higher levels of volatility. The figure also shows one of the limitations of the methodology implemented; using the approach of Markowitz (which is purely quantitative) indeed can lead towards the construction of portfolios that are not well balanced and concentrated on few indices.

Figure 33 – Comparison between the efficient frontiers



Source: personal elaboration on Thomson Reuters Datastream Professional data.

Figure 34 - Weightings of asset classes based on risk



Source: personal elaboration on Thomson Reuters Datastream Professional data.

From the analysis of Figure 33 we can also notice how inefficient is the classic 50/50 portfolio (the yellow point EQW) composed only with the four asset classes (bonds and equities) compared to the portfolios of the efficient frontier. At equal risk (shifting upwards) we might get a portfolio characterised by the same risk but from higher return. At the same performance level considered (shifting to the left), we might choose a portfolio with the same return but characterized by a significantly lower volatility. To give some figures, Figure 35 presents the average monthly returns and volatility of the benchmark and of the two portfolios (GMV and TAN) we decided to consider. As we can see, the BMK is inefficient with respect to the

portfolios on the frontier. If for example we choose the TAN portfolio, we could obtain a 1% higher return on average, while reducing the volatility of 53% point.

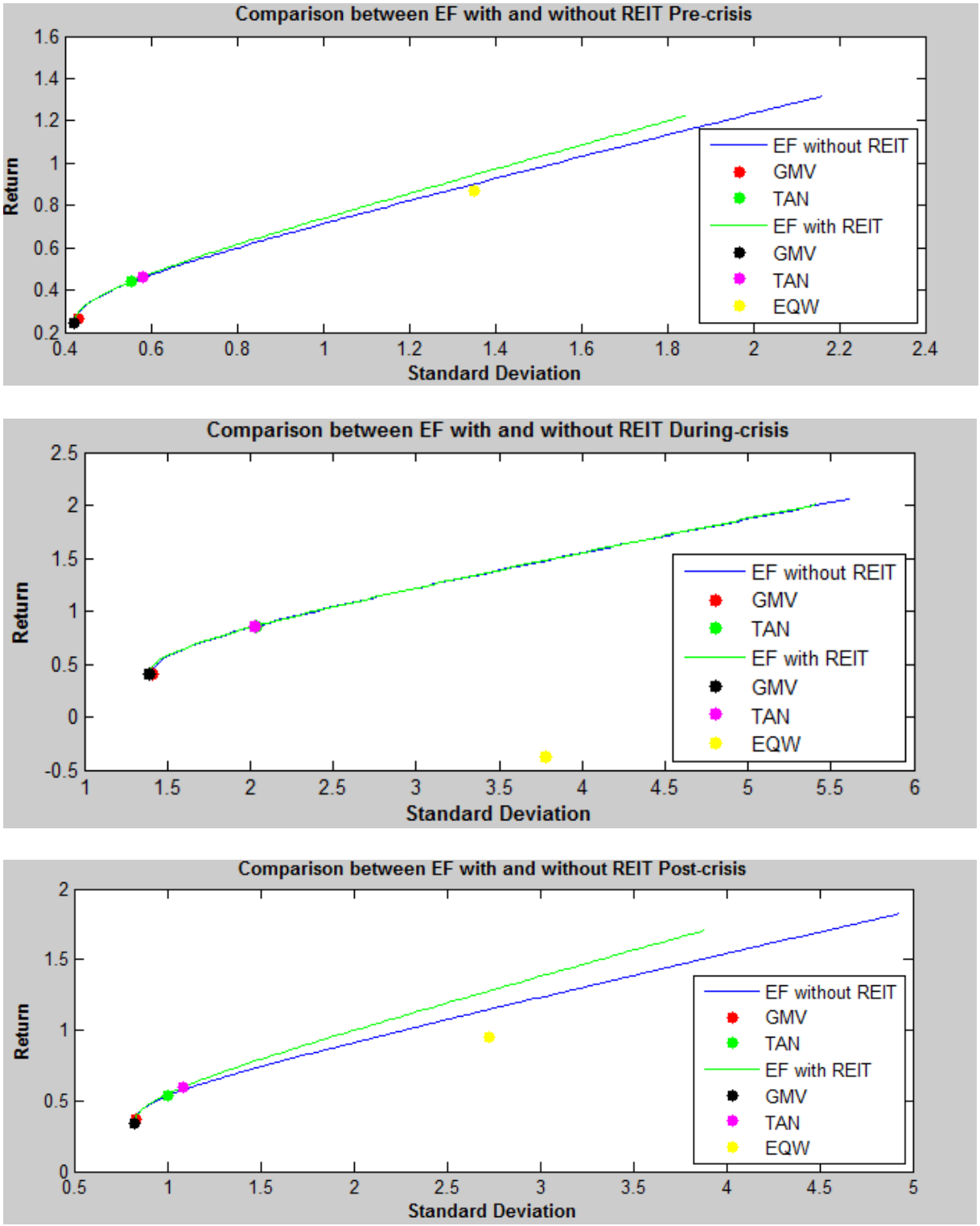
Figure 35 – Average monthly returns and volatility

Full sample	GMV	TAN	BMK
Average monthly Return	0,3063	0,4848	0,4792
Average monthly Volatility	1,0519	1,3235	2,8555

Source: personal elaboration on Thomson Reuters Datastream Professional data.

