A qualitative review of the investment climate of institutional office real estate investors in light of the circular economy

Master Thesis

MSc Spatial Planning – Planning, Land and Real Estate Development

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Radboud University

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"Our planet and our economy cannot survive if we continue with the 'take, make, use and throw away' approach. We need to retain precious resources and fully exploit all the economic value within them. The circular economy is about reducing waste and protecting the environment, but it is also about a profound transformation of the way our entire economy works. By rethinking the way we produce, work and buy we can generate new opportunities and create new jobs."

Franz Timmermans,
First Vice-President of the European Commission
Brussels, 2015

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Master Thesis
July 2018

COLOPHON & PREFACE

This document that you are about to read marks the completion of my Master in Spatial Planning at the Radboud University of Nijmegen, and thus the end of my formal schooling years.

As many will say, this period has been a challenging one. My stubbornness led me to dive into a field of study of which little was known; and a field in which I myself was unfamiliar. However, I could not be happier with the end result and the immense amount of knowledge and newly found ambition that I have discovered along the way. I am incredibly grateful for the opportunity to be one of the first to delve into the investment climate of Dutch institutional (real estate) investors; and their intrinsic motivations towards applying circular principles towards the redevelopment of existing office real estate.

My greatest wish is that those who follow after me consider the reflections and recommendations of this paper and they themselves are driven to delve into this, still greatly indeterminate, but incredibly competent, market group.

At this point I would like to take the opportunity to thank everyone that I have spoken to about the circular economy and the real estate market during this process. The enthusiasm and input from my Delphi participants in particular was eye-opening. Thank you all for listening, taking the time to explain and consistently raising new challenges for me.

There are several people without whose contribution the result of this research would not have been made possible. I am very thankful for the professional support I received from Royal HaskoningDHV. In particular, the discussions and feedback sessions towards shaping the research with Ellis, Martine and Jarit proved to be a great learning experience. Applying circular principles to existing real estate and investment strategies is still a real challenge for the practical world as I have had to learn for myself.

My admiration and immense gratitude go to my mentor Professor dr. Erwin van der Krabben. Even from the various corners of the globe and in between his jammed full agenda did he always answer my persistent questioning and requests for advice concerning the research but also my further carrier ambitions. His vast amount of knowledge and effortless manner to find the calm and structure in any situation are traits to aspire to have. Our shared curiosity concerning the intrinsic motivations of institutional investors gave rise to memorable discussions.

Thank you to Hobie and my friends for their unconditional support. Their interest in the Circular Economy almost seemed obligatory having involved them in countless debates concerning its potential and added value towards making our existing built environment and our manner of living sustainable.

Lastly, I come to the most important stimulus in my entire education: my family. They have been present at each and every high and low, and have always been able to motivate and inspire me to be where I am today.

Radboud Universiteit

Royal HaskoningDHV
Enhancing Society Together

SUMMARY

Institutional investors invest an estimated € 124 billion into the Dutch real estate market. As real estate makes up a large proportion of our surrounding built environment, investors are of great influence in shaping its development. The Circular Economy (CE) emerged as a new economic system which intends to overcome the contradiction between economic and environmental prosperity within the real estate market. This thesis explored the investment climate in which institutional real estate investors currently perform within The Netherlands, with particular attention to the circumstances under which institutional investors are willing to invest in the circular redevelopment of offices. In scientific research, and in practice, very little is known on this matter.

Through the use of various qualitative research methods, several hypotheses were tested. The Delphi technique was one method used in order to more thoroughly explore the motivations amongst various investors. This allowed for a qualitative conceptualization of the conditions favourable for investors, whilst simultaneously bringing attention to individual opinions and allowing the anonymous exchange of information by the researcher. Seven Dutch institutional investors investing in office real estate participated in this research throughout four consecutive Delphi rounds. By means of iteration, convergence of viewpoints allowed for the development of a framework in which it is clear which conditions an institutional investor applies towards an investment.

The findings of the literature review and empirical investigation suggested that the lack of knowledge concerning the application of circular principles in exiting real estate lead to higher risk perception for investors. Investors deemed financial results as the most important investment aspect in relation to external institutions, such as their obligation to conform to their shareholders. Large amounts of uncertainties concerning the end-value and the rental income of a circular property work as repellent in their obligation to conform to their own institutions. This demonstrated the great complexity in which an institutional investor must make decisions. The investment strategy of institutional investors therefore includes a high level of risk management, in which the determination of the desired return, level of sustainability, and coherence of results are but a few of the key aspects of the criteria with which they act.

The research also suggested that the CE is founded on the awareness that energy and resources will be used and returned in loops known as product and material lifecycles, in which economic value is retained or further enhanced. Both the desk research and the empirical investigation (interviews and Delphi) demonstrated that the circular economy in exciting buildings has no singular definition as of yet. Neither does it have technical characterization of how to implement it within a redevelopment process. As investors do not have a clear understanding of the CE in both forms of existing and new real estate, they do not wholly adopt the concept yet. Another barrier to including CE principles included the lack of guidance towards measuring the concept in value.

The analysis further explored the real estate market system using the economic model known as the Four Quadrant Model to explain the relation between various real estate parties, including developers, investors and tenants. The results showed that institutional investors call upon other market parties to take responsibility. This includes advisory parties, governmental institutions and even assessors. The quality of the reflections concerning the role of an institutional investor in the matter was however insufficient. The evidence would suggest that further research is necessary that involves other market segments in order to fully comprehend the interaction between them.

This research contributed to the expansion of knowledge concerning the behaviour of institutional investors within the commercial real estate market with respect to the CE. The results of this research provided insight how to better include principles of the circular economy in investment strategies. The results can contribute to the development of a tool that helps investors overcome these barriers.

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TERMINOLOGY

The terms noted in this list are important to this thesis. The definitions as stated below are leading, and the reader must be aware to use these as the foundation of their understanding. They are defined through the use of relevant literature and will be further contextualized throughout this thesis.

Circular Economy (CE): A circular economy is one that is restorative and regenerative by design, which aims to keep products, components and materials retained at their highest utility and value at all times, distinguishing between technical and biological cycles. Resource input, waste, emissions and energy leakage are minimized through the closing of material and energy loops.

Indirect Real Estate investment: Here an investor commits capital to a fund manager, who then commits to several smaller real estate investments, managed by local operating partners. These partners are then responsible for investing in real estate assets and are paid fees from the investors' capital.

Institutional investor: A financial entity that invests large amounts of money in order to purchase securities, commodities and other investment assets on its own behalf or on the behalf of its shareholders. This includes: insurance companies, pension funds and mutual funds.

Investment strategy: An investment strategy is an investor's plan of action to guide their investment decisions based on individual goals, risk tolerance and future needs for capital. The components of most investment strategies include asset allocation, buy and sell guidelines, and risk guidelines.

Linear Economy: An economy that works according to the 'take-make-dispose' step plan. New resources are continuously extracted, used for production, and discarded as waste. Value is created by the maximization of the number of products produced and sold.

Office Real Estate: An independent spatial unit used to maintain or occupy professional or business offices. This type of commercial property houses management and staff operations and may refer to parts of a building including floors and parts of floors, but also the whole building and office parks.

Real Estate Development: This is a process in which land, money and the users are brought together in order to realize a new construction for the market. The costs incurred in addition to the intended profit margin must be offset against the proceeds of the rent or sale of the project. The development must lead to financial profit that contributes to the company's income statement.

Real Estate Property: This refers to the real estate object and a bundle of rights attached to the object. Real Estate property consists of both physical objects and common law rights, including: the rights to possess, govern, enjoy, exclude and discard.

Real Estate redevelopment: In this process the real estate object retains its existing function at the end. Redevelopment refers to renovation and revitalization of an object for the same function, on the same location. This is different to transformation, in which the function of the object is changed.

"Like all major transitions in human history, the shift from a linear to a circular economy will be a tumultuous one. It will feature pioneers and naysayers, victories and setbacks. But, if businesses, governments, and consumers each do their part, the evolution of innovative business models and closed-loop concepts like remanufacturing, refurbishing and parts harvesting, will put the global economy on a path of sustainable growth. Many years from now, people will look back on it as a revolution"

Frans van Houten,
CEO, Royal Philips
2014

1 INTRODUCTION

The aim of this chapter is to give the reader an insight into the problem framework that has led to the choosing of the thesis subject. It includes an overview of the problem context and analysis in which the main topic is imbedded, following on into the problem statement. The main research question will be established, including the various supportive sub-questions. This chapter will give a clear description of the ambitions of the thesis and the overall relevance for scientific and societal purposes.

1.1 Problem context

In accordance to research conducted by the NLII (Netherlands Investment Institution) (2017), pension funds and insurance companies invest an estimated € 345 billion in the Dutch economy; this being approximated at 51% of the country's Gross Domestic Product (GDP). It can be argued that institutional investors have a relatively large investment capital in relation to the national economy and can therefore be of great influence in its development. Considering investments in real estate, both pension funds and insurance companies invest respectively € 114 billion and € 10 billion into this market segment (NLII, 2017). Various other studies (CBS, 2017; Colliers International Nederland, 2017; Klapwijk, Nijskens, & Buitelaar, 2017) have shown similar results in determining the market size of the capital institutional investors invest in Dutch real estate. Intuitional real estate investors thereby play a vital role within the financial sector.

In recent years, there have been noticeable improvements in the Dutch real estate market pertaining to the last economic crisis. The office real estate market remaining the largest of all commercial segments. Several major factors have been noted to contribute to this situation. These being the on-going yield gap, the on-going inflow of capital from abroad and the smaller stock of office real estate (Savills, 2017). The prime office yield in The Netherlands currently stands well above long-term interest rates. This is beneficial for investors as they can achieve a significantly higher return with a relatively small increase of risk. In addition, the range of countries and regions that invest in Dutch offices has become significantly larger. In the past the dominant investors were the UK, the US and Germany, whilst in recent years Asia and the Middle East have shown an increased interest (Cushman and Wakefield, 2017; Savills, 2017). This results in a more stable inflow of foreign capital where The Netherlands is no longer dependent on just three countries but can now rely on an inflow from various parts of the world. Lastly, there has been a structural improvement in the stock, making the occupiers market more attractive. The amount of withdrawals and transformations has even led to a certain level of scarcity again in some local office markets.

Similar to the natural ecological order, the context in which real estate parties act is ever changing. Major trends influence the way we build, consume and do business at a global scale. Subjects of serious debate are the scarcity of our natural resources and climate change. In this discussion, the focus lies on the relation between these two subjects and the real estate sector. Regularly, research reports pass indictors that expose the extent of the impact that the construction sector has on our natural environment and society. Considering all raw material harvested worldwide, no less than 50% is destined for the construction sector (Adams e.a., 2017; De Wit e.a., 2018; Rabo Real Estate Finance, 2018). In The Netherlands we use more than 250 million tons of materials per year, whilst simultaneously producing approximately 23 million tonnes of waste (Woertman, 2018). Almost every real estate professional will know that more than 95% of these materials will be downgraded when recycled, often used as subsurface for roads. This seems an inefficient use of materials that offer much more potential within their lifespan. The Paris Agreement in 2015 is one of the results of the increase in global temperature. Hereby, The Netherlands (and 195 other countries) constructed a climate agreement in order to reduces the amount of greenhouse gases by 2030.

As a response to the dwindling of natural resources and the necessity to reduce climate change, the Circular Economy (CE) emerged as a new economic system which promises to overcome the

contradiction between economic and environmental prosperity (Pomponi & Moncaster, 2017; The Ellen MacArthur Foundation, 2015). In accordance to the report of Circle Economy (2018) various businesses are already adopting circular practices, ranging from multinational corporations, to start-up companies. The Netherlands is one of the first European Countries where governments are incorporating circular principles and targets into policies (e.g. country-wide circular economy roadmaps). A political measure that has come from the emergence of the CE is that the construction sector must be 50% circular by 2030. Although investors are increasingly more aware of responsible investing – evident in Responsible Investment guidelines and ESG-policies (Environment, Social, Governance) – it is currently unclear what measure investors are willing to apply within their investment strategies in order to contribute to this goal within the real estate sector.

1.2 Problem analysis

When considering the existing built environment, circular redevelopment in real estate provides opportunity to strengthen existing systems through various initiatives and innovations including energy storage at a local level to the reuse of materials to make new products, and even integral area development (Jonkeren, 2016). This could be seen as the greatest challenge for real estate investors for the near future. Real estate may be renovated, redeveloped or converted, and its materials reused in order to sustain the future value of the real estate object. However, for such innovation to succeed they are often developed or calculated in controlled conditions where user behaviour is considered optimal. In the existing built environment, user behaviour is erratic and existing systems and processes may dampen actual performance of such innovations (Suurenbroek, 2015). New real estate developments would not lead to such vast complications. Considering the real estate sector, many more social and economic factors influence the performance of the real estate object. Even within the office market – which is considered by some as progressive in terms of sustainability (Kastelijn, 2011; Kuipers, 2015; NVM, 2017b) – there are few examples of circular redevelopments. The lack of concrete practices ensures a lot of uncertainty for the financial sector in order to value developments, let alone finance them (VBDO, 2017). In order for investors to integrate circular principles in their investment policies, investors must first have to gain more insight into what circularity within real estate exactly means. The translation of circular ambitions into (re)developing the existing real estate is therefore still an essential and challenging task (Raad voor de Leefomgeving en Infrastructuur, 2015).

According to the Circle Economy & IMSA (in ESPON, 2016) businesses that wish to adopt principles of the CE are expected to need alternative business models with different manners of organizing business processes towards circularity. Unfortunately, research shows that the financial attractiveness of these models – in terms of risks and returns – is still uncertain (Buitelaar, Sorel, Verwest, Van Dongen, & Bregman, 2013; Raad voor de Leefomgeving en Infrastructuur, 2015). The uncertainty refers to the vagueness of the future potential of such a change in business strategy and whether the contributions of developers would be sufficient to cover the related costs. These issues raise the question whether institutional investors would be interested – and under what conditions – to invest in circular developments in the existing office real estate. When exploring existing literature, it is of yet unclear on the manner in which institutional investors set up their investment strategies with attention to circularity.

1.3 Problem statement

Considering this above context, the following problem statement can be formulated:

There is an increasing pressure for institutional investors to invest in sustainable initiatives. In order to achieve circular initiatives in the (re)development of existing buildings, different manners of organizing business processes towards circularity are required. This includes innovative changes in the current framework of business strategies moving from linear to more circular. Investors often pose conditions for their investment (providing they are looking for long-term returns with relatively low risk in the

investment profile). It is however still unclear under which investment conditions institutional investors operate (and are willing to operate) in relation to the trends towards circular development within the real estate market.

1.4 Research Aim

The objective of this research is to provide an insight to the conditions that institutional investors lay upon investment incentives in circular real estate development. This will predominantly focus on the (re)development of the existing office real estate. Through explorative research, an analysis will be made on various investment strategies towards real estate (re)development and to test experimentally the conditions that must be met to increase the attractiveness of circular re-development in real estate as an investment criterion for institutional investors.

Ultimately, the results of this research will provide insight to the possibilities for circular development in real estate based on the conditions learnt from institutional investors. The results will signal the opportunities for investors to invest in circular initiatives. The results of this research can contribute to the development of a tool that helps investors to include principles of the circular economy in investment strategies.

1.5 Research questions

In order to give direction to solve the above-mentioned objective, the following main research question will be applied to this research thesis:

Under which circumstances would institutional real estate investors be willing to invest in the circular redevelopment of office real estate?

The following sub-questions have been formulated in order to give further direction to the scope of the research and to aid in answering the main question:

1. *What are the current characteristics for the environment of an investment strategy for the redevelopment of office real estate?*
2. *What is the circular economy? And how can it be integrated to existing office real estate objects?*
3. *What are the most important factors and preconditions applied by institutional investors which influence their decisions to invest (or perhaps not) in circular redevelopment of existing real estate?*
4. *Which arguments are given by institutional investors concerning the responsibility for the initiation of the implementation of the circular economy within existing real estate? And how do they evaluate the effects of this?*

1.5.1 Hypotheses

Several hypotheses are formulated to be tested throughout the research. These noted below:

1. *As long as the requirements for circularity in existing real estate remains unclear, the participation of asset managers and institutional investors will remain limited.*
2. *As the importance of CSR / responsible investment increases, so too will there be more interest from institutional investors for the inclusion of the circular economy in the redevelopment of real estate.*
3. *As long as developers and other market players do not take initiative, the efforts of institutional investors will remain limited to include circularity in real estate redevelopment.*

4. *As the various market components within the real estate system are loosely coupled, this will continue to create barriers for the implementation of the circular economy in real estate redevelopment by investors.*

1.6 Research relevance

The following sub-chapters will clarify the relevance of this research. The scientific relevance notes the importance this thesis has within existing literature, and the basis theoretical knowledge has within this subject field. The social relevance notes the significance this thesis has towards the urban development and real estate investment practice.

1.6.1 Scientific relevance

The scientific relevance of this research relates to the Four Quadrant Model (4Q-model) of DiPasquale and Wheaton (1992) and the assumptions of Buitelaar (2013) concerning this model, using these as a theoretical basis for the workings of the real estate system. Included in various researchers within the real estate studies, the 4Q-model assumes that trading parties within the commercial real estate system are rational (DiPasquale & Wheaton, 1992). And that therefore the different market segments react upon one another dependently and conform to the demand. For example, occupiers demand more office spaces and the investment and construction market of the real estate system will supply this. This research places this theory within a context that has never been done before, focussing on institutional investors and the circular redevelopment of real estate. Two strikingly under-researched subject matters.

Within this context, the 4Q-model would assume that institutional investors, as an actor within the investment market, rationally respond to changes in demand. In addition to the increasing attention towards circular principles amongst various public and private parties, and the increasing attention towards responsible investing, investors are pressured to be more aware of what they invest in, and how this contributes to a sustainable society and environment. The model would therefore assume that the response from investors (investment) towards the demand for circular redeveloped real estate should be no different than by regular (linear) real estate. However, there is little evidence as of yet to suggest that the inclusion of the CE has been considered in investing markets. Here, this research relates to the study of Buitelaar (2013) who would suggest that the various market segments do not rationally respond to one another. The response is rather slow and inadequate due to the fact that the segments are bound to their own institutions and market dynamics. This research contributes to the expansion of knowledge – in relation to the 4Q-model – concerning changing behaviour of institutional investors within the commercial real estate market when considering the inclusion of circular principles.

Considering the manner in which this research will be executed (explorative research), the methods that will be used give an in-depth scientific analysis of the research subject. The Delphi technique allows for scenario building of the circumstances, clarifying the opportunities that invite investment from institutional investors. The research methods within the Delphi-technique would contribute to our understanding of the financing and implementation of circular principles in office real estate redevelopments under changing institutional and market conditions. This manner of execution ensures that discussion can arise amongst various stakeholders. This research would be valuable to researchers in the field, as it provides an insight into the design framework towards investment strategies that include circularity. It would provide an outline in which researchers can explore, experiment, test and evaluate new approaches to circular initiatives in existing real estate.

1.6.2 Societal relevance

As noted in the problem context, the development of real estate within circular economy is a current topic that is seeing increase in interests from various parties (politicians, businesses and groups within

the civil society). However, according to McCahery et al (2016: 1), little direct knowledge is available regarding the manner in which institutional investors engage in investment within circular initiatives. This research has the ability to distinguish various business approaches and their designs based on the circumstances and conditions that institutional investors lay upon them. The information gathered is expected to support the resolution of strategic issues towards developing in a circular manner through the collective gathering of motivations and opinions under controlled conditions. The research framework and strategy can be used to improve communication between institutional investors, foster consensus and create commitment.

The project aims to distinguish the barriers investors face in the investments towards circularity, with the intention to increase attractiveness for institutional investors to participate in the financing of circular developments in existing office real estate. The results of this research are expected to support investment decisions by institutional real estate investors. Although it is not expected that these results will directly lead to change in behavioural approaches of institutional investors, nor is it expected that the results will lead to evident market opportunities for them, it is the hope that this research will demonstrate that circular redevelopment of office real estate in the existing built environment can become a potential (and important) new investment market for the future. This is related to the overall ambition of the research, which flows directly from the necessity to aid in the transition from a linear approach in development, towards a circular approach. This research would contribute to the expansion of knowledge amongst investors about the alternatives and opportunities available in circularity for real estate development.

2 THE REAL ESTATE MARKET IN REVIEW

This chapter will focus on the development of the real estate market, with special attention for the office real estate. Prior to the explanation of the sustainable/circular office development and real estate investment processes, it is important to understand the office market as it provides essential information necessary to understand the playing field in which each of the previously mentioned processes interact. An essential element for this research is the focus on the redevelopment of office real estate that are positioned in real estate investment funds, indirectly financed (or funded) by institutional investors. This will be further explained in Chapter 3.

2.1 General overview of the market

When reviewing various prospect reports concerning the real estate market it is evident that in just a few years the market is currently undergoing an optimistic recovery period. In 2011, the Dutch Real Estate Bank noted that the macro-economic climate for real estate development was extremely difficult (FGH Bank, 2011, p. 11). At that time, the construction sector was expected to see a further decline in assignments, with a vigilant plea to focus more on matching future real estate stock towards user demand (Barras, 2009). In 2013, PBL Netherlands Environmental Assessment Agency confirmed increasing oversupply of offices and shops (Buitelaar et al., 2013). According to BNP Paribas (2012), Amsterdam ranked as the city with the highest real estate vacancy rate in Europe. An independent national authority – not the central government – was desperately needed to advise and coordinate the market in order to restore equilibrium.

Considering recent reports, economic recovery, growing exports and increasing investment in real estate are causes for optimism (FGH Bank, 2016, pp. 6–7; NVM, 2016; Syntrus Achmea, 2014). Various real estate related businesses have published reports on investors' willingness to invest, the optimistic price trends and the increased construction output. Concerning the financing of commercial real estate, banks and loan funds are showing initiative and are creating more opportunities. The Triodos Vastgoedfonds – the first zero-emission investment fund in sustainable real estate – is an initiative aiming to contribute to the trending transition of sustainability in the sector, with a focus on offices (Triodos, 2016). This is a prime example of how financial institutions are matching the real estate stock towards (future) user demands (see Chapters 3 and 5 for further explanation).

Despite these recent developments, the underlying problem of overcapacity still remains. Particularly in commercial real-estate, vacancy rates remain extremely high (FGH Bank, 2016). Although the economy is in recovery, investors are increasingly only interested in the most prime real estate. Consequently, although this segment offers great opportunities, investors are too focussed on a relatively small part of the market. The results include investment shortages in various real estate market segments.

2.2 Defining office real estate

Real estate is a collective name for anything that is not movable, such as land, buildings, roads and bridges. According to Buunk (2013) the real estate market can be divided into commercial and non-commercial real estate. A distinctive characteristic for commercial real estate is the separation between ownership and use. Examples include retail, offices, industrial buildings, hotels and parking garages. Non-commercial real estate is used by private individuals, in which residential housing forms the largest category within this segment (Buunk, 2013).

The term office real estate, refers to a type of commercial property used to maintain or occupy professional or business offices (Realtors Commercial Alliance, 2005). This type of real estate houses management and staff operations and may refer to parts of a building including floors and parts of

floors, but also the whole building and office parks. Amongst office properties there are several classifications that distinguish the real estate object according to quality, rent costs and efficiency. Grade A properties are the most efficient and functionally modern (Realtors Commercial Alliance, 2005). Grade B and C usually obligate lower rents as these properties are older and outdated, often less desirable due to their design or condition casing functional problems. Location is one of the most important variables that distinguishes Grade A properties from Grade B and C.

2.3 The office real estate market

In the Netherlands, the total amount of office real estate space amounts to approximately 50 million m² (ING, 2014). This accounts for more than 80.000 buildings. In contrast to past research papers, the market for office real estate has been improving in recent years (NVM, 2017a). Since 2015, this real estate type has seen a slow but stable decrease in the amount of vacant office properties as the demand for offices grew tremendously, with approximately 1.16 million m² being let out or sold on the open market (excluding owner-occupied premises) (NVM, 2016, p. 43; NVM, 2017). From 2015 to 2016 the direct available supply of office space decreased to approximately 7, 75 million m². Figure 1 illustrates this situation in which the number of square meters of available office space sees a decrease since 2014.

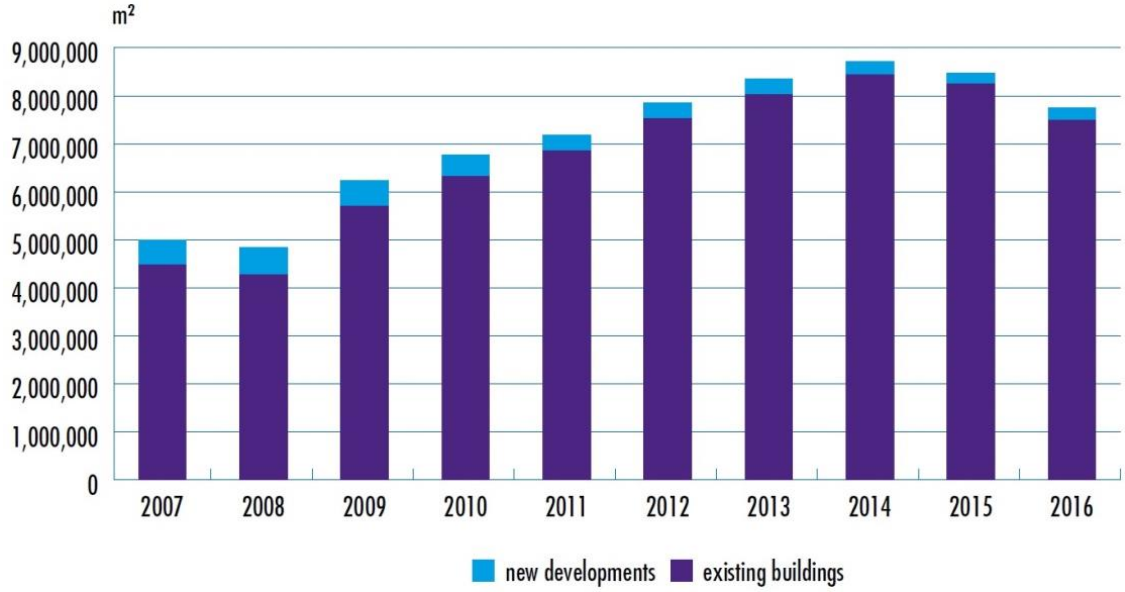


Figure 1: Supply office space according to building type (NVM, 2017a)

At the year-end of 2016, supply levels of office real-estate dropped significantly as approximately 7,75 million m² was available for rent and sale at year-end 2016 (NVM, 2017a). That is almost 16% of the total office stock in the Netherlands at that time. When comparing to 2015, in which 8,47 million m² was available. In the coming years, the supply of office space is expected to continue to decrease as demand is expected to intensify and a large amount of buildings are projected to be withdrawn from the stock. At the end of 2016, the amount of withdrawn offices real-estate amounted to approximately 1,08 million m². This decrease in supply can again be seen in Figure 2 and Figure 3 when looking at the stock figures, and the take-up and availability.

