



The incorporation of sustainability into the real estate investment portfolio

How do institutional investors currently select their asset allocation and what is the relative market penetration of sustainability in that extent?

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Colophon

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How is the financial performance of office buildings in real estate investment portfolios related to the extent of sustainability?

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Management summary

The context of the real estate sector is drastically changing, as traditional ways of working do not correspond with renewed sustainable interests. The global crisis in 2007 and onwards forced the real estate society to think different and discover new opportunities and challenges. Sustainability should be taken seriously and companies should shift their attention and combine innovative ideas in a Corporate Social Responsibility strategy (CSR). To fully commit to sustainable operation is currently a bridge to far, but the generated benefits could be eminent when considering the sustainable opportunities that lie in front of us. Being socially responsible is often set aside as being too expensive. But is it? When continuing business as usual, indeed sustainability will be expensive. Consider change as facilitator of sustainable success and likewise benefits in image, productivity and investment returns. Sustainability emerged in the late 60s in correspondence to environmental degradation. Since the late 60s there has been a lot of change in the view towards the general concept of 'sustainability'. Commonly known among researchers and scientists is the UNCED report (1987) which is named 'Our common future' and written by the Brundtland-commission. This report contains a definition of sustainable development which has currently a widespread influence: *'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'*

Especially after a boiling summer, the effect of sustainability comes to mind. The resource consumption to keep the air conditioning running is part of the energy scheme of a building. Sustainability in real estate can be traced back to the eco-output of a building, specially related to concepts of energy, water and carbon emissions, but also the reachability, and used materials among others. There are evident relationships between the notions of CSR, RPI, GRI and eco-labeling, while scale is the major difference. CSR-performance is part of the general strategy of an organization, while RPI often is the financial part of a company's strategy. Environmental labels are examples of measures that influence the outcomes of sustainable reporting. Although there are several definitions for responsible property investing, these notions are more a general overview of the various choices a professional organization could make. The implications of these kinds of performance measures and initiatives are broad. Not only occupiers of the involved assets, but also investors can benefit from aligning physical real estate to sustainable operation. Currently investors are increasingly integrating sustainable principles within their asset management activities to respond to tenants being increasingly concerned about the environmental performance and operational efficiency of the assets they occupy.

Due to the mess of sustainable principles and the lack of a heterogeneous attitude, sustainable certification systems were introduced some while ago. Sustainable certification systems such as BREEAM, LEED, EPC and Energystar are nowadays certified measuring systems to assess and quantify the sustainable level of a building. These sustainable certification systems are related to the relative degree of sustainability. The relative sustainable performance of an asset or an investment portfolio is based upon drivers that have predicting powers. One could possibly argue that only financial performance matters in case of real estate funds, but these benefits are also dependent on other criteria. Based on research of Nelson & Frankel (2012) there are five crucial drivers that influence the relative sustainable performance or attitude in the real estate market. These are respectively: enhanced operating efficiency, investor criteria, regulatory compliance and incentives, tenant demand, and competitive positioning.

The literature provides a good baseline towards the added value of green assets. Eichholtz et al. (2009a) discussed the financial possibilities of green buildings and stated that it increases rents and



value. To be specific: +3% average rent, +16% higher building value. Others such as Pivo and Fisher (2009), Fuerst and McAllister (2011b), and Miller et al (2010) also acknowledge this evidence, however with different values for rents and asset value. Besides quantitative figures, various authors stated the importance and opportunities of the incorporation of sustainability. Certified properties tend to have a rental premium and an improved occupancy rate. In addition to premiums, there is an increased market value and a lower risk-profile regarding the property. More and more commercial buildings apply for a sustainable certification, which results in an increasing share of green buildings in the market. In most cases RPI neither harms nor improves total return. Investors still have the same return profile in almost every case, so why not invest in sustainability is the key question?

As an investment portfolio is subject to constant change during its lifetime, current knowledge of rating systems or benchmarks does not operationalize data on asset level. Moreover, it does not provide the investor with the importance of sustainable variables, such as detailed information about energy use, locational factors, waste management, carbon emissions, and water use between investors. Especially at asset level it is important to discover which variables are significantly influential on financial performance. While these variables are identified, there is an opportunity to state an outcome about the general financial performance of an investment portfolio as a whole. Consequently related to the preceding explanation the problem statement will be as follows:

How is the financial performance of office buildings in real estate investment portfolios related to the extent of sustainability?

Considering that real estate investment portfolios can be upgraded using benchmark data and related literature, the accompanying variables should prove to be significant thus show an impact on financial performance. These variables shape the backbone of an equation to calculate and rank several portfolios. The variables extracted out of the theoretical framework will prove to impact performance of portfolios significantly. Consequently these drivers will serve as determinants later on in the process of evaluating a real estate portfolio. It could be of great value to identify, 'translate', and benchmark these indicators to separate variables which influence the financial performance of an asset.

Reflection

Fortunately I had the opportunity to encounter my graduation subject some time ago during my holiday. As I was reading in a magazine, my eye fell on an article about the relative financial benefits of sustainability and the sustainable certificates LEED and EnergyStar. This came in handy when I attended the first lectures about choosing a graduation theme and the layout of your research. Since I did prepare myself on a basic scale, I was able to make choices faster and more effective. As such my research advanced in a rapid pace. Besides the assistance from my graduation mentor, I challenged myself to reading a lot of literature about the subject. Although these articles were rather economical, understanding them became easier as I attended my free electives at the University of Amsterdam at Real Estate Finance. Consequently, this P2-report is the outcome of an eventful half year at either the university in Delft or Amsterdam. I am looking forward to advance and really start working on my end-product and contribute something to the existing body of knowledge about the incorporation of sustainability into the real estate investment portfolio.





Introduction

Research introduction

Shown on the news, it is a major topic in documentaries, often labeled on grocery products, and a practical example is the Toyota Prius. Altogether they share the common notion of sustainability, all in their own way. Sustainability is rapidly gaining ground and is expanding across various market sectors. Clothing brands produce their goods through the use of responsible labor. Grocery stores sell bio-diverse and environmentally-friendly produced goods. Consider a new initiative of the sustainable grocery store: Marqt, a place where only biological products are being sold. The society considers the effect of climate change and greenhouse emissions more seriously during recent years as evidence shows concrete results. For companies, sustainability is generally about the complex challenge of self-interest with environmental protection, merging different interests and creating new opportunities (Hal van, 2010).

The context of the real estate sector is drastically changing, as traditional ways of working do not correspond with renewed sustainable interests. The global crisis in 2007 and onwards forced the real estate society to think different and discover new opportunities and challenges. Sustainability should be taken seriously and companies should shift their attention and combine innovative ideas in a Corporate Social Responsibility strategy (CSR). To fully commit to sustainable operation is currently a bridge too far, but the generated benefits could be eminent when considering the sustainable opportunities that lie in front of us. Being socially responsible is often set aside as being too expensive. But is it? When continuing business as usual, indeed sustainability will be expensive. Consider change as facilitator of sustainable success and likewise benefits in image, productivity and investment returns.

Change is often stated in yearly report and CSR initiatives, but are they really embraced? This all sounds quite subjective. Consider Henry Ford back in the '20s. He is better known as the inventor of the production line, which is famous for its productivity increase and better financial performance. Sustainability is not a standard answer on constraints, but often the solution is around the corner. Unfortunately it is too bad that most ideas do not leave the drawing table as public support often lacks commitment. Equal as in other sectors, sustainability is a hard notion to conform and commit to.

As this thesis focuses on the real estate aspect related to sustainability, some basic constraints can be identified. Think about the growing supply of office space during recent years, as new developments were being developed in a rapid pace. The economic crisis had its impact on the employment rate across the globe. Demographics show a worrisome figure as the population (not only in the Netherlands) is ageing. This only stipulates the preceding paragraph in which new possibilities have to be identified. This is also evident for the overflowing existing office stock in which the supply often disconnects with current real estate demand. Sustainability in its current extent could be influential to push businesses towards a more environmental-friendly future.

When considering the rationale of the commercial real estate market to move into sustainability, some basic questions could be asked, in the likelihood of: why would real estate professionals invest in sustainable real estate? An emerging topic within the commercial real estate market is the effect of sustainability on performance. As nowadays investors are increasingly interested in the measurement of sustainable performance and benchmarking, as these results provide a solid base line towards the potential acquisition or transformation of an asset in an investment portfolio. Consequently, how to gather these data and quantitative indicators for the objective measurement and benchmarking of sustainable performance? Although several authors stated evidence with regard to sustainable performance, investment styles, and risk/rewards profiles still relatively much knowledge is absent. The diversification potential of real estate funds when investing in sustainable



assets could be an option to dissolve risk. Nevertheless investments in sustainability are not the same as being a socially responsible investor. The management of the organization should be involved in the sustainability program to recognize the added value and equal importance of such practice.

The short introduction indicates a lot of potential issues which are related to sustainability and the integration of the concept in the business cycle. The intent of this research is particularly on the incorporation of sustainability into the real estate investment portfolio. Benefits of a sustainable approach are described by several researchers and provide the author with a background and a sneak peek in the general decision-making process and the markets' regard towards sustainability. Still the question remains: Should the degree of sustainability be an asset selection criterion for office buildings within an investment portfolio? And continued, which indicators are influential on the determination of the rent level? This contribution to existing knowledge attempts to investigate current relationships and research further in the field of wealth maximization and sustainable performance as basis for (responsible) asset allocation.

Problem

Following chapter addresses a sound definition and provides a solid background on current problems related to the incorporation of sustainability into the real estate investment portfolio. The chapter starts with the introduction of eco-labeling into the investors' environment during recent history. Second, the facing issues related to the objectivity of the valuations of green office buildings. The problem background continues with some remarks about the GRESB initiative which has the possibility to benchmark property portfolios of institutional investors. Concluding with a paragraph in which the scientific gap will be identified and defined as a research subject in this thesis project.

Problem background

Currently sustainability is a hot issue stretching from energy consumption, carbon emissions and water usage. This broad concept is commonly noticed in the field of real estate indicated into the introduction. Nowadays investors, users, developers and constructors explore possibilities to incorporate sustainable principles in their field of work, often through CSR-performance and the pursuance of sustainable initiatives. Although the society comprehends the broad notion of sustainability, we do not really have detailed knowledge of all elements and opportunities situated within this discipline. As such, sustainable research is popular because of the potential added value of green buildings in the commercial real estate market.

Especially after a boiling summer, the effect of sustainability comes to mind. The resource consumption to keep the air conditioning running is part of the whole energy scheme of a building. Sustainability in real estate can be traced back to the eco-output of a building, specially related to concepts of energy, water and carbon emissions, but also the reachability, and used materials among others. Due to the mess of sustainable principles and the lack of a heterogeneous attitude, sustainable certification systems were introduced some while ago. Sustainable certification systems such as BREEAM, LEED, EPC and Energystar are nowadays certified measuring systems to assess and quantify the sustainable level of a building. Scores can be obtained per category and through quantitative weighting a total score is obtained. Within bandwidths the total score of the examined building receives a qualification on the certificate from for instance "Pass (+)" to "Outstanding (+++)".

Such certification systems provide companies across the globe the opportunity to assess yearly and evaluate their sustainable performance of their building stock. This is often done in a particular part in the annual report while the company would like to stress their sustainable or CSR-performance, often in combination with the acquisition of responsible property investments (RPI). These



certification systems can be used as a basis towards a sustainable performance increase. Adding sustainable features and certifying buildings in a real estate investment portfolio could enhance operating expenses besides ecological emissions and improvement. Companies could also benefit from an increase in CSR-performance (P. Eichholtz, Kok, & Quigley, 2009b), which focuses more on social and governance values.

Alongside the introduction of sustainable features is the valuation of the green properties. Many problems arose because of the introduction of sustainability in buildings and appraisers did not how to value these features objectively. Nowadays investors employ better valuation standards for sustainable buildings, but still the investors argue about added risk and poor market compliance among others. Different approaches are currently being used to solve for sustainability issues in the valuation process. There are three standards described by Lorenz et al. (2008), which are all extracted from the main sustainable valuation question. How to identify, evaluate and price those new value-influencing factors that have previously not been on the radar of appraiser? Valuers have an ultimate legal responsibility to clients to provide an unchallengeable assessment of the market value of a property, based on market evidence and valuers' own knowledge and understanding of the market and trends (Warren-Myers, 2012). The valuation of sustainable properties thus is an important factor, while conducting responsible property investments and contributing to a better CSR-performance.

As already stated investors are currently uncertain of the actual added value of sustainable improvements. Eichholtz et al. (2009a) discussed the financial possibilities of green buildings and stated that it increases value. To be specific: +3% average rent, +16% higher building value. Others such as Pivo and Fisher (2009), Fuerst and McAllister (2011b), and Miller et al (2010) also acknowledge the added value of 'green' buildings, however with different values for the rent and value. Besides quantitative figures, various authors stated the importance and opportunities of the incorporation of sustainability. Certified properties tend to have a rental/risk premium and an improved occupancy rate. In addition to premiums, there is also an increased market value of the property. More and more commercial buildings apply for a sustainable certification, which results in an increasing share of green buildings in the market. Equally as sustainable assessments, green certification also is a broad notion. Besides different labels, the actual content of each certificate is different. There is not much coherence between these different certificates as well. Some focus solely upon the energy consumption of the building, others on the whole operation or lifecycle of a building.

Certification is currently more on a national basis in which national products prevail. In the US, LEED-certification and Energystar are most common in practice. In the UK, BREEAM-certification has a big market share. These sustainability certification systems have been issued approximately 15.000 labels worldwide. Although not much, this number is growing quickly and more and more companies are introducing labels which certify their properties. Various certification systems encourage property owners and investors to measure and reduce their environmental footprints, but also by promoting broader awareness of the contributions of buildings to climate change. Although until recently many certification systems did not focus on performance, this is rapidly changing. 'Many systems fail to provide the kinds of actionable data needed to support decision-making, such as considering the value of achieving standards or the financial returns associated with alternative levels of environmental standards' (Nelson & Frankel, 2012). Achieving these certifications could be expensive and are often forgotten while observing financial implications of sustainable features.