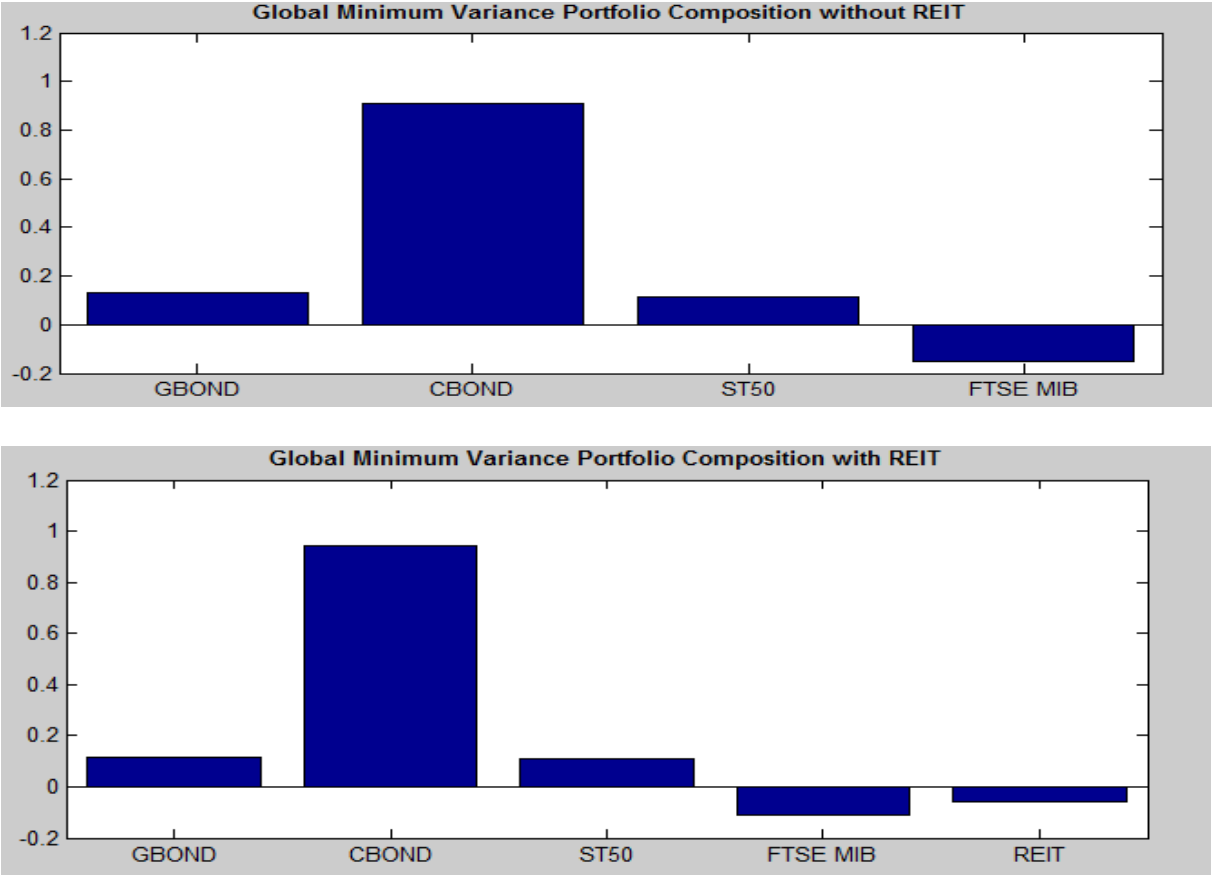
In order to check the validity of the findings related to the effect of the real estate asset class on the efficient frontier, we repeated the above discussed methodology on the three sub-samples considered: pre-crisis period, during-crisis period and post-crisis period (see Figure 36).
Like in the full-sample case, the efficient frontier with REIT dominates the one composed only by equities and bonds and the effect of the REIT inclusion is mainly in the upper part of the frontier. In the comparison of the during-crisis sub-sample, we can denote that the two frontiers are indistinguishable and the GMV and TAN portfolios are nearly equal. This happens because the quantitative estimation method gives the same weights to the different asset classes in order to obtain the efficient frontier. To give an example, we can see from Figure 36 that the weights of the GMV portfolios are almost identical with and without the REIT inclusion.

Figure 36 – Efficient frontiers in the three sub-samples



Source: personal elaboration on Thomson Reuters Datastream Professional data.