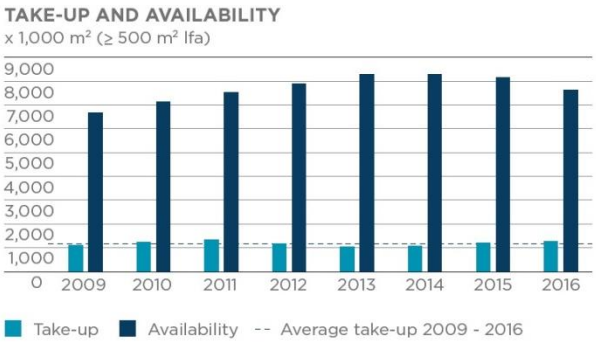


Figure 2 (left): Office stock in use 2009-2016 (Cushman and Wakefield, 2016)
Figure 3 (right): Office take up and availability 2009-2016 (Cushman and Wakefield, 2016)

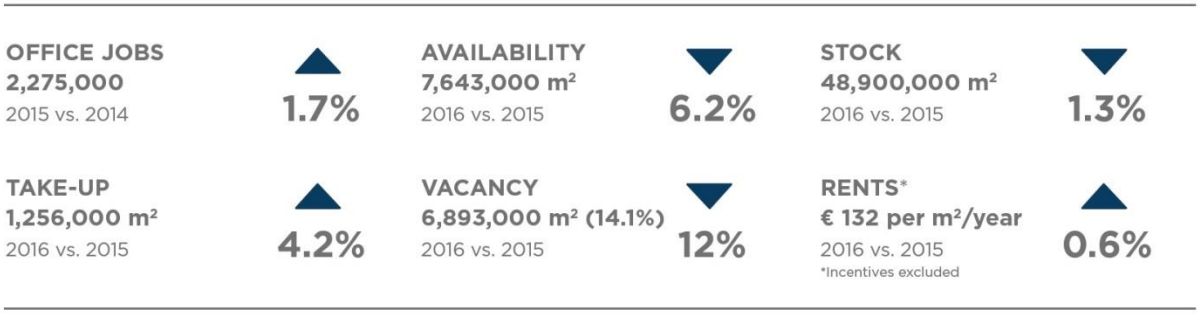


Figure 4: Development within the office market (year-end 2016) (Cushman and Wakefield, 2016)

Considering Figure 4 in light of the previous figures in this section, it is evident that the office market has seen various dynamic changes in recent years. Since 2009 the vacancy in the office real estate market has only increased, due to the excessive production of new properties. The production of new real estate has a process duration that is often miscalculated, leading to a supply rate that remains structural while demand scarcely increases on balance (FGH Bank, 2016). This causes an increased gap between the total stock and the stock in use, and thus an increase in vacancy (Figure 2). Since 2013, this gap slowly increased to a record breaking 16% vacancy rate in the office market, with in 2015 the year-end seeing an staggering high 17,1% vacancy rate (NVM, 2017a). Yet, in the past years there has been some improvement. At the end of 2016, vacancy dropped significantly, to approximately 14% (Figure 4). This decrease in vacancy is greatly due to the intensifying demand in office real-estate as the economy is recovering, leading to new businesses and the need for office space. Although an optimistic sign of progress, one must consider that a vacancy rate of 4 to 6 percent is accepted as healthy, therefore structural vacancy and over capacity remains a serious problem. Even though the economy in the Netherlands is in recovery, this does not automatically resolve the underlying problem of increasing office real estate vacancy.

In addition to the crisis, office use has changed due to a number of structural factors, including: an ageing population, Alternative Workplace Strategies and increased demand for sustainable spaces and buildings (FGH Bank, 2016). A contributing factor is also the change in the quality criteria, amongst both users and investors. In recent year, more companies have decided to exchange their existing premises for high-quality alternatives, usually combined with good public transport accessibility and a mix of facilities in the surrounding area (Hieminga, 2015). These factors influence the manner in which the demand on the office real-estate market is determined by replacement demand. In this situation, new offices had been built just before the crisis due to office users demanding more efficient office buildings; therefore, moving from older buildings that are no longer competitive, leaving

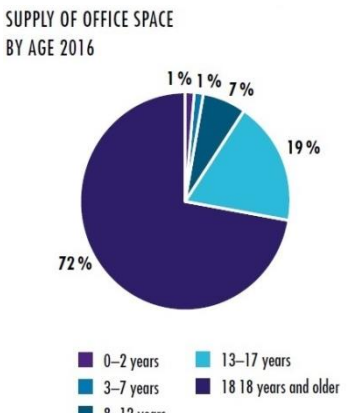


Figure 5: Office supply by age (NVM, 2017a)

these behind for new buildings. Now that the construction of new real estate has slowed to an almost standstill, this results as one of the greater contributors to the vacancy and over capacity rates, but even more so to the lack of quality office spaces. Unfortunately, no (attractive) solution has been found in order to solve the issue. One of the most important elements parallel to the issue, is that a large percentage of the office supply is rendered unsound and out-dated (NVM, 2016, p. 43). Figure 5 shows that almost 75% of the office supply is 18 years and older. Older buildings are often considered a complication, due to their complexity in relation to hazardous building materials including asbestos and lead paint, but also other environmental issues such as energy-efficiency and sustainability are also issues of concern (Klaseboer, 2011). Energy efficiency is an upcoming standard in real estate which will be enforced by the national government in upcoming years. As a decree, by 2023 all office real estate in the Netherlands must at least have an energy label C. The consequence being that those buildings with a lower energy label (D to G) will not be occupied anymore (Arnoldussen, Zwet, Koning, & Menkveld, 2016). A good energy label is noted as an important element that increases the value of real estate; just as making the existing supply more sustainable extends the lifespan and functionality of the building (ING, 2014).

In order to make the existing office real estate supply more sustainable – particularly the proportion that is vacant – this asks a redevelopment scheme; as devaluation and demolishment are neither profitable nor justifiable solutions to balancing out the oversupply in this market segment. The latter two options (demolishment and devaluation) would, in the case of this research, also result in a significant loss of investment asset capital for investors (Klaseboer, 2011). Redeveloping and renovation of existing buildings is not yet seen as an effective solution to improve the structural oversupply of office real estate in the Netherlands. The reality is that without investments in improving existing real estate, the gap between the existing stock and the stock in use will only increase; as older office properties will only continue to become more unattractive for use and particularly for investment (FGH Bank, 2016).

In the United States, investments via real estate funds in green developments and sustainable initiatives have proven pioneering successes (Knuth, 2014). The reuse of materials and energy efficiency resulted in lower environmental impact and in addition, financial benefits for all involved parties, and not only the user of a building. Such developments have proven to give investors increasing power to shape the surrounding urban environment (Knuth, 2014, p. 17). Within these trends in investment, the sustainability element began to take position; with a focus on the sustainable performance rate of investors in real estate and their portfolios.

2.4 The development of the idea of sustainability in the real estate market

In the past decade the term sustainability – when related to the built environment – has transformed from a ‘catch-all term’ to one that can be calculated, scored and measured. Even more so, with the accumulation of measurement tools (BREEAM, LEED, etc.) used to measure the sustainability of real estate objects, in very recent years more attention has been placed on the investing strategies and the financial side of sustainability in the built environment. In 2009, GRESB (Global Real Estate Sustainability Benchmark) was launched as a method that enables investors to assess the sustainability performance of their real estate portfolios and compare it to equal participants. This method examines various aspect of the real estate sector, including management, risk assessments to performance data regarding energy, water, GHG emissions and waste (Rolaff, 2015). In accordance to Rolaff’s findings (2015), this measurement – along with other green building certificates (GreenCal+, BREEAM, LEED etc.) – have been a more important driver of financial performance towards sustainability by investors than management regulations and national policies. The benefits of sustainability measures within portfolios have been discussed by real estate fund and assets managers, noting that asset valuation significantly increases due to such an approach (Cushman & Wakefield, 2011; Knuth, 2014; van Gool

& Peek, 2015). Furthermore, based on a study of the University of Cambridge, GRESB has proven that a sustainable portfolio results in higher return rates investments (Carbon War Room, 2015).

Thus, in relation to the development of real estate, this trend towards sustainability in this market segment is becoming an increasingly important factor. Particularly in relation to Corporate Social Responsibility, many real estate related companies are recognizing how important social responsibility is to their shareholders. The current developments in new real estate often consider sustainability as a norm within the development process. In the case of existing properties, investments in sustainability have been lagging (Eichholtz, Kok, & Quigley, 2010). The expectation is that more than 80% of the stock will be regarded as outdated and not sustainable in the coming 20 years if no significant progress is made (Timmers, 2016). In order to achieve the sustainability goals set out by the Paris Agreement in 2015, in the Netherlands we require a redevelopment of approximately 14.000 buildings each year towards energy neutrality.

In accordance to the trends noted by Ten Dam (2014), in which she states that traditional forms of real estate development including the investment process, the development process, rent income and even the quality of the floor space (square meters) will have to change. Ten Dam (2014) argues the current manner of development and functioning of real estate will no longer satisfy future demands towards sustainability. Along with many others, she argues the idea of 'circularity' of materials and energy as a norm for the future, rather than an exception. Therefore, the circular economy (CE) has emerged as the newest form of sustainability, in which the success of real estate projects is determined by the extent to which user demand is applied as a guide. Chapters 4.4 will elaborate on the CE as an economic system, specifically its relation to the existing built environment and the real estate sector.

Concerning the above-mentioned aspects and trends, it is clear that investments in office real estate in the Netherlands are necessary, but there is still insufficient information available concerning the conditions under which institutional investors (and their asset managers) are prepared to make such an investment. A noticeable knowledge gap exists. To give insight to this issue will be the focus of this research.

3 REAL ESTATE INVESTMENT

Within this research it is important to define the type of investment in which this research delves. The process of purchase and exploit of a real estate object is only considered to be an investment for institutional investors within an indirect investment when the primary function of the real estate object is to gain financial advantage. Once the function of the real estate shifts from an asset to a mean of production – for example, when office space is bought for the use of the purchasing entity – this is not the kind of investment on which this research focuses. The development and selling of new real estate is also not the kind of investment this research focuses on. The investment type that we will focus on is that of real estate under management of asset managers, therefore indirect investments. Here the institutional investor invests in investment funds or asset managers that exploit the real estate for them.

3.1 Real estate in the investment portfolio

Real estate in all forms has traditionally been a stable part of the investment assortment of institutional investors such as pension funds, insurance companies and other large financial institutions. Although there are great differences in percentages amongst the different types of institutional investors – particularly Dutch investors range from 0%-23% – the percentage placement on average within the portfolio has remained stable at around 10% (see Figure 6). Due to the globalization and the increase in cross-border opportunities for various activities (including real estate investments) – and the greater return potential this has proved – there has been an increased trend for institutional investors to allocate real estate in their portfolios (Stammers, 2017).

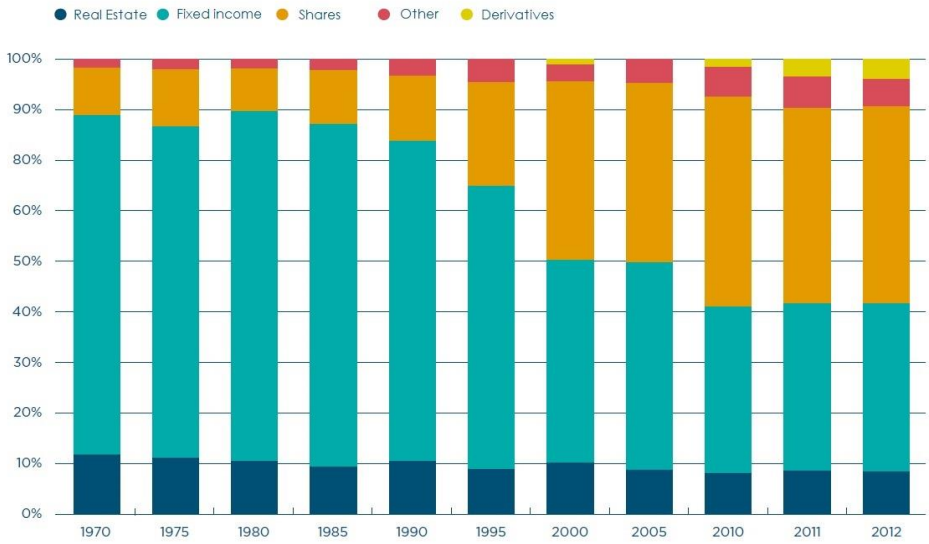


Figure 6: Average portfolio distribution of institutional investors in The Netherlands (Wetten, 2014)

An important aspect of real estate, which is significant to it being an element in a portfolio, is that its value on the market is assumed to be cyclical. This is because the supply of real estate is always delayed as it responds to structural changes in the demand of the user market (as will be explained in 5.1.1: The Four Quadrant Model), therefore affecting its value. This is what makes real estate an interesting, yet stable, investment asset in the market. When comparing the return rate of real estate to other asset classes, to a certain extent the cyclical nature of real estate provides predictability in the short and long term (Bloom, 2011; Wetten, 2014). This aspect is visible in all countries in which data concerning steady long-term yields for real estate is available. In The Netherlands, over the past 20 years real estate has delivered high returns with relatively low risks; and has been classified as the asset class with the most return per unit of risk (Wetten, 2014, p. 4). In this time, real estate has delivered a return rate that is comparable to the return on equities, whilst the risk was comparable to that of government bonds. In addition, according to Bloom (2011), the unpredictability of real estate

in relation to shares is relatively low, and the correlation of unlisted real estate compared to shares also low. As a result, when considering the spread of investments, unlisted real estate is well-connected to shares. Bloom (2011) notes that real estate is more resistant to inflation than other investment categories as the income from real estate through wage indexing clauses in rental contracts increases with inflation.

3.2 Real estate as an asset class

In addition to the above noted aspects, real estate has investment attributes that make it an attractive asset class. These attributes include: a strong income component, a degree of inflation hedging and diversification benefits due to a lack of correlation with other asset classes (INREV, 2014).

According to Van Gool ea. (2013) and Woodbridge Wealth (2016), capital preservation and growth are the main reason for holding real assets. However, there are several reasons to why investors acquire real estate assets as part of their investment portfolios. Investment in this asset class can occur by means of direct or indirect investment, and a difference exists also when considering listed or unlisted real estate. The explanation of the advantages and disadvantages of these forms of investment are explained below.

3.2.1 Direct real estate investment

The strategy of investing directly in real estate objects grants the investor the rights to exploit the real estate with the purpose to gain financial advantages in the form of rental income. Hereby, the investor owns the brick and mortar of the bought objects. Therefore, the investor has total control of management regarding the objects. The strategy of direct investing has its own advantages as well as disadvantages.

Advantages:

- Portfolio diversification: Due to the different nature of real estate compared to other asset classes, such as stocks and obligations, real estate reacts differently towards economic fluctuations. The negative correlation between real estate assets and other investment assets enables an investor to diversify its portfolio in order to spread and reduce the risk.
- Stable cash flow: The lengthy technical lifespan and long-term rent leases ensures the investor with a stable income during the exploitation period. The quality of the real estate object and its location can secure this cash flow due to an ongoing demand for prime real estate objects.
- Attractive return/risk-profile: The characteristics of the real estate market, such as its lack of transparency and the possibility to gain inside information, leads to market players gaining exceptional profits.
- Inflation hedge: The rent income of real estate objects is indexed annually. Investors/owners can legally adjust the rent similar to the inflation rate, which is usually 2%. This provides protection against capital devaluation.
- Increased return by intensive management: Increased return can be achieved by actively manage leasing, energy-management, maintenance, renovation and redevelopment. The direct returns are not fixed in contrast to stocks and obligations.
- Specific chances in the market: Due to the inefficiency of the real estate market, market players are able to gain an advantage of others which enables them to close attractive deals with a reduced level of risk.

Disadvantages:

- Knowledge- and management-intensive investment strategy: Increased returns can only be achieved by active management which is time-consuming compared to other investment assets, such as stocks and obligations.

- Capital intensive: Besides time-consuming, direct real estate investments requires the investor to have a great starting capital in order to buy real estate objects due to the high prices.
- Lack of transparency: Besides being an advantage, the lack of transparency can also be a disadvantage. Frauds and criminal activities cannot easily be detected.
- Illiquid assets: Real estate assets are illiquid due to the heterogenic nature and the high transaction costs.
- Difficult performance measures: Indirect return is determined based on valuations. These valuations are subjective estimations in which different methods of valuations are being used.

3.2.2 Indirect real estate investment

The strategy of indirect real estate investments does not make the investor the owner of the real estate objects. The investor is only entitled to the financial advantages of the assets, such as the rent income. Indirect real estate investment does not give the investor total control over the management. The advantages and disadvantages are different compared to direct real estate investments.

Advantages:

- No need for local expertise: The lack of management by the investors means that they are not required to have local expertise regarding the real estate objects and the market.
- Less capital intensive: Indirect investments do not require a large initial investment because acquisition costs are divided over all the participants of the fund.
- No transfer taxes: Indirect real estate investments are free of transfer taxes
- Increased liquidity: The increased liquidity only appears by listed funds. Hereby, an investor is allowed to sell its stake at any given time.
- Economies of scale: This advantage appears due to the concentration of knowledge and expertise in a local management organization. The concentration is cost-efficient and enables a fund to expand without a proportional increase of costs.
- Less emotional involvement: Indirect real estate puts the investors further away for the real estate objects which leads to better rational decisions. The investor is less attached to the individual objects.
- Leverage: The use of loaned capital (debt) can increase the return when the interest of the loan is lower than the potential direct return

Disadvantages:

- Reduced influence on investment policies: The investor has less control over the policy of management regarding the real estate object due to the lack of ownership.
- Less ‘feeling’ of the market: The investor relies on the asset managers and advisors because of the increased distance between the real estate objects and the investor itself.
- Leverage increases the risk: The use of leverage increases the risk due to the payment obligations of the loan. When the flow of cash stops, the investors is unable to pay the bank.
- Listed real estate increases the risk: Listed real estate is comparable to the stock market. The volatility of the stock value fluctuates which removes the stability of capital growth over time.

The indirect real estate market is split up into two separate submarkets. Indirect investments can be done in listed and unlisted real estate. Listed real estate are publicly traded (shares) whilst unlisted real estate cannot be traded on the stock market. The focus of this research is on unlisted real estate. Therefore, listed real estate will not be further elaborated. When investing in unlisted real estate, the investor becomes partial owner of the relevant fund. Participating in an unlisted real estate fund usually has restrictions. Restrictions vary from a maximum number of participants (investors) to a minimum volume of capital required to launch a fund. Unlisted real estate funds are characterised by a low number of participants and often have a focus on one particular real estate sector. Investors

allocate their capital by investing in different unlisted funds. This reduces the overall risk of their own portfolio.

3.3 Types of investors

On the real estate market, there are various kinds of investors depending on the real estate type. Within the Dutch office real estate investment market, there are two main types of investors active: private and institutional investors. The investment objectives, level of professionalism, the size of capital and the term length in which is invested (long or short) differs for these two groups.

Private investors

The majority of the investors in the real estate market are individual or private investors. There can be various kinds of private investors, depending on the manner in which they invest but also the size of the capital used. In general, private investors have unlimited liability and tend to aim for target pairs, obtaining (future) income or purchasing power maintenance actions and value increase of their assets (Van Gool, 2013). Private investors invest in listed real estate funds, private real estate funds and family-owned real estate (Cuppen, 2011). Considering these three types of investors, family-owned real estate is considered highly experienced real estate investors and most comparable to institutional investors in the manner in which they invest. Family-owned real estate generally has a long-term scope for their investments; have a sizeable amount of capital and a similar professionalism to institutional investors.

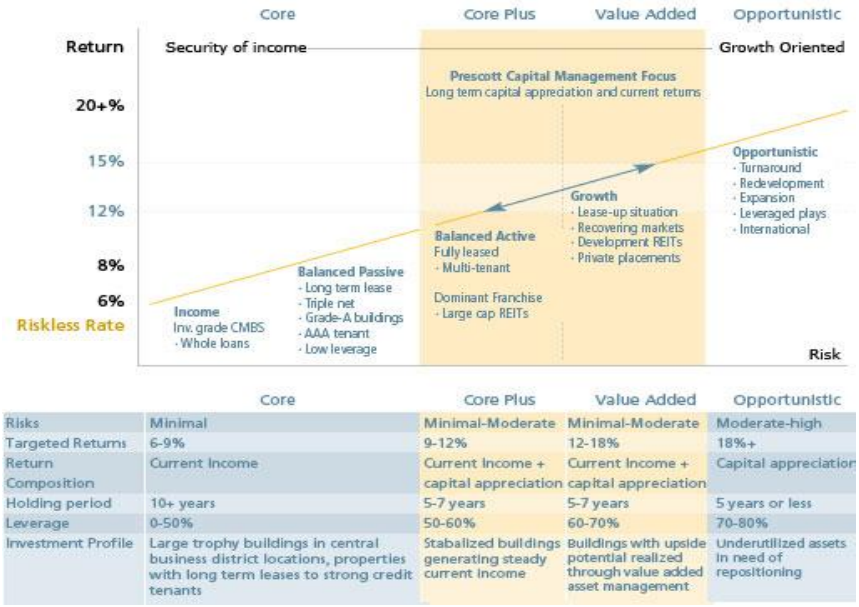
Institutional investors

According to Van Gool (2013) pension funds, insurance companies and various investment funds are considered institutional investors. Through the activities of these investors they obtain capital (funding), which they must invest in assets. In the case of this research, this will refer to real assets, and in particular real estate objects as a real asset class. Various activities in which institutional investors participate include covering obligations, generating extra return over the risk-free return on investment. These investors do this utilizing long term investments. The general objective of this type of investor is usually to manage the capital of its participants (e.g. pensioners), in order to be able to expend benefits such as pensions and insurance money in the future. This type of investor can invest both directly or indirectly in real estate, for the benefit of creating financial advantage.

Institutional investors have two main responsibilities, managing large sums of capital and upholding their obligations to their participants. In order to perform both, it is important for investors to consider future risk and return expectations of assets. Various factors are considered in order to determine the value of future assets and liabilities, including rent and inflation (Van Gool, 2013, p. 80). Particular for pension funds it is important to also consider the demographic trends of their participants (including average age, income, etc). Other remaining factors of importance include premium level, the extent to which the participants accept a change in premium level, the extent to which the sponsor can and is willing to overcome setbacks, the indexation policy and the initial funding ratio. Investors use asset-liability management studies (ALM-studies) in order to determine the risk and return ratio in light of their activities. Through these studies a prognosis can be made, and structure can be given concerning future obligations, economic expectations and investment strategy.

Considering the latter, the investment strategy of institutional investors vary on basis of their investment undertakings (Rubbaniy, 2013). Several style classifications are available to help investors and fund managers define the investment style of their funds. The European Association for Investors in Non-Listed Real Estate Vehicles (INREV) introduced the below classifications (see Figure 7), in order to promote greater transparency and standards of best practice within the non-listed real estate funds industry. The available fund classifications include Core, Core+, Value Added and Opportunistic. These

styles consider the level of market risk of the assets held by the fund. Other notions that are considered include the risk and return ratio.



	Core	Core Plus	Value Added	Opportunistic
Risks	Minimal	Minimal-Moderate	Minimal-Moderate	Moderate-high
Targeted Returns	6-9%	9-12%	12-18%	18%+
Return Composition	Current Income	Current Income + capital appreciation	Current Income + capital appreciation	Capital appreciation
Holding period	10+ years	5-7 years	5-7 years	5 years or less
Leverage	0-50%	50-60%	60-70%	70-80%
Investment Profile	Large trophy buildings in central business district locations, properties with long term leases to strong credit tenants	Stabalized buildings generating steady current income	Buildings with upside potential realized through value added asset management	Underutilized assets in need of repositioning

Figure 7: INREV real estate investment styles (Prescott, 2017)

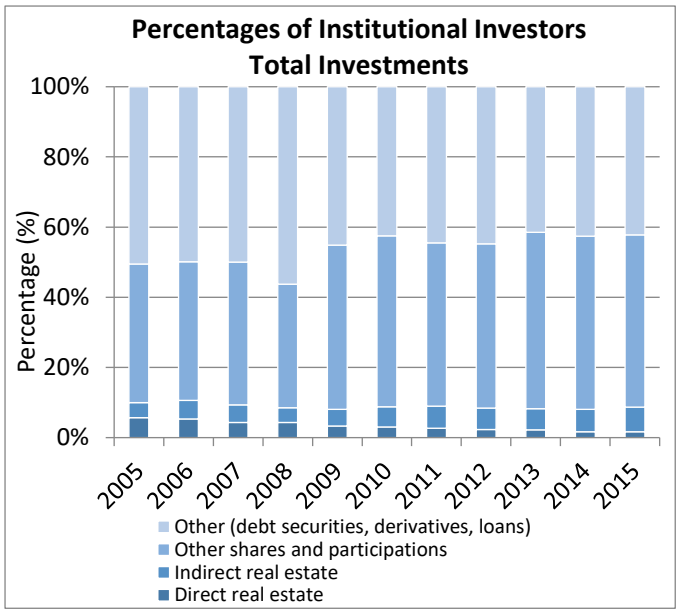
In accordance with the details explained in Figure 7, core investments often appeal to longer term, strategic investors, including institutional investors. Investors in core assets seek a secure return rate, that is generated from a stable, ongoing property cash flow. Although the overall returns are low, investors in the core category view these returns as offering an attractive premium relative to other asset classes such as stocks and bonds.