Whereas the sustainable certificates systems could be useful when looking at building performance, a benchmark has the attribute to state a remark about an investment portfolio as a whole. As sustainable features are being implemented throughout more buildings in a portfolio, it is reasonable



to assume that it will add value. These rating systems are emerging to comply with market demand. To integrate various sustainable certificates and combine them into a central knowledge point, the Global Real Estate Sustainable Benchmark (GRESB) was founded in 2009. This benchmark generally consists of an extensive survey which measures sustainable features in an investor's portfolio. Not exclusively on their environmental and financial performance, but also on policies and procedures behind their operations. Through the use of this benchmark, companies have the opportunity to measure and benchmark their performance against other comparable institutional investors. Therefore this benchmark is a huge database full of useful data relating to energy, water and carbon emissions among others. The greenness of real estate investment portfolios is currently often an important tool which is absent at most real estate companies. As such, GRESB currently attempts to establish an actual connection between green labeling and portfolio management. The influence of the organization on the performance of portfolios is evident. Since the benchmark has an ever increasing database of information and current economic times force portfolio managers to review their assets, this data could be of great help. Portfolio managers should be more open-minded towards sustainable alternatives. In current portfolio strategies the effect of such buildings is non-existing and thus an important missing piece in the framework of investment portfolios. While GRESB provides the opportunity to improve portfolio performance by the means of sustainable inputs, it lacks the evidence to operationalize the data on asset level.

The identification of a scientific gap regarding current knowledge is though, since the notion of sustainability can be far reaching in the real estate sector. Market parties still are eager to find out about the actual financial returns when investing or leasing green property, which is both a split between the investor criteria and tenant demand. Especially sustainable certification systems or eco-labels provide the investor and the user with a limited evaluation opportunity of their property. Several researchers have (successfully) tried to quantify rent and risk premiums. To encourage further increase in sustainable performance, several rating systems or benchmarks were developed to comply with market demand. A benchmark provides the opportunity to an investor to gain insight in their sustainable performance asset –or portfolio wise. A clear remark was made on the actual usefulness of the extracted data. The operationalization of the data on building level is still an unknown area within the sustainable field. Alongside the operationalization of the data are the consequences on asset level through the impact of sustainable variables. It is still partially unclear what variables are significantly important for a profitable operation of a property. Especially information on asset level is missing related to the current knowledge about sustainable operation of an investment portfolio.



Problem statement

The problem background provides for an understanding of sustainable principles and current issues which investors' face in the real estate sector. Further on in the thesis more about the current motives of investors to get involved in sustainability. According to the Bauer et al. (2011) institutional investors are struggling to find the appropriate tools to carry out environmental assessments. Benchmarking performance complies with current demand of institutional investors to evaluate their real estate investment portfolios across the world compared to the competition. A benchmark consists of several variables to determine and structure an objective outcome, which could be influential in this research.

Green value is becoming more and more important to investors to reduce risk and adjust their CSR-performance. Literature also indicates the potential gains of sustainable features and implementations in a real estate portfolio. Could some relatively easy implementable sustainable features make the difference for an office portfolio to add value, thus becoming more profitable towards the investor? An investment portfolio is subject to constant change during its lifetime. Current knowledge of rating systems or benchmarks does not operationalize data on asset level, and does not provide the investor with the importance of sustainable variables, such as detailed information about energy use, locational factors, waste management, carbon emissions, and water use between investors. Especially at asset level it is important to discover which variables are significantly influential on financial performance. While these variables are identified, there is an opportunity to state an outcome about the general financial performance of an investment portfolio as a whole. Consequently related to the preceding explanation the problem statement will be as follows:

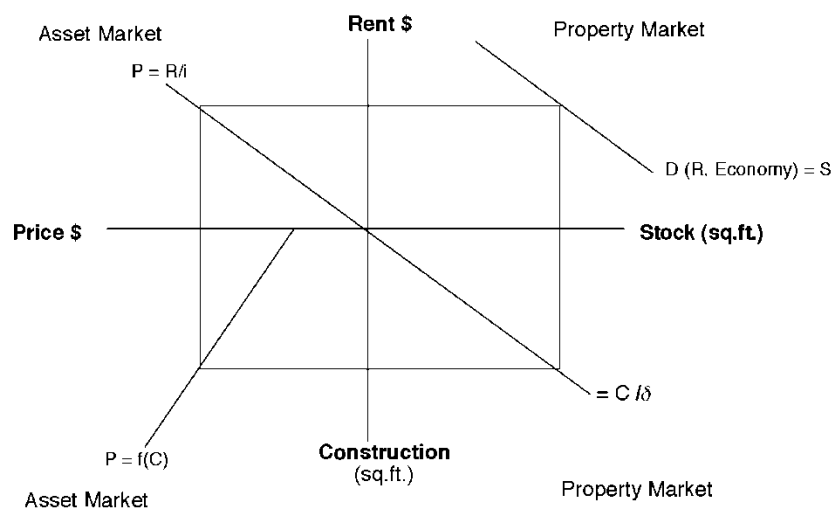
How is the financial performance of office buildings in real estate investment portfolios related to the extent of sustainability?

Considering that real estate investment portfolios can be upgraded using benchmark data and related literature, the accompanying variables should prove to be significant thus show an impact on financial performance. These variables shape the backbone of an equation to calculate and rank several portfolios. The variables extracted out of the theoretical framework will prove to impact performance of portfolios significantly. Consequently these drivers will serve as determinants later on in the process of evaluating or transforming a real estate portfolio. It could be of great value to identify and 'translate' these indicators to separate variables which influence the financial performance of an asset.



Target groups

Sustainable efforts can be measured on a global scale, but this broad notion is not applicable for this research. This research uses data of several institutional investors, which are familiar with CSR-performance and partly uses sustainable certification systems. Although their CSR-performance consists of many activities, often they are eager to learn about the actual functioning of sustainable features. Although the focus is on institutional investors, they are not the only involved peer group for this research. The influence of the occupier related to the investors is best considered in the real estate system, which is described by DiPasquale and Wheaton (1992) in the four-quadrant model. When looking at the four quadrant model the focus is both on the occupant and investor market due to the functioning of the real estate market. Consequently this point of view explains that both occupiers and developers are part of the sustainable outcome. The use and existence of the real estate system will later on be described in the theoretical framework.



Circle of blame

During recent years, the relationship between sustainable efforts and impacts versus market value has received a considerable amount of attention. Sustainability should affect market value of a property, but this balance is still missing in direct and unbiased evidence. Blame points to many stakeholders in the industry, but no stakeholder really adopted the principle of sustainability (Cadman, 2000). Various actors in the real estate sector are pointing fingers to each other, and as a consequence the vicious circle of blame was developed. As Cadman elaborated further on the mixed interests of all involved actors, further research identified one more stakeholder in the process. As earlier stated, the valuation practice did not adopt either to the changing market conditions. As sustainability began to gain ground in the commercial real estate sector, actors admitted that there was a need for a change of attitude towards sustainable principles. Lorenz and Hartenberger (2008) created to opposite of the earlier stated circle of blame, while introducing a positive spin to the framework. 'The virtuous circle of blame' tries to demonstrate the added value of sustainability on the cooperation between actors. However the positive spin to the framework explains the potential opportunities for especially occupiers and investors, the main question of financial justification still remain. What does the institutional investor get in return?





Source: Cadman (2000)

Since this research would like to focus solely on the impact and effects of sustainability of investors and occupiers, they are to only ones to be illuminated below. The occupiers are willing to invest in a green office building. To be concrete, occupiers are willing to pay an additional rent premium on the lease. Among several reasons why occupiers would like to rent green building, most important arguments are increased operating efficiency, productivity and added corporate image according to CSR-performance. Occupiers seem to be more positive about sustainability, but do not want to pay the price fully. Thorough knowledge of the division of costs is needed while renting out green space. However the actual sustainable performance of the building is still not included. Some occupiers just want to comply with current or future regulations while not because of their attitude towards an environmental better performance. It is not the question about the actual demand anymore, but the amount of greenness of a building compared to the rent is a renewed key issue. Going back in the circle of blame framework, the question can be reversed to investors.

Investors need to think about added value to themselves while still providing the desired quality towards the client or occupier. This needs to be done through sustainable measures, but to what extend? Sustainable certification systems are a perfect example for the cohesion between investors and occupiers, while such labels rate properties and thus provide comprehensive grades. The grade will reflect the greenness of the property and can be translated into the sustainable performance of the involved organization. For investors, it is more the question which benefits result from sustainable improvements and if they will produce the expected rate of return. Still the whole mechanism between the investor and occupier balances on the notion of financial justification. The barrier makes it especially hard for investors to invest in green buildings while some elements of impact are still unknown. Investors are eagerly searching for the most profitable combination of sustainable elements through certification systems or sustainable benchmarks. Therefore a research in the significance of sustainable variables on office buildings will be beneficial.



Aim and objectives

The general scope is the implementation of best practice, which generates profitable and sustainable solutions for real estate investment portfolios. Through analyzing and detailed measurement of data, sustainable determinants can be identified. These determinants will form the backbone of a statistical analysis to quantify the financial performance of a real estate portfolio.

The existence of various certification systems and the proofing of real estate portfolios is evident. Although many investors around the world have different views about, for instance CSR performance and financial feasibility of green offices the actual truth about the profitability of certain sustainable features has not been uncovered yet. Generally the objective is to uncover partly *the influence of sustainable features on net rental income and likewise on investment returns*. In this research the used data of both literature and benchmarking data will prove to be of great help in the quest to find the most influential sustainable determinants.

This research will provide the institutional investor a solid handle regarding sustainable determinants while investing in green assets. While sustainable features are being divided into sub-categories, the impact of each individual one is clearer. The aim is to provide a benchmark for investors of which they can evaluate their relative performance on. Furthermore the end-users of the office market will benefit of an increase in the supply of green buildings which fits their requirements as CSR performance becomes increasingly important.

When reflecting on foregoing added value for the occupier and the investor, the circle of blame comes again to mind. This research is targeted at the investor's supply towards the occupier. The research will try to quantify assumptions and provide more detailed knowledge on the functioning of sustainable variables on asset level. From an investor's point of view, the current demand for green buildings is clearly there. With the provision of significant variables, the performance of a real estate investment portfolio will be the result from the functioning of the underlying sustainable assets. These underlying sustainable assets will be measured on office building level and quantified to state evidence about the whole picture, the combined performance of several portfolios. This can be seen as a green benchmark which provides institutional investors with a relative output towards their financial and sustainable performance.



Research questions

Out of the foregoing motivation about the current functioning of sustainability into the real estate market, it is possible to formulate and define research questions. These are related to the problem statement which forms the fundament of this thesis.

How is the financial performance of office buildings in real estate investment portfolios related to the extent of sustainability?

On the basis of the preceding main research question it is possible to formulate several sub research questions. This is important to put boundary conditions on several elements of this research. These sub questions can be also be seen as a guide through the research.

1. Should the degree of sustainability an asset selection criterion for office buildings within an investment portfolio?
2. What are the crucial sustainable determinants which define sustainable and financial performance and how to align them to gather results?
3. What are the financial benefits regarding net operating income (NOI) of such sustainable indicators?
4. Could these results be benchmarked and used to construct a green index that indicates the relative degree of sustainability in the sample set?

Research sub questions

1. *The relative degree of sustainability within investment portfolios across the commercial real estate market*
 - How does the commercial real estate market operate and what is the relative position of real estate investors in this respect?
 - Why should real estate funds be interested in investing in sustainability?
 - What does current evidence regarding sustainable performance stipulate and recommend concerning the added value of real estate?
2. *Better portfolio proofing through sustainable determinants which define financial and sustainable performance.*
 - How to assign weights to the variables: energy, carbon, transport, and to a lesser extent water, waste, and well-being when focusing on sustainable and financial performance?
 - How to analyze and quantify these determinants when looking at multiple real estate portfolios of various funds?
 - On which part of the performance of an office building do these determinants have influence on in a real estate investment portfolio?
3. *The change in net operating income when improvements regarding sustainable features have been made.*
 - Which model to use when net operating income is used to define financial performance on



asset level?

- Can sustainable determinants predict future implications of sustainable measures in a real estate investment portfolio?
- 4. *Benchmarking ability results and the construction of a green index that shows a relative degree of sustainability*
- Can significant results regarding sustainable performance be used to predict a return profile?
- Could the results be used to construct a green index in which various portfolios are benchmarked?

Assumptions

In the following, the author would like to state some assumptions to be able to provide feedback after the research into sustainable drivers. Often people refer to a draft solution to a problem as a hypothesis or assumption, frequently stated as an educated guess. It can also be perceived as a suggested solution based on preliminary evidence presented by the introduction and literature review. For every sub question an assumption will be formulated to test alongside the findings of the analysis and model outcomes.

Assumption 1: The leading sustainable indicators extracted out of benchmarks and the theoretical framework are indeed providing the institutional investor with useful information regarding its office building portfolio and formulate clear recommendations.

Assumption 2: Sustainable features do add value to offices and is recognizable in a better financial performance portfolio-wise.

Assumption 3: Only energy use and locational features can predict for the relative higher net operating income of office properties.

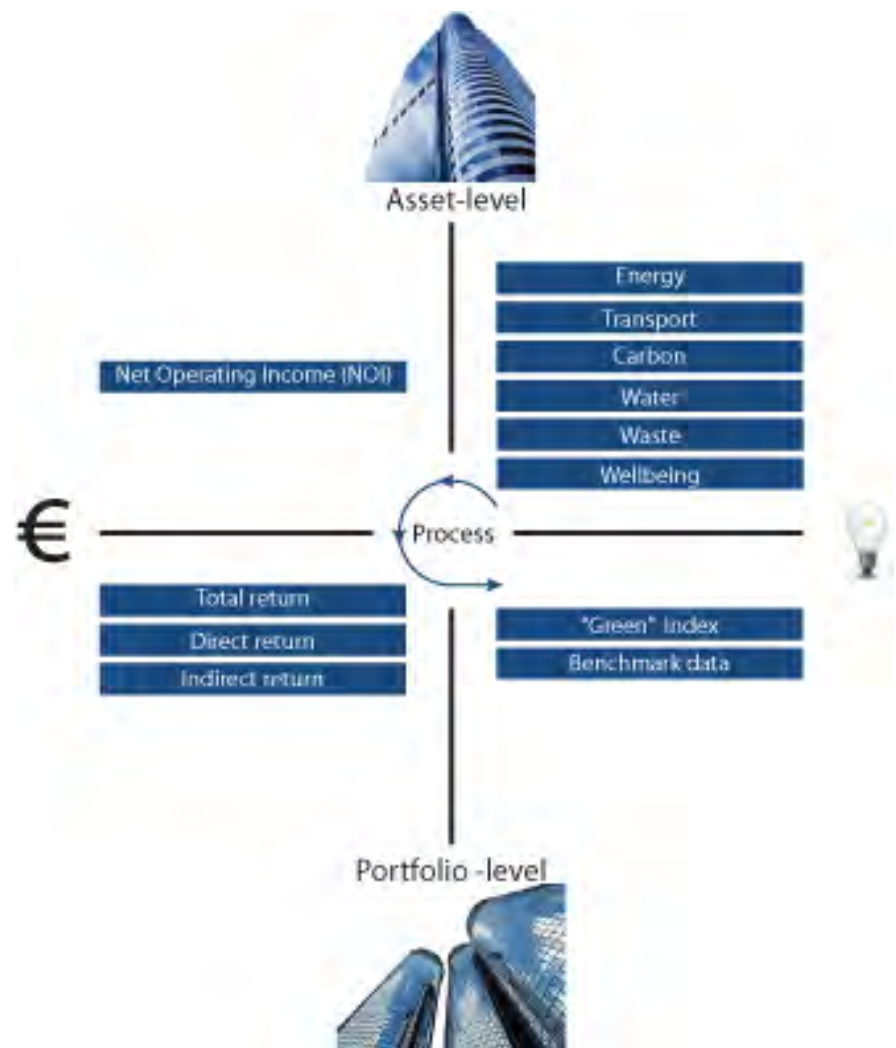
Assumption 4: Besides CSR performance, responsible property investments in sustainable certification systems could be an advantageous approach to reduce risk while still profiting from an equal or higher financial return.