Figure 37 – GMV portfolios composition



Source: personal elaboration on Thomson Reuters Datastream Professional data.

While it is a useful tool to analyse historical performances, the traditional Markowitz's mean-variance optimization approach rarely leads to balanced asset allocations that are intuitively forward-looking, i.e. strategic asset allocations that can be implemented in portfolios to achieve realistic expected returns over the long-term future within acceptable risk limits (Idzorek et al. (2006)). It has been noted that the use of mean-variance optimization techniques could potentially lead extreme portfolios whereby some assets take on zero weights while others have large allocations, like in the GMV portfolios of Figure 36 (Black and Litterman (1992)). While portfolios derived from pure mean-variance optimization techniques are statistically optimal, they are by no means intuitive and acceptable to any prudent portfolio investor due to their extreme asset allocations (Byrne and Lee (1995)).

To overcome some of the limitations encountered and to study whether the inclusion of the real estate asset class would have had positive effects in terms of higher performances or lower risk, we have decided to conduct a further backtest analysis. This time, instead of implementing an unconstrained allocation (as in the previous case), we decided to impose limits to the weights of the various asset classes as it is usual for mixed asset portfolios. The goal of imposing these

limits is to avoid problems of excessive concentration on some indices. The constraints we decide to impose are the following:

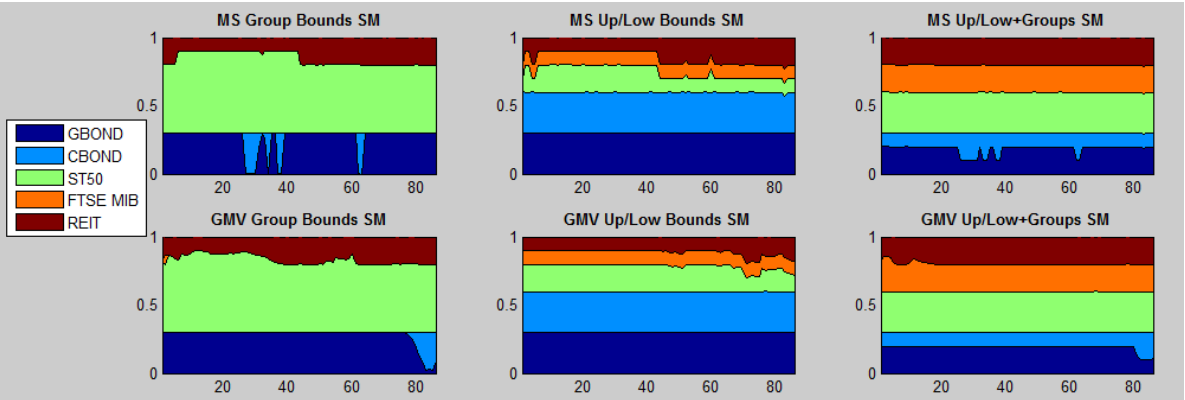
- no short selling constraint[101] (so all the weights have to be positive or at least equal to zero);
- lower bound (10%) and upper bound (30%) to avoid extreme positions and to guarantee a minimum diversification among the asset classes;
- group bounds to ensure that all the macro-asset classes (equity, bond, real estate) are represented. The bounds we choose for the weights are the following: 20% < Bonds < 30%, 50% < Equities < 70%, 10% < REIT < 30%.

Instead of examining the efficient frontiers, using the inputs previously computed and the above bounds we compared the evolution of GMV and TAN portfolios implemented with the following three different strategies:

- no short selling and lower/upper bounds;
- no short selling and group bounds;
- no short selling, lower/upper bounds plus group bounds.

As in the previous case, to gather further conclusion we also considered our usual benchmark, the equally weighted portfolio. The first thing we can notice (see Figure 38) is that using the constraint the portfolio composition is much more balanced and diversified across the different asset classes. Both the first and the second strategy lead to a more balanced allocation with respect to the one we have seen in the unconstrained efficient frontiers (see GMV portfolio of Figure 37).Therefore, we have been able to overcome one of the limitation previously encountered.