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
							Billion Euros (€)					
Pension funds	**Direct**	22,9	19,8	19,2	16,4	15,8	9,5	9,3	8,8	8,5	8,3	7,7
	Indirect	40	54	52,6	45,2	49,2	64,8	68,6	73,4	74,3	92,2	102,3
	Total	*62,9*	*73,8*	*71,8*	*61,6*	*65*	*74,3*	*77,9*	*82,2*	*82,8*	*100,5*	*110*
Insurance Companies	**Direct**	13,2	14,2	12,7	8,6	8,7	7,4	6,2	6	5,4	5,1	4,6
	Indirect	3	3,4	3,2	2,3	2,4	2,6	2,7	2,6	2,6	2,9	3,3
	Total	*16,2*	*17,6*	*15,9*	*10,9*	*11,1*	*10*	*8,9*	*8,6*	*8*	*8*	*7,9*
Investment institutions	**Direct**	24,5	27,3	19	26,6	25	31,1	31,9	31,2	29,7	28,4	29,8
	Indirect	2,7	3,5	2,2	2,8	20,2	26,1	37,2	44,5	43,4	58,3	64,3
	Total	*27,2*	*30,8*	*21,2*	*29,4*	*45,2*	*57,2*	*69,1*	*75,7*	*73,1*	*86,7*	*94,1*

Table 1: Total amount of real estate investment (per type) for each kind of institutional investor 2005-2015 in the Netherlands (CBS, 2017)

This research will focus on institutional investors. According to the Central Bureau of Statistics Netherlands (CBS, 2017), at the end of 2015 the value of investment in real estate by institutional investors was 211,9 billion euros. Only two years earlier this amount was 163,9 billion euros. The significant increase is the result of an increase in indirect real estate investments, particularly amongst pension funds and investment institutions. Pension funds have since the beginning of the twenty-first century seen a decline in the amount of capital being invested in direct real estate (from 22,9 billion euros in 2005 to 7,7 billion euros in 2015), and a great increase for indirect investment in real estate (40 billion euros to 102,3 billion euros) (see Table 1). The same can be said for investment institutions. Insurance companies have seen an overall decrease in real estate investments, with a change in portfolio composition in the past 10 years. For them, direct real estate has decreased, whilst indirect

real estate investment has generally remained the same (about 1% of all investments; see Appendix 1 for more detail).



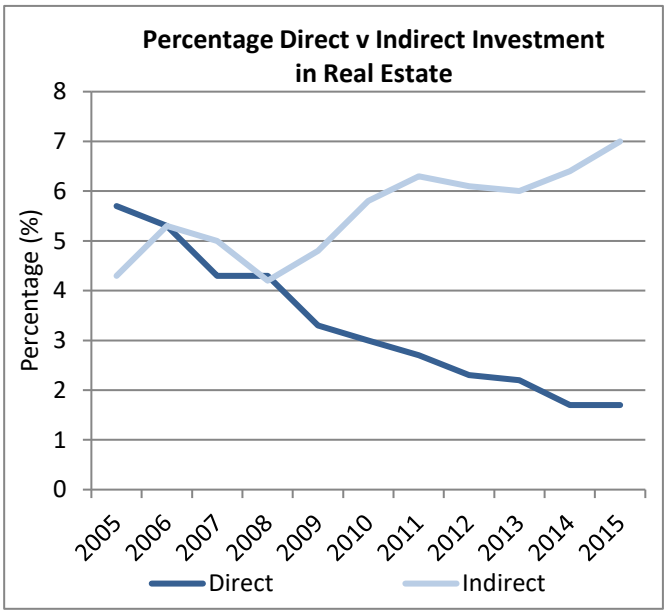


Figure 8 (left): Relative percentages of total investment for institutional investors 2005-2015 (CBS, 2017)
Figure 9 (right):Percentage of indirect- or direct investments in real estate for institutional investors 2005-2015 (CBS, 2017)

Overall, it seems that indirect investment in real estate has been increasing in the past decade for institutional investors; reaching 7% of total investments in 2015 (see Appendix 1 for details). Figure 9 show the change in type of real estate investment for institutional investors in The Netherlands, with the importance in direct investment decreasing to 1,7% of total investments in 2015. According to Amlal (2012, p. 21) in 1980 only 3 percent of the total property portfolio of institutional investors consisted of indirect real estate. In a period of 30 years, this percentage had risen to 64 percent in 2010.

When comparing institutional investors to private investors, the former must fulfil greater obligations such as the payment of pension and insurance funds. They set specific yields standards that they must meet in order to reach such future obligations. Private investors usually attempt to acquire as high a return with an as low risk profile possible, whilst institutional investors are guaranteed to be risk aversive and do not require as high returns compared to private investors.

In order to get as much information out of the market as possible, for this thesis the pension funds, fund managers, asset managers and other sustainability managers or experts were approached (see Figure 10). The reason for this is that the specific knowledge for the circular economy in the built environment (read: Real Estate) is often divided between these parties. Only as a result of speaking to the various levels of the real estate investment process, can be determined what the motives are concerning the investment strategy in real estate redevelopment concerning the circular economy.

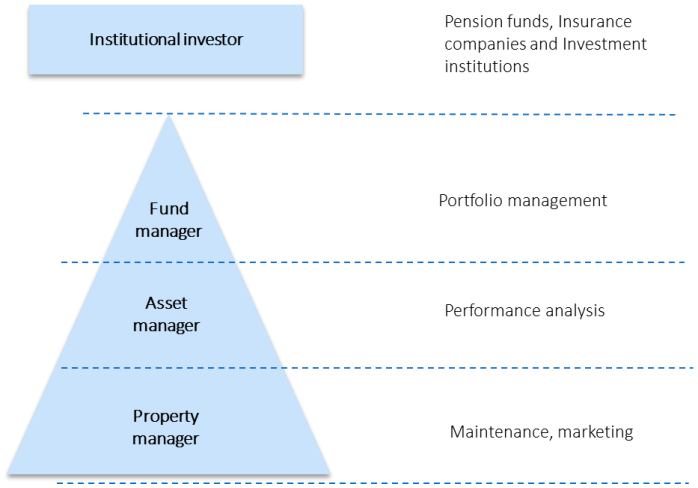


Figure 10: Levels of real estate management for an institutional real estate investor (own illustration)

3.4 Investment in sustainability and redevelopment of offices

Across the entire real estate market awareness towards sustainability is unmistakable. Society demands it of them. As De Nederlandse Bank (2016) uncover in their annual report, pension funds have in recent years been required by law to be transparent about their investments, and particularly those towards sustainability. However, the extent of this 'transparency' is not always put into perspective. In countless reviews and annual reports of the investments done by institutional investors the degree in which is invested in the redevelopment of offices is unclear. That is to say, many investors provide examples of sustainable investment activities; however, there is no indication to the weight of this invested capital against the remaining entirety of the investor's investment capital in real estate assets under management. The question whether investments in sustainability lead to favourable return and risk ratios is also still at large.

There still exists an inconsistency in recent studies concerning the impact of sustainable investments on the portfolio of institutional investors. Some say that there is no significant correlation between investments in sustainability and return (Bauer, 2008; Hoepner & McMillan, 2009). The reason for this being that the research on the matter is still in its initial stages. Others argue an increasing opportunity and growth of positive impact (Baas, 2013; Renneboog, Ter Horst, & Zhang, 2007). In the Netherlands, there is a growing willingness for investors to invest responsibly (TNO, 2014). Pension funds are leading in this area, with a recent research by the VBDO towards sustainable investments in which 50 large pension funds participated. The results of this research showed that pension fund board members have little vision concerning sustainability investment policies and its execution, whereby the latter is mostly done by fund managers. Nonetheless, pension funds are making steps in the right direction. In comparison, although the movement is there, the results showed that insurance companies are slower to implement responsible investment policies.

When focussing on investments in real estate, existing micro-economic studies on the return on investment in renovations and building improvement mainly focus on the ESCo-market (Energy Service Companies) in the United States (Bauer, 2008; Kok & Jennen, 2010). Thereby, studies mostly focus on sustainable developments in installations, finance and management of energy saving measures when it comes to existing office real estate. Further scientific evidence concerning the returns on investments through energy savings in itself is limited. More is known concerning the indirect effects of investments in energy efficiency, including a positive relationship between sustainability, energy efficiency and renting price levels of commercial real estate, both before and after the financial crisis (Baas, 2013; Cox, 2017; Eichholtz et al., 2010; Klaseboer, 2011).

Recently, banks such as Triodos and ING have contributed to the financing of sustainable redevelopment of real estate objects for their clients. Institutional investors such as pension funds are less apparent in the media for their investments in redevelopment. Some examples would include the CBRE Dutch Office Fund that has been successful in the refurbishment and redevelopment of the Beatrix II and Nieuw Amsterdam Gebouw. Internationally, the joint venture of PGGM Private Real Estate Fund (PREF) and Legal and General Capital; Vantage London Limited Partnership, and the sustainable redevelopment project of London office's is considered a remarkable achievement in the reduction of energy and gas consumption, and the amount of CO2 that these buildings emit (PGGM, 2016). The ASR Headquarters in Utrecht is an example in which the building was reconstructed, reusing the structure of the original office building from 1974. These are but few examples to the extent that is invested in sustainable real estate redevelopment. Unfortunately, the extent of the investments done in redeveloping office real estate in the entire real estate market is uncertain.

What is known globally, is that Dutch institutional investors are leading in the field of sustainability and in the broader sense Socially Responsible Investing (Rakhorst, 2015). Dutch pension funds are acknowledged as critically-minded partners who are not afraid to practice to make use of their greatest

asset: the power to exclude those companies and investment projects that do not comply with the Environmental, Social and Governance-criteria (ESG). The extent to which they apply this conduct in the built environment and their investments in the sustainable redevelopment of real estate will be explored in this research.

4 THEORETICAL FRAMEWORK: THE CIRCULAR ECONOMY

The Theoretical Framework is divided into two themes: The Circular Economy in Real Estate and the Role of Institutional Investors in relation to the investment in circular redeveloped real estate. Insights from Chapters 4 and 5 together lead to the construction of several hypotheses concerning the conditions under which institutional investors are willing to invest in circular real estate (re)development in existing real estate.

It is essential that first the concept of the CE be thoroughly examined concerning its intended meaning within this research. As the literature review has proven, the term is used incoherently and often leads to confusion due to its widespread application in innumerable fields of knowledge and practice. The underlying cause of this lies predominantly in the fact that the topic is relatively perplex in its definition as it is still in a stage of refinement. The practical implication of the term and its interpretations within the scope of this research will be treated within this chapter, especially in relation to real estate development. Furthermore, this chapter will also define what is understood by circularity within the office real estate sector within the existing built environment.

4.1 Origin and definition of the Circular Economy

The increasing recognition towards resource efficiency and security in order to contribute to future economic competitiveness and resilience is not a new phenomenon. Many socio-economic and political movements in the past have been charged with similar ambitions. This has led to the concept of the Circular Economy (CE) being built upon preceding concepts, contributing to its wide scope and the unfortunate incoherency concerning its definition.

Considering its formation and entry into academic literature and practice (politics, economy and business) the generic CE concept can be applied to, and claimed by, several different schools of thought. Therefore, it is difficult to trace its origin to a specific date or author. The work of Kenneth E. Boulding (1966) and his article "The Economics of the Coming Spaceship Earth" has been widely cited as the original proposer of the CE-concept. He suggested that the economy needed to evolve from the traditional "open system" relying on infinite materials to resource continuous production, manufacture, sales, and disposal of goods and services, to a "closed system" to account for true impacts (Zero Waste Scotland, 2015). His article was one of the first to model the economy according to circular material flows.

In the late 1970s, major schools of thought relating to the practical application of the essence of the CE-concept to economic systems and processes emerged. However, these only gained momentum and status in the 1990s. In chronological order, this included the functional service economy (performance economy) of Walter Stahel (2008); the Industrial Ecology of Reid Lifset and Thomas Graedel (2002); Biomimicry as defined by Janine Benyus (1997); the "Cradle to Cradle"® design philosophy of William McDonough and Michael Braungart (2005); and finally, the Blue Economy systems approach by Gunter Pauli (2010).

The research of the Ellen MacArthur Foundation (EMF) was undoubtedly the first organization to give the CE-concept a coherent framework. Since its establishment in 2010 this British NGO (non-governmental organization) has conducted an incredible amount of research with businesses, governments and educational institutions. Their efforts have given the concept wider coverage and appeal to various parties due to their attention to the economic opportunities available within such a system.

The EMF describes the CE as a system that is "*restorative and regenerative by design*" aiming to "*keep products, components and materials retained at their highest utility and value at all times*" (EMF, 2015a, p. 1). Although in previous reports defined as an 'industrial system', the EMF (2015b) also

describes the CE system as one that "*distinguishes between technical and biological cycles*", in which "*resource input, waste, emissions and energy leakage are minimised through the closing or narrowing of material and energy loops*". With reference to the words 'restorative' and the implication that resources return in 'loops', the concept defined by the EMF implies that large amounts of materials be re-used. This reference applies not only to bulk material, but also to products themselves and components. These recently defined components together lead to the following delineation of the concept:

> *A circular economy is one that is restorative and regenerative by design, which aims to keep products, components and materials retained at their highest utility and value at all times, distinguishing between technical and biological cycles; and where resource input, waste, emissions and energy leakage are minimised through the closing of material and energy loops.*

As mentioned, the restorative action of these loops occur in both technical and biological cycles; each cycle having a different design criteria (van de Kaa, 2013). The EMF's renowned 'butterfly diagram' is the first model to coherently explain these cycles and give a schematic overview of the concept (see Figure 11). In recent years, this model has been altered as it has been supported by various principles. In their most recent report 'Towards a Circular Economy: Business Rationale for the Accelerated Transition' (2015) the EMF established a new version of the model as seen in the figure below:

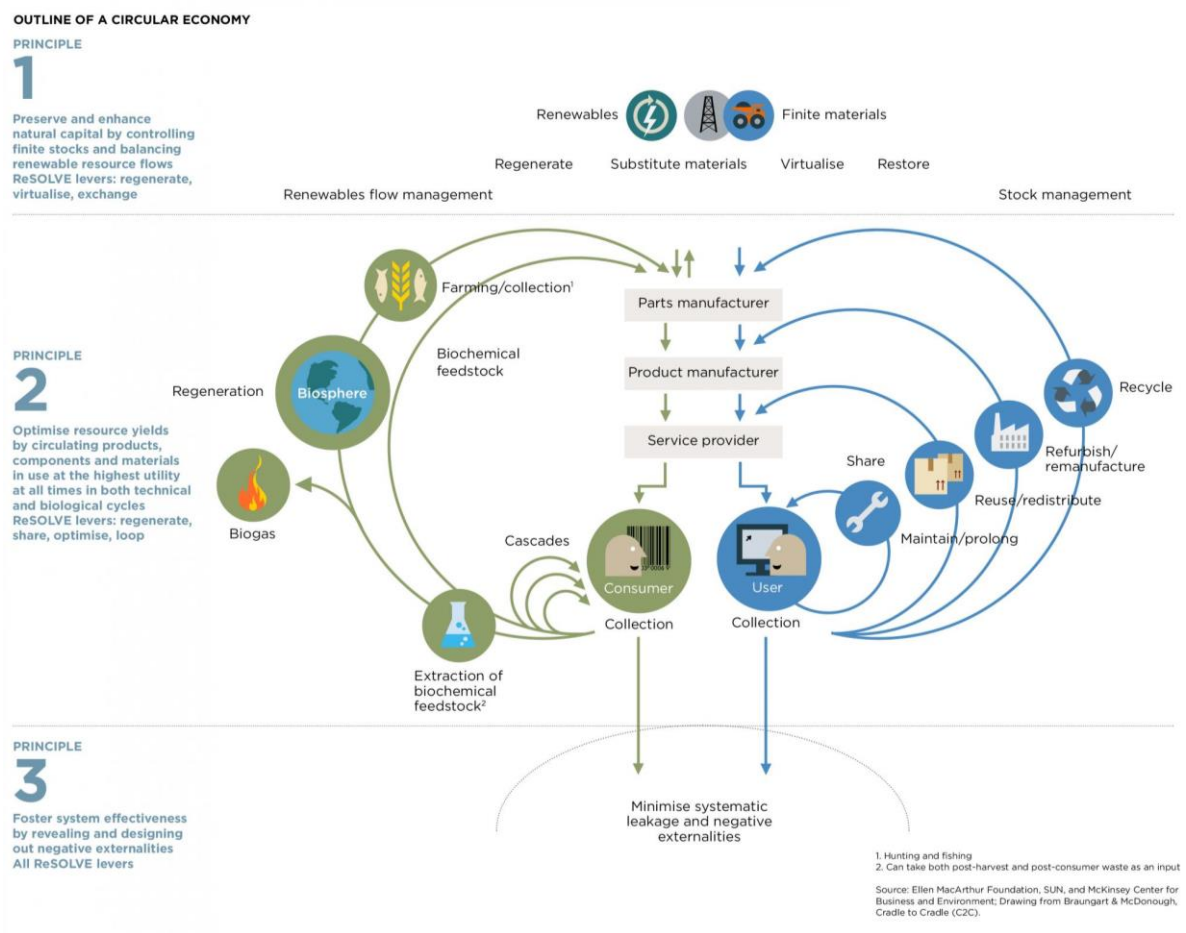


Figure 11: Circular Economy System Diagram (The Ellen MacArthur Foundation, 2015)

Considering the many theories that preceded the circular economy, whether these ideas were novel or not, it is important to note that the lessons from past attempts have been fruitfully exploited into current efforts (Bocken, et al., 2017). Various scientists argue that the proponents and concepts that

have been integrated from previous strategies are where the framework gives its greatest contribution to bringing the CE into practice. The report presented by Bastein et al (2013, pp. 10–12) explains some of the guiding principles that lead to value creation within the Circular Economy Systems Diagram. The accompanying text will elaborate on this further.

Biological Cycle

The biological cycle encompasses the flows of renewable materials. Renewable (biological) nutrients are mostly regenerated within this cycle, however not in the same way as the technical cycle. The EMF (2015) and Bastein et al (2013) explain that biomass and biological residues are ultimately returned as biological nutrients to the Earth after adding as high a value as possible through a cascade of processes. The following points describe the left side of the loop diagram (Figure 11):

- Through the *extraction of high-quality raw materials (biochemical feedstock)* small amounts of high quality chemicals can be extracted from biomass through processes known as bio-refinery.
- During *anaerobic digestion* microorganisms break down organic material. The result of this is methane (biogas), which can be used as an energy carrier, thus contributing to our energy supply.
- In the processes of restoration and farming/collection, all biological nutrients should be used as a non-toxic ingredient for improving the biosphere as fertilizer for example agriculture.

Technical cycle

The technical cycle involves the management of stocks of finite materials. Use replaces consumption. Technical materials are recovered and mostly restored in the technical cycle. The following 'feedback loops' can be distinguished:

- Reparation and maintenance are the natural first steps undertaken in a circular economy. This ensures that products are kept as long as possible within circulation, at the highest possible value.
- Through reuse and redistribution, a product experiences low loss of its functionality. The second-hand market is an example of this.
- Within refurbishing, key components (or parts) of a product are repaired or replaced, resulting in the product having a lower warranty than the original new product. During remanufacturing, components from used products are taken and paced in new products. This results in product quality control and thus delivers high (warranty) valued products.
- During recycling, materials are recycled from products to be used in a production process. While retaining the value of raw material, the added value of a product (in the form of energy, labour, investments etc) will be lost.

In order to achieve the closing of material loops within the technical cycle, management and exchange of resource-related information (e.g. material passports), networks of material exchanges and end-of-life system for flows of resources are required. As the built environment is highly dependent on natural resources, this research will focus on the material and energy loops within the technical cycle of the butterfly model. To achieve a more holistic approach to understanding the working of the model shown in Figure 11, the principles of the circular economy will be explained.

4.2 The principles of the circular economy

Since its introduction, the interpretation of the circular economy is the reusability of products and raw materials, the restorative ability of natural resources and the minimization of value destruction. Due to the broad scope of the term, this research will uphold the most important principles with reference to the built environment and real estate in order to delimit the extent of the concept of the CE. The following characteristics describe the circular economy more concisely (The Ellen MacArthur Foundation, 2015):

- Waste is designed out by intension. Technical materials are designed to be recovered, refreshed and upgraded, maximizing retention value and minimizing energy input.
- Build resilience through diversity. Just like living systems, economies need diversity in order to advance their adaptability. Modularity and flexibility of products and systems is essential in a fast-evolving environment.
- In a CE, the system will only rely on renewable sources of energy (examples include solar, wind and wave energy). This will decrease resource dependency and increase resilience.
- System-thinking is applied broadly. Many parts, products and systems are strongly (inter)dependent on one another.
- Waste is food. The closing of biological and technical loops ensures that products are returned to the production chain. Biological nutrients return to the biosphere, whilst technical materials are used without loss of quality.
- Usage rather than ownership. A product owner hires it to a consumer. The materials remain in possession of the company. This requires new business models for production, consumption and collection.

Building upon this, the research team of Rizos, Tuokko and Behrens (2017) identified the main circular economy processes, summarizing them into three main categories, including (1) using less primary resources, (2) maintaining the highest value of materials and products and (3) changing utilisation patters. These are presented in the table belowbelow.

Use less primary resources	Maintain the highest value of material and products	Change utilisation patterns
▪ Recycling ▪ Efficient use of resources ▪ Utilisation of renewable energy sources	▪ Remanufacturing, refurbishment and re-use of products and components ▪ Product life extension	▪ Product as service ▪ Sharing models ▪ Shift in consumption patterns

Table 2: Main circular economy processes (based on research by Rizos, Tuokko and Behrens, 2017)

An important element that they note is that the categories of processes are not mutually exclusive. In support of the claims by EMF, Rizos, Tuokko and Behrens (2017) argue that many elements are often interlinked while in some cases strategies and developments can involve multiple circular processes. For example, industrial symbiosis can be both the utilisation of renewable energy resources as well as to remanufacturing practices in the building sector.

While these characteristics are fundamental to describe the workings of the CE, the following points defined by the EMF (2015) outline the principles for action and are also included in Figure 11:

1. *Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows*

   In the CE, when resources are needed the system selects them wisely and chooses technologies and processes that use renewable or better-performing resources. The system also ensures conditions for regeneration.

2. *Optimise resource yields by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles*

   Designing for remanufacturing, refurbishment and recycling occurs here, in order to keep technical components and materials circulating in and contributing to the economy. Maintenance occurs wherever possible, preserving embedded energy and other value. The extension of product life and optimization of reuse occur here, as does the encouragement for the re-entering of biological nutrients safely into the biosphere.

3. *Foster system effectiveness by revealing and designing out negative externalities*

   This means reducing damage to the system and its various areas (including managing externalities such as land use, air and water pollution).

The aim of the combination between the above principles and characteristics enlighten the motivation behind the circular economy, which is to reduce the impact on nature and add value towards society, the environment and the economy. Ultimately, the result of the CE is the decrease in demand and extraction of natural resources, stepping-over to the use of renewable energy and bringing diversity to social, environmental and economic aspects. The following paragraph will elaborate on the value creation of the CE which is necessary to understand attempts to analysis tools for circularity.

4.3 Value creation

According to the EMF (2015) the principles and fundamental characteristics of a circular economy all drive four clear-cut sources of value creation. Early reports have established various estimates of value that result though the circular economy practices. However due to the lack of a common definition, these have no more aided in defining circularity in practice than they have in providing a framework for evaluation. Therefore, the estimates of value creation are still key assumptions that underlie research analysis. The research of the EMF (2015, p. 8), and Moreno et al. (2016, p. 9) noted that circular thinking resulted in four main value potentials as seen in Table 3.

(The Ellen MacArthur Foundation, 2015)	The power of short cycles	Repair and adjust existing products and services in order to retain more value than the recycling of individual raw materials.
	The power of long cycles	Extending life and usage cycles of existing products and processes in order to increase value creation. This can be done by maximizing the number of consecutive cycles.
	The power of cascading	Diversifying reuse across the value chain through creating new combinations of raw materials and components. This includes the purchase and selling of upgraded residual flows.
	The power of pure cycles	Using 100% pure raw materials in order to easily recycle them in the future increases redistribution efficiency and maintains quality and productivity.
(Moreno et al., 2016)	*Slowing resource loops*	Extending and/or intensifying the utilization period of a product through product-life extension (e.g. repair or remanufacturing), resulting in a slowdown of the flow of resources
	Cycling for longer	Through recycling, the loop between post-use and production is closed, resulting in a continuous circular flow of resources
	Cascaded uses	Creating new combinations of resources and material components across industries (e.g. transforming cotton clothing into housing insulation)
	Narrowing resource flows	Using fewer resources per product

Table 3: Sources of value creation in a CE (own illustration)

In the CE, value is a significantly important element that is often misunderstood. Value creation (and also reduction) in linear business thinking is often perceived as a dependent variable reacting on time and scarcity; therefore associated with temporary systems (Verberne, 2016). In the CE, value is perceived as a result that can be achieved over long periods of time (cascading). The perception of value is an important consideration towards implementation of CE principles. To review, the objective of the CE to maximize the true value of materials and components by making them reusable by means of subsequent uses, ultimately aiming to minimize the footprint on the Earth. The later has become an increasingly important indication measure in business management; an notable example being its

implementation into supply chain management (for more information (Chang, Yeh, & Liu, 2015; De Benedetto & Klemeš, 2009).

In various researches – and confirmed through expert interview (Blomsma & Brennan, 2017; amongst others; see also Appendix and Interview fragments) – many contend that indicators and other assessment methods will play a key role in defining and specifying the CE concept in the future. This is particularly necessary when evaluating CE in the built environment. Linder et al (2017) respond to the lack of standardization for measuring circularity at a product level through the proposal of a single value economic metric. Their research suggests a calculation of the ratio of economic value of the recirculated materials to the total product value, using value chain costs as an estimated measurement.