Methodology

The selected sustainable determinants out of existing literature and benchmarks can be integrated into a hedonic pricing model which defines the significance of the sustainable indicators: energy, transport, carbon, water, waste, and well-being. These determinants will be tested against an output variable which forms the background of the results, the net operating income (NOI). The use of this variable in particular makes it possible to measure and rank the financial performance among the (non-)green buildings in the portfolio of an investor. The net operating income (NOI) is used because of its reliability, thus minimizing bias in the data. In this research framework the first step is to identify the relative significance of the sustainable indicators related to the NOI. Second is the matching of the evaluated assets in their relative portfolios and a discussion about the relative importance of sustainability when allocating assets. Third is the construction of a green index in which office portfolios can be benchmarked across the rest of the participants.









A hedonic pricing model will shed light into the operationalization of the sustainable variables related to office buildings in the data set. If these variables prove to be significant regarding the financial performance an indication of portfolio returns can be generated. As such the relative performance of the involved portfolios can be benchmarked. This benchmark based on the net operating income will be influenced by a degree of sustainability (shown in the asset-level variables). This research aims to prove that a larger amount of sustainable features provides a better return. The last possible step is to create a 'green' index which benchmarks performance throughout time and provides an insight in the sustainable improvement. The research will provide the investor of a detailed look into the operation of its own portfolio while influential variables are identified. Through the use of these variables a portfolio can be adjusted, evaluated and be optimized.



The relationship between financial performance and sustainable indicators can be described by a hedonic pricing model. The dependent variable related to financial performance is the net operating income (NOI), which stretches a better precision with less bias. Independent variables are related to their relative sustainable influence. As earlier has been described, these are respectively energy, transport, carbon, water, water, and well-being.

$$P_i(\text{NOI}) = \alpha + (\text{Market})\beta_1 + (\text{Asset})\beta_2 + (\text{Energy})\beta_3 + (\text{Transport})\beta_4 + (\text{Carbon})\beta_5 + (\text{Age})\beta_6 + (\text{Water})\beta_7 + (\text{Waste})\beta_8 + (\text{Well-being})\beta_9 + \varepsilon_i$$

Where the factor group Market consists of variables regarding supply, absorption, stock, average GDP, and employment volume. The variable asset determines the relative asset which reflects size, layout, asset type, and image. "Energy" includes energy efficiency, based on usage on kWh. The variable "Transport" accounts for the relative distance to either a transport hub (train –or public transport station) or the nearest highway. Parking is also included in the factor group transport as this is related to automotive accessibility. "Carbon" relates to the relative emissions the asset accounts for. Age defines construction year as part of the model. The variables water, waste, well-being are in this phase of the graduation seen as secondary variables. It is very likely that these variables do not have significant influence on the determination of the NOI. The attentive reader has already noticed that this model is focused on each asset individually. Indeed, this is true as every asset gets "labeled" on their relative sustainable score. Through this method it is possible to both state evidence portfolio-wise and benchmark properties across several portfolios.

Variable	Reference
NOI	
Energy	
Transport	
Carbon	
Age	
Water	
Waste	
Well-being	

A preliminary hedonic pricing model has been developed for the ranking among several portfolios. As such the impact of various variables can be explored while at the same time the influence of sustainability can be tested. The model could be used to explain the score on the conceptual Green Index which takes the form:

$$P_i(\text{Score}) = \alpha + (\text{Financials})\beta_1 + (\text{Region})\beta_2 + (\text{Sustainability})\beta_3 + \varepsilon_i$$

where "Financials" include company size (market capitalization), financial performance (return on assets), leverage (LTV total assets), and openness to the capital market (percentage of closely held shares) based on Kok, N., Eichholtz, P., Bauer, R., & Peneda, P. (2010). There is also a dummy variable for each region (set relative to Amsterdam). Lastly, "Sustainability" is based on the relative financially better position of a green asset.

This methodology still has its loose ends, but it is a good starter to revise and enhance the hedonic pricing models. These preliminary hedonic models give an indication how to solve for these statistical problems. As this graduation report proceeds, the attention is to a large extent focused on the methodology section as this forms the key to both answering the research questions and subsequent recommendations.



Research design

The preliminary phase can be seen as a summary of the first half year of graduating. Although the student is not explicitly conducting research in terms of data gathering and structuring its aims and objectives, the first steps into the demarcation process of the subject have started. Incorporated in the preliminary phase are the P1 and P2 presentations which are basically a status display of progress. Thus the preliminary phase provides the context for further development of the research thesis. During these first steps into the research subject, the first quarter has been used to elaborate further on the opportunities and possibilities of the research project. As earlier stated the notion sustainability is very broad and needs to be reduced into a comprehensive whole. The literature and gained information from various benchmarks will be used to configure a set of sustainable variables, which will be used further on in the research. Subjects to be addressed during the preliminary phase are divided into two major parts. First the general research field needs to be defined together with an identification of the scientific gap. Through these two components the research questions can be devised. Second, the literature study which forms the basis for the theoretical framework. This literature review will help in the definition of sustainable variables later in the process.

In-depth phase

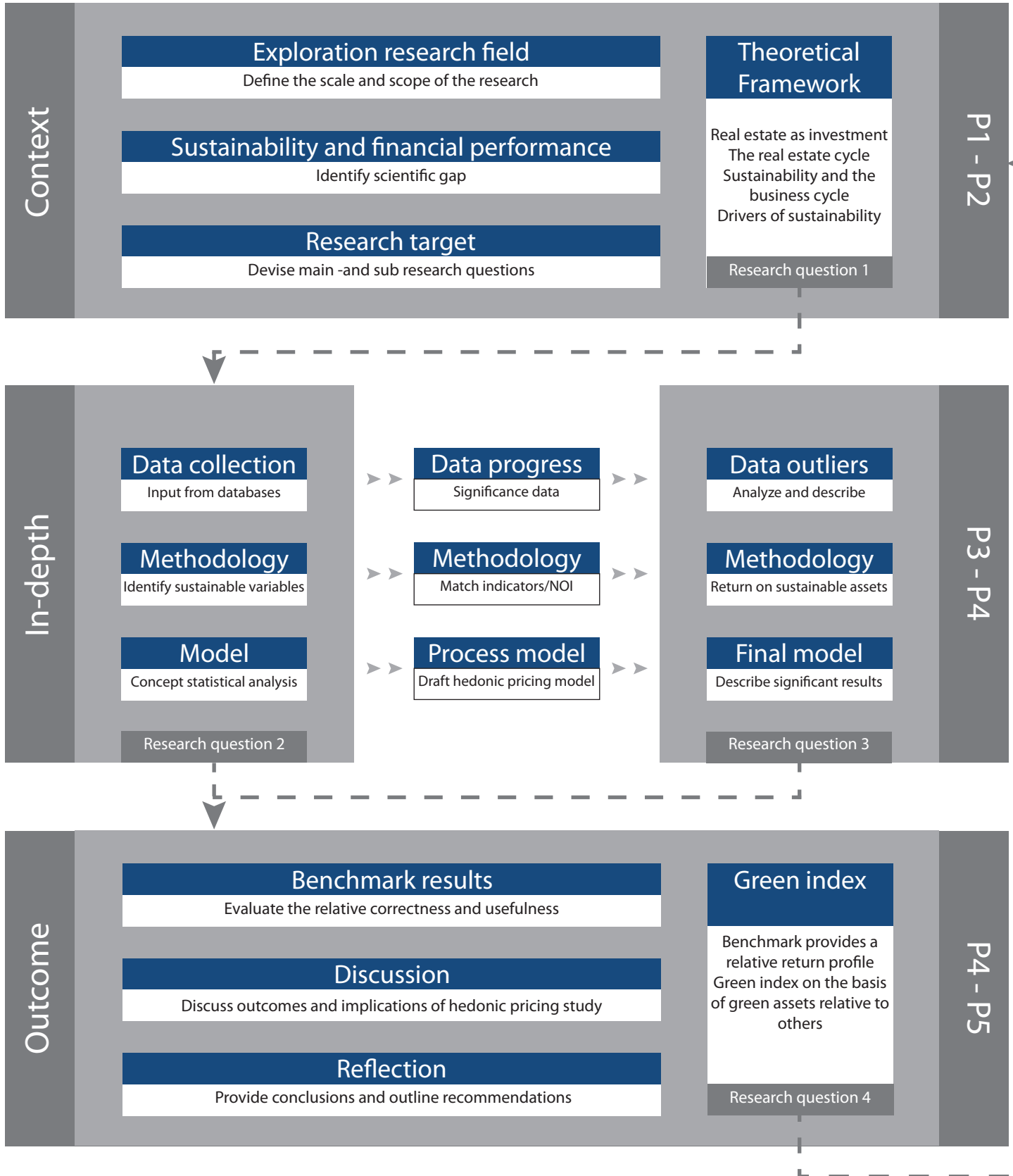
The main phase of the research consists of the gathering of data through various sources. The main aim of this data is the operationalization through a statistical analysis. As the preliminary phase will describe the sustainable variables to be used in the model, the main phase will process them into quantitative data. First the data is collected from several sources, namely the database of IPD (with reservation), DTZ, Strabo, and VTIS. This data needs to be structured and be used as an input in the hedonic pricing model. As the sustainable indicators are gathered and identified, the first conceptual analysis can occur. The quantitative data will generate an outcome regarding the financial performance of the involved asset. In this case, office buildings are subject of research and thus the most objective benchmark will be used. The net operating income provides the best perspective on the financial performance, while vacancy and operating expenses are already subtracted from the amount. As such, the indicators will provide a significant relationship between the sustainable determinants and the financial performance. As the results of the hedonic pricing model are being processed, the return on sustainable assets will be indicated. Outliers in the research will be identified and describe why their data is not corresponding with the general slope of the sample set. The effects on asset level are visualized and can state possible implications on portfolio level. While this process is being repeated for several portfolios, the opportunity arises to combine this information in a benchmark.

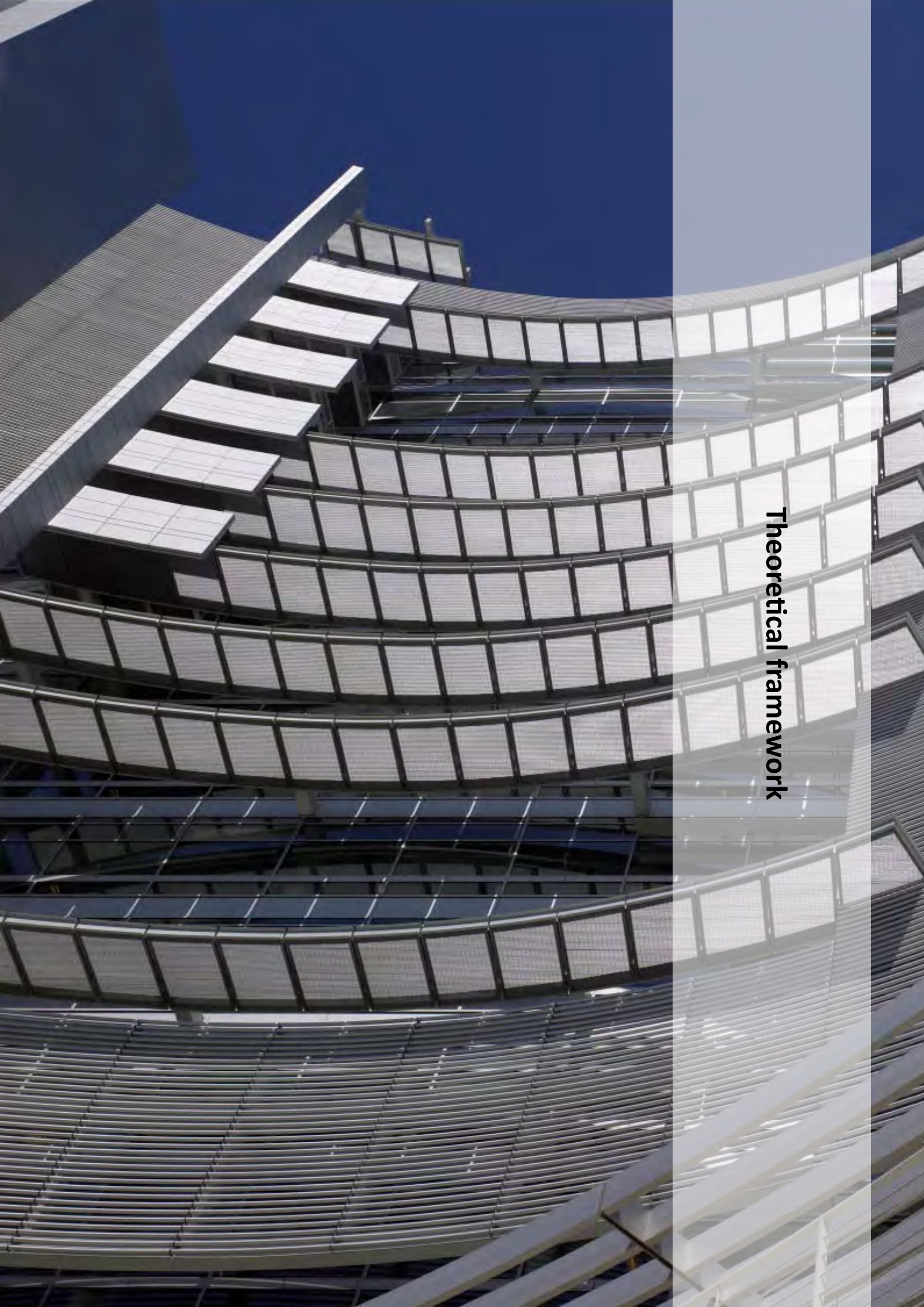
Evaluation phase

The evaluation phase starts with the relative correctness of such a benchmark as not all data will be of good quality. Consequently, the benchmark will be evaluated on its correctness and usefulness. Do the gathered findings provide evidence of a set of crucial determinants? The evaluation will describe the findings in detail and connect them to existing knowledge. The benchmark forms the basis of a green index which scales green assets relative to others. As such the difference between sustainable elements and the relative return profile can be visualized. After the final research element of the report, the discussion of the outcome comes about. The research questions and the accompanying assumptions are being discussed and evaluated on their correctness. General objective is to estimate a relationship between the degree of sustainability in the underlying assets and the financial performance. The concluding part consists of an accurate reflection which connects conclusions with recommendations and potential future research opportunities.