Figure 38 – Composition evolution of the different strategies

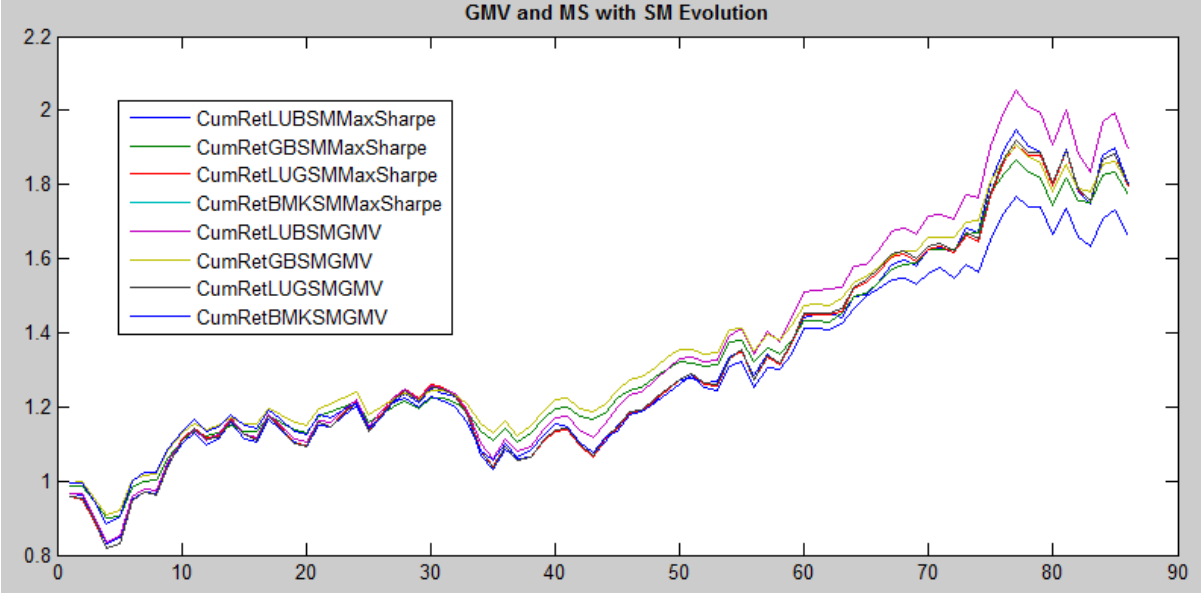


[101] When we put such constraints an analytical solution does not exist any more. Anyway, we can estimate the vector of the portfolio weights by numerical approaches starting from a set of optimal portfolios.

Source: personal elaboration on Thomson Reuters Datastream Professional data.

Using the weights and the realized returns of the strategies, we also compared the cumulated returns[102] (see Figure 39). As we can see, they are all positive. The best performer is the Global Minimum Variance computed only with upper and lower bounds, while the worst is our equally weighted benchmark. This is a good result for our analysis since the GMV portfolio includes a good amount of real estate asset class (the average weight across the period is 12%), confirming the results of Hoesli and Morri (2010), Mueller et al (2003), Lee and Stevenson (2007) in terms of performance and those of Fogler (1984), Firstinberg, Ross and Zisler (1988) in term of optimal allocation.

Figure 39 – Cumulated returns of the portfolios



Source: personal elaboration on Thomson Reuters Datastream Professional data.

The results of the cumulated returns are also confirmed by the evaluation of portfolio moments and by the analysis of performance measures. In particular, we compared the different portfolios using the Sharpe ratio[103] and the Sortino[104] ratio (Figure 40). The GMV and the TAN (MS) portfolios including a 10-12% amount of real estate exhibits the better Sharpe ratio and the

[102] Computed as $R_t = [\prod_{i=m+1}^{t}(1 + r_i)] - 1$ where m indicates the months.
[103] The return per unit of total risk: Sharpe = $E\ [R_t] / V[R_t]$, where E indicates expected returns and V standard deviation.
[104] The return per unit of downside risk (DSR): Sortino = $E\ [R_t]/[DSR]$, where DSR represents the volatility of negative returns.

better Sortino ratio and once again, they prove more efficient with respect to the classic portfolio made by equities and bonds only.

Figure 40 – Performance measures

Strategy	Sharpe ratio	Sortino ratio
GMV Group Bounds	0,218	0,380
GMV Up/Low Bounds	0,279	0,460
GMV Low/up+Groups	0,194	0,337
MS Group Bounds	0,199	0,329
MS Up/Low Bounds	0,271	0,458
MS Low/up+Groups	0,193	0,333
BMK	0,202	0,342

Source: personal elaboration on Thomson Reuters Datastream Professional data.

However, the purpose of our analysis is not to implement a real strategic asset allocation but to study the effect that the inclusion of the REIT could have on a classic portfolio. Even if they provide great insights to understand the potential role of the real estate investment within a multi asset portfolio, the comparison methodology based on the efficient frontiers and the portfolio simulation used up to this point do not give information to specifically quantify the benefit supplied by the REITs to the portfolio or the alternative asset classes. In addition, all the analysis made until now are dependent on the specific weight given to the real estate asset class.

Consequently, in order to study in depth this issue, we need to refer to the model developed by Liang and McIntosh (1999) that allow us to get rid of weight dependency on our analysis.