One of the leading frameworks used to analyse the circular economy is that of the EMF, the ReSOLVE Framework (Regenerate, Share, Optimise, Loop, Virtualise and Exchange). According to Bocken et al and Mendonza et al (2017; 2017) this framework has been identified as a leading CE tool used by businesses for building CE business models and strategies. This is the focus of this thesis. The most relevant explanation of the framework applicable to this thesis is that which is explained in the most recent report of the EMF '*Circularity in the Built Environment: Case Studies'* (2016). This report explains the 'elements' of circularity already existing in many buildings and defines new elements that can be implemented. The following table explains the ReSOLVE elements:

ReSOLVE actions	Description	In the built environment
REGENERATE	Regenerating and restoring natural capital by: ▪ Safeguarding, restoring and increasing resilience of ecosystems ▪ Returning valuable biological nutrients safely to the biosphere	Use of renewable energy to power buildings Land restoration Resource recovery Renewable production systems
SHARE	Maximizing product utilisation by: ▪ Mutualising the usage of assets ▪ Reusing assets	Residential sharing Infrastructure sharing Appliances / Tools sharing Co-housing Office-sharing Shared water consumption
OPTIMIZE	Optimising system performance by: ▪ Prolonging products' use period ▪ Decreasing resource usage ▪ Optimising the logistics system through ▪ implementation of reverse logistics	Industrial process, off-site production Smart urban design Energy efficiency Water efficiency Material efficiency Reduction in transport
LOOP	Keeping products and materials in cycles by: ▪ Remanufacturing and refurbishing products and components ▪ Recycling materials	Optimisation of end-of-life of the building/materials Modularity of the building Remanufacturing of materials
VIRTUALIZE	Displacing resource use and delivering utility virtually by: ▪ Replacing physical products with virtual services ▪ Replacing physical with virtual locations ▪ Delivering services remotely	Tele- working Virtualization of products Virtualisation of processes Smart appliances
EXCHANGE	Selecting resources and technologies wisely by: ▪ Shifting to renewable energy and material sources ▪ Using alternative material inputs ▪ Replacing traditional with advanced technical solutions (3D printing) ▪ Replacing product-centric delivery models with new service-centric ones	Better-performing materials Better-performing technologies New products and services

Table 4: The ReSOLVE framework applied to the built environment (Ellen MacArthur Foundation, 2016)

The research of Fernandez Mendoza et al (2017) who – through the example of a vacuum cleaner – presented a new generic framework based on the ReSOLVE framework more applicable to strategy and business management. The BECE (backcasting and eco-design for the CE) framework is in support of developing new business models and product designs within the CE. The BECE empowers organizations to tackle the CE holistically by embedding its concepts into corporate decision making. In this process, both systems and operational thinking are brought together which increase the likelihood of successful implementation. The most interesting contribution of their research is the updated version of the EMF's ReSOLVE framework, which map circular solutions for both product-specific related changes, as systematic changes. They adjusted the framework, naming it the iReSOLVE framework, in which the action IMPLEMENTATION is added; giving a number of requirements that must be undertaken by project managers in order to increase the likelihood that ReSOLVE actions will be undertaken (see Appendix 2 for more information). This framework is presented as a checklist in which actions represent business opportunity that reinforces and accelerates the performance of other actions related to the CE principles. The result is a strong compounding (systemic) effect that can have profound impact across different economic sectors (Mendoza et al., 2017). Being considered a significant CE tool the ReSOLVE framework is taken as a basis for circular principles in the built environment within this research. The following chapter will elaborate upon these elements in relation to the real estate sector, with particular attention to the redevelopment of real estate.

4.4 The circular economy and the built environment

The CE is a holistic approach that until now finds its practical application through the defined principles. As noted, defining the circular economy at a 'real estate object level' has not been scientifically categorized in the literature found for this research. Therefore, in order to explore the circular economy at a building level, this research will now look into CE features which are related to the built environment and concentrate on their significance to a building.

The built environment is known as one of the largest systems that make up our surrounding environment, and one of the most polluting industries. Involving many stakeholders in its production process and use, the built environment is a large producer of waste. This system includes various classifications of areas and urban scale, including cities, districts, neighbourhoods and buildings themselves. When concerning sustainability in the built environment, much has been written about defining this in areas such as (1) the facilities within a building, (2) the surrounding natural environment, (3) people satisfaction and (4) transport systems (Verberne, 2016). These elements consider resource and energy consumption of various materials during their life-span and the impact the building of infrastructure has on the natural environment. These are the elements that in part can be considered the foundation of circularity in the built environment. The CE is founded on the awareness that energy and resources will be used and returned in loops known as product and material lifecycles. The most important aspect of the CE, is that it is an economic system. Various stakeholders collaborate in order to maximize value of materials and product during its lifecycle, ultimately reducing costs and loss of energy and resources (Van Oppen, 2015). Circularity in the built environment should ultimately be cost effective in all aspects of costs, including production, use, maintenance and management. Therefore, CE in the built environment is closely related to technical aspects including (1) circular material use and (2) circular design (including modular design for adaptability, reassembly and recycling) (Guy & Ciarimboli, 2005; Moffatt & Russell, 2001; Zabalza Bribián, Aranda Usón, & Scarpellini, 2009). Both these elements are also applicable when considering a real estate product within the circular economy.

4.5 The CE in a real estate object

In order to understand the CE in a real estate object, it is important to re-establish the components of which it is made. Buildings and infrastructure alike are assets with a long lifespan, consuming large amounts of metal, minerals and other petroleum-derived materials for construction (technical

nutrients). A real estate product is comprised of various layers in which these nutrients (in a manufactured form) reside. In relation to this, a building should thus be seen as a composition of various components (assembled materials), each of which have their own technical and economic lifespan.

Realistically, an existing building will never become 100% circular. Therefore, for the sake of this thesis, the reader must contextualize the CE in the existing built environment (and thus real estate) as including some but not all aspects of the principles of the CE as explained in chapters 4.1 and 4.2.

As buildings are used as entities, their functioning will change over the long-term due to shifting user demands and the changing external (environmental, social and economic) conditions. Therefore, for the future it is important to consider the future adaptability of real estate objects. Ten Dam (2014) noted that the success of real estate in the future will be determined by the extent to which the demands of the user have been taken into account. The FGH Banks' yearly report (2016) also urges the real estate sector is to shift their attention to end-users.

4.5.1 The building and its layers

Although current research is being done concerning CE in the construction of new buildings, much still has to be done concerning the adaptation of existing buildings towards circularity. In order to make a building circular it must uphold the principles of flexibility, demountability and extensibility in order to respond to changing needs and demands over time (Mohammadi & Slob, 2016). In literature, models have been presented by various researchers, known as building decomposition models that support the idea of a building as a composition of various layers. The most well-known, the "Shearing Layers model" (also known as the 6S-model) of Brand (1995) will serve as a foundation towards explaining the possibility of CE in an existing real estate object (in this research: an office building). Brought forth out of the earlier theories of Rush (1986) and Duffy (1990), this model defines a building to consist of various layers (and elements) with particular emphasis on the fact that all of these have a different life cycle.

Figure 12 shows Brands' (1995) original Shearing Layers model in which he notes that the 'Site' is the geographical, or urban location on which the building stands. The life span of this layer is eternal as it is immovable. The 'Structure' includes the foundation elements of the building (all load bearing components) and has a life span of 30 to 300 years. The 'Skin' comprises of all exterior surfaces (the facade) and has a life span of 15 to 20 years, whilst the layer 'Services' – comprising of wiring, sanitary, plumbing, heating and similar systems – should be adjusted every 7 to 15 years. The life span of the final two layers differs in accordance to the real estate type. In the case of offices, the 'Space' layer (e.g. hallways and working areas) is adjusted every 2 to 3 years, whilst the layer 'Stuff' (including furniture, paintings and sculptures) unceasingly changes (less than a year).

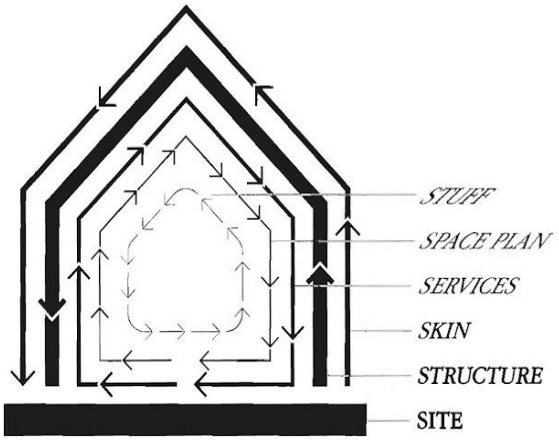


Figure 12: The Shearing Layers model of Brand (1995, p. 15)

The suggestion that the components that make up the various layers within this model can be decoupled from one another is incorrect. In some cases, the 'Skin' layer is a part of the 'Structure' of a building as well as the fact that it holds various installations of the 'Services' layer. Although this model is the foundation for the CE in a real estate object in this thesis, the reader must be aware of the difficulty in separating the layers and components from one another in existing buildings. In the case of this research, design components for the dismantlement and reuse of certain materials were not

taken into account upon construction. Another suggestion that the model makes – the hierarchical relationship between the different layers, in which the layers of a longer lifespan alter the layers of a shorter lifespan – is another circumstance applicable to older existing buildings.

Throughout various recent literature and studies towards the circular economy in real estate (Achterberg, Hinfelaar, & Bocken, 2016; Bocken et al., 2016; Mohammadi & Slob, 2016; Verberne, Supervisor, Consultant, & V, 2016 and more), this model is used in order to explain one manner of viewing circularity in buildings. It is imperative to acknowledge this theory as it is evident real estate parties use this manner of viewing circularity in buildings in todays practice.

4.5.2 The circular real estate (re)development process

In addition to building layers, it is also important to consider the relevant use and the (re)construction process of a building in order to determine circularity within a real estate object. The initial design phase of the object is not taken into consideration as the focus within the research is set on existing buildings, in which during the design phase aspects of the CE where not consciously taken into consideration. The operating phase of the real estate object is important. According to the Green Deal report '*Handleiding en paspoort circulaire gebouwen'* (2016) during a buildings lifetime, a circular building does not use raw materials. This refers not only to the construction of new buildings, but also to the operational phase and repair phases of existing buildings. In the report a statement is made emphasising CE in existing buildings, stating '*in order to optimally make an existing building circular this must occur in natural moments such as the operating phase of the building, and in periods in which reparation, refurbishment or renovation occur'* (Green Deal, 2016, p. 5). During the operating phase, action is taken in order to extend the technical and economic lifespan of the real estate product as a whole. In relation to the Butterfly model of the EMF, an operating phase including CE-related interventions, can refer to the technical side of the model in which moments of 'looping' occur in which materials and technical components are being reused. During refurbishments, large amounts of technical materials are either removed or added to a building. Although reparation of components extends its lifespan, practices of it will not be explored in this thesis as these interventions occur on a small scale and often do not apply to a greater measure of the long-term layers of a building.

Another phase within the lifespan of a building is the end-of-life phase. Once a real estate object (consisting of various components) has reached the end of its technical and economic lifespan, it enters the phase known as the end-of-life phase. This thesis also considers the fact that the user (the tenant) no longer finds the building attractive a feature of the end-of-life phase. In a circular economy, the concept of end-of-life naturally replaced with restoration, where a shift is made towards making use of renewable energy and where waste is eliminated (Ellen MacArthur Foundation & McKinsey & Company, 2014). In this context, economic growth is decoupled from the use of raw materials and resources, using 100% reused and reusable materials instead. At this point, the owner of the building will eventually decide to take action. Demolition in the form of total destruction of the building with no forms of reuse is not an option in the CE. Although transformation is a form of lifecycle extension, this thesis chooses to focus on the preservation of the original function of the object (offices) and therefore this intervention will not be further explored. The remaining relevant actions include refurbishment, renovation and disassembly. The later refers to the complete extraction of components for recycling or reuse elsewhere.

4.6 Relevance of CE for real estate markets

Looking back at the CE and its effect on the real estate market, there are several points in which the principles conflict with the 'traditional' workings of the real estate market. One important example is the use and ownership of commercial real estate. The result: a modified model of ownership (Mohammadi & Slob, 2016). In traditional construction the client is regarded as the owner of the project and thus the end product. In the CE, the client is only interested in the use and performance of

the product, rather than its possession. Resources and materials will therefore no longer be sold to developers, and the end product (the real estate object) no longer property of the client. Consortia will become a new form of 'ownership', in which the functions such as housing and work will become services provided by the developer, and the raw materials remain property of the supplier. This will require new trade agreements, including repurchasing and resale, and thus new business models in which the service is the product.

In order to achieve this, another challenge arises. The CE requires more collaboration along the chain of construction. As Buitelaar (2013) and Mohammadi (2016) would both argue, the current chain of construction of real estate beholds loosely coupled systems in which supply and demand reacts on one another, and responsibility of the object is passed on to each system along the chain of construction. The transition to closed production chains (closed loops) requires the right distribution of responsibility and risk among the actors involved, both on the demand and the supply side (Mohammadi & Slob, 2016; Schoolderman, van den Dungen, & van den Beukel, 2014). The CE would demand two new approaches of collaboration including: (1) chain-based collaboration and (2) area-oriented collaboration. The former focuses on closing material loops at the level of the construction chain, whilst the latter focuses on closing cycles within a certain area. Although at different levels, both require changes in existing policies in order to organize such collaboration.

Another challenge includes the valuation of real estate. In the traditional and linear real estate market, an object is often depreciative in value. This is written off periodically, in relation to the age of the product. The CE would suggest that materials retain high level of value throughout several cycles. This will require a new perspective on financing, with different payback periods and residual values. Mohammadi and Slob (2016) argue that the CE will require new revenue models to include the principles of the CE as mentioned in chapter 4.3, including cascading, cycling for longer and slowing resource loops. According to them, the CE would require a change in the design of cash flow, investment capital (in the form of pre-financing) and legal structures concerning the value of collateral. In summary this asks for a new role and responsibility for the banking and investment sector. Within the CE, investors will no longer be at the forefront of project financing, but act as a financer behind the business models of suppliers. Financers must invest in commodities in the form of perpetual bonds within the circular economy (Mohammadi & Slob, 2016).

5 THEORETICAL FRAMEWORK: THE ROLE OF INSTITUTIONAL INVESTORS IN RELATION TO THE CIRCULAR ECONOMY

In this second chapter of the Theoretical Framework several aspects related to the circular redevelopment of real estate and the investment behaviour of institutional investors will be elaborated upon. Firstly, the real estate system and two strongly related theories will be presented to establish the theoretical basis of this research. Following this, the influence of responsible investments and CSR policies will be related to the changing dynamic of investment decisions. Similarly, the strategy development of institutional investors will be discussed, including the various stages of an investment decision and the importance of risk analysis. The final sub-chapters will refine the actuality of the circular economy within the current strategic management of an investor and summarize relevant criteria for investment.

5.1 The real estate system

This research conceptually relates to mainstream urban economic research and real estate economics. In particular, it relates to the many models which focus on the sub-markets of the real estate system. The most well-known model is that of DiPasquale and Wheaton (1996), and another with focus on sustainability within the real estate market is that of The Circle of Blame.

5.1.1 The Four Quadrant Model

The Four Quadrant Model developed by DiPasquale and Wheaton (1996) (see Figure 13) is internationally considered the leading theory to represent the real estate system. The Dutch real estate market has often been quoted to be strongly influenced by the propositions presented within this theory (see for example (van Gool, Jager, Theebe, & Weisz, 2013) (Vlek, van Oosterhout, Rust, van den Berg, & Chaulet, 2011). By these parties, the model is claimed as a great model to understand economic movement. Theoretically, through the understanding of this model it is possible to make predictions concerning the effect of changes in economic activity, financial markets, construction costs, inflation and regulation on the real estate market. An important aspect that this model determines is that the real estate market itself would not exist without its 3 interrelated market segments. These segments include: (1) The space market, (2) investment/asset market and the (3) building and development market.

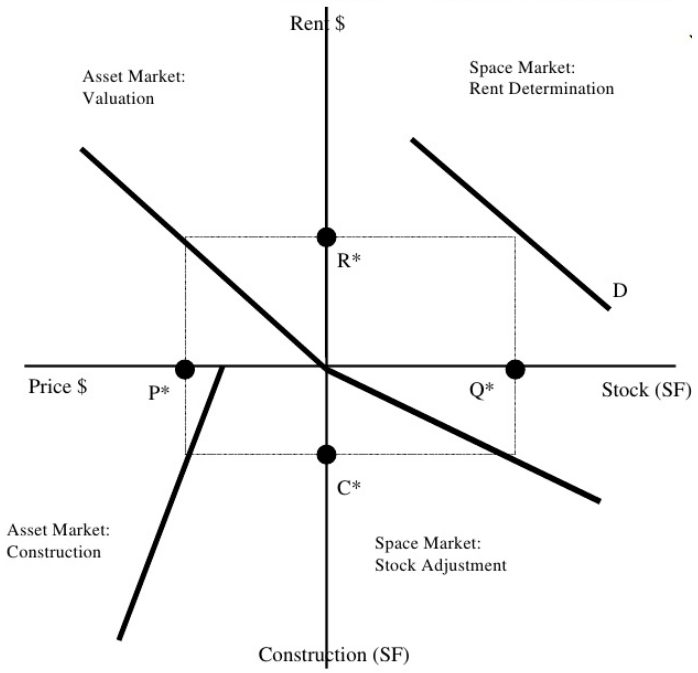


Figure 13: Four Quadrant Model (DiPasquale & Wheaton, 1996)

The model is built up upon 4 axes, which represent the relationships to which the market segments are interrelated. These include the rent prices, value of investments, building construction and the building stock. The model is therefore useful as a tool in order to explain basic knowledge of the long-term equilibrium between the space and asset market; in which the market is allowed sufficient time for the supply of built space to adjust to demand. Internationally, many authors have used this and similar models to explain the developments on the commercial real estate market and the effect of macroeconomic changes to it. See for example Boshoff (2013) for an assessment of the South African office market according to the REEFM (Real Estate Econometric Forecast Model). This article concludes that the application of this model had statistical significance when explaining the office property behaviour in South Africa. The extensive research of the German office market by Bönner (2009) shows how real estate markets differ within a country according to regional aspects and other economic variables. These are but a few examples to the application of the model.

The space market

To interpret the model the reader must begin in the top right quadrant at the space market. Here the value of income generating properties is dependent on the demand and supply of real estate. Furthermore, the equilibrium is set by the quantity and the rent per square meter which is determined by demand and supply. The downwards slope of the line therefore indicates that demand for space decreases when the price for rent increases. As Van Gool et al (2007) would suggest, economic developments greatly influence this quadrant. An example of this would be the 'dot-com bubble' (otherwise known as the information technology bubble) which occurred roughly from 1997 to 2001; a period of extreme growth in the internet usage for both businesses and consumers. In this time, the amount of small start-up businesses increased which led to an increase in demand for rental spaces (Buitelaar et al., 2013). Another influencing variable is the location of a property, which affects the price of rent and consequently the real estates' investment value. However, the measurement of this variable differs in different countries and therefore the value of an investment is determined by the market in which it is located.

The asset market

The second quadrant, the asset market, illustrates the relationship between the rent prices of real estate and the market value of the real estate; the latter being one of the most important aspects for investors. There is a positive correlation between these two elements; in which when the rent increases as will the value of the real estate and thus the value of investments. This gradient is also known as the gross initial yield (Dutch: 'aanvangsrendement') (van Gool et al., 2007; Vlek, van Oosterhout, Rust, van den Berg, & Chaulet, 2011). The gross initial yield is measured as the annual return on an investment prior to taxes and expenses, divided by the current price of the investment. The yield is lower when the investment object is more in demand. This measure functions as an important indicator for the investment sentiment, in which the rule is: 'the lower the initial yield, the more competitive the market and the higher the prices for real estate objects'.

The latter is not considered a constant, as it generally fluctuates with the interest rate on the capital market. Lower interest rates often lead to lower yield rates. An important variable that affects this segment is the type of real estate which is considered, as these vary in initial yield rates.

The construction market

Within this third quadrant, a positive correlation between the price of real estate and the construction of buildings (measured in square meters) is illustrated. As the value of real estate increases in price, so too will the amount in building production. This correlation occurs proportionally as it is only profitable to develop new real estate if the construction costs do not exceed the value of the real estate. This is the reason why the contour within this quadrant does not start at the origin of the axle system (see Figure 13). The process of regional development is an important process which takes place within this

quadrant. This process influences the quality of the location, which automatically influences the value of the real estate. Important actors within this quadrant thus include local authorities as they institutionalize the land and spatial planning policies that both facilitate and consolidate such development.

The stock adjustment
The fourth and final quadrant does not illustrate a market segment, but the consequence of real estate construction in the third quadrant. Not only the development of new real estate, but also demolition, renovation (extending the lifetime of a real estate object) and even transformation (also known as withdrawal) affect the total stock (measured in square meters). Adjustments in the stock constitute the supply side of the space market, as depicted in the first quadrant. The sloping contour within this quadrant illustrates that when the construction of real estate increases, so too will the total amount of stock.

Limitations of the Four-Quadrant model
Just like every theoretical model, this four-quadrant model is only a depiction of the reality of the real estate market. One limitation of the model is that too often the interpretation is that the real estate system warrants balance, as correction mechanisms are activated between supply and demand amounts, and prices and rents. However, as the development of real estate takes time, there is a delay within the reaction capacity of the market segments. Buitelaar (2013) considered the connections between available space on the one hand, and the construction, development and investment market on the other hand, as relatively loose. This separation of usage and ownership of real estate he called 'loosely coupled systems', in which the supply of offices reacts incompletely and also slow to the demand for space. He noted that this intensifies the fragility of the model. Each market segment has its own dynamics. These are otherwise known as external factors, such as institutions (both informal and formal) and differing economic environments of each segment. Institutions are rules created by society that structure the interaction between people. Formal institutions are laws, policies, regulations; all of which have legal consequences. Informal institutions such as conventions, taboo's, work practices and social expectations – although not enforced by law – greatly influence societal behaviour. The four-quadrant model does not directly account for these influences. Therefore, according to Buitelaar (2013), the model is incorrect to imply that the reactive behaviour of the real estate system solely begins at the space market (Q1). For example, the scale and the degree of financial and organizational integration of real estate development ensure that the lead time is sometimes long and therefore it is less easy to respond to changes in demand. The reader must be aware of these limitations.

Use of the model
Theoretically, the degree of sustainability should affect the market value of a property. However, the 4Q-model was originally developed without the consideration of sustainable, life-extending renovations of buildings. Despite this, theoretically speaking the model can to some extent explain what effect this will have to a greater fraction of the real estate system. The model demonstrates that if the demand for a particular product is high, various parties will be willing to pay for it. In turn this will increase the value of the product and it will then be produced more. These are the assumptions of the model. However, in accordance to Buitelaar (2013), the 'looseness' of the market segments ensure that through indirect investment in real estate, partial ownership by institutional investors distances them from the experience of using the real estate, placing their focus predominantly on the objects financial performance. Theoretically speaking, the separation between usage and ownership might prevent the circular economy to be implemented within the redevelopment process. The tentative behaviour of real estate investors to react upon proven financial benefits (as will be elaborated in Chapter 5.3), and not solely upon user demand is an aspect of the real estate system that is absent in the assumptions of the 4Q-model as the model cannot specify the behaviour of every particular type of investor. Furthermore, the suggestion from Buitelaars (2013) research, that organic forms of

(re)development are more capable of dealing with uncertainties and risks, making the system perhaps then less vulnerable to changes in demands within the various market segments. By limiting the financial and organizational integration of real estate development - this is closely related to the ambition of intra-plan equalization - the span of control is limited, so that the system of development is better able to deal with external changes, particularly within the demand for real estate in The Netherlands (Buitelaar et al., 2013, p. 28). Incidentally, without affecting the further urban development cohesion within an area. As noted, this form of development is also appropriate for the shift from relatively simple extensions to the more complex transformation task.

In summary, the effects of the circular economy currently have no consideration within this model. In order to comprehend the opportunities and constraints that the real estate system have towards implementation of the circular economy, this model lays only the groundwork of the basic workings of the system and should not be considered to have verified conditions of the system. As Buitelaar (2013) concludes, the 4Q-model responds with difficulty to changes in demand.

5.1.2 The Circle of Blame

To be more concrete, the theory of the 'circle of blame' is a known concept that can help explain in more detail the motivations of various actors within the real estate system concerning the motivations for sustainable buildings. The concept was first introduced by British environmentalist Jonathan Porritt, and then adapted by Cadman (2000; see also Lorenz, 2008b, p. 5) towards the office real estate market to metaphorically explain the obstacles parties face in the transition towards the development of sustainable buildings. Figure 14 below maps the dynamics of the property market, showing the different actors (e.g. occupiers, contractors, developers and investors). Each actor seems prepared to take action but is held back, or so they say, by another actor.

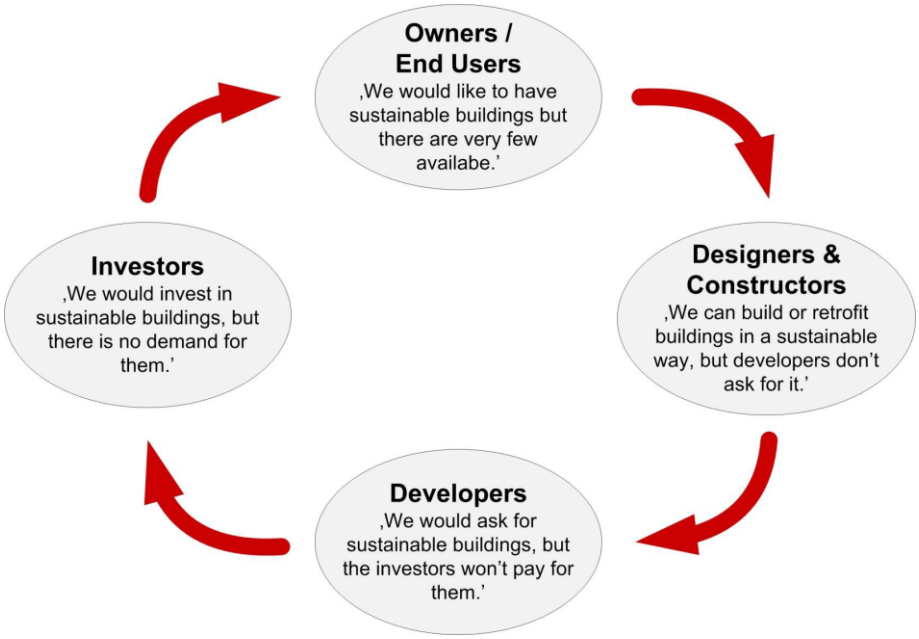


Figure 14: The vicious Circle of Blame (Cadman, 2000; in Lorenz, 2008)

In theory, this model can also be applied to the circular redevelopment of the exiting real estate stock in order to reduce the high vacancy rates. Each party feels the need to preserve the existing stock as we know very well that a reduction in its magnitude is environmentally responsible and also desperately needed. However, at the same time, the parties point to each other when it comes to taking the first step. One of the reasons that occupiers would want to rent a circular redeveloped building would be their increased operating efficiency, productivity and their corporate image. Although occupiers are a demanding party, they consider justification of the expense set against the

benefits of such a building as an important aspect. Therefore, realigning incentives and sharing information can be a fundamental precondition for breaking the vicious circle of blame not only in theory but also in practice (Lorenz, 2008a). This requires a great degree of transparency, the various parties providing appropriate feedback on both the environmental and social aspects of a buildings performance. This asks the involvement of additional groups of actors such as assessors, banks, certifiers and other property professionals as well as research and educational institutions (see Figure 15 below).