Incorporation of sustainability into the real estate investment portfolio





Theoretical framework

Theoretical framework

The general focus of the research will be conducted in the field of the investor's real estate market. The added value of sustainability through the use of sustainable features (energy, carbon, transport, water, waste, and wellbeing) will be subject of research. In the theoretical framework several subjects will be discussed as they all contribute partly towards a better sustainable performance. At first a general overview of the investors' market will be provided. What are the relative benefits when investing in real estate and what is the difference between public and private real estate. As the general framework of real estate investments is discussed, the focus will shift towards the current attitude towards sustainability. After a brief summary of findings subtracted from the literature, the general market attitude can be divided into a couple of sub-topics, namely real estate investment vehicles, and the existence of a real estate cycle. The desired goal is the identification and verification of sustainable variables as these are the input for the hedonic pricing model to define net financial performance on asset level. The theoretical framework is connected to the first research question, which is:

What is the relative degree of sustainability within investment portfolios across the commercial real estate market?

In this framework several topics will be addressed, starting from point zero. First the general commercial real estate market is described through a rather summarized perspective. Consequently the role of the investor is explored and described. As the perspective of the investor is defined, the integration of sustainability at company level can be shown. The literature review is continued with the current condition of sustainability investments regarding institutional investors or funds. What does the investor gain when investing in sustainability, improved return, occupancy rate or corporate image? This evidence is concisely concluded while describing the added value of sustainability.

Introduction to commercial real estate

The definition of the commercial real estate market is very well explained by Geltner and Miller (2007) in their book "Commercial Real Estate, analysis and investments". This reference is used throughout this theoretical framework as a key component. The commercial real estate market consists of two major components which are relevant for analyzing real estate: the **space** market and the **asset** market. The space or usage market is related to the use of real property, which can be seen as the right to use space or the actual property as the land or built space. On the other side of the real estate market is the asset market which represents the ownership of real estate objects. Often the asset market is compared from an economical point of view related to the capital market in which stocks and bonds are traded. Consequently, the real estate asset market must be considered as integrated within a much larger capital market.

The space market is more fundamental of the two in the sense that it determines the cash flows property can generate, and these cash flows underlie any value the property can have. This is based on the underlying notion that within the space market there is an ever changing situation between *demand* and *supply* of real estate. The occupation of an object by a tenant thus decreases supply as the space (in square meters) will be absorbed. In return the owner requires a financial compensation from the tenant to cover the costs of living/working and a premium. This short paragraph elaborates on the basic position of the space market in the much bigger real estate market. Although the space market seems to have great importance for the proper functioning of the real estate market, the asset market is of equal importance because it determines the valuation of property assets, and this in turn governs the flow of financial capital to real estate. Moreover, the asset market is most directly relevant to the analysis of investment in commercial property.



Real estate as an asset class

Investment - considered as a broad notion - is the act of putting money aside that would otherwise be used for current spending, such as groceries or luxury articles. An investor that invests its capital in an investment opportunity has two objectives to accomplish to guarantee a return on his expenditure. First, the *growth* objective is defined as the value growth of an investment based on a longer time period. Second the *income* objective which indicates that the investor has a short-term and a continuous need to use cash generated by the investment. Consequently an investor has to adopt one of these principles or both. Based on these two fundamental principles from an investor's point of view, investors are eager to maximize their wealth through investments in opportunities.

Real estate investors face in an ever changing market difficulties and typical drawbacks. These constraints are summed up by a wide range of authors, such as (Geltner & Miller, 2007), (Benjamin, Sirmans, & Zietz, 2001 in Gijsselaar, 2010) and (Dhar & Goetzmann, 2006 in Meijners, 2012). These constraints of real estate are related to other asset classes in the capital market, which are largely stocks and bonds (and cash).

- Illiquidity
- Transaction costs
- Large unit prices
- High management intensity
- Non-transparent market

Real estate is an illiquid asset, which means when buying or selling an investment it takes quite some time compared to other easily traded asset classes such as stocks and bonds. An office building is thus an illiquid good compared to a stock of the AEX-index. Investors thus face difficulties when acquiring or selling properties in a rapidly shifting market.

At the same time when selling or purchasing real estate, transaction costs are part of the process. Relating to the Dutch housing market, recently transaction costs are lowered from 6% to 2%. This means that 2% of the transaction price is designated for the government. The costs associated with the acquisition of a house are generally way higher since real estate agents, advisors and the notary also charge fees. This means for investors a burden when acquiring or selling a property, which explains why investments in real estate often have such a long-term horizon.

In addition, high unit prices make it difficult for smaller investors to enter the real estate market. An property does not consist of several components that are up for sale. The property is sold to an investors or fund as a whole, which often results in a high unit price.

Management intensity is related to the operational requirements of real estate. Think of an office building and its operational requirements (vacancy, energy etc.). All these components make real estate an intensive investment related to stocks and bonds which can be managed relatively easy.

A concluding constraint is the rather opaque real estate market in which investors can face difficult problems when not adequately prepared. For stocks and bonds there is a continuous index that informs about current conditions. In real estate information is often held back by investors, brokers, tenants and so on.

So why should you invest in real estate? The foregoing constraints presents real estate in quite a bad light, but what are the advantages of real estate compared to the other assets classes (stocks, bonds, and cash)?



- Diversification potential
- Relatively high returns
- Hedging against inflation
- Long-term growth benefit
- Stable and predictable cash flows

The first argument for investing in real estate is because of its diversification potential, and therefore the opportunity to decrease the portfolio risk. Unlike other assets, real estate and real estate diversification pays off at the very time when the benefits are most needed, that is, when consumption growth opportunities are low (Chun, Sa-Aadu, & Shilling, 2004). When managing an investment portfolio the addition of real estate to stocks and bonds is ideal. Mostly because of the predictability of real estate returns, equivalent with the predictability of the stock market. Thus investors could assign real estate a much more important role in the optimal portfolio. The optimal asset-liability investment policy involves an allocation of between 6-12% to real estate on average (Chun et al., 2004). Other evidence suggests an allocation of 10% to real estate in a mixed-asset portfolio (Brounen & Eichholtz, 2003).

Another advantage of real estate is a relatively high return on a long-term basis. Due to the illiquid nature of real estate a long-term vision is requisite. Thus real estate provides a long-term growth benefit and a short-term continuous predictable cash flow. Due to the influence of these benefits real estate can be scaled between stocks and bonds in the investment universe. Due to the stable cash flows, thus predictable returns, real estate has the attribute to hedge against inflation. Several studies looked at the hedging opportunities of real estate and two main results were found. First the inflation hedge is derived from the actual capital gain from the property instead of the stable cash flow (or income return) (Huang & Hudson-Wilson, 2007). Second, not only the capital gain is an appropriate hedge against inflation, also rent indexation protects the investors against inflation (Baum, 2009).

Investment Concern	Stocks	Real Estate*	Long-Term Bonds**	Cash (T-Bills)
Risk	High	Moderate to Low***	Moderate to Low***	Lowest
Total Return	High	Moderate	Moderate	Lowest
Current Yield	Low	High	Highest	Moderate
Growth	High	Low	None	None****
Inflation Protection	L. R. Good	Good	Bad	Best (if reinvested)

(Geltner & Miller, 2007)

Real estate investment vehicles

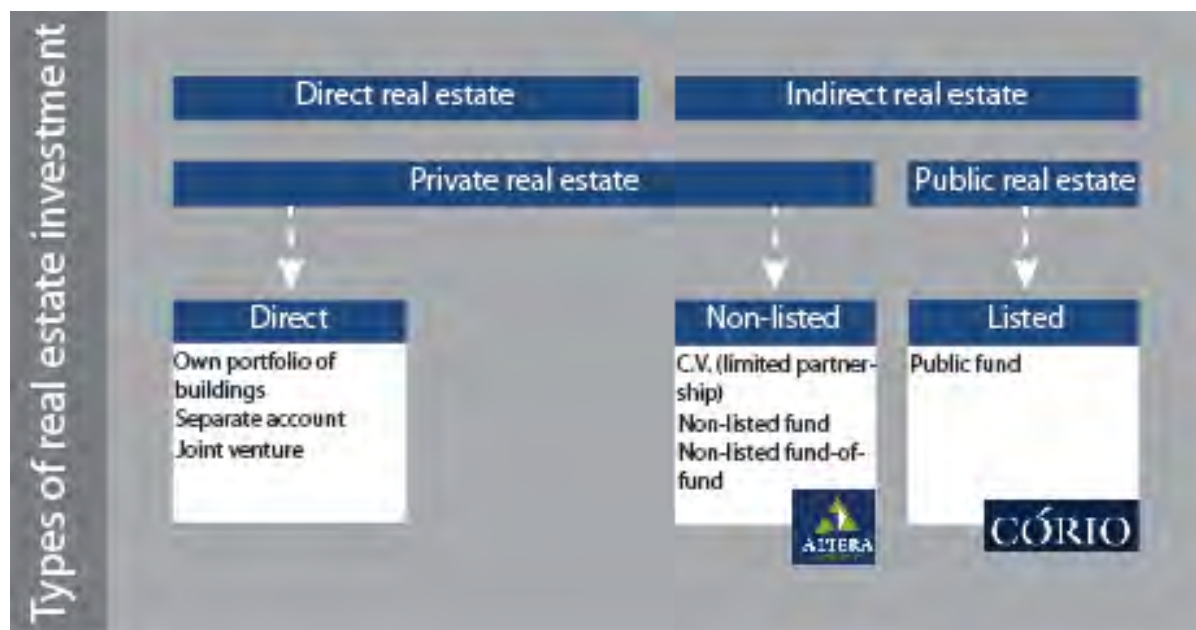
Within real estate there are different types of investment vehicles. Since institutional investors have access to a wide variety of types, this paragraph will try structure these types and divide them up in comprehensive pieces. This typology regards real estate assets or properties as underlying assets in the framework of the investment vehicles direct and indirect real estate.

Direct and indirect real estate



Direct real estate investments are the most traditional way of investing in Real Estate. Basically the acquisition of an asset and generate a stable income through the tenant with an exit return when the asset is sold. Direct real estate is the purest form of investing because of the total control of the investment policy and the feeling with the market. Direct real estate can be compared with the purchase of your own house. The equity is directly invested in the asset without many intermediaries. The constraints of direct real estate are generally the ones cited above, namely the lack of liquidity and the transaction costs connected to the high initial investment. Therefore investors sought for other solutions to invest in real estate, because the risk associated with direct investments is often too high. These events created the introduction of indirect real estate, which has a different focus on real estate investment.

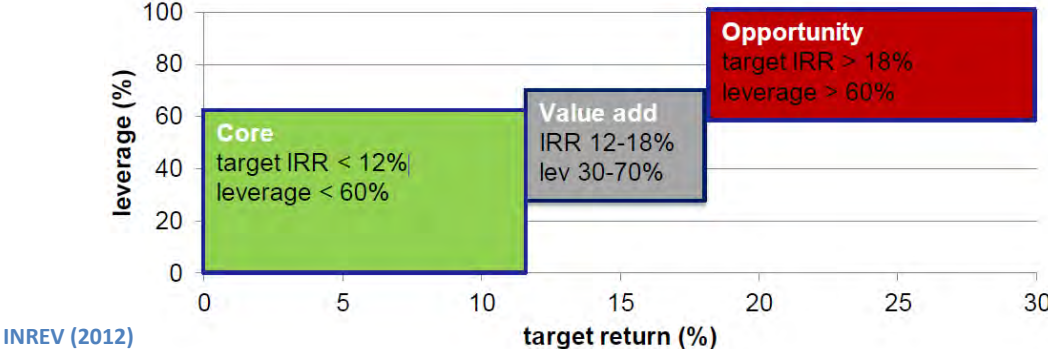
Indirect real estate can be seen as investments in real estate, except for the direct acquisition of real property. Investment in indirect real estate is practice for passive investors. Passive investors are those who do not wish to be deeply or directly involved in the management and operation of the underlying real estate assets. They lack the necessary specialized expertise or the time and resources required by such management, yet the value the risk and return characteristics of commercial real estate equity (Geltner & Miller, 2007). Take for instance a pension fund which is interested to diversify its portfolio. Since most pension funds do not have the expertise or employees to invest directly into real estate, investing in indirect funds could be advantageous. In the table below the basic scheme of the types of investment are shown.



In the following paragraph the differences between listed real estate and non-listed real estate will be discussed. Let's start with listed funds. Listed real estate (US: REIT's) is similar to corporate stock in that it provides investors with an ownership interest in the underlying asset, which is sometimes leveraged. Public real estate trades in shares, enabling small (individual) investors to participate in commercial property investment. Second, these shares are usually publicly traded and so provide the investor with more liquidity than direct real estate investments (Geltner & Miller, 2007). A withdraw of listed real estate is the correlation with the overall stock market, which makes the returns more volatile (Brounen, Veld 't, & Raitio, 2007). Until now the correlation with the stock market seems to work against real estate, this is actually not true. Due to the transparent nature of the stock market, thus the public real estate market it is easier to measure performance and benchmark portfolios. Due to the volatile nature and the simultaneous added risk, the returns of public real estate could be higher than all other types.