3.2.2 Second methodology: how to measure the benefits

As we have seen in the literature review of chapter 2.2.2, several authors have studied the effect of including real estate asset class inside a multi-asset portfolio (Kuhle, (1987), Mueller et al (2003), Lee and Stevenson (2007)). Nonetheless, none of the previous studies examined the magnitude and the type of benefits REITs offer to the mixed-asset portfolio. In other words, none of them analyses if real estate is a return enhancer, diversifier or both. This part of the work examines this issue using the method suggested by Liang and McIntosh (1999), which decompose the overall risk-adjusted benefits of an investment to an existing portfolio into its diversification benefits and return benefits. First we will conduct an analysis on the single asset

classes considered and then, using the benchmark developed in the previous section (the 50/50 portfolio equally divided among stocks and bonds), we will study the potential benefits of the inclusion of the real estate asset class into that portfolio. In addition, rather than simply analysing the benefits of the REIT over the entire time period under investigation, we will examine the evolving behaviour of the benefits of real estate asset class to the benchmark portfolio in the three sub-periods stated in the previous part.

3.2.2.1 The model

The simplest way to examine the benefit from holding a portfolio consisting of an allocation w in investment i and $(1-w)$ in an existing portfolio is to calculate the difference in returns between the old and new portfolios:

$$R_{new-old} = R_{new} - R_{old} \qquad (1)$$

$$R_{new} = w_i R_i + (1 - w_i) R_{old} \qquad (1\text{-bis})$$

where R_{new} is the return of the new portfolio, R_{old} is the return of the existing (old) portfolio and w_i is the weight in investment *i*. However, because the old and new portfolios have different risk characteristics the two portfolios cannot be compared directly by equation (1). Liang and McIntosh (1999) therefore suggest using the risk-adjusted performance (RAP) measure developed by Modigliani and Modigliani (1997) to make the risks of the two portfolios comparable, which then allows the two portfolios to be compared on an equivalent return basis. Unlike the Sharpe Ratio, from which it is derived, Modigliani and Modigliani's RAP is measured in basis points, the traditional unit to measure return, and hence allow investors to easily compare the risk-adjusted performance of alternative investments. The RAP of the new portfolio compared with the old portfolio can be derived as follows[105]:

$$RAP_{new} = \frac{\sigma_{old}}{\sigma_{new}} \left(R_{new} - R_f\right) + R_f \qquad (2)$$

where RAP_{new} is the risk-adjusted performance of the new portfolio, $\sigma_{new}$is the standard deviation of the new portfolio's returns, σ_{old} is the standard deviation of the old portfolio's returns, R_{new} is the return of the new portfolio and R_f is the risk-free rate of return.

[105] Using this method, the portfolio's excess return is adjusted based on the portfolio's relative riskiness with respect to that of the benchmark portfolio (i.e. $\sigma_{old}/\sigma_{new}$). The Modigliani and Modigliani measure is used to characterize how well a portfolio's return rewards an investor for the amount of risk taken, relative to that of some benchmark portfolio and to the risk-free rate.

Therefore, after adjusting for the differences in risk between the new and old portfolios, the difference in return performance can be examined on a comparable basis by:

$$R_{new-old} = \frac{\sigma_{old}}{\sigma_{new}} \left(R_{new} - R_f\right) - (R_{old} - R_f) \qquad (3)$$

However, the RAP of the new portfolio has the drawback that it is dependent on the amount of capital invested in the additional investment (since the return R_{new}depends also on the amount invested in the new investment *i*). For example, if the additional investment is extremely attractive relative to the existing portfolio, the total benefits to the portfolio will increase (or decrease) as more (or less) capital is invested in the additional investment. Therefore, the overall benefit (and other benefits as well) cannot be compared with the overall benefits of different investments available in different amounts. To a certain extent, we can overcome this problem by normalizing the benefits. Dividing the benefits formulas by the allocation will yield the benefit per unit of allocation, or the normalized value of the benefit. Therefore, the overall benefit (OB) of the new portfolio needs to be calculated as:

$$OB_i = \left[\frac{\sigma_{old}}{\sigma_{new}} \left(R_{new} - R_f\right) - \left(R_{old} - R_f\right)\right] / w_i \qquad (4)$$

where OB_i is the overall benefit of investment *i* and all the other terms are as before. When $R_{new} = R_{old}$, (i.e., $R_{new} = R_{old} = R_i$), Liang and Macintosh (1999) show that the diversification benefit (DB) of investment *i* in the new portfolio can be calculated as:

$$DB_i = \left[\left(R_{old} - R_f\right)\left(\frac{\sigma_{old}}{\sigma_{new}} - 1\right)\right] / w_i \qquad (5)$$

Alternatively, if the volatilities of the new and old portfolios are the same, namely $\sigma_{old} = \sigma_{new}$, the return benefit (RB) of investment *i* is equal to its overall benefit:

$$RB_i = (R_{new} - R_{old}) / \ w_i = R_i - R_{old} \qquad (6)$$

Lastly, the interaction benefit (IB) term between the return benefit and diversification benefit of investment *i* with weight (w_i) in the new portfolio is calculated as:

$$IB_i = [(R_{new} - R_{old})\left(\frac{\sigma_{old}}{\sigma_{new}} - 1\right)] / w_i \qquad (7)$$

so that $OB_i = DB_i + RB_i + IB_i$. The interaction term is typically small relative to the diversification benefit and return benefit because it is the product of two second order terms.