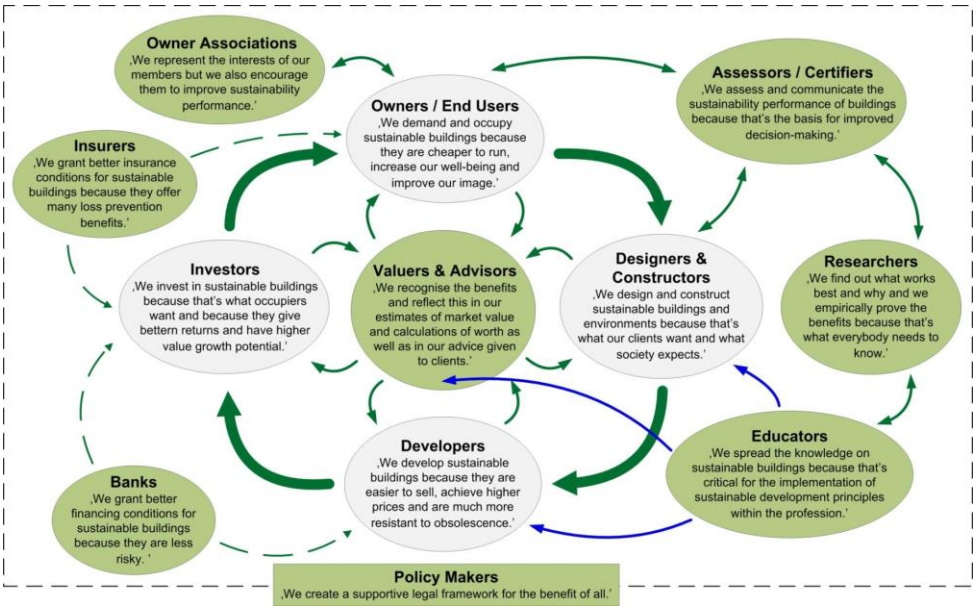


Figure 15: Virtuous loops of feedback and adaptation (Lorenz, 2008a)

For the occupier, it is important that the renovations, readjustments and other circular alternations to the building should make up for the paid rental premium. This information is currently unavailable due to the absence of certified circular indicators in buildings and an adequately defined legal framework for regulation. Likewise, this information is just as important for the investor. Certification systems are an example of the comprehension between investors and occupiers, translating for both parties the quality and performance of real estate. The greatest barrier for the investor is the notion of financial justification. An extensive study conducted by The Royal Institution of Chartered Surveyors (RICS) and several other Canadian institutions concluded that the noted parties above must provide appropriate feedback on both the environmental and social aspects of building performance as well as on its various interrelations with financial performance and property value (RICS, 2010). The research emphasizes the influence of valuation professionals and valuation processes. Their most relevant conclusion, is that large financial professionals are unwilling to include sustainability issues in property investment and financing decisions until they understand the benefits of these to the net value of the asset (RICS, 2010). Considering the large amount of uncertainty to the measurement and valuation of circular redevelopment in existing buildings, this notion can to some extent relate to the investors in question within this research.

Relevance of the Circle of Blame

This theory is important to position motivations surrounding sustainability in real estate within the real estate system. Particularly amongst its actors. FGH Bank (2016) noted that the development (and redevelopment) of real estate will increasingly be focused from the point of view of the user. Investors and developers alike can be expected to change their investment approach in order to incorporate the demands of the user. As sustainability is increasingly becoming an integral part of real estate development; so too are the interests arising towards the contexts of the circular economy in real estate. Elements of the circular economy have (through experimentation) already begun to take form

within this sector. It is the ambition of this research to investigate to what extent this can be part of an investment strategy. To conclude, this model provides an overview of the interaction and motivations amongst real estate actors concerning sustainable buildings and will be used as the theoretical basis for the empirical investigation.

5.2 Responsible investments

As explained, although more specifically based on the materials within our ecosystems and economy, the principles of the CE find their foundation within the concept sustainability. The most fitting and more graphically comprehensive approach of this concept is described in Elkingtons' (1998) bottom line or 3P-approach: People, Planet and Profit. Briefly explained, when applied to practice in businesses these 3 principles seek the prevention of pollution, the endorsement of resource efficiency, the reduction of the impacts of climate change and the protection of the natural environment in order to ultimately improve processes and influence more 'responsible' decision making. The 3P-approach aids businesses in assessing not only their own activities but also indirectly influences companies along their supply chain and even their competitors (Govindan, Khodaverdi, & Jafarian, 2013).

In recent decades, the idea that governmental parties and municipalities should no longer be the only drivers of sustainable development has taken form. Municipalities, developers and corporations should work together with institutional investors in order to (1) ensure integration within the business supply chain, and (2) warrant evaluation and continual improvement of investment policies that contribute to a sustainable level of prosperity in a healthy living environment (De Munnik, 2014; van Gool & Peek, 2015). Many large businesses and institutional investors have begun to take an interest in the manner in which they invest their capital (Scherer & Palazzo, 2011). Some of the largest investors in the Netherlands have begun to realize the power and importance of their role as managers of large amounts of capital within the transition towards the circular economy. In a dialogue session with many institutional investors organized by PGGM in Zeist in 2014, Feike Sijbesma (CEO of Royal DSM) noted that pension funds can contribute by smartly investing the billions they manage, and using the power position of money responsibly by engaging in dialogue with the companies in which they invest (PGGM, 2014). Sijbesma (2014) noted that impact, influence and responsibility must always be balanced, and refers to the 3P-approach that investors must incorporate in their business and investment strategy in order to enhance the circular economy. He advises investors to review their portfolios and when doing so consider all three aspects (society, environment and economy) when evaluating their products.

The 3P-approach is a market driven, schematic target system whose ideas are very much similar to the concept of ecological responsibility. Bansal and Roth (2000, p. 728) consider ecological responsibility as a motive born from the importance of an enterprise to social obligations and values. The ethical implications of this motive suggest that companies act from a sense of commitment, responsibility and philanthropy. Although the data analysis of Bansal and Roth (2000) focused on private businesses, their research suggests that top management companies establish corporate values in order to evaluate their performance and role towards society.

Today, for market parties these concepts and ideas are not new. Many consider them to be an integral part of a company's business strategy towards the market (Bastein et al., 2013). According to TNO (2013), these concepts are related of the emergence of Corporate Social Responsibility (CSR) and similar policies. CSR has been viewed by companies as a necessary way to ensure future-oriented development. It has influence on the company's strategy and can support steps towards practices related to the circular economy, including: sustainable business development, company products and services, chain approach and stakeholder dialogue. CSR goes beyond the instrumental view of politics, where private actors play an active role in the democratic regulation and control of market transactions (Scherer & Palazzo, 2011). In order to be successful in its implementation, CSR policies

reach a wider set of economic, environmental and social issues that benefit community and society at a global scale.

5.2.1 Responsible Property Investment (RPI)

Responsible property investment (PRI) is an extension of CSR in which the social attitude of the financial operation of a company is described. In a nutshell, it means maximizing the positive and minimizing the negative effects of property ownership, management and development on society and the natural environment in a way that is consistent with investor goals and fiduciary responsibilities (Pivo & McNamara, 2005). Relating to institutional real estate investors, the operationalization of their social responsibilities – through for example, the extension of loans or the investment strategy – can be defined by RPI.

Indisputably, the construction industry consumes a tremendous amount of energy and natural resources. The built environment accounts for 40% of the total energy consumption and over one-third (38%) of the total carbon dioxide emissions worldwide (Falkenbach, Lindholm, & Schleich, 2010, p. 203; Vlasveld, 2012). In the Netherlands, the construction sector consumes 50% of all raw materials (Mohammadi & Slob, 2016, p. 3). As one of the greater financers of urbanization and the real property markets, the activities of institutional investors have significant influence on the surrounding environment. Therefore, the decisions and choices made by institutional investors are central to the potential mitigation or exacerbation of many critical social and environmental issues.

In addition, investors have begun to integrate these concepts of responsibility as measurement instruments to determine financial risks (Jochims, telephone interview, August 9 2017). Several CSR and RPI elements are considered interesting for asset allocation and portfolio risk analysis. Ideally, an analysis of such information and practice could aid in the decision-making process of acquiring or disposing of real estate property. In the case of the CE it can be thinkable that properties can be evaluated according to RPI interventions in order to improve the operational efficiency of the object. Minimum standards could be set for properties within a portfolio. GRESB is one example of a well-integrated performance indicator in which many institutional investors can assess the fund itself, an asset across the whole fund, or an asset of a certain value or type. The benchmark allows investors assess their performance according to Environmental, Social and Governance (ESG) indicators. Although GRESB does not consult on activities that could ultimately increase performance, it helps participants to understand their own position relative to their peers. For an indirect investment approach, institutional investors use the benchmark to assess the performance of the real estate fund. For the circular economy however, the indicators for such a benchmark are still uncertain. The most challenging aspect seems to be the lack of definition and thus measurement tools to credit performance towards circularity. The aim of this investigation is to bring clarity not in defining this, but towards exploring the ambition towards implementing circular practices in real estate redevelopment.

5.3 Defining strategy for institutional investors

Strategy is often defined as a contingent plan of action designed to achieve a particular goal (Casadesus-Masanell & Ricart, 2010). An essential element of strategy concerns the set of committed choices, made by the management, which must be upheld. Both Mintzberg et al. (1999) and Porter (1996) support this in their extensive research concerning the definition of the word. Porter (1996) states the importance of the creation of a unique and valuable position, involving a different set of activities. The created activities in this sense being a reflection of the firm's strategy. In order to expand the applicability of the term, Mintzberg et al. (1999) defines strategy according to five aspects, including: plan, ploy, pattern, position and perspective. Strategy as a plan is seen as a consciously intended course of action (or set of guidelines) to deal with a situation. They are usually made in advance to the actions to which they apply, and they are developed purposefully. Strategy as a ploy refers to a specific manoeuvre intended to outwit an opponent or competitor. This competition

element can repeatedly be found in scientific literature concerning strategy. Both these aspects refer to the intended strategy. Strategy as a pattern encompasses the resulting behaviour and refers specifically to the realized strategy. It reflects on past activities and gives a description of these as consistent behaviour over time. As a result, a distinction can be made between deliberate strategies (where set intentions were realized) and emergent strategies (where patterns developed despite intentions) (see Figure 16). Strategy as a position refers to the mediating force between the environment and the organization. It concerns itself with the external and internal contexts, involving the matching of products to markets. In ecological terms, strategy here becomes a niche; in management terms this formally refers to a product-market 'domain'. Lastly, strategy as perspective is to an organization what personality is to an individual. It greatly consists of the ingrained way an organization perceives the world; the realm of common thinking. This strategy is shared by members, through their intensions and by their actions.

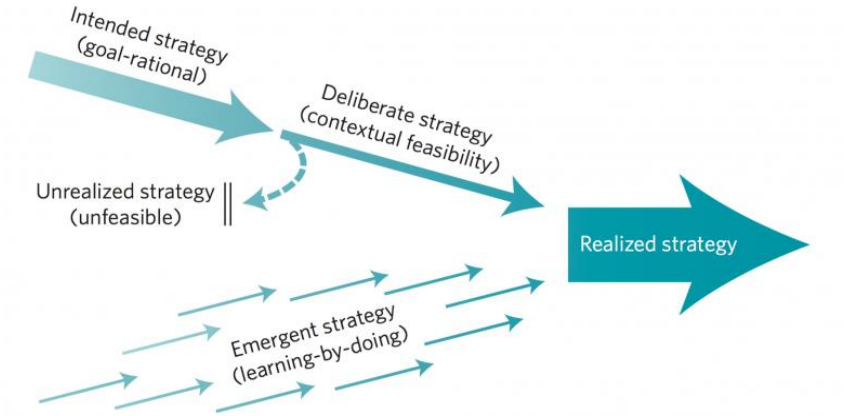


Figure 16: Framework for strategy development (Mintzberg, 1987, p. 14)

Consistent with the various aspects noted above, Casadesus-Masanell & Ricart (2010) relate strategy to the contingent plan as to what business model to use. They argue that strategy is a high-order choice that has a profound implication on competitive outcomes. Choosing a particular business model means choosing a particular way to compete, emphasizing on the perspective and logic of a firm, a particular way to operate and to create value for the associated stakeholders.

As seen in Figure 16, and in combination with the above information, strategy is very much influenced by external elements. The nature of strategy is rather complex, due to the changing environment in which an organization is situated. Many micro-, macro- and meso level developments ensure for certain risks to be analysed and evaluated that may affect the activities of an organization. Further elaboration on the effect of risks on strategy implementation will follow in the subsequent chapters. As Veldman and Janssen (2014) note, strategy is a general direction and delineation of particular activities of an organization for the long-term. It provides the organization with a competitive advantage through the strategic deployment of resources (e.g. capital, knowledge, etc) in order to adapt to the changing environment to meet the needs of the market and stakeholder expectations. The following chapter will elaborate on the decision-making process, which in this thesis is seen as the step-by-step procedure to comply with the goals set out in a strategy, set against the context of institutional real estate investors.

5.4 Stages of the investment decision-making process

The scanning of business reports and other real estate related researches (i.e. FGH Bank, 2016; ING, 2014; NVM, 2017) suggests that real estate investment decision-making has become more sophisticated and intricate over time. In accordance with the research of Farragher and Savage (2008), who performed research on the investment decision-making process of equity investors, suggest that evolution of analytical tools and re-evaluation of processes has led to the improvement of investment

practices. The most important element to making a well weighted real estate investment decision is to apply experience, good judgement, and creativity in a sophisticated decision-making process (Farragher & Savage, 2008). Although the scope of this research does not provide evidence of the quality of the respondent's experience, judgement and level of creativity, it does focus on the decision process referring to the systematic research, acquisition, tender and analysis of the desired real estate asset in order to realize the investors' strategy. Therefore, in this thesis, the 'investment decision' will be defined as 'a commitment to the allocation of financial resources of investing organization to the next development phase of the real estate (re)development project, by making an integral evaluation of the development aspect and taking into consideration the goals of the project as well as the objective of the organization, approved at the strategic level of the organization' (Gehner, 2008, p. 77). This definition is the most compelling and comprehensive as it includes all the above-mentioned elements of a decision process in relation to strategy execution.

In relation to this definition, the work of Farragher and Savage (2008) has explicitly investigated the investment decision-making processes used by institutional real estate investors, including REIT's, pension funds, life insurance companies and private investment and investing real estate development organizations. The results of their research focusses on the use of an investment decision-making process that includes the following stages: setting strategy, establishing return/risk goals, searching for investment opportunities, forecasting expected returns, evaluating forecast returns, assessing risk, adjusting for risk, decision-making, implementing accepted proposals, and auditing operating performance (see Figure 17 below).

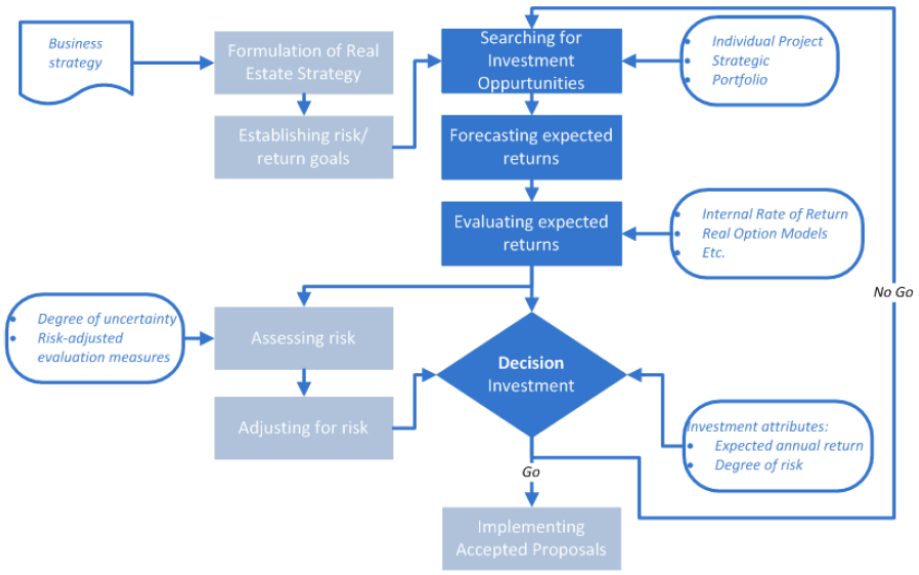


Figure 17: Decision-making process for real estate investment (Farragher & Savage, 2008; in Kuijstermans, 2012)

The results of their research suggested that institutional real estate investors place greater importance on strategy, establishing quantified risk and return goals and the searching for investment opportunities. Although the last of the three is also considered of great importance for private investors, the first two stages of the decision-making process are less important to private investors when set against the other stages. Conversely, private investors place great importance on forecasting expected returns and assessing and adjusting for risk than institutional investors do. Considering their results concerning the degree of importance of factors when searching for investment opportunities, it seemed that for both institutional as private investors individual project factors were the most important factors, beside strategic and portfolio factors (Farragher & Savage, 2008, p. 32).

5.5 Risk analysis by institutional investors

Defining risks and managing them is a prominent task for institutional investors before making an investment. The deterioration of the market, shifting consumer behaviour, increasingly expensive resources and greater pressures from affected stakeholders, are all of concern for the real estate market and its players. Given the nature of assets of a real estate investor (long-term horizon), the continuity of an organization is an end in itself. However, this is never a given. It can only be ensured by controlling the organizational processes and by responding adequately to changes occurring in the surrounding environment (Amlal, 2012, p. 17). Strategy is necessary to ensure that the workings of an organization deal with external (market) developments. According to Ghai et al (2014) leading institutional investors ensure that their investment strategy and processes flow naturally from their philosophies. The strategy influences asset allocation, outlines a specific investment approach for each asset class (e.g. by setting benchmarks) and defines the support structure of the organization. Each of these elements are highly interdependent of one another. Mapping the risks for activities is an essential part of determining strategy as this provides a preview of expected results of investment. By recognizing risks, it is possible to generate viable and sustainable returns by developing control measures. Risks should be managed through accredited risk management systems and measures based on current laws and regulations. Overachieving investors review strategy and structure of the organization periodically, through monitoring of customer needs using surveys or interviews (Ghai et al., 2014).

It is essential to understand the importance of risk managing as institutional investors are not only focused on achieving returns, but also on managing the associated risks. This is known as the risk-return ratio. The most general objective of an institutional investor is the management of the assets of its participants (or shareholders), in order to make benefits on the long-term. In order to achieve this objective successfully, this must be decisively organized. This entails that the risks are limited and the stable investment returns are guaranteed to prevent highly variant premiums or sponsorships from the contributors. The main elements that are considered within the criteria of an institutional investor include: the desired short and long-term return, the acceptable risk, the desired level of debt financing, and lastly the ethical issues deemed to be respected (Van Gool, 2013; Veldman & Janssen, 2014).

Relating the risk profile of an institutional investor set within the context of the real estate system (read 4Q model), Veldman and Janssen (2014) conclude that in the separate quadrants the market parties strive to achieve competitive advantage. They do this by distinguishing their organization from others within that market sector. In accordance with the research of Urbancova (2013) on innovation and competitive advantage ensures added value, performance and thus the continuity of the organization. This closely depends on intellectual and/or organizational knowledge assets and the ability to employ these assets. In an ever-changing market and economic situation, the rules of the game are constantly being reformed. The organizations ability to adapt to the situation is essential to its success and continuity. Thus, in relation to Figure 16, an organization that implements emergent strategy formation (learning-by-doing) demonstrates its ability to acclimatize and react on its changing environment (Mintzberg et al., 1999). Contextualization is increasingly important. For greater chance of success, the real estate system and its sub-markets must be prepared to adapt, adjust and redefine their individual strategies.

In this thesis, the concept of implementing elements of the circular economy in the redevelopment of existing real estate is a complex subject. It has only been introduced in in the real estate system in recent years and has therefore has only yet taken position within the strategies of real estate organizations. The extent of the motivation and possibilities for institutional investors to involve aspects of circularity within their market sector and strategy is the focus of this research.

5.6 Refining the CE within strategic management of investors

Through the explorative interviews with experts and institutional investors alike, concerning the impact that the CE has had on the functioning of their business and in particular their investment strategy, the majority have indicated no significant changes to have been made thus far (see Appendix and media attachments for more information). Many have indicated that the possibility exists however, yet they point out that the concept of the CE in real estate must first prove itself in practice. Many referred to leading measurement criteria such as LEED, BREAAM or GRESB to indicate influential tools within the real estate market. Measurement tools being noted as key indicators in order to assess 'success'. A similar notion is made by Schoolderman and his colleagues (2014, p. 36) in which they argue that an intervention such as the CE must achieve radical changes in the market-'playing field' in order to reach a mainstream phase and push a businesses to adjust their strategy. This requires an overall cultural change (Jochims, interview August 9 2017; and van der Waals, interview 6 September 2017). Currently, businesses and their clients still think in terms of the linear economy in which a product has a beginning and a definite end. Business and investment strategies alike consider goals and milestones, but these are often only considered for the short-term (maximum of 5 years) (Hieminga, 2015; Schoolderman et al., 2014). The 'loops' in which CE actions occur however are not measured in precise term-periods. Therefore, in the case of this thesis, it requires investors to think open-mindedly when making a strategy.

As noted in sub-chapter 4.3, value creation (or value retention) is an important element of the economical aspect of the CE. The work of Schoolderman et al. (2014) has been one of the most credible in which CE value creation has been translated into performance indicators for business strategy management. They depict these opportunities within the framework of existing (linear) strategic models in order to ease the transition in adopting performance indicators related to circularity. Although focused on entrepreneurs, their research is significant to this thesis as they provide a multi-stakeholder perspective on business strategy and strategic sustainability. In their research they summarize three generic business strategies that businesses use to increase their competitive advantage, including:

1. A low-cost strategy: in which production and distribution of costs are minimized as much as possible. Products and their quality are determined by cost efficiency.
2. A differentiation strategy: where unique and superior products are offered that are distinguished by design, quality, performance and status.
3. A focus strategy: in which focus is set on one or a limited number of market segment(s), within which a choice is made for a low cost or differentiation focus.

The business strategy most relevant for the focus group of this research, institutional investors would be a low-cost strategy. However, it is possible that some institutional investors consider themselves to have a differentiation strategy concerning their products (buildings). For example, investors may choose to invest in various real estate types, and may therefore hold portfolios of various asset types, with varying class and level of performance. Acquiring unique and superior products enables them to differentiate themselves from other investors.

As described, the CE has to prove itself before becoming a viable investment product for institutional investors. The strategic management of institutional investors is greatly influenced by the risk and return of an investment and the strategy they may choose to follow. These factors determine the success of a new investment product without the use of a measurement tool. As the risk of an investment is always an estimation, some may not always determine this risk correctly due the lack of knowledge regarding a certain product, in this case the CE. As a new product enters the market, the exact risks and returns are still unknown and therefore investors are cautious, preventing them to allocate capital to this new product (Mintjes, De Beer, & Zijlstra, 2016). While estimating the risk for

CE redevelopments, the possible higher initial investment to apply CE does not match with the low-cost strategy as there are other cheaper methods for redevelopment.

5.7 Relevant criteria for real estate investment

The process of investing in real estate starts by defining investment objectives. Based on these objectives, investors form criteria in order to reach these objectives. This is called the investment strategy. The criteria vary for each investor based on their background, clients and goals. However, certain sets of criteria form the basis of the investment strategy, regardless of their exact strategy and objectives. According to Van Gool (2013) these criteria are:

- the desired investment returns
- the investment periods
- the intended liquidity of the investor
- the acceptable risk of the investments
- the use of loan capital
- the level of sustainability of the investment assets
- the coherence between the investment results and the obligations of the investor to their clients

These criteria form the basis of the investment process. Properties with deviating characteristics compared to the investor's strategy will not be acquired for the portfolio. However, acquired properties within the existing portfolio are dynamic. Certain characteristics of these assets include: investment return, change overtime due to aging and changing economic situations. On an operational level, decisions need to be made in order to optimize the performance of these assets during the exploitation period (Van Gool, 2013). Asset managers determine a strategy at property level. The options for manage a real estate asset is to continue the current exploitation, redevelop the asset, demolish the asset and build a new building, or sell the asset. The options of exploitation, demolition and selling will not further elaborated because redevelopment is the main focus in this research.

Redevelopment is done in order to improve the quality and the performance of the property. The investor decides to redevelop if he expects that the property will meet with the predefined criteria of the investment strategy and also if the redevelopment is financially attractive. The figure below shows what drivers are behind the option to redevelop real estate properties. At property level, the target is to increase property value. An increased property value results in a better total investment return, which is part of the investment strategy. The increased property value is caused by an increase of rental income, and a decrease of risks and property costs.