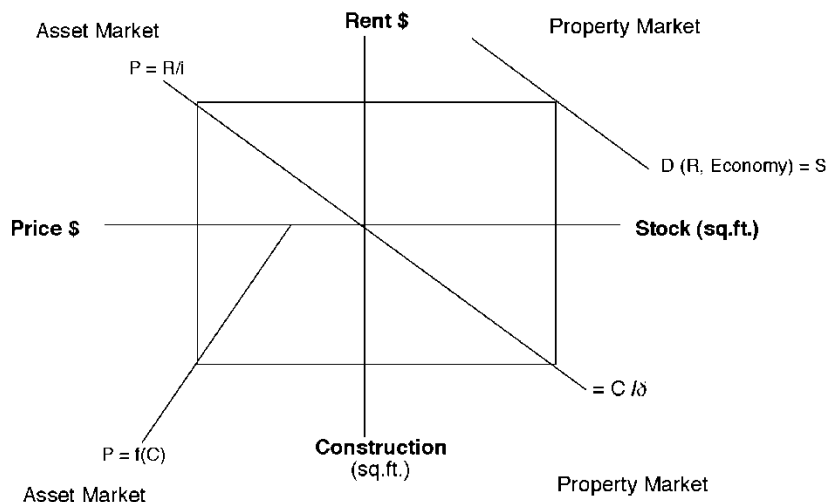
When considering private investment, one has to know that there is no trade in shares or stocks, which is rather different from the public side. A private fund thus has the unique ability to benefit from market inefficiency, thus lower correlation exist between the stock market and the private funds' performance. Besides the inflation hedge (discussed in previous paragraph), a stable return, capital growth and lower risk is often applicable. The risk depends on the particular investment style of the fund. When investing in private non-listed funds, one invests indirect. Investors can benefit from this in multiple ways, namely the absence of transfer tax, lower capital investment requirements, and less local knowledge is required. As funds gather capital from multiple investors, a non-listed fund benefits from the relative scale thus bigger investments form a burden to a lesser extent. Between non-listed funds, investors can opt for different types of funds such as finite life or infinite life funds. Several types of funds are available with varying levels of market risk (depending on the type of real estate assets held by the fund and on the country where such investments are undertaken) (Hoesli & Lekander, 2008). As such, investors can choose between investment styles of several funds. These investments styles represent the risk appetite of a particular investors regarding private indirect real estate. These investment styles are described by INREV(2012a) and shown in the graphic display below. An investment style consists of several notions, but most importantly on the risk/return profile. An investor can choose between different notions such as Core, Core+, Value added or Opportunistic. These labels are related to the preferred return and the amount of risk the investor is willing to take.



The existence of a real estate cycle

Let's go back to the beginning, in which the cycle of demand and supply are central components of the real estate system. The availability or unavailability of real estate forms the backbone of the space and asset market and creates an equilibrium within the real estate market. The graphic representation of the real estate system just described is useful for performing some basic analyses of the system, and has been developed by DiPasquale & Wheaton (1992). The four-quadrant framework is useful for the description of the long-term equilibrium within the real estate system, allowing the markets sufficient time for the supply of built space to adjust to the demand. The process of external changes to the real estate system, for instance employment growth or capitalization rate disrupt the equilibrium situation, thus the four quadrant framework provides a guide to return to a stable situation.





where:
 D = demand for space
 R = rent
 F(C) = replacement cost of real estate
 S = stock of space
 i = interest rate
 δ = depreciation rate

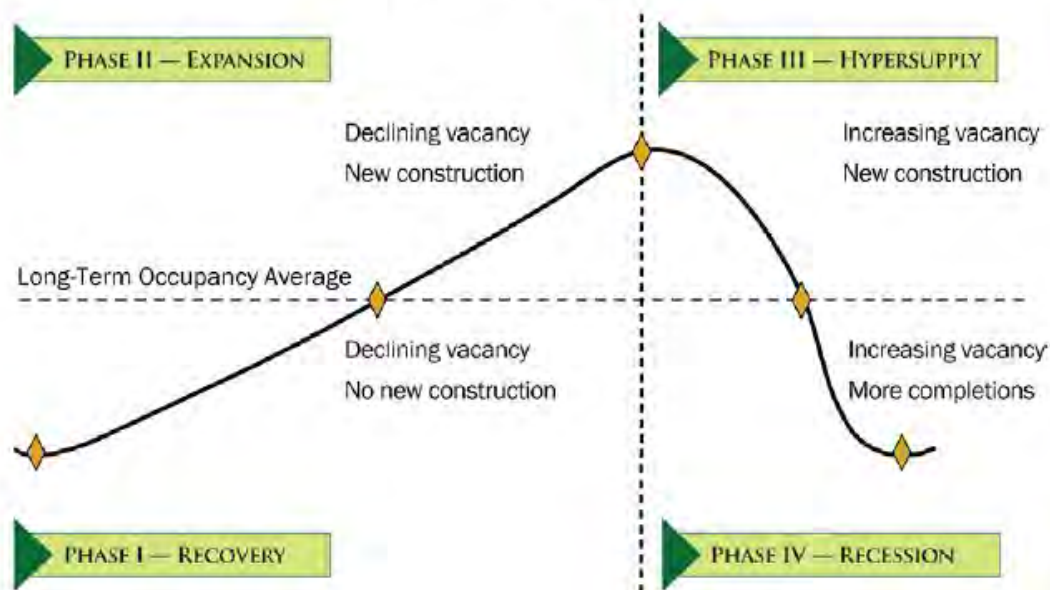
Figure 1.
 The equilibrium of the
 real estate market

Several authors wrote about the real estate cycle, both for commercial or residential properties. The four quadrant framework is in this regard a basic tool used for explaining rudimentary knowledge. One set of authors tries to identify a house price cycle through the use of statistical analysis. With the use of a wide set of regression analysis the authors find often macroeconomic determinants of the housing markets (Adams & Füss, 2010), (Beltratti & Morana, 2010), and (Englund & Ioannides, 1997). These determinants can predict a housing price cycle, but evidence is not strong enough to conclude the existence of a real estate cycle of house prices. Other authors tried the same for commercial properties and their macroeconomic determinants (DiPasquale & Wheaton, 1996). See for instance Jackson, Stevenson & Watkins (2008) regarding the “single cross-continental office market”. This article surprisingly identifies New York and London consistent with each other, more because of their scale and the same kind of economic base (finance related). Other (recent) research by Srivatsa & Lee (2012) shows that the real estate office markets in Europe are not fully integrated and indicate that diversification across Europe is still a viable investment strategy. These are just some examples that often real estate markets differ from each other and regional aspects prevail in the determination of macroeconomic variables.

In this subsection, explanations have been given regarding the four quadrant model and the general functioning of the real estate system and the integrated (international) real estate markets (or rather lack of it). When the crisis of 2007 emerged, real estate took the fall and simultaneously real estate prices dropped, with office properties as frontrunner. After the Dotcom-bubble, the so called “Wall of money” made everything possible, ranging from extra ordinary transaction prices to the acquisition of farmland to be made into prime property. As the crisis attends, real estate fluctuates around an imaginary “average” value. Kaiser (1997) wrote an interesting article about the existence of the real estate cycle. Key findings included the fact that there are many different property cycles and that the real estate cycle is driven by inflation spikes on a long-term basis. Müller (1999) made an very interesting graphical approach in his article, which is shown below. The figure indicates the general functioning of the market and represents the real estate cycle in a comprehensive way.



Market Cycle Quadrants



Müller (1999)

The commercial real estate market is very broad with literally millions of different investment products and opportunities. This segment summarized the essential knowledge regarding the real estate system and commercial real estate to continue with investments in sustainability. As the preceding elaborated further on the perspective of an investor, the influence of sustainability on investment decisions can be described further on. Demand and supply form in that point of view an important indicator towards innovation in real estate. As sustainability is becoming more and more integrated in the real estate market, variances between listed and non-listed are still likely, due to their different natures. Sustainability could also be part of an investment strategy or style of a real estate fund in which sustainable features such as certification systems form an important part of the limitation of risk. Lastly, both the real estate system and the real estate cycle form a good indication of current (economic) times. The position of sustainability can be placed in a spectrum of current times; hence it is easier to comprehend opportunities and constraints. Therefore, this theoretical part should be perceived as a short introduction to the work of commercial real estate in which sustainability will be an evolving factor.



Sustainability

The first part of this extending sustainability section discusses the content of the research related to the social relevance. Sustainability is a well-known issue which currently faces multiple actors in the real estate sector. Before the extensive discussion of current evidence regarding sustainable performance and benchmarking, the author will try to enlighten the reader about the general definition of 'sustainability'.

What is sustainability?

The notion of sustainability emerged in the late 60s in response to concern about environmental degradation. Sustainability can be applied to various disciplines and sectors globally and has been on the agenda of major institutions such as the United Nations or the Organization for Economic Cooperation and Development (OECD) among others. Since the late 60s there has been a lot of change in the view towards the general concept of 'sustainability'. Commonly known among researchers and scientists is the UNCED report (1987) which is named '*Our common future*' and written by the Brundtland-commission. This report contains a definition of sustainable development which has currently a widespread influence: 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'

This definition is commonly cited as the general concept of sustainability worldwide. Therefore the social relevance of sustainability is a small piece within sustainable development. According to (Mak & Peacock, 2011) environmental sustainability is in common with social sustainability. Consequently social sustainability is the idea that future generations should have the same or greater access to social resources as the current generation ("inter-generational equity"), while there should also be equal access to social resources within the current generation ("intra-generational equity"). The meaning of this sentence could be traced back to the added value of sustainability on our current business.

The textual explanation of sustainability from Brundlandt and Mak et al. is rather vague. As each person can interpreted sustainability through its own intuition. A more comprehensive graphical approach is stated by Elkington (1998). Elkingtons methodology towards sustainability is the triple bottom line or 3P-approach. In the figure underneath the three definitions can be observed: People, planet and profit. These principles form the background for every 'responsible' decision or investment. Translated into practice, these principles focus on preventing pollution, promote sustainable use of resources, contribute to reducing climate change, and protecting the natural environment. As such, the PPP-approach acclaims the strategy of 'reduce, re-use and recycle', while encouraging the use of environmentally friendly technologies and the use of "renewable energy".



Besides the improvement of involved products, process adjustments are also commonly used in practice. Usually a social shared value is introduced to evaluate and reorganize the supply chain. In that matter, not only the 'responsible' business is involved but also indirectly influencing companies along the supply chain. Hence the triple-P approach has as target to improve the process and implement products to reduce environmental impact as much as possible.

Social sustainability

Social sustainability is not an innovative topic anymore but a genuine part of a business strategy towards the market. Subsequently different aspects of social sustainability are often considered in



Corporate Social Responsibility (CSR). CSR performance is a notion of sustainability in a company, which consists of several fields of interest. The success of a company is not only dependent on the obedience of regulations and laws but also through a wide set of economic, environmental and social issues in ways that benefit the entire community and society globally. An extension on the definition of CSR is the social attitude of the financial operation of the company, also known as Responsible Property Investment (RPI). The RPI component within the CSR is aimed at the operationalization of social responsibilities through, for instance real estate investments and the extension of loans.

Responsible investments in real estate

The preceding paragraph elaborated on the principle of socially responsible investing. When considering the impact of RPI on buildings and construction figures, sustainable development of real estate should be part of a companywide strategy. The United Nations Environment Program (UNEP) Sustainable Buildings and Climate Initiative (2009) suggests that buildings are responsible for more than 40 percent of global energy use and one third of global greenhouse gas emissions. It also estimates that buildings are responsible for up to 80 percent of greenhouse gas emissions in our cities and towns. While considering the reduction of greenhouse gas emissions, improvement can easily and cheaply be made in the built environment. In addition to the greenhouse gas emissions, the built environment is also responsible for 30 percent of natural material use and 20 percent of water use on a global scale. It also produces an estimated 30 percent of all solid waste.

Investors are starting to integrate CSR factors alongside traditional measures of financial risk as part of their asset allocation and portfolio risk analysis. The results obtained from such analysis can contribute to specific decisions about whether to acquire or dispose of a property, or identify which properties would benefit from specific RPI interventions to improve their operational efficiency. In addition investors are starting to use RPI criteria to set minimum standards for funds or individual assets they may acquire or hold. Standards can be applied at different levels (across the whole fund or for certain type of properties within the fund, or for assets over certain value) and can be set according to industry benchmarks, certification schemes among others (UNEP, 2012). Investors that have an indirect investment approach wish to integrate RPI and make an assessment of the relative RPI performance of the real estate fund. Until recently it has been challenging for investors to compare the RPI credentials of different funds or property companies, as no complete independent organizations existed to do this. Fortunately some organizations that integrated sustainable performance were founded the past years of which GRESB is one of them.

Global Reporting Initiative

Sustainable certification systems, which includes building and material certification, building energy intensity, water intensity and greenhouse gas emissions for buildings in use, and management and remediation of contaminated land are three issues covered by the Global Reporting Initiative (GRI). This non-profit organization promotes economic sustainability through the provision of standards for sustainable reporting. While providing such standards the Global Reporting Initiative is responsible for increasing transparency and social responsibility (CSR & RPI) in the real estate sector.

According to the GRI organization, the measurement, monitoring and reporting on the sustainability of buildings is an enormous challenge. Therefore a sustainability report is the key communication tool for sustainable performance, and capturing relevant information that can influence company policy, strategy and operations on an ongoing basis. GRI provides investors with key knowledge and ensures correct sustainable reporting in over 4000 companies worldwide.

GRI can be divided up into more subareas of attention, such as financial services, food processing or



oil and gas. There are also guidelines within the construction and real estate field which focuses solely on the development, construction and management of buildings. This is called the GRI's Construction and Real Estate Sector Supplement (Global reporting initiative, 2012). The main reason for developing additional guidelines for real estate was to provide an universal language that different companies throughout the world could use to communicate about sustainable performance. This framework of sustainable drivers is very broad and applicable throughout the whole real estate sector with various components. The focus is upon the whole cycle of real estate from construction to demolition, also known as the economic lifecycle of a building. As such this initiative provided various real estate companies with a solid base to act and communicate with each other to increase transparency, thus making sustainability more comprehensive.