If we take one further mathematical step, Liang and McIntosh (1999) suggest that we can eliminate the allocation dependency entirely. If the allocation to the additional investment is infinitesimal (so we take the limits on the right hand side of equations 4, 5, 6 and 7, as w_i

approaches zero), the normalized benefits become marginal benefits that are unrelated to the allocation to the additional investment. Using this assumption, the overall benefit of the additional investment then has a single value relative to the existing portfolio that can be compared with the overall benefits of different investments measured in the same fashion. The benefits equations became as follows:

$$OB_i = \left(R_i - R_f\right) - \left(\frac{\sigma_i}{\sigma_{old}}\,\rho_{old,i}\right)\left(R_{old} - R_f\right) \quad (8)$$

$$DB_i = \left(R_{old} - R_f\right)\left(1 - \frac{\sigma_i}{\sigma_{old}}\,\rho_{old,i}\right) \quad (9)$$

$$RB_i = R_i - R_{old} \quad (10)$$

$$IB_i = 0 \quad (11)$$

Equations 8, 9, 10 and 11 show a number of features of interest with regard to overall benefit, marginal diversification benefit and marginal return benefit of an additional investment . First, they show that the overall benefit of an investment can be clearly decomposed into a diversification benefit and return benefit without the interaction term. Second, equations 8, 9 and 10 show that once adjustments are made for the different risk characteristics between the new investment and the existing portfolio, the benefits can be stated in return terms holding risk constant. So that the benefits offered by an investment are directly comparable to the returns of an existing portfolio, since all the benefits are uniformly stated on the risk-adjusted basis. Lastly, equations 8, 9 and 10 show that the benefit of a new investment to an existing portfolio is positively related to its returns but negatively related to the risks between the two investments.

3.2.2.2 Data and results of the second methodology

We have already seen in Figure 32 the summary statistics related to the different asset classes (that we will use as inputs for the model) and the evolution of the correlation coefficients, so it is not necessary to repeat the considerations previously stated. The only input needed by the model that we have not considered until now is the risk free rate. To implement the computation, as suggested also by Liang and McIntosh (1999), the risk-free rate is represented by the short term 3-month Treasury bill[106]. Like for the other assets, the computation of the T-Bill rate is

[106] A treasury bill (T-Bill) is a short-term debt obligation backed by the U.S. government with a maturity of less than one year. T-bills are sold in denominations of $1,000 up to a maximum purchase of $5 million and commonly have maturities of one month (four weeks), three months or six months. T-bills are issued through a competitive bidding process at a discount from par, which means that rather than paying fixed interest payments like

made in the full sample and in the three different sub-samples considered. The average values are the following:

- full sample = 1.3%;
- pre-crisis period = 2.92%;
- during-crisis period = 1.31%;
- post-crisis period = 0.08%;

Our purpose is to study the benefits of the real estate asset class (in the form of REITs) to the alternative asset classes and to an already existing portfolio (our usual benchmark) made by equities and bonds in the same proportion. Using the equations 8,9,10 we have estimated the marginal benefits that are unrelated to the allocation to the additional investment. To give an example of how the benefits are computed, the following equations evaluate the benefits of REITs to the government bond (Gbond) asset class:

$$OB_{Reit} = \left(R_{Reit} - R_{free}\right) - \left(\frac{\sigma_{Reit}}{\sigma_{Gbond}}\,\rho_{Gbond,Reit}\right)\left(R_{Gbond} - R_{free}\right)$$

$$DB_{Reit} = \left(R_{Gbond} - R_{free}\right)\left(1 - \frac{\sigma_{Reit}}{\sigma_{Gbond}}\,\rho_{Gbond,Reit}\right)$$

$$RB_{Reit} = R_{Reit} - R_{Gbond}$$

The results of the computation are provided in Figure 37 and 38.

conventional bonds, the appreciation of the bond provides the return to the holder. Data are taken from Thomson Reuters Datastream Professional data base.

Figure 37 – Overall, diversification and return benefits of REIT to the alternative asset classes (average monthy percentages)

Full sample: 2003-2016	Gbond	Cbond	Stoxx	Mib
Overall Benefit	0,663	0,048	0,479	0,726
Diversification Benefit	0,324	-0,531	0,140	0,128
Return Benefit	0,339	0,579	0,339	0,597
Pre-crisis: 2003-2007	**Gbond**	**Cbond**	**Stoxx**	**Mib**
Overall Benefit	1,541	1,341	1,047	1,063
Diversification Benefit	0,177	-0,189	0,689	0,510
Return Benefit	1,365	1,530	0,358	0,554
During crisis: 2007-2011	**Gbond**	**Cbond**	**Stoxx**	**Mib**
Overall Benefit	-0,582	-1,348	0,020	0,380
Diversification Benefit	0,290	-0,460	-0,125	-0,337
Return Benefit	-0,872	-0,888	0,145	0,717
Post-crisis: 2011-2016	**Gbond**	**Cbond**	**Stoxx**	**Mib**
Overall Benefit	0,832	0,387	0,387	1,225
Diversification Benefit	0,286	-0,727	0,399	0,704
Return Benefit	0,546	1,114	0,514	0,521

Source: personal elaboration on Thomson Reuters Datastream Professional data.