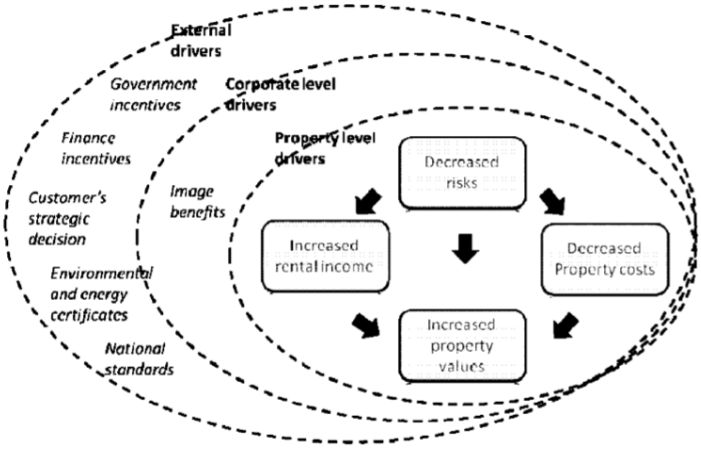


Figure 18: The framework of drivers for the real estate investor (Falkenbach et al., 2010, p. 206)

The rental income is the main source of income of any real estate investor. A stable cash flow of the property is required to remain attractive for an investor. In practice can be seen that the rent of older properties is substantially lower compared to the rent of greenfield projects. The rent is a major factor by determining the value of the property. Thus, the importance to create a rent premium, a rent which is higher than the common local market rent for a certain type of real estate, is well understood among investors. These rent premiums can be accomplished by outperforming other properties. Recent analyses proved that tenants are willing to pay rent premiums for sustainable buildings. The willingness to pay this rent premium for sustainable real estate is explained by the increased occupant productivity potential image benefits towards tenants, and lower service costs. This attractive settling climate for tenants in office real estate is beneficial towards investors because it reduces the risk of vacancy (Falkenbach et al., 2010). The criteria to redevelop that distils from this is that the redevelopment need to have a positive effect on the cash flow by increasing the rent.

As stated before, a sustainable redevelopment proved tenants are willing to pay a rent premium for sustainable real estate to enjoy other benefits. This leads to a reduction of risks, such as vacancy. By redevelopment, especially sustainable redevelopment, an investor is future-proofing the property. Property-related risks also arise from legislative requirements. Examples of negative influences on the cashflow of property are increased penalties for excessive gas emission and energy consumption. Also, the requirement to have an energy label of C or higher is a risk for investors (Falkenbach et al., 2010). The criteria to redevelop that distils from this is that the redevelopment need to reduces risks which could affect the cash flow.

Rental levels are only one part of the cash flow. The annual income is reduced by the annual costs and by lowing these costs, a higher net income is achieved. A study by Shiers (2000) analysed 14 BREEAM-certified buildings and compared them to conventional buildings. The results showed a reduction in energy use, and savings ranging between 6% to 30%. Similar studies by Miller, Spivey, and Florance (2008) and by Turner and Frankel (2008) confirm reduced energy costs of sustainable buildings. The costs for energy are a substantial amount of the service costs which are paid by the tenant. A reduction of the energy costs can be beneficial for the tenants by having lower service costs or for the investor (owner) because there is room to increase the rent price while the monthly costs for the tenants remain the same due to the lower service costs (Falkenbach et al., 2010).

Impact of sustainability on rent, risks and operating costs exert influence on the property value. The demand towards sustainable real estate has increased significantly. Tenants are willing to pay a higher rent (premium) with the benefit of having lower service costs. The combined effect of the three aspects mentioned above result in an increase of property prices and selling prices. Sustainable real estate is documented to have a selling price of 10% or higher compared to conventional real estate (Falkenbach et al., 2010).

5.8 Towards hypotheses

Based on the extensive context analysis and literature review, several hypotheses have been formulated. These hypotheses have been formed on the basis of the theoretical framework outlined in chapters 3 through 5. These form the foundation of the empirical investigation.

Hypothesis 1: Requirements for circularity

Institutional investors are considered long-term strategic investors and therefore core investments appeal to their investment strategy. These more often insure a secure rate of return and a stable ongoing income. The implementation of CE-principles requires a new perspective on financing and valuation of real estate objects. As mentioned, institutional investors are risk aversive and therefore the willingness to experiment with new revenue models and cash flow designs does not fit within their practice. Furthermore, the difficulty to invest in the circular redevelopment of existing real estate

requires best practices. This is evident in the dependence of investors on existing measurement criteria such as LEED and BREAAM in order to assess good practice. Therefore, the first hypothesis notes: As *long as the requirements for circularity in existing real estate remains unclear, the participation of asset managers and institutional investors will remain limited.*

Hypothesis 2: Importance of responsible investment
A trend in the office real estate market is the increasing pressure to redevelop real estate sustainably. The Paris Agreement and the lawful decree for offices to have an energy label C by 2023 are examples of this. Both have resulted in investors allocating capital towards sustainable purposes. A similar trend has been noticed amongst large institutional investors in regard to responsible property investments. RPI has been viewed as an integral part of a company's business strategy towards the market and a way to ensure future-oriented development. Similar to the power that Corporate Social Responsibility has had in shaping business performance, elements of responsible property investment practices are now being considered for asset allocation and portfolio risk analysis for investors. It is thus thinkable that properties could be evaluated according to circular interventions in order to improve the operational efficiency of the object as part of responsible investing. The second hypothesis is then: a*s the importance of CSR / responsible investment increases, so too will there be more interest from institutional investors for the inclusion of the circular economy in the redevelopment of real estate.*

Hypothesis 3: Initiative of other market players
Within the real estate system, three key market parties exist including the user, the investor and the developer. In accordance to the assumption of the 4Q-model, the market segments react upon one another in order for development of real estate to take place. Within this system, an investor is dependent on user demand in order to be certain that the real estate will be occupied. The developer in turn is dependent on the investor and user demand for occupation and funding. Thus, the real estate system is demand driven. Similarly, the circular redevelopment of offices would follow the same process. Being risk aversive, the institutional investor abides to solid risk-return ratios. An investor will be dependent on other market parties to develop suitable investment opportunities before initiating funding. The vicious circle of blame suggests that the other market parties will be similarly hesitant in taking initiative. The third hypothesis is then: *as long as developers and other market players do not take initiative, the efforts of institutional investors will remain limited to include circularity in real estate redevelopment.*

Hypothesis 4: Consequences of a loosely coupled system
Although the real estate market relies on user demand, the various market segments operate within their own dynamics. As a consequence, the reactive capacity of the market segments to respond on one another is slowed down due to both informal and formal institutions. In addition, partial ownership of real estate through indirect investment distances investors from the experience of using the real estate, placing their focus on the objects financial performance. The assumption is that segments have come to be 'loosely coupled' to one another. The tentative behaviour of real estate investors to react upon proven financial benefits instead of directly on user demand would currently prevent the circular economy to be implemented within the redevelopment process. Therefore, the fourth hypothesis is: a*s the various market components within the real estate system are loosely coupled, this will continue to create barriers for the implementation of the circular economy in real estate redevelopment by investors.*

6 EMPIRICAL INVESTIGATION: RESEARCH STRATEGY AND METHODS

In this chapter the research strategy, selected methods and validation of these methods for the empirical investigation will be elaborated upon. First, the chosen strategy is presented, with argumentation regarding its implementation and purpose. Following this, the various methods will be discussed in response to their contribution to answering the research questions. This section is divided into various sub-sections which respectively discuss the various methods used including: the literature analysis, explorative semi-structured interviews with experts and the Delphi method.

6.1 Research strategy

According to various scholars (Hay, 2010; Kumar, 2011; Verschuren & Doorewaard, 2010) identifying a research strategy is one of the most demanding, yet essential aspects when preparing any research and deciding upon the usable research methods. In order to answer the main research question '*Under which conditions would office real estate fund managers be willing to invest in the circular redevelopment of office real estate?'*, the strategy formation guidelines of Kumar (2011) and Verschuren & Doorewaard (2010) were used. The guidelines included making decisions of the following aspects:

1. The objective (explanatory, descriptive, correlation, exploratory)
2. The mode of enquiry (quantitative or qualitative)
3. The application (applied research or pure research)

Considering the research question, the literature review proved that there are currently no examples available concerning the structure of investment strategies for circular (re)development in existing real estate. Therefore, the objective of this research is predominantly explorative. This research explored (and exposed) underlying assumptions or information leading to the different motivations of institutional investors towards investing (or perhaps not) in circular redevelopment. Concerning a topic with little evidence and scientific research, explorative research was particularly useful as it ultimately indicates whether the topic is worth extended research and, therefore, build theory (Gray, 2010, p. 36). The difficulty of explorative qualitative research is that the data collected is often characterized as subjective and unreliable. According to the research approach of Popper (in Hay, 2010: 335) termed 'critical rationalism', this research is structured through the use of hypotheses, with the intention to detect and organize relevant conditions for the inclusion of circularity in investment decisions.

The mode of enquiry chosen was qualitative research. A qualitative research approach is an appropriate mode of inquiry when new concepts are to be explored (Boeije, 't Hart, & Hox, 2009, p. 254). Various opinions and motivations concerning a delicate subject matter can be examined. In the case of investments in circular redevelopment, it is still unclear how various elements influence one another. Qualitative research has an inductive nature in which empirical observation can lead to concepts and theory. This mode of enquiry allowed the gathering of unstandardized information through an epistemological position, where the stress is on the understanding of the social world through the examination of the interpretation of the world by its participants (Bryman, 2008, p. 366). According to Saunders, Lewis and Thornhill (2011), the analysis of the results in qualitative research is done through conceptualization. Qualitative research was thus an appropriate mode of enquiry as the intended result of this research was to distinguish the barriers and factors towards including circularity aspects within investment decisions. The methods that support qualitative research within this thesis included desk-research, interviews and the Delphi-method.

Lastly, concerning the application, Kumar (2011) would note that this research is applied research in which the collection of information about various aspects of the issue can be used in other ways

(including perhaps policy formulation or the enhancement of understanding of the phenomenon of investment in circular initiatives).

The theoretical framework of this research demonstrated the ontological position of qualitative research. Theories such as 'the circle of blame' and 'the real estate system' were used to construct a mental model in order to understand the context of the research field. This research forces an examination of the impact of various motivations on change processes. It offers generativity [*a concern for establishing and guiding the next generation*] instead of problem solving as a way to address organizational issues concerning how to invest in circular redevelopment for institutional investors. Therefore, the theoretical framework gave form to the empirical investigation.

6.2 Research methods

As mentioned, the research took a qualitative approach to collect the needed information. The research methods applied in this research in relation to the research questions and the phases of the investigation are presented in Table 5. The following paragraphs will further discuss these methods and give justification for their application.

Phase of the research process	Phase 1	Phase 2		Phase 3
Sub-questions	Literature survey	Secondary research	Semi-structured interviews	Delphi method
Current environment of an investment strategy	X	X	X	X
Circular Economy and real estate objects	X	X	X	X
Factors and preconditions in investment decisions in CE	X	X	X	X
Stakeholders responsibility for the implementation of the CE			X	X

Table 5: Research methods for each of the sub-questions and set within each research phase

6.2.1 Desk Research

Before the start of the empirical investigation, a certain amount of background information concerning the current characteristics of the redevelopment of urban real estate and real estate investment was necessary. This required a qualitative research method – namely desk research – in which information was collected using existing literature and various business report analyses. The desk research was deployed in two forms: a literature review and secondary research.

Literature Review

The analysis of existing literature provides insight to the current information available concerning circularity in urban real estate development. Such research provides the limitations of current research and provides justification and definition of certain aspects (Farthing, 2016, p. 65). The review provides an understanding to the current state and criteria framework of a general business strategy related to some (but not all) aspects of circularity. It provides insight in the problem context and therefore strengthens the relevance of the research by connecting the literature to the research questions (Hsu & Sandford, 2007). The literature review was used as background knowledge in order to structure the context and questions for the semi-structured interviews. This method was used in order to provide a theoretical basis for answering the first three sub-questions.

Secondary Research

Secondary research refers to the large amount of gathered data that is produced by others (Verschuren & Doorewaard, 2010). Various documents such as annual business reports, annexes, public databases and project documents have been analysed within this research in order to provide actual information concerning companies and their activities. The analysis of these documents at the beginning of this

research provided a broad orientation to the activities of certain institutional investors within the real estate market. This information was predominately used to set a realistic contextual framework of the investment strategy in the office market and its involved parties. Many of these findings have been represented in the theoretical framework. This method too provided the basis for answering the first three sub-questions.

6.2.2 Semi-structured explorative interviews with experts

As the literature review suggested, there has been little research on the subject: investment in the circular redevelopment of existing office real estate by institutional investors. Therefore, the purpose of this research was to explore ideas, interpretations and experiences of various parties within the real estate system within the context of circular real estate redevelopment. This research has therefore made use of semi-structured interviews as a research method. Such an interview is content-focused and is organized around the idea of flexible questioning, which allows opportunity to elaborate on ideas and issues judged by the researcher to be relevant to the main research question during the interview (Hay, 2010). This interview method allowed the exploration of subject matter with experts more intensely involved with what is happening within the real estate market. In order to increase the flexibility of the interview content and fully make use of the knowledge of the expert, an interview guide (see Appendix 3) in the form of a list of fully worded questions was prepared beforehand, but the interviewer was not restricted to deploy these questions. Open-ended questions were used to encourage more personal descriptions, and to a certain extent discussion. This allowed for further exploration of various themes, as the researcher was able to probe or prompt for details.

Using this method, it was important as researcher to act as a facilitator, an interventionist, in order to redirect the conversation if it had moved too far from the research topics. Furthermore, as researcher, one had to be aware of own assumptions and opinions of the research topic. As the number of conducted interviews increased, so too did the researchers understand of the subject-content. In order to retain awareness of ones growing understanding and shaping of opinion, the information gathered from previous interviews was taken into the closing questions of the following interviews whereby the collected interpretations amongst the experts could be substantiated. This ultimately lead to a collective understanding of the topic.

The importance of these interviews is that they allowed the search for patterns. One of the most important characteristics of a well-executed qualitative study is the interaction between data collection and analysis (Boeije et al., 2009, pp. 268–269). However, unlike a majority of research, the interviews conducted are not the empirical heart of this research. The information gathered from the interviews are used mainly to explore the topic of CE in the real estate investment sector, and to provide content and insight to a practical approach of the Delphi method.

Almost all the conducted interviews have been recorded and included in the Appendix of this thesis, with exception of 1. The interviews have a duration between 45 minutes and 1.5 hours. The interview subjects included experts in various corners of the field of real estate including investors, researchers, managers, analysists and consultants. The information gathered aids in capturing the characteristics and conditions (both existing and preferred) of a business strategy for institutional investors, and also clarify the most important factors influencing their decisions to invest (or not invest) in circular real estate redevelopment. The information gathered by this method contributes to shaping the form of the various rounds of the Delphi investigation (see following sub-chapters). This method was used in order to gather information that aid in answering all four research sub-questions.

The candidates selected for the expert interviews include those who are aware of the investment behaviour of institutional real estate investors and institutional real estate investors themselves. Not all have the candidates have specific knowledge of the CE in office real estate. In part, this has been done to observe the extent of the awareness of CE in real estate in various parts of the sector. Due to

privacy, the names of the interviewee's do not appear this thesis. Appendix 5 and 6 hold the entire participants list and recordings.

6.2.3 Delphi method

As noted several times previously, there is a large amount of incomplete knowledge concerning to the extent in which institutional investors are willing to invest in the circular redevelopment of existing real estate. The focus group of this research is often considered a reserved group to approach and therefore it was difficult to determine the proper method in order to ensure participation and commitment throughout the investigation. Equally important, it was essential to select a research method that would allow for the improvement of our understanding of this complex issue, including opportunities, motivations and forecasts of possible actions within the focus group concerning implementation of aspects of circularity within investment strategies. In order to assess the varies theories presented in the theoretical framework, structured group communication was a necessary component that had to be achieved with the research method.

In accordance with the decision tree of Cock and Honingh (2006), the Delphi method was selected as an appropriate participative research method. According to these authors, this method is most suitable for research with the purpose to (1) gather new information, (2) bring attention to individual opinions (divergence), (3) give attention to substantive arguments based on other (differing) opinions and finally (4) allows for the anonymous exchange of information by the researcher. Often used in order to build consensus amongst individuals, in this research the Delphi method also mapped the opinions of those directly involved regarding the conditions they apply to investments, in which interaction was controlled in order to limit disruption of the process and results.

For the purpose of understanding the workings of the Delphi method, a short description of its characteristics will be given. According to Loo (2002) and Skulmoski et al. (2007), the Delphi method is characterized by several aspects:

a) Anonymity of the participants: allowing participants to freely express their opinion without social pressure to conform to others in the group;
b) Iterative process: allowing participants to refine their views in light of the progress of the group's work each round;
c) Controlled feedback processes: informing participants of each other's perspectives, providing opportunity to clarify or change their views;
d) Aggregation of the group response: allowing for a thorough analysis and interpretation of useful information concerning complex problems (such as motivations towards investments in the circular redevelopment of existing real estate).

As various researches have demonstrated, the Delphi method has had many variations. The above noted characteristics capture the most common aspects of the methods description. Generally, the method has been used as a tool for expert problem solving. One variant that has received widespread use is the ranking type Delphi-survey, used to develop group consensus (Hallowell & Gambatese, 2010). The type of application of the method in this thesis is that of 'issue identification/prioritization' (de Cock Buning & Honingh, 2006). The motivation for this type of application is that it allowed for the formation and conceptualization of the conditions that various institutional investors apply to their investment. This allowed for the identification and clarification of certain opportunities and barriers through ranking (Hsu & Sandford, 2007).

As shown in Figure 19, the technique used in this thesis consisted of 4 Delphi rounds, in which participants were interviewed through computer-mediated communication (CMC) (read: E-mails). This had several advantages including convenience for both researcher and interviewee (flexibility), more reflective informant responses and reduced interviewer's effects due to the visual anonymity. The latter advantage is particularly coherent with the Delphi method as the informant's anonymity and the absence of interaction with the researcher allowed for freedom of expression and detailed answers.

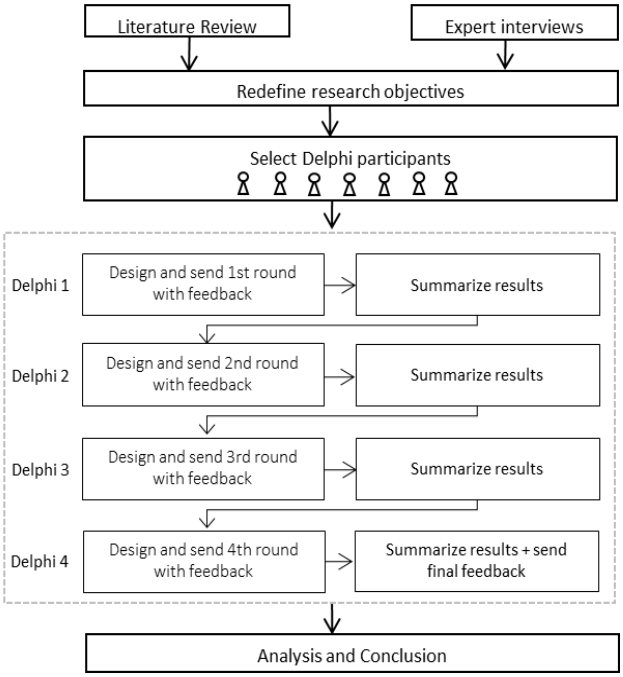


Figure 19: Systematic overview of the Delphi Method used (own illustration)

After each round, the engaged experts were confronted with each other's (anonymised) answers. Through this confrontation at each new round, informants were asked to clarify and narrow down the most important conditions for investment in circular office real estate (re)development. This method was used in order to gather information that aid in answering all four research sub-questions.

The Delphi candidates were approached after consultation with the Vereniging van Institutionele Beleggers in Vastgoed, Nederland (IVBN). In accordance with their list of members, the list was narrowed down to 12 organizations investing in office real estate. Those selected give a good representation of the landscape and various involved actors of the (institutional) real estate investment market. The selection included pension funds, insurance companies and various investment institutions. As noted in Chapter 3.3, the occupation of the various participants differed to include such as fund managers, asset managers and other executive managing directors. Each of the participants were approached via E-mail and asked whether they would be prepared to participate in an interview preceding participation in the Delphi investigation. This was in order to establish trust with the participants, which according to Morse (2015) ensure thicker and richer data. This selection of participants included those directly involved with the management of office real estate for the organization, which ensured detailed and current knowledge to be collected of the research phenomenon. In total, 12 institutional investor organizations were contacted to participate in this research. In response, 7 participants responded positively, 3 indicated that from a strategic point of view that they did not wish to take part and the remaining 2 organizations did not respond at all.

7 VALIDITY AND TRUSTWORTHINESS

In this short chapter the approach to data collection and analysis will be discussed concerning the validity of the research and the trustworthiness of the findings.

The validity and trustworthiness of the results and conclusions of this research benefit from a carefully structured research process. This is due to the careful selection of participants from a relatively small target group. From the candidates that participated, a variety of different functions and backgrounds ensured a rather heterogenous group of experts within the enrapturement of the term 'institutional real estate investors'. In addition, the results of this research are not only based on the Delphi research, but also on the theory from the literature review and secondary analysis, and the empirical research through interviews. The literature research is well-ordered and replicable, the practical study of the expert interviews and the Delphi research is very carefully and structurally designed and executed through the use of various research management techniques. This included the use of interview forms, information documents, summary reports, digital recordings of responses and verification of data by respondents through iteration. Repetition of the research will most likely yield the same results from the same group of experts due to the convergence of arguments and the same structured approach.

The qualitative research is presented in a way to allow a complete overview of the various responses and motivations given, and as much description as possible surrounding the respondents' environment and context. The results of the Delphi study are based on the opinions and arguments of the experts and not those of the researcher. In the appropriate section, the researcher has reflexively acknowledged and made explicit those choices that have influenced the creation, conduct and interpretations of the research. This is done in order to take responsibility for the perspective of the researcher and their position in the research. The weaving of quotes from the participants together with the evidence gathered from the desk research is at the same time a representation of the issues of power and the juxtaposition of identities within the research, as it is a description of the actualities. This depth of description ensures as much transparency as possible at all times. Moreover, the anonymity of the respondents and the data collection method increased by the validity of the research due to the openness of the responses.

8 EMPIRICAL INVESTIGATION: ANALYSIS OF THE RESULTS AND DISCUSSION

This chapter is the core of the research as it holds the results, analysis and discussion of the empirical investigation. It will include a description of the execution of the Delphi and will analyse the information gathered during the Delphi research process to the information gathered in the literature review and the interviews with experts. The execution of each individual Delphi round will be described and the most relevant findings outlined. Towards the end of this chapter, the research analysis will narrow down towards answering the hypotheses (accepting or refuting them). This incorporates a discussion of the collected Delphi results, comparing them to the literature findings and the expert interviews. This will give structure for the reader to the answering of the research objective and the corresponding research hypotheses.

8.1 Execution of the research

The theoretical framework (Chapters 4 and 5) and the expert interviews form the basis of the Delphi research. As noted, these phases of the research process have proven that circular redevelopment of existing real estate is still a phenomenon that shows little participation and contribution by institutional real estate investors. The possibility and motivation for them to include such practises is still unknown. The Delphi method is therefore used to identify and describe the conditions under which investors of this sort are willing to participate. Attention is paid to the identification and clarification of certain opportunities and barriers through prioritization.

By means of several open questions sent through E-mail communication per Delphi round, the participants determine the aspects that they consider relevant towards motivating their participation in adapting circular traits within their investment strategies. These include standpoints and arguments concerning the nature of the issue. These arguments could be of individual or collective nature, market or institutional, corporate or more personal, and structural or incidental. These aspects referring to the fact that some Delphi rounds were completed by several colleagues of one organization. At times, questions were posed within a certain time frame in order to trigger rationale concerning short or long-term intervention and forecasts. Other times questions were posed concerning arguments about how, what and by whom action should be undertaken. Throughout the following analysis, the anonymity of the participants is maintained. Due to the sensitivity of some information only a general summary of certain business strategy aspects can be given within this thesis.

After each consecutive round, the arguments and standpoints were collected, summarized and sent as feedback. Subsequently, by means of iteration, convergence of viewpoints allowed for the development of a framework in which it is clear which conditions an institutional investor applies towards an investment in circular redevelopment of existing office real estate.

As noted in Chapter 6, the analysis is of qualitive character and therefore this research is explorative. Chapters 8.1.1 to 8.1.4 will in elaborate on the detailed responses from the Delphi participants in order to ensure good qualitative research. Appendix 4: Summaries of the Delphi Rounds (Dutch)holds the summaries of the Delphi rounds. Communicating qualitative research results and ensuring its ‘trustworthiness’ is difficult. Therefore, for the purpose of transparency, the reader must be aware of the highly personal embodiment of the responses given within the Delphi rounds as represented below. Thus, responses are emphasized by the use of quotations. Reflexivity and acknowledgment of these response will be structurally discussed in Chapter 8.2, along with the confirmation or disconfirmation of hypotheses, supplemented by an explanation to why interviewees formed the given opinions.

8.1.1 Delphi round 1

In the first round of the Delphi research, participants were asked 3 questions concerning the most important characteristics for an investment in office real estate, the characteristics of real estate important for an investment in redevelopment and to the uniformity of these within the business's CSR-strategy. In the Appendix a duplicate summary of the 7 responding transcripts can be found in which the standpoints and arguments of each respondent are presented. In order to keep the analysis tangible, solely the most relevant responses that have added value to answering the research questions will be discussed within the analysis.

Concerning the structured understanding of the investment strategy in real estate, it was essential to establish early on with the Delphi participants which aspects of the office real estate object they consider important. This was necessary in order to depict the framework in which the selected investors make decisions. It was important in the phrasing of this question that the participant be asked to motivate their response by assessing the importance of the aspects according to their own business strategy. This required the reflection capacity of the respondent to consider the weight of these aspects from a business or corporate standpoint and not a personal standpoint. Asking for motivation allows more in-depth insight to the relation between certain aspects and encourages the respondent to reveal more information concerning the incentive behind an answer. It is important to note that in the first Delphi round, the first and second question were related to one another, as the questions were intended for elaboration on the characteristics in a regular investment as the characteristics important in an investment in redevelopment. It is notable that participants repeated several aspects to be equally important for both kinds of investment. The third and final question asked for the participants to relate the mentioned characteristics to their business strategy.

From the responses concerning the aspects important for a regular investment, the most prevalent aspects included location, flexibility (of space and installations) and the degree of sustainability. It is unanimous amongst 6 respondents that the location of the real estate object is the most important aspect for an investment. The remaining respondent focusses investment solely on a specific type of location and therefore did not note this aspect. An argument given in motivating the importance of location is that "it is an aspect of real estate that cannot be made whilst a building and its rent circumstances can be adjusted" (Participant 3) and therefore "requires thorough real estate analysis with help of big data in order to establish a target market" (Participant 4) before an investment can be made. It is clear amongst several respondents that a real estate object is considered in combination with its location, the additional land-use functions, public transport accessibility and types of people in the surrounding environment. One respondent demonstrated the extent of the importance of location by noting that their corporate strategy focusses "solely on offices located in the 4 major cities and within these only in specific locations where the most growth is to be expected" (Participant 5). The major cities can be expected to always have an attractive investment climate. Particularly this type of investor, pension fund, demonstrates a strong predisposition of institutional investors for certainty and risk aversion.