Eco-labeling

Over the last decade, the commercial real estate sector has seen the introduction of a wide range of so called eco-labels. Eco-labeling can be deducted and interpreted as a sustainable certification for properties. These labels follow the trend already explained in the preceding paragraphs while through CSR-performance, socially responsible investing and the global reporting initiative sustainability in general is stimulated. Therefore these labels are a mean to achieve a company's sustainable target. Especially during the introduction of the first eco-labels the differences were quite significant while not every label consequently used all involved (sustainable) factors related to the subject property. Although during current times labeling becomes more and more harmonized, differences between labels are still evident. When considering labeling on an international scale, there are various voluntary eco-labels competing with each other to evolve into market leader. In national real estate markets, there can be a mixture of compulsory and voluntary eco-labels. Foregoing indicated that some eco-labels are obligatory. Indeed, while the measurement of sustainable features is an important factor in reducing emissions. Although not every aspect of eco-labels is integrated into EU regulations, the impact of energy use is. Measurement of energy use in new and existing buildings has become obligatory following the EU Energy Performance of Buildings Directive. The Directive requires that all buildings at construction, sale or rent to have certificates giving information about their energy performance through a rating CO2 emissions.

The direct aim of eco-labels is to provide information to consumers or users about the environmental performance of a product with the indirect aim of influencing their consumption choices, suppliers' production outputs and, as a result, the level of environmentally harmful emissions (Fuerst & McAllister, 2011c). Assuming that sustainable performance is a significant attribute for investors, eco-labeling basically enables them to discriminate between properties according to their performance. Consequently, the demand will increase for properties with a reduced sustainable profile and energy performance, thus providing an economic stimulation to invest in sustainable labeling. The implementation of such an eco -or sustainable label sounds like a wise investment, while the investors benefit from a reduced risk profile and the occupier with a state-of-the-art property which consumes less energy or resources. On the other hand, there is a down-side to the implementation of sustainable labeling, while there are also several reasons why not to invest in environmental performance. Most importantly, investors are still not that eager to invest in sustainable properties or labeling while the available data lacks compared to information regarding other property classes.

Nonetheless, the variety of sustainable certification systems is enormous and not all labels are equally important with regard to the commercial market. Though relatively limited in use, with an estimated number of 15,000 labels worldwide, they are growing quickly and they tend to have more support both within and especially beyond the commercial real estate industry. We can distinguish a couple of major players on the field of labeling, which starts with the internationally used Leadership



in Energy and Environmental Design (LEED) and the Building Research Establishment Environmental Assessment Method (BREEAM) rating systems. These two labels are mostly internationally orientated and are being used globally. One major international difference between LEED and BREEAM is that, BREEAM criteria depend on the use of a particular building and include the option of being adapted to suit local circumstances. LEED, on other hand, has a methodology based on homogenous criteria, with less focus on the use of the building. This makes LEED assessments easier and quicker to carry out, especially for mixed-use schemes, although they are not as fine-tuned to individual circumstances. LEED is growing in global popularity and remains the preferred accreditation among US occupiers and investors (Cushman & Wakefield, 2008). Other systems are more nationally based such as the Comprehensive Assessment System for Built Environment Efficiency (CASBEE) in Japan and the National Australian Built Environment Rating System (NABERS) in Australia. While each sustainable certification system has its unique design and point system, and thus weights each category differently, they all consider the same general factors:

- Energy efficiency
- Carbon emissions / pollution
- Water efficiency
- Waste and recycling
- Building materials
- Indoor comfort and air quality and
- Site quality and access to public transit

Only in the Netherlands alone, there are five well-known sustainable certification systems. In the Netherlands, the EPC-label has the biggest market share which is related to the obligatory assessment due to government regulations. The landlord or owner has to inform the tenant about the energy consumption of the property. With regard to BREEAM, this certificate is gaining terrain as the assessment is based on a broad set of requirements. Potential tenants have in that opinion “more value for their money”. In the table below, a short summary of all different labels has been given which shows the relative broad and extended view of BREEAM and LEED compared to other (older) labels.

	BREEAM	LEED	EPC	Greencalc +	GPR Gebouw
Energy/CO2	19,0%	27,0%	100,0%	65,0%	20,0%
Material	12,5%	20,0%	-	21,0%	20,0%
Water	6,0%	8,0%	-	6,0%	20,0%
Mobility	8,0%	-	-	8,0%	-
Health	15,0%	23,0%	-	-	20,0%
Management	12,0%	-	-	-	-
Waste	7,5%	-	-	-	20,0%
Ecology	10,0%	22,0%	-	-	-
Pollution	10,0%	-	-	-	-
Application	Design & process	Design & process	Design tool	Design tool	Design tool
Quality	Yes, assessment	Yes, assessment	Yes, assessment	No	No
Scope	Broad	Broad	Limited	Limited	Limited
Qualitative	Yes	Yes	Yes	No	Yes
Quantitative	Yes	No	Yes	Yes	No

Conclusions

There are evident relationships between the notions of CSR, RPI, GRI and eco-labeling, while scale is the major difference. CSR-performance is part of the general strategy of an organization, while RPI



often is the financial part of a company's strategy. Environmental labels are examples of measures that influence the outcomes of sustainable reporting. Although there are several definitions for responsible property investing, these notions are more a general overview of the various choices a professional organization could make. The implications of these kinds of performance measures and initiatives are broad. Not only occupiers of the involved assets, but also investors can benefit from aligning physical real estate to sustainable operation. Currently investors are increasingly integrating sustainable principles within their asset management activities to respond to tenants being increasingly concerned about the environmental performance and operational efficiency of the assets they occupy. As utility prices increase, and labeling of efficient buildings increases, it is likely that this could contribute to reduce rent, decrease vacancy and lead to faster depreciation in less efficient assets due to the absence of tenant demand.

Sustainability in practice

Currently different organizations, initiatives, and alliances exist in the field of sustainable real estate. The framework of sustainability consists of various actors and stakeholder ranging from end-users to investors and developers. They all share one common need related to objective measurement of sustainable features. Independent organizations that provide the real estate market with useful and measurable information based on objective data. Indeed these organizations exist, but are not widely noticed in the market. In the first paragraph the author will elaborate on well-known existing organizations before introducing sustainable drivers.

Organizations and functions

Throughout the world numerous sustainable certification systems have been developed. These labels are developed under the supervision of national appointed sustainability organizations. The three organizations below are some examples on national scale:

USGBC – United States Green Building Council
BRE – Building Research Establishment (UK)
EPBD – Energy Performance Building Directive (European)
DGBC – Dutch Green Building Council
Agentschap-NL (governmental organization)

Some influential certificates originate from these organizations. Take for instance the USGBC, which initiated the LEED-certification. Corresponding with the situation in the US, BRE initiated the BREEAM certification. On national scale (the Netherlands), BREEAM is gaining a bigger market share due to the DGBC. Another example is the European energy certificate developed by the EPBD, the EPC-energy label is regulated since early 2008, and thus required to use during a transaction. Unfortunately the Lower House rejected a governmental bill that enabled buyers and tenants to go to court if the owner of a building would not provide an EPC- certificate (Rijksoverheid, 2012). Although rejected in November 2012, it is likely the bill will pass during 2013.

These organizations are an example of the relative governmental influence regarding sustainability. Often these initiatives are not market-based and provide a threshold toward the real estate market. Besides the earlier named organizations, investors led initiatives arose during recent years. One of the most well-known organizations is theGRESB, which is an industry-led organization committed to rigorous and independent evaluation of the sustainability performance of real estate portfolios.



Why is benchmarking sustainability important?

Sustainability is a vague term, and it's hard to put a number on it. But if you ask the right questions and translate that into a benchmark, it allows the capital market to integrate sustainability into their underwriting, investment decisions, their engagements with investment managers and so on. Once benchmarking is transparent, the sector can really start to move forward. For example, if you can compare office REITs using the same criteria, it becomes clear how active some property managers are in implementing sustainability solutions, where others are not yet fully engaged (Consol, 2012).

GRESB works in tandem with institutional investors and their portfolio managers to identify and implement sustainability best practices in order to enhance and protect shareholder value (GRESB, 2012). The organization has a benchmarking function for a large share of real estate funds around the globe. The basis for the benchmark is an annual survey measuring the environmental and social performance of real estate companies and funds at the portfolio level. The survey is comprised of two parts: Management & Policy (weights about one-third), focusing on environmental policies and reporting of respondents, and Implementation & Measurement (weights about two-thirds), which addresses environmental key determinants, such as energy and water consumption of the real estate portfolio, and the infrastructure needed for superior environmental performance (Bauer et al., 2011). The weight of each dimension thus depends on how it may affect financial performance. The weighting is designed to reflect an overall GRESB score that rewards efforts more than words.

Consequently, the GRESB gathers relevant sustainable data among listed and non-listed funds with as overall target to benchmark the quantitative data and assist institutional investors in their investment decisions. The GRESB provides the investor with an individual scorecard which quantifies the funds' performance among others in the business. Good performing funds get renowned through the title: "Green star", and get market exposure due to their good sustainable performance. Bad performers (or "Green starters") are enabled to discuss their outcomes and encourage them to get involved. Some institutions are even going so far as to incorporate sustainability performance scores into their investment models to better project growth rates and risk levels (Kenney, 2012).

Besides the GRESB are more organizations backed by the real estate industry. Although these organizations have a wide set of supporting institutions they often lack the exposure of the GRESB. These organizations often have a better focus on asset-level and provide data on building level. An example is the Green Rating Alliance (GRA). To date the environmental performance of over 4 million m² of European property space in more than 60 cities across 12 countries has already been measured by the GRA. Future prospects state an increase of members which would lift the value of the rated assets to €16 billion covering a surface area of 5 million m² (Seebus, 2012). Other institutions include the International Sustainability Alliance (ISA), Greenprint, Green Property Alliance (GPA), and Sustainable Buildings and Climate Initiative (SBCI) and so on.



Conclusions

All these organizations, from the USGBC to the GRA all share common goals towards a sustainable future. Either in a managerial way while ignoring sustainability issues will expose a manager to sustainability-related risks or in a financial way to enhance and protect shareholder value. The quantitative data enables organizations to indeed benchmark their performance worldwide but also in their relative peer group based on geographical borders or property type. Often the front runners are announced with high regards related to sustainability. Bad performers on the other hand are not judged, but are informally engaged through the principle: “no naming, no shaming”. Still most initiatives are poorly conceived by the market as the withholding power of almost all the real estate funds is still large. Sharing of data remains quite the same in the real estate sector and most funds are not too eager to communicate sensitive digits. Second most initiatives are not backed by the commercial real estate sector and do not obtain the exposure to actually be successful. Third, asset level initiatives remain sketchy and are either biased or are not being refreshed on a yearly basis. On the other hand, there are practical reasons why real estate funds are interested to join with such initiatives. First is the data collection of sustainable features and the comparison with other real estate funds (benchmarking function). The second argument can be quoted as “join the club”, which means that most funds sense a relative pressure to join since others already joined the benchmark. The third and last argument is about the gathered information, which can be used for CSR-reporting.

Drivers of sustainability

The current practice distinguishes differences between the degree of sustainability. The relative sustainable performance of an asset or an investment portfolio is based upon drivers that have predicting powers. One could possibly argue that only financial performance matters in case of real estate funds, but these benefits are also dependent on other criteria. Based on research of Nelson & Frankel (2012) there are five crucial drivers that influence the relative sustainable performance or attitude in the real estate market. These are respectively: enhanced operating efficiency, investor criteria, regulatory compliance and incentives, tenant demand, and competitive positioning. These notions will be elaborated further on in this sub-chapter.

The author would like to start with an example of early published evidence regarding sustainable performance. Authors Eichholtz, Kok & Quigley (2010) were among the first the state evidence about the financial well-being of “green” buildings. They used (US-only) data from the Costar group and made clusters of green buildings versus non-green buildings to measure the relative differences. Findings derived from their research show that ‘green’ is more than just an intangible eco-label. When energy efficient investments are made at the time of construction this could insure against increases in future energy prices and decreases greenhouse gas emission. Reduced operating expenses will save the investor costs. Other benefits from green buildings can be better behavior of employees (less absenteeism and higher productivity), a better image for the company and lower volatility in market value. The last benefit is based upon the preference of tenants who would rather have sustainable buildings. As such, quantitative studies provide the incentive to invest in green buildings, while investors are benefiting from added rent/value premiums and the tenants from increased operating efficiency. Basically if the tenant is *willing-to-pay* the added rent premium, the higher initial investment for investors is justified.

On the table on the next page shows a summary of current existing evidence of various authors, most of it focused on office buildings. Although this table represents not all existing evidence, the author is convinced that this will provide a solid base line to start from. In the following paragraphs, the table will be used to state evidence of the articles relative to the subject discussed.