Figure 37 shows a number of features of interest for the analysis. On a general basis, with the only exception of the crisis period, the overall benefits of REIT are positive for all the asset classes and they have changed substantially over time, supporting the findings of Lee (2010) and Mueller, et al. (2003). If we start considering the full-sample period, we can state that the real estate asset class offered better overall benefits to the government bond and to the equity asset class the represents the Italian stock exchange. The only asset class that have a low benefit from REIT is the one of the corporate bond, mainly because of the negative effect of the diversification benefit, since the return benefit is positive and quite good. This negative diversification value comes from the substantial correlation between the assets and by the high monthly volatility of REIT compared to the one of corporate bond (if we recall equation 9, this means that the ratio $\sigma_{Reit}/\sigma_{Cbond}$ and the correlation coefficient $\rho_{Cbond,Reit}$ are high and the result of the computation inside the second parenthesis is negative). While in the first sub-sample REITs offered great overall benefits to all the asset classes, mainly because of the high return benefit (for bonds asset classes) and both return and diversification benefits to the other

two asset classes, in the crisis period the results are very different. Real estate offered negative overall benefits to the bond asset classes, due to the high negative return benefits that dominate over the diversification benefits. For the equity asset class representing the Italian market the overall benefit is still positive and substantial, given the poor average performance it experienced during the period (so that the return benefit offset the negative diversification benefit). If we consider the last period of the analysis, the one from 2011 until 2016, we can notice that all the overall benefits are back positive and particularly high for government bond and Italian equity asset class. From the parameters estimated in the post-crisis period we can stress once again how important are all the different component of the overall benefits. In effect, if we look at the overall benefits for corporate bond and for the European equity asset class, we can notice that they are equal but the total benefits comes from two different channels: while for equity it comes from both positive return and diversification benefits, for the corporate bond asset class the overall benefit is the result of a strong return benefit that is however almost completely offset by a negative diversification benefit.

In order to examine the benefits of REITs to the mixed-asset portfolio, the analysis have been extended to the benchmark portfolio we stated in the previous part, the one composed by the four asset classes in the same proportion. The results of benefits computation are summarized in Figure 38.

Figure 38 - Overall, diversification and return benefits of REIT to the mixed-asset portfolio

	Full sample: 2003-2016	Pre-crisis: 2003-2007	During crisis: 2007-2011	Post-crisis: 2011-2016
Overall Benefit	0,287	0,598	-0,032	0,639
Diversification Benefit	-0,177	-0,353	0,192	-0,035
Return Benefit	0,464	0,952	-0,224	0,674

Source: personal elaboration on Thomson Reuters Datastream Professional data.

Figure 38 shows that over the whole sample period the real estate asset class offered a positive overall benefit to the classic mixed-asset portfolio, with the benefit coming from a good return benefit that offset the negative diversification benefit, supporting the findings of Lee and Stevenson (2007) and Mueller et al (2003). As in the previous case, the negative parameters comes from the substantial correlation between the benchmark and the real estate asset class and by the high monthly volatility of REIT compared to the one of benchmark. In line with the findings of Lee (2010) and those of Mueller, et al. (2003), the benefit of REIT has changed over the three sub-periods. In the first sub-period REIT offered a positive overall benefit that is the

result of a strong return benefit (0.952% on a monthly basis) that dominates the negative value of the diversification benefit. In the second sub-sample, the crisis one, the overall benefit is negative as in the previous analysis, so that it would not be optimal to include the real estate asset class in that period. In this case, even if the diversification benefit is positive, it is counterbalanced by the bad return performance of REIT. In the last sub-period, the one related to the last five years, the overall benefit of the real estate asset class reached its highest value equal to 0.639 on a monthly basis. This total benefit is the result of a strong return benefit and a little negative diversification benefits, as once again REIT returns have shown a strong positive correlation with the portfolio as a whole (the correlation coefficient $\rho_{Bmk,Reit} = 0.7$).