In relation to this, the aspect of flexibility was equally noted by almost all the participants as an important aspect that reduces risk for a long-term investor. The adaptability and adjustability of space within a real estate object ensures less risk of vacancy. As an institutional investor indirectly invests in office real estate which is rented out to various types of users over longer period of time, this aspect is of grave importance in order to realize continual multi-tenant division of space (Participants 1, 2 and 6). Motivations given for this aspect include those towards the contractual, legal aspects of the real estate object. Large percentages of vacancy are minimized due to the set expiration dates in rental contracts. Interesting is that one respondent noted that these contractual aspects of a real estate object can lead to a division of class amongst the tenants, which reduces the risk of default (P2). In addition, the argument was given that the ultimate goal of an investment is to achieve a stable and predictable return, which require that the valuation be less volatile (P3).

Considering the degree of sustainability, nuance was provided that this aspect is predominantly important for the preferred sustainability level of the entire portfolio within which the object is held, and not necessarily in its acquisitioning (P1). Although noted by 5 of the participants as an important aspect, it is not considered by any as the most important. This is demonstrated in a powerful argument made that "every real estate object can be made sustainable with enough investment, and therefore as long as the return on the initial investment can be achieved, the existing degree of sustainability of the object counts less heavily than others as an aspect for investment" (P1). Considering this aspect, motivations that were given to support the importance of this aspect within an investment in purchasing an object, is that sustainability is an aspect as important as it is demanded by the users (tenants) of an object. Several parties indicated that there is increasingly more demand for sustainable buildings from both users and investors (noted from the perspective of investment fund managers). An important argument by one participant is that they are "convinced that sustainable buildings guarantee a higher return on the long-term" (P2).

It is important to note that often the answers related to the aspects of regular investments were approached from two motivating standpoints. This meaning that some participants motivated their answers from a user standpoint, focusing strategy on the wishes and demands of the tenants. Whilst other participants responded from a predominantly market-based, economic standpoint. Participant 3 for example noted that every situation within a building readjustment is possible, as long as it guarantees the demanded return within the set timeframe.

Significantly, participants indicated that several aspects that are deemed important by regular investments have equal importance within an investment in redevelopment. Logically, as the questioned referred to objects already in their portfolios, location was no longer mentioned. The degree of sustainability was unanimously considered by all 7 participants as an important aspect when considering investing in renovations or revitalization of an object. One participant argued that part of the quality of a real estate object is determined by the sustainability of the building, as long as this results in lower costs for tenants (P3). Various standpoints demonstrated an increasing attention of investors towards the users of the real estate in order to prevent future vacancy. This has relation to the future-proofing of real estate investment, in which it appears sustainability has a significant role particularly in reducing the costs and improving the circumstance for the well-being of the tenants (P2, 3, 5, 6). Meeting the needs of tenants appeared to be an increasingly important factor within a decision to redevelop the building. Attention is given to several topics within sustainable buildings, including the reduction in energy use, the production of green energy, but also the (re)use of materials. All participants seem aware that the degree of sustainability will be a significant regulation within the office real estate market in the future. An interesting addition within this Delphi round is that several participants indicated the dependence on sustainability certifications such as BREEAM, in order to vindicate the degree of sustainability. One important argument made by a participant which demonstrates the reserved nature of institutional investors notes that 'when an object no longer meets all the requirements set out in the portfolio strategy, and the costs for renovation exceed the set return values, the object will be sold' (P1). Noteworthy is that within an investment decision for redevelopment, the tenants' health and well-being was given more attention. Argumentation for this aspect was that 'tenants are going to demand this in the future' (P6), and that the aspect has already been taken into account within future CSR policies and targets.

Institutional investors were asked to determine the extent to which the aspects of investment are included within the Corporate Social Responsibility (CSR) and Responsible Investment (RI) policies. This required a degree of reflection from the participants to judge the extent to which sustainability is targeted and how. Arguments given were extensive and differed greatly. Certificates such as BREEAM and GRESB were given as measurement tools to respectively quantify sustainability targets at a building and portfolio level towards the greater public (P2, 3, 5 and 6). One participant noted that their

business strategy is to a large extent set towards the scoring of a high BREEAM label (P6). Their sustainability criteria in real estate investment are for a large extent established according to the BREEAM. Another noted that every building within their portfolio must meet BREEAM standards or have the potential to meet these standards (P3).

Several participants noted ESG-criteria (Environment, Social and Governance) as a manner in which they organize their sustainability targets and policies within real estate investment. Considering his role as an investor in offices, one participant argued that he can "make a significant impact and that sustainable and future policy leads to better result" (P4). Accordingly, another argument is given that "although ESG-policy is integrated throughout the entire investment process, at the same time an institutional investor is never 100% owner of real estate objects" (P5). Referring to indirect-investments, the investor further argued that 'prior to an investment, it must be determined whether the policy of partners correspond with the investors vision'. As an investor (or shareholder), pressure is exerted via a top-down strategy in order to ensure that the above noted aspects are included in order to achieve maximum feasibility in terms of sustainability (P5). Two parties claim to not make an investment if it has no positive impact on the sustainability strategy set out in CSR-policies (P1 and 4).

8.1.2 Delphi round 2

The responses of the participants of the first Delphi round were summarized and briefed according to the motivations given by the participants. Particularly through the summary of the aspects considered important for an investment decision, the participants were able to gain an overview of the aspects that fellow institutional investors deem important. The purpose of the second Delphi round was to firstly evaluate the responses given in the first round and inquire more detailed responses to each particular investor into how they deem to achieve the targets set out in their individual business' CSR (or RI) policies. Secondly, the second Delphi round aimed to explore the positions, standpoints and various propositions of investors towards the concept of the circular economy within existing real estate; a phenomenon not currently defined within current practice or literature alike. This helped to understand the line of reasoning of the participants and to understand the position in which they determine the circular economy in the real estate sector. The individual face-to-face interviews with investors which occurred before the initiation of the Delphi combined with the questions in round two ensured that each participants standpoint was scrutinized twice to understand their state of mind regarding this matter.

Based on the information gathered in the first round of the Delphi, new questions had arisen. As in the first round, the participants were asked to describe which real estate related aspects were important regarding investing in real estate. Most of the participants interpreted this referring to physical aspects of the real estate only and thus excluded financial aspects associated with the real estate object. Therefore, in the second round, the participants were asked to evaluate the importance of the financial parameters of real estate investments.

All seven participants reached agreement concerning the fact that financial parameters (such as risk and return ratios) are one of the most important variables within the investment process and have priority over the physical real estate related aspects. This is confirmed through arguments such as "Return and risk is the most important aspect for us as investors" (P5) and "If the risks are not in line with the financial parameters, the acquisition will most likely not take place at all" (P4). These answers are in line with the expectations from the preliminary research in which is described that the purpose of investing indirectly in real estate is to gain financial advantages and profit.

An interesting argument given that nuances the reserved character of institutional investors notes "financial parameters are important as it depends on the stakeholders and to what extent they are willing to pay for circularity" (P6). Overall, despite the type of institutional investor, and various other

aspects of their business strategy, each participant confirms the strong importance of gaining financial profit within the market.

In order to understand and to gain more insight on how each participant uses their CSI/RI-policies in their daily practices, each participant was asked to give examples of the targets regarding sustainability as described in their business strategies. Several participants had given concrete examples in terms of sustainability targets at different management levels, including building level, as well as portfolio and corporate level. The various targets were sometimes also divided in short and long-term goals. Due to the confidentiality of the shared information exact details cannot be shared in the following analysis. Merely a general summary of the target aspects can be given. Consequently, Table 6 broadly summarizes the targets mentioned by the participating investors:

	Delphi Participants						
	1	***2***	***3***	***4***	***5***	***6***	***7***
Corporate-level							
➢ *Reducing carbon emissions (CO^2)*	√	√	√	-	√	√	-
➢ *Own energy generation*	√	√	√	√	-	√	-
➢ *Reducing energy consumption*	√	√	√	√	√	√	√
➢ *Reducing water consumption*	√	√	-	-	√	√	-
➢ *ESG-policies: targets, goals and actions*	***√***	***√***	***√***	-	***√***	-	-
Portfolio-level							
➢ *Achieving a GRESB score*	√	√	√	√	√	-	-
Building-level							
➢ *Obtaining BREEAM-NL labels (In-Use)*	√	√	√	-	√	√	-
➢ *Obtaining EPC labels (Energie Prestatie Coëfficiënt)*	√	√	√	√	√	√	√
➢ *Obtaining WELL certificate*	√	-	√	-	√	√	-
➢ *Re-using materials*	√	-	√	√	√	√	-
Stakeholder-level							
➢ *Periodically measuring CSR goals*	√	√	√	√	√	√	-
➢ *Periodically measuring tenant satisfaction*	√	√	√	-	√	√	-
➢ *Green leases*	√	√	-	-	-	√	-
➢ *Customer Due Diligence for the selection of business partners; sustainability clauses in new contracts*	√	√	-	√	√	-	-

Table 6: Examples of sustainability targets in CSR/RI-policies (*own illustration*)

The table above only shows sustainability targets that were mentioned within the answers of the participants. For the convenience of the reader, the responses towards sustainability targets in all 4 Delphi rounds are summarized in the above table. Through the iteration process these targets were elaborated upon and often arose spontaneously in Delphi rounds. The green scores (***√***) indicate that the aspect was mentioned, those indicted with a hyphen (-) note that these participants did not indicate the implementation of these throughout the Delphi investigation. Elaboration of remaining answers can be found in Appendix 4: Summaries of the Delphi Rounds.

As described in Chapter 2.4 and 5.2, CSR-policies make use of measurement tools which have gained popularity as they turn soft variables into measurable goals and targets. The term 'sustainability' is an example of this as it is made measurable by the BREEAM standard. The participants included a large range of different targets set in their CSI/RI-policy. However, most of the targets set by the participants were based on a benchmark, score or certificate. The increase in acceptance and use of measurement tools is therefore confirmed. It appears that the significance of such handholds is to explain a complicated and new concept to market players which are interested in experimenting. This is necessary for innovation in the real estate sector as well as making the real estate stock 'futureproof'.

To maintain uniformity regarding the concept of circular economy, the participants were asked to define what circular economy means to them within the context of redevelopment in the built environment. This was necessary to prevent misunderstandings in future questions and to explore the

familiarity of the definition amongst various institutional real estate investors. As noted within the expert interviews, a common point of interest is to consider that participants within the scope of this research all 'speak the same language'. Remarkably, all participants used similar or related words to describe the concept. The words that were used by all participants were: 'reuse' and 'materials'. One participant claimed to uphold their own definition of the concept as "the reuse of building materials within a redevelopment, for as much as possible, and the application of new components that are on their own circular" (P5). Others noted that the process should "ideally loose as little raw materials and value as possible" (P1) and that "the flow of building materials along the chain of construction should be optimized to minimize material waste" (P4). The most important conclusion of the answers given is that all participants are in line with each other and that these answers are, although to a lesser extent, also in line with the definition of circular economy as described in theoretical framework.

When asked to explain their expectations of the impact of the circular economy on existing real estate in the coming 10 years, almost all (6 of the 7) of the participants argue that the aspects of the circular economy will slowly be integrated within the building process. The motivations to defend the arguments show a broad variety of impressions of the mindset of some institutional investors concerning their projections for the circular economy in the redevelopment of real estate. However, within the argumentations, disparities existed amongst the optimistic character of the implementation of the circular economy, as it did amongst the mentioned parties within the real estate system that ought to be responsible for this. For example, almost all acknowledge the increasing necessity to include circular aspects within real estate development in general but conclude that the implementation shall demand costly efforts and experimentation. "Clients will increasingly ask about circular alternatives, and if the market can provide these, they will choose these (dependent on whether it will cost them more money than a regular development) …" (P6). It is apparent in this response that some market parties assume that the circular economy will be more costly than regular redevelopment. This is an honest observation of the development process. Another participant supports this claim stating that in the future "We have to expect more requirements and rules, and we will have to more accurately account for actions in maintenance, replacement, refurbishment and redevelopment according to authorized criteria related to circularity" (P2).

In general, concerning the process of implementation, all participants agreed that this will be slow, and that this process has only just begun. There is general consensus that the concept is only yet taking form. Several note that at the beginning, there will be limited influence of the CE on the redevelopment process of existing buildings, but in time it will take form. Several arguments are given concerning the influences of increasing implementation including the increase in knowledge of circularity, aiding technologies, the construction of iconic buildings and the establishment of market places for the material exchanges will prove the acceleration of the CE in real estate (P1 and P4). An interesting trend within the responses was that the concept would first have to become mainstream before it will be upheld within the development process (P1). It was evident, that some participants were optimistic regarding the future role of the circular economy, whilst others remained withdrawn in their arguments. In contrast to the other arguments, one participant noted that "in the coming 10 years, the circular economy as a concept will have to prove itself, both in terms of sustainability and profitability" (P7). The participant demonstrated a (weighted) economic rationale in which they argued that the concept has no proven economic success as of yet. Within the scope of this research and the available responses, this participant stood alone in this standpoint. This seems consistent with the argumentation given later on in which the implementation of the circular economy within existing real estate should not cost more money than regular non-circular investments (P1).

In the responses, merely one participant attempted to address the roles of the various parties within the process. This participant addressed which party should be responsible to drive the implementation process of the CE in existing real estate. As a pension fund, this respondent argued that advisory parties (consultancies) and executive parties (developers) will be expected to be more innovative in their

operation (P5). Participant 5 further argued that owners of office real estate will be expected to be more concrete in their requests for redevelopment. Owners will be expected to provide a circular framework with executive guidelines in which maximum circularity can be achieved within set budgets.

Concerning the question requiring the participants to describe the preconditions essential in order to establish circular aspects as an obligatory aspect within the investment decision process of redeveloping existing office buildings, various arguments were given that noticeably differed from one another. Each of the participants described a different driver. The first noteworthy argument noted that "Circularity should be integrated within sustainability measurement tools such as BREAAM and GRESB" (P2). Complementary to this argument was the statement given that "…there should be a measurable criterium to measure circularity" (P3). As described before, measurement tools have gained popularity because they are able to translate a new concept to specific, quantifiable and assessable targets. These two participants recognize the expediency of such measurement tools and therefore consider this an important step to integrate the circular economy within real estate investment decisions. Another important driver would be examples of best practices. While the circular economy is still an unfamiliar concept to the built environment, participants argued that best practices would provide market players with more evidence of increased return (P2). By providing best practices, many uncertainties could be taken away which could improve the risk estimations done by investors. Gaining more information is also mentioned by several participants as a driver in order to integrate the circular economy within the redevelopment of real estate, "Circularity within the framework of ESG is a relatively unknown phenomenon, where many companies are working on it implicitly but not explicitly" (P3; and also, P1, P2). Indirectly, transparency is noted as a requirement in order to gain more momentum in the application of circular aspects within investment strategies. Within the argument of who is to be responsible for creating momentum, one participant argued the influence of laws and regulations, enforced by the government or higher organs (e.g. the EU) (P2). How powerful they deem this influence is not noted. Curiously, only one participant argued that they had already implemented circular aspects within their business strategy, however the detail of their practices was limited: "…circularity is an objective in the project business plan and documentation" and "…circularity is to be implemented in final design and procurement strategy" (P6). The argument of one participant stands out above the others in which it is noted that only when circularity fulfils a double function (P7). Through this argument the participant notes the necessity of circular real estate must result in an increased return compared to regular redevelopment investments, whilst at the same time ensuring sustainability and increasing the comfort for tenants. Only then will the concept be more prone to be implemented within an investment decision in real estate redevelopment.

8.1.3 Delphi round 3

The participants were sent the summary of the second Delphi round in order to communicate the convergence of responses concerning the subjects of sustainability targets, forecasts for the future of CE in real estate and finally the drivers for investment initiatives. Particularly the question concerning sustainability aspects within Responsible Investment policies, was an element that was to be elaborated upon within the third Delphi round. As noted in Chapter 8.1.2, the results of this are added to Table 6. Additionally, this round would explore the (lack of) argumentation given within the previous rounds concerning the responsibility of institutional investors towards accelerating the CE in real estate.

It was crucial that the participants were asked directly about their role as investor, and to give concrete examples of barriers and possible solutions they see within the inquiry of CE in existing real estate. The response from the participants to this question lead to rather similar arguments and explanations. With certainty it can be stated that every participant noted the large degree of uncertainty concerning the application of circular concepts in existing buildings as the greatest barrier.

The most prevalent argument, noted by the majority of the participants, is the lack of profundity in the definition, which to a large extent leads to obscure and ill-defined information towards the market (P1, 2, 3 and 4). Another common argument in relation to this noted barrier, is the absence of a measuring tool in order to quantify the benefits of circular aspects (P3). In this trend, the lack of example projects was also noted by several participants. Perhaps the most obvious but sensitive observation is that institutional investors are often not directly involved with the real estate themselves, and therefore have no practical knowledge of the technical applications of the circular economy. Therefore, the argument that the complexity in applying the CE within real estate results in increased pressure and strain within an investment decision making process (P4). Lack of knowledge towards the opportunities for reusing materials is considered an important barrier that often leads to investors choosing alternatives that are known to them (non-circular redevelopments). A repeated argument is that only very few specialist parties have this knowledge (P4), which then again contributes to a lack of available information. Three of the participants noted the lack of insight into the financial benefits of the CE in real estate in general as their only barrier for not investing. Thereby, two of these participants strongly noted that within implementing the CE in existing real estate, one party "does not see any barriers, other than the fact that the object must continue to make a profit" (P5) and that another argues that "there is inadequate evidence that the circular economy is profitable" (P7). One participant argued that as an institutional investor, the absence of policy and regulations gives little pressure in order to implement the CE. From the responses, an overall eminence of uncertainty seems to be the greatest challenge for institutional investors as of yet.

When asked for possible solutions, the participants were asked to reflect upon their own capabilities in resolving their named barriers. Regrettably, many did not give concrete examples to their contribution in solving these barriers. One given example included that "aspects of circularity in existing real estate objects demand operational requirements in which for, example, optimal circularity in times of maintenance and renovation should be pursued" (P1). Others that do not give examples simply note the challenge for circularity to be made affordable and reliable as a solution and thus task for the market to realize. Obvious solutions are the establishment of an operational definition and thus a fitted measuring tool to quantify circularity in existing buildings. An interesting argument from one participant is the claim that circularity should be organized at an area level (and not at building levels) (P3). Again, which party is to undertake this task is still unclear to the participants. Two parties are strongly convinced in their argument that publicity of successful examples from developers, tenants, contractors and investors themselves will trigger a wave of innovation. Within this movement, these parties must demonstrate that circularity will lead to added value for both society and environment, "only then will the higher costs be acceptable" (P6 and P2). In addition to this, appraisers must demonstrate this value through innovative (financial) business cases, from which standardization can lead to acceleration for investors.

When required to consider implementing the concept of circularity in existing real estate, the participants were asked which market player the initiator should be and why. This question was asked to determine if the principles of the circle of blame holds up in practice, as the participants were now able to elaborate on the responsibilities of other market players. The first noteworthy response is of Participant 7, who concludes that investors are not the ones that should take initiative as their first priority is managing capital. "Only after the profitability is proven, could we substantially invest more in such concepts" (P7). All other participants agree in some form that investors could be the initiator. "Investors sure have a role as initiator by drafting policy and using this to guide and give impulses to circularity" (P2). However, five of the seven participants say that this should or could be done in association with other market players. This is confirmed by arrangements such as "It should be a cooperation between market players (investors, asset managers, developers) and the government" (P3), "It should be an interaction but I believe that we should stop pointing fingers and everyone should get started" (P1). Three participants mentioned the government (or a governmental institution) as an important player. As Participant 4 describes: "Last but not least, the government can play an important

role to give circularity a chance to succeed". One participant noted Het Rijksvastgoedbedrijf, as large governmental institution to be perfectly capable of initiating experimental projects for the sake of evidence (P6). Another player that is mentioned twice is the developer, which should play a role in circular adaptation as this is stated as follows: "We would expect developers and advisors to play an important role in giving circularity content" (P5). Finally, one of the participants mentioned that regardless the willingness of the investor, they should respect the wishes of the shareholders when investing in unfamiliar concepts. "Our actions depend on our profile as an investor and on what the shareholder wants" (P6).

When asked to consider what is necessary to make investors the initiators for implementing circularity, three of the seven participants mentioned that they require more insight on how circularity is useful/helpful for the society. This is described as follows: "Make clear how circularity contributes to the overall ESG targets" (P3), "Especially to raise awareness" (P2) and "That the owner of the assets (pension funds, shareholders etc.) sees the usefulness of this concept" (P6). Another possible requirement that is mentioned four times is evidence of circularity which prove profitability. This is namely described as: "For the investor, financial returns are top priority" (P5), "An elaborate feasible business case will be a very good first step" (P1), "Have a clear added value, and risk reduction" (P7) and "Promising projects that contribute to good evidence" (P4). Many of these have already been previously stated, however, one participant further elaborated their answer by stating: "In addition, we make demands on the sustainability of our portfolio, but not specifically with regard to circularity. However, we believe in real estate that has such a good location that it pays to continue to redevelop the building over time and to adapt it to the needs of the users" (P5). This indicated that the centrally located properties have more chances to be redeveloped with circularity if this is what the tenants demand.

8.1.4 Delphi round 4

In consultation with the various participants, a fourth and final Delphi round was announced. Firstly, to briefly reflect on the conclusions of the previous round and to further ask clarifications. Secondly to confront the participants with the convergence of views regarded (1) the matter of best practices from the participants, (2) the influence of the demand towards circularity by tenants, (3) the role the government can play by implementing circular economy, and (4) the relevant barriers and solutions towards implementing circular aspects within investments for real estate redevelopment.

As the importance of best practices of circular project was highlighted in the previous rounds, the participants were asked to give examples of the roles they could play to contribute to experimental best practices. The question was formulated in such a way that not only certain roles could be mentioned, but also the possible already existing best practices. The participants were asked to explain the roles they could fulfil. The reason of asking this question was to gain insight on how each participant saw their own power and potential in implementing circular economy to a redevelopment process. The responses regarding this question were rather similar to one another. All participants, except Participant 6, mentioned the absence of circular best practices, pilots or projects within their business. Participant 6 explained their project, however in order to protect the anonymity of the participant further details cannot be given. Participant 3, 4 and 7 solely answered that they do not have exemplary projects without further elaboration. One reason of not implementing circularity to their business is "due to the concept of circularity being too broad" (P1). While participant 2 lacked exemplary projects, they did elaborate on further steps they were willing to take. Participant 2 is currently setting up a framework that described what is meant by a circular building. "In the future, we will obligate advisers and suppliers to use this framework in order to indicate in which way circularity is involved" (P2). Lastly, participant 5 argued "we are not investing in experimental projects. There must first be a well-founded business case before it becomes part of our investment strategy".

When asked whether the demand of circularity from tenants could result in adjustments in the CSR/RI policy of the investors, the participants evaluated whether an increasing attention for circularity, related to Responsible Investment was imminent or already apparent. Most participants did not describe the influence of tenants on their CSR/RI policy. Two participants gave insight to this query. Participant 3 stated "Tenants certainly influence our CSR policy, especially in the context of sustainability. However, the demand for circularity is not explicitly stated yet". Participant 1 stated "Yes, tenants do demand more from our CSR/RI policy. However, our policy does not change significantly because of this, as tenant demand are often in line with the goals as described in our current policy". Another participant argues that "…our external managers inform us that tenants pay more and more attention to ESG/CSR/RI; however, they do not specifically refer to circularity" (P5). Two other participants argue that the increased demand in such policies is very limited. This is described as "Only a small part of our tenant's demand clarification in the manner in which we implement sustainability in our buildings" (P2) and "Only limited questions are asked by our tenants concerning our CSR/RI policy" (P6). Five participants contend that when a tenant concerns themselves with aspects of sustainability within the investors' business policy, it is (nearly) never regarding circularity. An important statement given by a participant is that, up until this point, "There has never been a question or request regarding circularity" (P6).

In order to reveal opinions concerning how market players perceive the role of the government in the implementation of circular economy, participants were asked to motivate their expectations. From the third Delphi round is became apparent that investors consider the government an influential party that is capable (and to some participants: should be responsible) to kickstart the CE as a concept through regulations. The first noteworthy conclusion that can be based on the responses given by the participants is that none of them disregard governmental intervention in the process of implementing circular economy in the redevelopment of real estate. However, the role that the government should take varies within the answers of the participants. A mutual argument considered by three participants is that the government should draft legal requirements which should form the standard for all market players (P1, 5 and 7). This is described clearly by the following statement: "Minimum requirements set forth in legislation are effective, as everyone must abide to them, which limits the effect on your competitive position" (P1). However, as participant 5 noted: "In general, the government should intervene if the market is unable to find a solution". One participant describes legislation as a limitation. Participant 3 argues: "the government should act as a stimulator for innovation in circular practices, and not as a restrictor by means of laws and regulations". An important argument given concerns the governments participation in financing the transition towards circularity. Participant 1 and 2 describes this as "stimulating by means of subsidies or financial advantages". In their opinion, sustainable (or circular) initiatives should be more favoured for governmental funding than the current unsustainable initiatives. Participant 1 thus suggests that "reproving polluting initiatives is more effective than subsidizing energy efficient and circular initiatives". Lastly, some participants agreed upon the fact that the government should have a stimulating role on providing exemplary projects. Two of the seven participants would like to see the government 'lead by example' by providing a platform for the sharing of initiatives and information (P2).

With regard to the barriers and solutions that were provided in the previous rounds, the participants were asked to rank these aspects in accordance to their importance within an investment decision. This gave insight to the degree of difficulty that investors consider the implementation of circularity and what they consider is the best solution to relieve this. Through the method of ranking, the participants were asked to indicate the rank of the barriers (1 being the greatest barrier) and the solutions (1 being the best solution). The results are shown in the following tables.