Author	Property type	Sustainable feature	Observed impact on(%)	Values
Brounen, D., & Kok, N. (2011)	Residential	EPC (A,B,C)	Selling price	2,80%
Eichholtz, Kok, Quigley (2010)	Office	LEED	Rental price	2,8-3,5%
Eichholtz, P., Kok, N., & Yonder, E. (2012)	Office	LEED	Rental price	3,50%
		Energystar	Return	7,39-7,92%
			Rental price	0,31%
			Return	0,66%
Fuerst & McAllister (2008a, b)	Office	LEED/Energystar	Selling price	31-35%
		LEED/Energystar	Rental price	6-9,5%
Fuerst, F., & McAllister, P. (2009)	Office	LEED	Occupancy rate	8%
		Energystar	Occupancy rate	3%
Fuerst, F., & McAllister, P. (2011)	Office	LEED/Energystar	Selling price	18-25%
			Rental price	3-5%
Kok, N., & Jennen, M. (2012)		EPC A	Rental price	6,50%
		Transport hub	Rental price	13%
Miller, N. (2010)	Office	LEED	Rental price	12,1%
			Selling price	17,7%
		Energystar	Rental price	0,2%
			Selling price	0,0%
Pivo & Fisher (2009)	Office	Energystar/Transit location	NOI	2,7-8,2%
			Occupancy rate	0,2-1,3%
			Market value	6,7-10,6%
			Caprate	(-)0,4-1,5%
Wiley, J.A., Benefield, J.D. and Johnson, K.H. (2008)	Office	LEED/Energystar	Rental price	7-17%
			Occupancy rate	10-18%
Preceding evidence by other graduate-theses				
Erve van der (2011)		EPC A	Rental price	5%
Heineke (2009)	Office	EPC	Rental price	3,7%
Snoei (2008)	Office	Energy cost savings	Energy savings	76%
Visser (2010)		Energy cost savings	Rental premium	32%

Enhanced Operating Efficiency

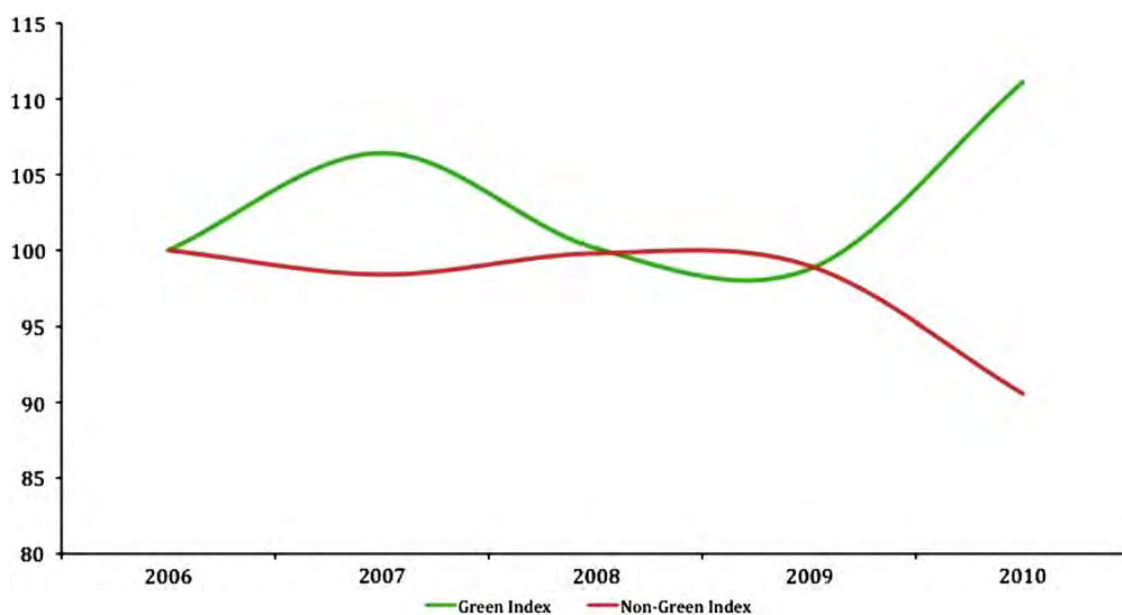
This variable often is regarded as one of the most influential when related to sustainable performance. Indeed this is partly through, because the relative objective data makes it rather suited to apply quantitative tools. Currently a lot of evidence exists on energy efficiency as part of a rental premium or occupancy rate. An office building which has an enhanced operating efficiency (on asset or portfolio-level) generates an incremental cash flow. This finding is supported by various authors who state the incremental cash flow as a rental premium or willingness-to-pay “extra”. Brounen &



Kok (2011) state evidence from a residential point of view as their findings relate to transaction prices. Indeed increased energy efficiency pays off in capital gain. But to what extent is this applicable to office properties?

Early evidence by Lützkendorf & Lorenz (2005) reported that the EU energy-efficiency directive is likely to have influence on property values and building design, renovation and investment decisions. This was before the obliged introduction of the EPC-labeling system across the EU. Other graduates at Dutch universities did (relevant) research on the topic of energy efficiency and the significance with rental values, with rental premiums ranging from 3,7% to 76% (Heineke, 2009; Snoei, 2008; Visser, 2010). The author would like to highlight the most recent research by Fleur van der Erve (2011). Her research indicated that the energy efficiency indeed relates to rental levels. In fact, buildings with high energy-efficiency have higher rents than conventional buildings, based on quantitative research. Energy efficient buildings with energy label A results in a 5% rental premium, compared to energy label B. One remarkable indication is related to buildings with extremely low energy efficiency, which seem to have high rents as well. This can be explained due to the relative age and the likely image of such buildings. Outliers in the data, which command higher rents, are often related with (prime) locations. From a qualitative perspective, the tenant can relate sustainability to higher productivity, due to high indoor environment and a positive corporate image. Visser (2010) makes a division between quantitative and qualitative motivations. The energy costs compensation refers to “green leases”, which are stimulating to split investment costs for sustainability. The research gives an indication that tenants are willing to pay about 2,5 times a rent premium regarding improved image and an increase of employee productivity compared to energy cost savings.

Other such as Kok, Eichholtz, Bauer & Peneda (2010) see investments in energy efficiency as an indicator to a higher net present value. This holds true especially for building management, lighting, cooling and heating technology, and better insulation. These investments are currently hampered by a lack of information and market awareness, lack of financing, and lack of proper incentives. Such evidence indicate that lower CO2 emissions in the built environment, actually pay back with regard to lower operating costs, improvement in the marketability of properties and, ultimately, are hedged against market and macroeconomic trends that will affect the value of their property portfolio (Kok & Jennen, 2012). Energy efficiency as part of sustainable performance will yield the opportunity for the creation of value and a decrease risks.



This index extracted out of the article of Kok & Jennen (2012) is based on the quarterly change (of the Dutch market) in rents for a portfolio of green buildings and a portfolio of non-green buildings. This figure shows that “energy-hogs” are currently facing relatively strong declines in rent, while more efficient office buildings show gradual increase in rental growth. Although the evidence provided by these authors seems ever convincing the commercial real estate market to step into sustainability and even more into energy efficiency, not all authors agree. Consider for instance Fuerst & McAllister (2011c) who found a negative relationship between energy efficiency and pricing in their research related to the impact of energy performance certificates. Firstly it is possible that the information contained in the EPC is not adequately considered by tenants in rental transactions. Second counter argument could be based on the sample size, which was relatively small especially considering that assets were spread across the UK. A final remark is that the data in this study is based upon appraised values rather than transaction prices.

Investor Criteria

With a growing number of investors considering sustainability as an integrated part of the commercial real estate market, how should these investors choose funds and organizations which are among top-rated sustainable performers? Nowadays sustainable certification systems are considered as a good indicator for sustainable performance. The certification is different from energy efficiency as most labels integrate more determinants in the decision-making process towards accreditation.

The table at the beginning of the chapter summarizes important results related to eco-labels and several authors find significant relationships regarding sustainable performance and rental level. Fuerst & McAllister (2008a, b) state that properties which have a rental premium often have a higher rating. Moreover the higher the sustainable rating, the higher the rent premium, and higher transaction prices. Pivo & Fisher (2009) turn assets results towards portfolio-level and explain when Net Operating Income (NOI) and market values are affected, capitalization rates (cap rate) scale down to approximately 50 basis points related to overall impact on return. A surprisingly contribution to existing knowledge is from Chegut, Eichholtz, & Kok (2012) which looked at the London office market and related green properties (BREEAM-certified) to rental heights and capital gain. The evidence suggest that there is a gentrification effect from green buildings, which expresses in reduced rental prices and value as the supply of green real estate expanded in districts. Each additional green building decreases premiums for a certified building in the rental and transaction market by 1% and 4%, respectively. The authors suggest that the supply and pipeline of real estate forms a potential bias in the results. Most of the green supply was introduced in 2007 and quickly after that. This was during the economic crisis in which London was heavily hit, as employment rate decreased in rapid pace. Consequently the quantitative results suggest otherwise, the authors believe that currently green office properties perform better. To be continued..

Overall, prior quantitative studies show that properties in redevelopment areas commanded higher rents but did not outperform on returns, that energy efficient and green properties had higher rents and values, and that in several instances properties near transit were more valuable and appreciated faster than in other locations. The paper by Pivo & Fischer (2010) states first evidence on the relationship between RPI, market value, and investment returns by comparing the financial performance of RPI and non-RPI office properties. The use of RPI is considered because the authors did not use certification requirement such as LEED. They looked at the overall energy use and the location factor “Transit location”. Their findings explain that the RPI status was associated with statistically higher incomes and/or higher values. The existence of rental premiums does not necessarily increase returns for investors because higher incomes lead to higher values which



generally offset benefits to returns. The capital gain is often a hard indicator to measure, but it suggests that the market is capitalizing at least some of the CSR-benefits of these types of responsible property investments. Pivo & Fisher close their discussion with the statement:

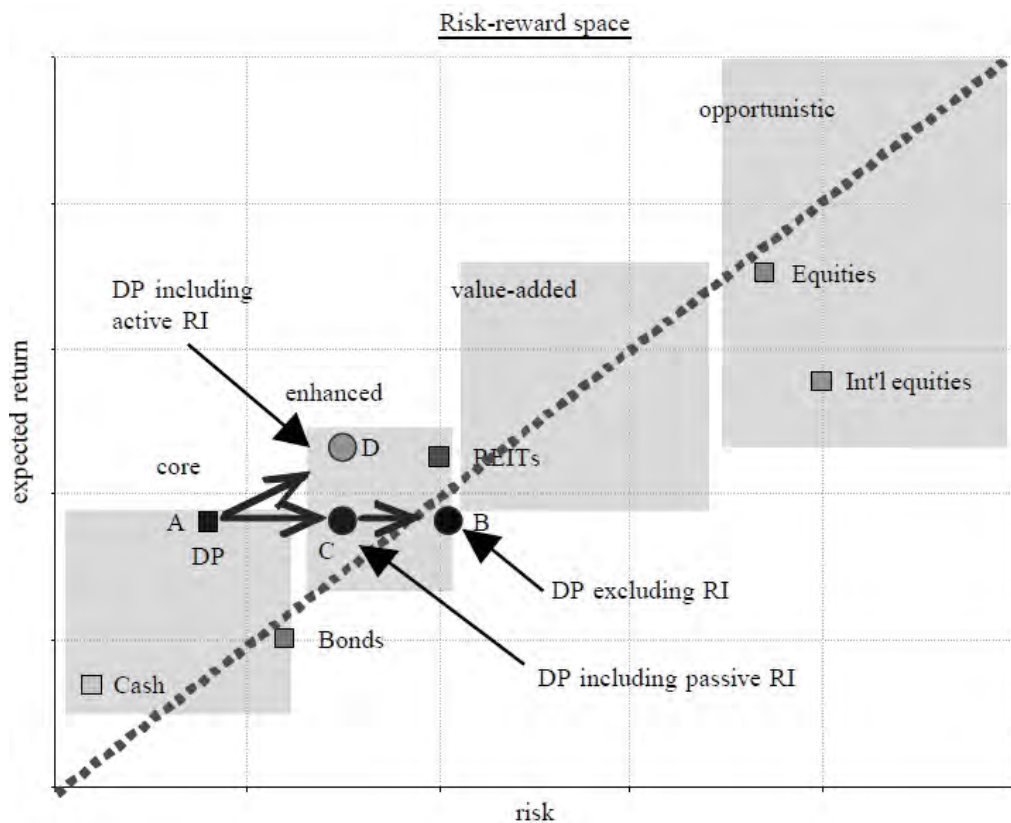
"Companies can do good and do well, even if they don't do well by doing good"

The statement basically says that in most cases RPI neither harms nor improves total return. Investors still have the same return profile in almost every case, so why not invest in sustainability is the key question?

Again Eichholtz et al. (2012) provide evidence regarding the incorporation of sustainability into the investment portfolio. They suggest that REITs are in the still in an early phase of incorporating elements related to energy efficiency and sustainability into their investment portfolios and have substantial opportunities to enhance operating returns by investing in green-certified buildings or in commercial building retrofits. Sound quantitative results indicate the relative attractiveness of LEED certification with a rental premium of 3,5% and an increased return of around 7,5% in the US real estate market. Given that portfolio greenness is positively related to operating performance and negatively related to risk, these results provide positive outlook for the return on equity and assets of (REIT) investors, and are likely to partially shield returns from the volatility of the business cycle. Another finding to prove the likely less risky situation is that occupancy rates in more efficient buildings are not only higher but more stable. The article provides a solid background to hedge against three fundamental drivers, namely the threat of regulations, energy prices and changing tenant demands.

Already in (2008), Francesco & Levy discussed the potential impacts of sustainability from a property investment perspective. Their attention focuses on the risk profile of sustainable real estate. In particular, the article argues decisions on investment performance, investment products and investment strategies. The figure below shows guidelines when responsible property investments occur.





A property with a core investment strategy that carries no sustainability issues may well sit within the core region, denoted by the A-square. When sustainability has an impact on investment performance, but uncertainty exists as to its impact on return and no action is taken, then the product offering moves from points A to B. When the principles of RPI are introduced, for instance LEED certification, the green building will move to D. Summarizing, a green building is more risky, but due to the influence of certification or other sustainable features the return will be higher. These authors are brought up because of the relative stance of the article. The results indicate a total different attitude towards sustainability than currently exists.

Eichholtz et al (2012) confirms and expands mostly qualitative findings from other authors which looked into risk/return profile and the relative market acceptance. Bügl, Leimgruber, Hüni & Scholz (2009) discussed in their qualitative research the market acceptance of sustainable real estate funds by institutional investors depends on cognitive drivers such as institutional context, and age. The results show that the focus of these actors are on economic aspects of energy and material flows, the life cycle of buildings, and maintenance costs, but less on CSR-criteria. As such, the view of the market on sustainability is dominated by capital gain and risk avoidance. Caijas & Bienert (2011) study identifies the factors affecting the firm's decision-making process to allocate financial resources into CSR-activities and whether these sustainable intentions mitigate the firm's risk profile. Results are two-fold in favor of sustainable performance, as CSR seems to be incorporated more and more among especially public real estate funds. Second, the risk associated with sustainability seems to be incorporated with the stock performance (publicly orientated). Therefore, the authors suggest that real estate funds should be more transparent about their CSR-activities, thus send clear signals to the capital markets.

Regulatory Compliance and Incentives



This subsection is important because of the legislation involved. This should be observed as a potential risk or hazard and needs to be integrated into future plans regarding the selection of assets in an investment portfolio. Governmental policies are often a long-term risk as decisions or new bills are being processed rather slowly. Although this seems quite harmless, real estate funds should be ahead of the legislation or face potential major reinvestments in their portfolio. Government policies regarding sustainability are often related to measurement and the disclosure of carbon emissions, and other (sustainable) metrics for buildings.