The results of this last analysis stress once again the positive benefits of the inclusion of REIT into a mixed-asset portfolio, with the benefits coming both from diversification and return benefits. The findings of the study are in line with the recent literature that underlines the potential benefits of the inclusion of REIT inside a portfolio made by different asset classes (Lee and Stevenson (2007), Baum (2006), Hoesli and Morri (2010)). On the contrary, the results do not validate the conclusions of previous studies (Kuhle (1987), Hudson-Wilson (2001)) that stress the inefficiency and the uselessness of the inclusion of the real estate asset class inside a multi-asset portfolio. However, even if the results of our analysis are good, they do not confirm the evidence from studies (Bond and Glascock (2006), Sa-Aadu, Shilling, and Tiwari (2010)) that emphasize the counter-cyclical properties of the Real Estate Investment Trusts. Contrary to the findings of the authors mentioned, in the period of financial distress the real estate asset class do not proved to be a good diversifier, showing negative overall benefits to the mixed asset portfolio and also to all the bond asset classes, because of negative performances (-0.6% on a monthly basis) and high volatility of returns (7.314% on a monthly basis).

Conclusions

This work contributes to the literature on asset management and real estate holdings in two ways: it realizes an analysis of the main instrument available to investors and it focuses on the role of the real estate asset class inside a multi asset portfolio.

With regard to the first point, we made an in-depth analysis on real estate instruments under Italian law; we highlighted the inefficiency and inadequacy that currently characterize those vehicles and the market in which they are traded. The Italian stock market of real estate investment is in fact significantly underdeveloped, taking into consideration the potential market and compared to European and non-European markets that are more mature and advanced. There are only 36 real estate securities listed in the Italian Stock Exchange as of 30 June 2015, 24 real estate closed-end funds listed on MIV and 12 companies, of which 2 SIIQs, listed on MTA and AIM Italia segments. Even more important, their capitalization, amounting to 5 billion, represents only 1% of the market capitalization. Listed real estate mutual funds were found to be few, with low capitalisation and scarce liquidity because of the small trade volume on the secondary market. In addition, the analysis conducted on the 24 funds still fully operational, highlighted an average maturity of 3.5 years, too little for the medium-long term investment horizon that usually characterize the investors interested on those type of instruments. On the other side, the study of the publicly listed real estate companies (SIIQS) seemed to have identified the more efficient instrument able to meet investors' needs. However, the fact that there are only two SIIQs (Igd Siiq spa and Beni Stabili Siiq spa.) with small capitalization and low trade volume as the real estate funds, underline a current lack of interest by professional investors. Nevertheless, recent legislative changes introduced with the Legislative Decree No 33 of 12 September 2014 (“Sblocca Italia” Decree) could in our opinion overcome some of the limitation encountered, levelling the playing field of Italian players in the sector with that of other countries, promoting simplification and facilitating the use of this vehicle.

The second contribution of our work derives from the analysis of the role of real estate assets inside a multi asset portfolio. The present study explores this issue through two methodologies: the approach suggested by Wong, Tong and Keow (2012) and based on the comparison of efficient frontier and the one suggested by Liang and McIntosh (1999), which decomposes the overall risk adjusted benefits of real estate investment to an existing portfolio into its diversification benefits and return benefits. The result of the case study highlight the positive effect of the inclusion of the real estate asset class inside the portfolio, both in terms of better

performance and lower risk. In particular, the results of efficient portfolio computation underline that effect is greater in the upper part of the efficient frontier, namely indirect real estate investment allows to reach a higher degree of return in riskier portfolios, confirming the findings of Hoesli and Morri (2010), Mueller et al (2003), Lee and Stevenson (2007). Contrary to what stated by Kuhle (1987), we can say that the effect of the indirect real estate investment is marginally positive in the lower part of the efficient frontier, but it produces a strong benefit if we move on the right side of the efficient frontier. The backtest analysis has further highlighted how a portfolio including an average allocation to indirect real estate of 12% would have performed better than a benchmark portfolio made up of equities and bonds in the same proportion, confirming the results of Mueller et al (2003), Lee and Stevenson (2007) and Hoesli and Morri (2010) in terms of performance and those of Fogler (1984), Firstinberg, Ross and Zisler (1988) in terms of optimal allocation.

To conclude, the application of Liang and McIntosh (1999) approach lead us estimate marginal benefits that are unrelated to the allocation to the additional investment. The results highlights that the average overall benefits of real estate asset to the alternative asset classes considered have been positive in almost all the period considered, stressing once again the positive benefits of the inclusion of REIT into a mixed-asset portfolio. The in depth analysis of the parameters estimated in all the sub-samples underlines that the return benefit component prevailed on the diversification benefit component. For this reason, real estate asset class emerged more as a return enhancer than as an asset able to reduce the volatility. However, contrary to what suggested by Bond and Glascock (2006), Lee (2003) and Sa-Aadu, Shilling, and Tiwari (2010), we could not confirm the ability of Reit to act as a relatively good diversifier of risk during periods of financial distress. Conversely, this asset class has shown a pattern more similar to equity asset class, with negative performances (-0.6% on average on a monthly basis) and a great volatility of returns (7.314% on a monthly basis) that combined with the increased correlations with other financial assets, eroded the diversification benefits of listed real estate during periods of extreme market volatility.

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