Besides introducing environmental bills, governmental departments often outsource research to be informed about the current trends and opportunities regarding energy efficiency, water and waste management among other. As such they demonstrate compliance towards not only investors, end-users, but the whole society. Agentschap-NL (2011) commissioned a research in the field of offices if transformation is better or more profitable than new construction. Consequently this governmental department keeps up to date with current market circumstances. An example regarding legislation (Agentschap-NL, 2012) are tax-exempt/deduction to stimulate investments in sustainability. The Dutch government has reserved an amount of 151 million to stimulate energy efficiency and sustainable energy in the Netherlands. This amount is not exclusively reserved for the real estate market, but measures on asset level are included such as HVAC, and LED lighting among others. The preceding describes the possible tasks from a regulatory perspective as local governments obliged some sustainable systems either by requiring new projects to meet certain environmental standards, or by providing financial incentives to developers who meet these standards.

Tenant Demand

Sustainability as an investment decision is not only based on the real estate fund wanting to be green and embrace the nature, while being environmentally friendly driven. Without end-users or in office context tenants, there would not be green buildings, environmentally driven investment approaches or green real estate funds. Tenants increasingly consider the total cost of in their location choices, and many seek space with strong sustainability ratings or certifications, in part to reinforce their own environmental image with clients, customers, shareholders and others.

Besides the financial perspective Eichholtz et al. (2009b) also describe the relationship between sustainable real estate and the role of CSR at companies. This article describes that the demand for sustainable real estate is evident and tries to estimate which industries benefit the most from the relative "greenness". The results indicated that corporations in the oil and banking industries, as well as non-profit organizations, which are among the most prominent green tenants. When considering the actual demand for green space and not the current occupancy rate, it is documented that firms in mining and construction and organizations in public administration - as well as organizations employing higher levels of human capital - are more likely to lease green office space. Furthermore, the results clearly show that leasing decisions can open up the way towards a better or improved CSR-strategy. As real estate forms a tangible asset, sustainability will push the involved company to a next level in which their desired image eventually will become more likely. Sustainable demand of tenants could be of importance for investors and developers and their competitive positioning. Change in their operation could mean a higher initial expenditure that may be needed for a newly constructed green building, or for the transformation of an existing office building can be regained through energy efficiency, rental heights, and lower risk.

Competitive Positioning

Competitive advantage over other direct competitors is always a driver in the commercial real estate market. A competitive advantage is partly based on the amount of green building in the investment



portfolio, but even more in the actual realized transaction price during sale. Building owners and indirectly investors must be as concerned with the value of their investments upon future resale as they are with current cash flow. These are again the major components of return divided in continuous rental income and capital gain. How to grasp the value of the property? This is where a valuer comes in, when a price has to be estimated.

Lütkenhof & Lorenz (2011) describe the relative role of the sustainability assessment of buildings as a key source of information for several actors in property markets. Since the commercial real estate market embraces current evidence regarding sustainability, often the valuation profession is criticized on their slow adjustment to a rapid changing environment. This indicates a change of mind, also in traditional value systems. Valuers are encouraged to adjust to a more pro-active approach which reflects sustainability, and will result in a competitive advantage. However, more traditionally oriented valuers are dubious about the level of detail of new value systems and their correctness. The struggle between these two sides can be seen in current practice, as a common approach for valuating sustainability features has not yet been approved. Besides the lack of an equal stance, questions arise about the extensiveness of such valuations, which can also be seen as more broad and takes up more time, thus money. When constructing a new approach towards truthful values of buildings one should not focus on the relative “brand value” of a particular label or certificate but on the respective informational content. Another constraint is the availability of sustainable data, as a big share of companies does not have tangible data about their assets. Valuers should focus on the proven relationship between property prices and sustainable credentials. This data should be adjusted and formed into an integral approach consisting of sub-analyses to determine single input estimators. These estimators divide sustainable features up in accessible and coherent data and ready to be used as input for a valuation. These results show that the valuation practice is still adjusting to the notion sustainability, since their profession drives on objective data to estimate market value.



Conclusion




In identifying the impact of sustainability on rents and values, the results of various studies by several authors have identified positive relationships, although by different percentages. The most consistent finding across all described studies was the positive effect of Energy Star and LEED certification on rents and values. Although one could comment that the rent and value premiums for LEED and Energy Star may be a result of a bull market, which is indicative of short-term demand in an under-supplied market. Across almost all studies, location was identified as the major predictor affecting value, but there is truthful evidence to suggest there are relationships between sustainability, rents, and values. However, this does not necessarily assume that the asset is going to automatically generate higher investment returns, and yet again the assessment is highly dependent on market dynamics. When returning to the main question of responsible property investments, if the benefits of sustainability lead to higher returns. One could confidently argue that positive externalities and higher returns are indeed expected. Assuming the rationality of investors, the fact that numerous stakeholders undertake the necessary costs and risks to implement sustainability into commercial real estate, indicates one or two outcomes. Either sustainability in real estate is anticipated to be a self-fulfilling prophecy given its high intrinsic value; or it does indeed yield higher returns, which directly justify the investment.

One should not forget the actual implementation or even the decision to invest or allocate to sustainability. In the beginning it is more a management decision to implement or think about sustainable implementation. For sustainability to achieve results, it requires the commitment of senior management and dedicated individuals with fund teams (INREV, 2012b). That is what people often forget, sustainability needs to be embraced by the organization otherwise there will not be any activity towards sustainable principles. Income and value evidence provides partly an answer to the question of an improved return profile. Risk is a better indicator regarding sustainability; consider an office building with a better green performance. The associated risk regarding vacancy and satisfaction is way lower compared to regular development. As such the landlord has the opportunity to engage with the tenant about green leases, energy use etc. Sustainability is not just about hard facts, but increases the mutual communication. Often in green buildings this understanding creates a better connection between the operational management (read: facility manager) and the upper management (read: allocation manager). These facts are translated into practice as the author identifies a quickly changed environment in 2008. Back 2008 the value of sustainability was in the return element, although with an increased risk profile. Currently green buildings account for a more core investment style as occupancy rate and income remain higher and more stable. So, indeed sustainability is integrated into the business cycle and gains exposure through magazines, the internet, and newspapers among others. Overall, companies are known with the notions CSR, RPI and certification systems. New evidence regarding the relationship between the degree of sustainability or sustainable features and financial performance on asset –or fund level is embraced. Still a lot of progress is to be gained in the nearby future through more extensive reporting of sustainability through for instance, benchmarking. A benchmark such as the one devised by the GRESB was successfully received by the commercial sector. Opportunities lie in front of us to fill the gap between commercial demand and current information supply. In this research the author is trying to find the key to objective performance measurement and the creation of an independent green benchmark.



Conceptual model

In this conceptual model, key notions of the literature review are combined in an overview. This table has been divided into three scale levels in which institutional investors face their decisions. Aim is to identify important drivers for investors to actually incorporate sustainability into their portfolio.

Should the degree of sustainability be an asset selection criterion for office buildings?			
			
Drivers	Asset-level	Portfolio-level	Macro-level
Operating efficiency	Reduced operating costs		Hedge against energy pricing
Investor criteria	Capital gain	Risk mitigation	CSR-policy
	Rent premium	Capital preservation	
	Higher or stable occupancy rate	Marketability	
Regulatory compliance		Hedge against regulations	Dependent on institutional context
Tenant demand	Productivity	Hedge against changing tenant demand	Corporate image
	Eco-labels or ratings	Willingness-to-pay	
Competitive positioning		Location/Transit oriented	Age
		Availability of sustainable data	Level of human capital in the firm

The table above provides a clear picture which indicates two outcomes, also discussed into the concluding section of the theoretical framework. On one hand the actual quantitative figures which indicate the added value of sustainable real estate in terms of risk and return profile. Several authors describe that real estate portfolios with a higher fraction of efficient, green properties, had significantly lower market betas, which means lower exposure to market risk. Moreover, occupancy rates in more efficient buildings are not only higher but more stable, they are less volatile. This just stipulates the quote of Pivo & Fisher in which the sustainable assets does not necessarily perform better, but at least performs the same as conventional assets. The second outcome has a more qualitative approach as this includes a side with more “soft edges”. Sustainability is not just about hard facts, but increases the mutual communication. Issues such as productivity, corporate image and the willingness-to-pay come to mind when exploring the qualitative side.

While hypothesizing and think about the hazards of regulations, energy prices and changing qualitative demands, we arrive to the conclusion that more efficient buildings have the ability to provide a hedge against all three factors. Through accurate reporting and benchmarking, the capital market has the opportunity to integrate sustainability into their underwriting, investment decisions, their engagements with investment managers and so on.



Definitions and abbreviations

Asset-Liability Management

A risk management technique designed to earn an adequate return while maintaining a comfortable surplus of assets beyond liabilities. Takes into consideration interest rates, earning power, and degree of willingness to take on debt, also called surplus management.

ANOVA

Analysis of Variance – A statistical method to compare groups

AUM

Assets Under Management – The amount of assets under management in value or numbers of institutional investors

CBS

Centraal Bureau voor Statistiek - Central Office for Statistical Data in the Netherlands

CPB

Centraal Plan Bureau – Central Planning Agency of the Netherlands

Closed-end fund

A closed-end fund, or closed-ended fund is a collective investment scheme with a limited number of shares.

Core fund

A substantial long-term holding in a portfolio. A core holding is bought with the express purpose of being held for a very long time, and is often of high quality with a history of fairly steady performance.

Correlation coefficient

Statistical measure of the linear relationship (correlation) between a dependent variable and an independent variable. Represented by the lowercase letter 'r', its value varies between -1 and 1: 1 means perfect correlation, 0 means no correlation, positive values means the relationship is positive (when one goes up so does the other), negative values mean the relationship is negative (when one goes up the other goes down).

CSR - Corporate Social Responsibility

Corporate initiative to assess and take responsibility for the company's effects on the environment and impact on social welfare. This generally applies to efforts that go beyond what may be required by regulations or environmental protection groups.

DCF

Discounted Cash Flow – A method to calculate the present value of an asset by discounting future cash flows

Dependent variable

In an experiment, the independent variable is the variable that is varied or manipulated by the researcher, and the dependent variable is the response that is measured. An independent variable is the presumed cause, whereas the dependent variable is the presumed effect.

Direct Real Estate



In case you own over 50% of the investment in a property, you invest direct.

Direct return

A percentage value for the total return that is created by an operation's income from property, a fund or an account. In case of real estate this is rent.

Diversification

Dividing investment funds among a variety of securities with different risk, reward, and correlation statistics so as to minimize unsystematic risk.

Eco-labeling

The provision of information to consumers about the environmental performance of a product (LEED, BREEAM, EPC, Energystar etc.) with the indirect aim of influencing their consumption choices, suppliers' production outputs and, as a result, the level of environmentally harmful emissions.

GFA

Gross Floor Area – The floor area measures from the insides of the walls including transportation and installation areas

Hedge

In finance, a hedge is a position established in one market in an attempt to offset exposure to price fluctuations in some opposite position in another market with the goal of minimizing one's exposure to unwanted risk.

Hedonic regression model

In economics, hedonic regression, also hedonic demand theory is a revealed preference method of estimating demand or value. It decomposes the item being researched into its constituent characteristics, and obtains estimates of the contributory value of each characteristic.

Income return

A percentage value for the total return that is created by an operation's income from property, a fund or an account. In case of real estate this is rent.

Independent variable

In an experiment, the independent variable is the variable that is varied or manipulated by the researcher, and the dependent variable is the response that is measured. An independent variable is the presumed cause, whereas the dependent variable is the presumed effect.

Indirect Real Estate

A way of investing in real estate without actually investing in the property. Indirect investment can be done in many ways, including securities, funds, or private equity. Most investors interested in indirect investment would do so through a company or advisor who has experience in this type of investing.

Indirect return

The increase in an asset's market price, also called capital appreciation.

INREV

International Association for investors in non-listed Real Estate funds – Association for nonlisted European Real Estate Professionals



IPD

International Property Database

IRR

Internal Rate of Return – The rate of return that can be seen as the return that equals the positive and negative cash flows over a specific time period. The discount factor that equals the NPV to zero.

IVBN

Belangenbehartigingsorganisatie voor institutionele beleggers in Nederlands vastgoed – Central office for Dutch Institutional investors in Real Estate

Lagging

An appraisal error caused by appraisers using ‘old’ comparables that fail to mirror market conditions current at the time of the appraisal.

LFA

Lettable Floor Area - The Floor Area that can be rented out according to Dutch Standards utilized by the Ministry of Housing, Spatial Planning and Environmental affairs.

Listed-fund

Listed managed funds hold and manage a portfolio of assets on behalf of their investors and can include a variety of assets. Buy and sell decisions are made by an investment professional on behalf of an investor.

MPT

Modern Portfolio Theory – A Nobel price-winning allocation model developed by William Markowitz

MSA

Metropolitan Statistical Area – A conglomeration of cities on basis of their economical / locational base.

NAV

Net Asset Value – The net value of all assets under management of an investor.

NCREIF

National Council of Real Estate Investment Fiduciaries – Association of Institutional Real Estate Professionals in the United States.

NOI

Net Operating Income – Gross Rent minus exploitation costs

NPV

Net Present Value – The present value of an assembly of cash flows in the future.

Open-end fund

An open-end(ed) fund is a collective investment scheme, which can issue and redeem shares at any time. An investor will generally purchase shares in the fund directly from the fund itself rather than from the existing shareholders. It contrasts with a closed-end fund, which typically issues all the shares it will issue at the outset, with such shares usually being tradeable between investors



thereafter.

Real Estate Investment Trust

A company that purchases and manages real estate and/or real estate loans. Some REIT's specialize in purchasing long-term mortgages while others actually buy real estate. Income earned by a trust is generally passed through and taxed to the stockholders rather than to the REIT.

Rental premium

A rent above the level which a property could reasonably be expected to command in the market on normal terms. Such rents may be justified in instances where the tenant receives a present or future benefit (sustainable improvement) against the normal market.

RPI – Responsible Property Investments

Property investment or management strategies that go beyond compliance with minimum legal requirements in order to address environmental, social, government and most importantly financial goals in the application of capital i.e. the actual investment process.

Smoothing

In the context of appraisal-based property series this is an under-measurement of 'true' variance. Or bias of time series second moments toward zero.

Standard deviation

The square root of the variance. A measure of dispersion of a set of data from its mean.

Total return

This is the sum of the income return and the capital growth. Total return is generally considered a better measure of an investment's return than income return alone.

Value-add fund

Value-added or opportunity-style investment funds seek to acquire portfolios of commercial properties with the potential for significant value creation over a shorter-term time horizon. Objectives may include "value-added" opportunities for capital appreciation and income potential in markets with higher volatility, lower barriers to entry and high growth potential for the more risk-tolerant investor.



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