Participant	1	2	3	4	5	6	7	Total
Barrier								
Ambiguity about the concept of circularity	2	9	1	4	6	2	9	**33**
Missing concrete measurement options (certificates)	4	8	2	5	5	3	4	**31**
Complexity of implementing circularity	1	2	3	6	4	6	6	**28**
Too little exemplary projects	6	3	5	3	8	4	8	**37**
Lack of knowledge regarding financial advantages	7	1	4	7	1	1	2	**23**
Lack of knowledge regarding reuse of materials	3	4	6	9	2	8	5	**37**
Lack of knowledge regarding already used materials in the object	5	5	7	8	3	9	7	**44**
Lack of specialised companies in circularity	8	6	8	1	7	5	3	**38**
Lack of guidance in policy of investors	9	7	9	2	9	7	1	**44**

Table 7: Barriers for implementing circularity in existing real estate (Source: author)

Participant	1	2	3	4	5	6	7	Total
Solutions								
Set up concrete measurements (certificates)	1	4	1	4	4	3	5	**22**
Making circularity a requirement in redevelopments	2	5	4	3	3	2	2	**21**
Providing exemplary projects	3	3	3	1	5	4	4	**23**
Give insight in added value on society and users	4	1	2	2	1	1	1	**12**
Give insight how circularity help to reach Paris Agreement	5	2	5	5	2	5	3	**27**

Table 8: Solutions towards relieving barriers for implementing CE in existing real estate (Source: author)

The barrier 'Lack of knowledge regarding financial advantages' was chosen by the majority of the participants as the biggest barrier in order to implement circularity. For three of the seven participants this barrier was selected as the most crucial barrier, and by one participant as the second most crucial. Interestingly, the pension funds within this research unanimously considered this barrier to be the most difficult. Similarly, the barrier 'complexity of implementing circularity' was argued to be the second greatest barrier overall. Subsequently, the barriers 'missing concrete measurement options (certificates)' and 'ambiguity concerning the concept of circularity' followed. Both the barriers 'lack of knowledge regarding the already used materials in a real estate object' and the 'lack of guidance in investors' policies' were deemed by the majority of the participants as the least (but still) crucial barriers for investment.

The solution that the participants deemed to be the most important is to 'give insight in the added value of circularity to society and users'. This solution was chosen four times as the most important solution and twice was it scored by participants as the second most important solution. From the economic standpoint of the investors, this importance of this solution could be deemed almost obvious. The solution 'making circularity a requirement in redevelopments' was estimated to be the second most important solution. None of the investors scored this solution with a first (1), however 5 of the seven participants marked this solution within their top 3 of most important solutions. The solution was therefore ranked quite highly. The solutions 'setting up concrete measurements (certificates)' and 'providing exemplary projects' followed closely after in the rankings. From the seven participants, the majority (5 participants) considered giving insight to how circularity helps reach the Paris Agreement as the least important solution amongst the 5 suggested solutions.

8.2 Discussion and hypotheses

On the basis of the literature review and the formulated theoretical framework, several hypotheses were formulated in order to test this framework against empiricism. The following section considers an elaboration of the discussion where aspects of the theoretical model will be related to the analysis of the results collected within the empirical investigation (interviews and the Delphi). In this chapter the formulation of conditions for investment will be further clarified. The results of the above empirical analysis will result here in the confirmation or disconfirmation of the formulated hypotheses.

Hypothesis 1

As long as the requirements for circularity in existing real estate remains unclear, the participation of asset managers and institutional investors will remain limited.

The majority of the participants, with exception of one, provided explicit argumentation for the confirmation of this hypothesis. A common argument provided by several parties was the lack of insight in the requirements in order to classify an existing building as circular. In relation to this, the general absence of definition for a circular building was evidence enough for the lack of knowledge amongst the participants. The majority of institutional investors require proven examples as a demonstration of how circularity can successfully be implemented before they will participate in including elements of circularity within their investment strategies. This would require the establishment of a measurement instrument, and best practices in order to quantify financial benefits for the investor set against a regular redevelopment excluding circularity. Based on the findings in the literature review, this general lack of knowledge could be cause for institutional investors to make minimal effort to include the circular economy in their investment decision. The lack of knowledge can lead to higher risk perception. The findings suggest that the institutional investors are risk-aversive. One investor noted that as long as a concept is not proven investors will not be willing to 'experiment' with their capital or participate due to the lack of insight regarding financial risks.

Hypothesis 2

As the importance of CSR / responsible investment increases, so too will there be more interest from institutional investors for the inclusion of the circular economy in the redevelopment of real estate.

This hypothesis has neither been confirmed nor disconfirmed but has rather lead to interesting additional discussions and recommendations for future research. Interestingly, without being explicitly asked, two investors stated that they are willing to adjust their CSR / responsible investment policies if their tenants demand it. In short, if increasingly more tenants would demand circular redevelopments, these investors are willing to alter their investment strategy towards circularity. With exception of one, all participants note that the external demand to justify ESG, CSR and similar policies towards the general public is increasing. From these, some argue that this is a significantly increasing demand. However, the participants do explicitly argue that the aspect circularity (and circular buildings) is not at all an aspect considered within the previously noted policies that is demanded as of yet. The gathered results suggest that the lack of demand in partly due to the fact that circularity as a concept is not widely known among tenants.

Hypothesis 3

As long as developers and other market players do not take initiative, the efforts of institutional investors will remain limited to include circularity in real estate redevelopment.

The results show that there is no general agreement on this issue and therefore this hypothesis can also neither be confirmed nor disconfirmed. Remarkably, there exists a discrepancy between the disconfirmation provided by some participants and the motivation behind this disconfirmation of the hypothesis. From the participants the majority have indicated that the responsibility to take initiative

towards including circularity should be further researched and the methods developed by advisory parties, governmental institutions (such as Het Rijksvastgoedbedrijf) and developers. These arguments demonstrate traits of the Circle of Blame, in which the anticipation of investors towards other market parties to first take action is clearly visible. However, rationally, the results would show that the absence of a clear majority proves that the evidence is insufficient to allow confirmation of this hypothesis. Thereby, two remaining participants did acknowledge that the issue requires the participation of institutional investors; of which one notes explicitly that institutional investors must participate by taking the initiative and responsibility to develop policies in order to stimulate and give impulse to circularity in real estate redevelopment. The final participant doesn't provide any indication towards the market party responsible for taking initiative.

Hypothesis 4

As the various market components within the real estate system are loosely coupled, this will continue to create barriers for the implementation of the circular economy in real estate redevelopment by investors.

The results of the empirical research show evidence to suggest the confirmation of this hypothesis. The responses show a general awareness of the investors for the demands of the tenant, within these remaining aspects that are deemed important (including flexibility, sustainability, with the mentioning of health and well-being) the weight of their importance for both user and investor is not exposed within this research. The various motivations by the participants does suggest that attention to certain real estate related aspects by investors is related to user demand. However, the aspects deemed most important for an investment include financial parameters, such as risk and return ratios, above all others. All participants noted this as the most important aspect within their investment strategy. This, in relation to the 4Q-model as explained by Buitelaar (2013, p. 28), demonstrates that indirect investment (partial ownership) distances an investor from the real estate object. Thus, investors have proven to deem financial results as the most important investment aspect in relation to external institutions, such as their obligation to conform to their shareholders. In the case of pension funds this would be the pensioners. As suggested, an investment decision is made on an estimate between risk and return. The responses suggest that the large amounts of uncertainties for an investor concerning the end-value of a property after circular redevelopment and the rental income are repellent in their obligation to conform to the institutions within their market segment. These results would suggest that the circular economy is therefore not ready to be taken aboard an investment strategy as the uncertainties lead to too much interpreted risk for an investor.

9 Conclusion, Reflections & Recommendations

Based on the theoretical framework and empirical research, the conclusions and recommendations are given in this chapter. The central question is also answered in this chapter. Subsequently, the objectives of this research will be considered and determined whether these have been met. Attention is also paid to the research method. The chapter ends with some recommendations regarding the research theme and for further research.

9.1 Conclusions

In the following paragraphs the conclusions of this research will be outlined.

9.1.1 Answering the central research question sub-questions

This research has given answer the central research question: 'under which circumstances would institutional investors be willing to invest in the circular redevelopment of office real estate?'

> *Institutional investors are willing to invest in CE redevelopment as soon as there is more knowledge about this concept on the market through the efforts of other real estate related market parties and governments. This requires more knowledge of its application and measurement, better risk assessment, exemplary projects and (legally enforced) standardization, so that the concept can be made measurable and controlled. This would in turn result in simplifying the manner of use of the CE to the shareholders of the institutional investors, allowing them to solidly fulfill their obligations.*

On the basis of the sub-questions, the main research question was answered as followed. The conclusions and analyses at the end of each previous chapter can be revised for more extensive support for the answering of these sub-question. The following summaries are a collaboration of the findings from both the desk research (literature review and secondary analysis) and the empirical investigation.

SQ1: The environment of an investment strategy

In Chapter 5 the explorative substantiation of the first sub-question concerning 'what the current characteristics for the environment of an investment strategy for the redevelopment of office real estate are?' is given. Using in part the context analyses of preceding chapters 2 and 3, the environment is presented in which the institutional real estate investor must function. It is clear that this type of investor must act within an environment with great pressures from shareholders and other market segments within the real estate system. This leads to a dynamic playing field of aspects to be considered within the decision-making process in the establishment of a corporate strategy. The empirical investigation demonstrated the great complexity of in which an institutional investor must make decisions. The investment strategy of institutional investors therefore includes a high level of risk management, in which the determination of the desired return, level of sustainability, and coherence of results are but a few of the key aspects of the criteria with which they act. Although strategy is influenced by emerging opportunities, institutional investors incorporate these with much hesitation due to the complexity of their environment. The sketched image is confirmed in the empirical investigation.

SQ2: Circular economy within existing real estate

In order to grasp the totality of the main research question it was important to conceptualize what is meant by the CE in the existing built environment and in real estate. Chapter 4 holds the literature study in which the following two-fold sub-question was explored: what is the circular economy? And how can it be integrated to existing office real estate objects? To answer this, the current system as initiated by the Ellen MacArthur Foundation was used to explain a decoupled system: The Circular Economy. The system holds a mixture of principles from multiple sustainability phenomena, whereby

the current production holds two types of cycles including (1) the biological cycle and (2) the technical cycle; the latter being most applicable to this research. The CE is founded on the awareness that energy and resources will be used and returned in loops known as product and material lifecycles, in which economic value is retained or further enhanced. Both the desk research and the empirical investigation (interviews and Delphi) demonstrated that the circular economy in existing buildings has no definition as of yet. Neither does it have technical characterization of how to implement it within a redevelopment process. The document analyses gave insight to one statement in relation to existing real estate noting that 'in order to optimally make an existing building circular this must occur in natural moments such as the operating phase of the building, and in periods in which reparation, refurbishment or renovation occur' (Green Deal, 2016). The empirical research demonstrated that this concept is not yet practiced, as investors themselves do have a clear understanding or definition of the CE in both forms of existing and new real estate and therefore do not wholly adopt the concept yet.

SQ3: Factors and preconditions for an investment decision in circular real estate

Particularly the Delphi investigation (Chapter 8) has given answer to the sub-question: What are the most important factors and preconditions applied by institutional investors which influence their decisions to invest (or perhaps not) in circular redevelopment of existing real estate? This is explored in combination with the information gathered from the context analysis, desk research and the interviews with experts. This has resulted in a range of opinions, experiences and motivations from 7 institutional real estate investors investing in offices in the Netherlands. From the results of the Delphi a short-list of barriers was established including most frequently noted: as (1) The ambiguity of the concept of circularity, (2) lack of knowledge regarding the financial advantages and (3) the lack of guidance towards measuring the concept(see chapter 8.1; and in particular 8.1.3 to 8.1.4). In addition, motivations behind such preconditions set against both organizational and governance structuring levels are given within the documented statements, which can be found in Chapter 8.1.2.

SQ4: Arguments concerning responsibility

The last sub question inquires: which arguments are given by institutional investors concerning the responsibility for the initiation of the implementation of the circular economy within existing real estate? And how do they evaluate the effects of this? Significantly, the empirical investigation does not give a complete answer to this sub-question. The Delphi research encompasses various arguments in which institutional investors remark on the responsibility of taking initiative towards other market parties within the real estate system. The results demonstrated that the responsibility to take initiative towards including circularity should be undertaken by various parties, including advisory parties, governmental institutions and developers. Further motivations can be found in Chapter 8.1.3 and 8.1.4. The empirical investigation further concluded that the quality of the reflections upon the role of an institutional investor within implementing the circular economy within real estate redevelopment in general was insufficient. The evidence would suggest that further research is required in order to fully answer this question.

9.2 Reflections

The following paragraphs provide a critical reflection of various aspects of the research process, divided into the scope of the research and the methods used.

Scope of the research

The purpose of this research was to gain insight to the circumstances within which institutional real estate investors are willing to invest in the adoption of the circular economy within the redevelopment process of office real estate. An ambitious and difficult path, one that uncovered in the beginning stages of the research set up the extent of the ambiguity of the phenomenon to almost every party within the real estate discipline. This required an enormous amount of preparation and extensive exploration in order to grip the concept. The absence of previous scientific research concerning this particular phenomenon lead to the requirement for a pure explorative research in which it was

intended to uncover evidence that was previously only assumed within the practice of real estate investment in circular economy. Significantly, the Dutch office market has been deemed to be much further than other global real estate markets concerning the attention for the CE in real estate. In this sense, the scope of the research could not have been performed in a more knowledgeable environment.

Research methods

The semi-structured interviews allowed opportunity to explore and conceptualize to a great extent the concept of the CE and its position within the office real estate markets. The subject matter proved to be of interest to an extensive number of experts within different proficiencies of the market. The common motivation included the lack of knowledge concerning the motivations of institutional investors on the subject matter of circular economy in real estate redevelopment. The actuality of the subject matter allowed for current and actual practical experiences. However, the interviews proved difficult to control the flow of the content matter as very much of it is still unknown to professionals.

The combination of the theoretical research (literature review and secondary data analyses) and the Delphi research, and above all in combination with the subject matter, is greatly of a practical nature. The 'compulsory' structured set-up and implementation phases of the Delphi research require an immense amount of preparation and operation time. Furthermore, the approach produces a large amount of information (including interview recordings, and email responses). This process requires great care in the analysis phase of the research process and demand much perseverance. As the outcomes of the research are based on the expertise of 7 of the largest institutional investors, converged into summaries and shown with as much transparency as possible, much of the results can be objectified. However, emphasis must be given on the fact that this group of respondents is small, and therefore it was difficult to generalize the responses. Furthermore, the method to approach participants through the use of email contact limits the opportunity to ask for further enlightenment with uncertain responses. The result being that sub-question 4 could not fully be answered. Still, the manner in which the results are presented depict a strong personal exposure of opinions from the participants concerning the topic, something that is has not been registered in scientific research as of yet.

Relevant scientific theories

Particularly the results obtained from the Delphi have been able to give new insights in the motivations of institutional investors within the real estate system. Referring to the 4Q-model as explained by Buitelaar (2013) the results of this research demonstrate the importance of comprehending the financial parameters for investment. Investors have demonstrated that financial results are the most important investment aspect in relation to external institutions, such as their obligation to conform to their shareholders. This would suggest to support Buitelaar's claims that market segments within the real estate system conform to their own obligations, with respect to investors. Concerning movements or trends (such as the CE), investors are not yet fully equipped to react to this demand alone until it becomes mainstream. That is to say, the other market segments must react as well. Further research will be necessary that involves other market segments in order to fully comprehend the interaction between them.

9.3 Recommendations

To conclude this thesis, the recommendations from this research will be published in the next two paragraphs. A split has been made between recommendations as a result of this research and for further research.

9.3.1 To the market

Due to the often still lacking transparency to the greater public, discrepancies can be found between the strategy pursued at the strategic level and at the operational level. It is in the interest of the organization (pension fund, insurer or investment fund) that the operational strategy results from the corporate strategy. In the current environment, a discrepancy between both strategies can have major consequences. This means that the implementation of a corporate strategy deserves more time and attention. The management of the organization must ensure that the chosen path is actually embedded in the organization. Repetition of the strategic message and continual check are suitable for this.

From the literature review it appears that in most cases the change capacity of the sector is considered conservative, rigid or low, while the change capacity that the organizations describe are large and well-willing. From the empirical investigation it is noticeable that there is a change potential. Innovation can be steered from this potential. In addition, more flexibility and professionalism are expected. This combination can ensure that sufficient answers can be given to the current uncertainty surrounding the subject matter of circularity in investment strategies of investors.

9.3.2 Further research

There is a need for broader and deeper research, in which more institutional real estate organizations have to join the empirical investigation. This would allow for further objectivity of the given responses, and within the matter of compromise building more information sharing towards the possibilities seen from the market perspective. Another recommendation within the field would be to make use of face-to-face interviews with the Delphi participants in the future, in order to further elaborate on motivations. This would however require much more available time and would be extremely difficult within the limits of the agendas of institutional investors, particularly of the heads of funds and asset managers.

The empirical research suggests that it could be interesting to further focus institutional real estate organizations on "blood group" (pension fund, bank, insurer and asset management institutions). The background or the parent company may influence how strategy is formulated and implemented. In order to gain more insight into successful strategies of each type of investor, it may be beneficial to choose for one of the strategic orientations. This research is only a first step to link the scientific fields of strategic management and real estate. Fortunately, the field of strategic management is rich in insights and theories, and above all well developed, and therefore allows much opportunity for this further research.

Finally, as noted in the discussion, this research was unable to confirm whether the importance of CSR policies could be of influence to the inclusion and implementation of circular principles within real estate investment strategies. Interestingly, investors confirm that the user influences the flow in demand and thus development of real estate, and therefore also shapes policy formulation. Further research that would test tenant demand as an independent variable and its impact on strategy development as a dependent variable may provide interesting results towards strategy formation. The gathered results of this research suggest that the lack of demand in partly due to the fact that circularity as a concept is not widely known among users. Perhaps, if this research were performed during a period in time where the CE has gained momentum amongst real estate tenants, the results would be fruitful to then determine the influence of user demand within strategy formulation for investors. It may then also be interesting to include tenants within a discussion with investors.

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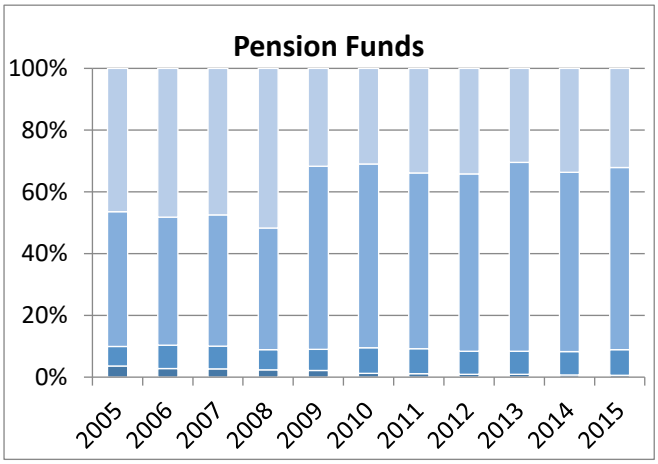
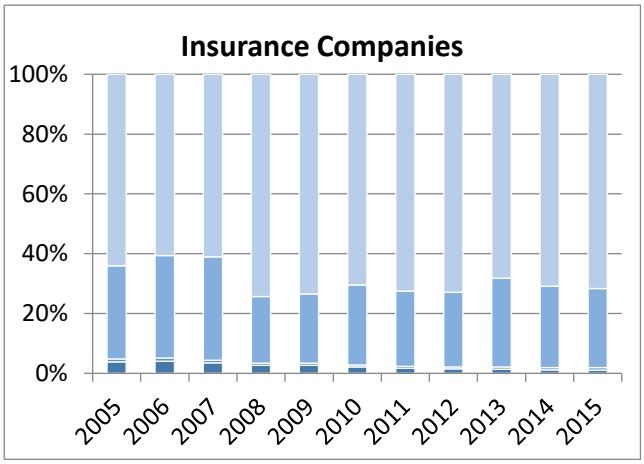
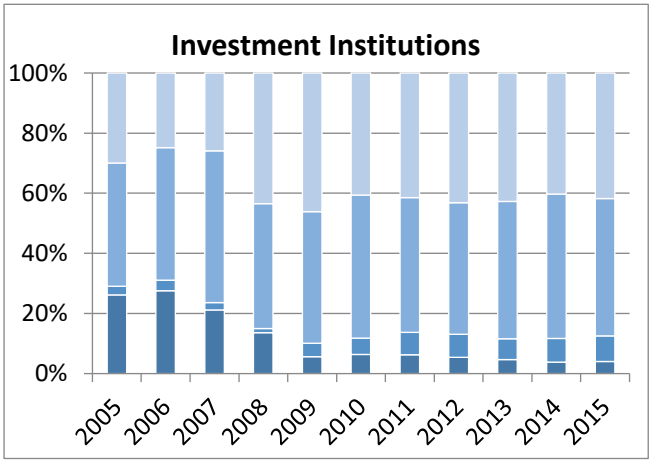
APPENDIX

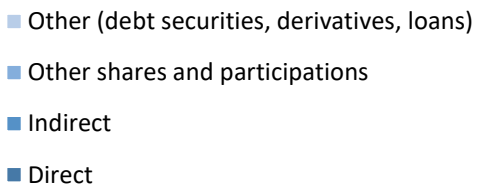
Appendix 1: Relative percentages of Institutional Investors Total Investments 2005-2015 (CBS, 2017)

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
		Relative percentages (%)										
Pension funds	**Direct real estate**	3,6	2,8	2,7	2,4	2,2	1,2	1,1	0,9	0,9	0,7	0,6
	Indirect real estate	6,3	7,6	7,3	6,5	6,8	8,3	8,1	7,5	7,5	7,6	8,3
	Other shares and participations	43,7	41,4	42,6	39,4	59,3	59,5	56,9	57,4	61,1	58	59
	Other (debt securities, derivatives, loans)	46,4	48,2	47,4	51,7	31,7	31	33,9	34,2	30,5	33,7	32,1
Insurance Companies	**Direct**	3,9	4,1	3,5	2,7	2,7	2,1	1,7	1,5	1,4	1,2	1,1
	Indirect	0,9	1	0,9	0,7	0,7	0,7	0,7	0,6	0,7	0,7	0,8
	Other shares and participations	31,2	34,3	34,6	22,3	23,1	26,7	25,1	25	29,7	27,2	26,5
	Other (debt securities, derivatives, loans)	64	60,6	61	74,3	73,5	70,5	72,5	72,9	68,2	70,9	71,6
Investment institutions	**Direct**	26,2	27,6	21,2	13,6	5,6	6,4	6,3	5,4	4,7	3,8	4
	Indirect	2,9	3,5	2,4	1,4	4,5	5,4	7,4	7,7	6,9	7,9	8,5
	Other shares and participations	41	44,1	50,5	41,5	43,8	47,6	44,9	43,8	45,7	48	45,7
	Other (debt securities, derivatives, loans)	29,9	24,8	25,9	43,5	46,1	40,6	41,4	43,1	42,7	40,3	41,8
Institutional investors	**Direct**	5,7	5,3	4,3	4,3	3,3	3	2,7	2,3	2,2	1,7	1,7
	Indirect	4,3	5,3	5	4,2	4,8	5,8	6,3	6,1	6	6,4	7
	Other shares and participations	39,5	39,5	40,7	35,2	46,8	48,7	46,5	46,8	50,3	49,3	49,1
	Other (debt securities, derivatives, loans)	50,5	49,9	50	56,3	45,1	42,5	44,5	44,8	41,5	42,6	42,2









Appendix 2: The iReSOLVE actions and requirements according to CE principle (Mendoza et al., 2017)

Circular economy principles	iReSOLVE actions	iReSOLVE requirements
Principles 1, 2 and 3	REGENERATE	Shift to renewable energy and materials
		Reclaim, retain, restore health to ecosystems
		Return recovered biological resources to biosphere
Principles 2 and 3	SHARE	Share assets
		Reuse, second-hand use
		Prolong product life (durable design, maintenance, repair)
Principles 2 and 3	OPTIMIZE	Increase product performance and efficiency
		Remove waste in production and supply chains
		Leverage big data, automation, remote sensing, steering
Principles 2 and 3	LOOP	Remanufacture products or components
		Recycle material
		Digest anaerobically
		Extract biochemical from organic waste
Principles 1 and 3	VIRTUALIZE	Dematerialize directly
		Dematerialize indirectly
Principles 1 and 3	EXCHANGE	Replace old with advanced non-renewable material
		Apply new technologies
		Choose new products/services
Principles 1, 2 and 3	IMPLEMENT	An ambitious vision/target
		A scaled-up business plan with a roadmap
		Stakeholder engagement
		Systems thinking (value chain, cross-cycle, cross-sector)
		Specific step-by-step guidelines and supporting tools

Appendix 3: Semi-structured interview list of questions (Dutch)

Interview: Institutionele beleggers en circulaire (bestaand) vastgoed

Toelichten eigen onderzoek

Algemene vragen:

- Kunt u uitleggen waar u zich precies mee bezig houdt hier bij _____?
- Over het algemeen, Wat ziet u bij beleggers binnen duurzaam vastgoed ontwikkeling?
- Bent u bekend met het fenomeen circulaire economie in (bestaand) vastgoed?

Over beleggers

- In welk type producten belegt een institutionele belegger over het algemeen binnen vastgoed?
  (Direct vastgoed (in stenen) of indirect vastgoed (in fondsen), ontwikkelingsprojecten of bestaande bouw)
- Wat is normaliter de afweging die beleggers maken om te beleggen in een bepaald product?
  (Rendement-risico verhouding, spreiding van risico, maatschappelijke bedrage?)
- Waar halen institutionele beleggers hun informatie ter behoeve van hun beleggingen?
  (zelf marktanalyse, advies van andere partijen)
- Waardoor worden beleggers getriggerd om duurzaam te beleggen?
  (Rendement? Risico? Maatschappelijke bijdrage?)
- Beleggen institutionele beleggers alleen maar in de vorm van fondsen of doen ze dit tegenwoordig ook in losse grootschalige projecten?
  (Gaan beleggers alleen maar mee als investering in de vorm van een fonds plaatsvindt?)
- Hoe staat de investeringsmarkt open voor de circulaire economie? (duurzame ontwikkeling)
- Hoe ziet het proces eruit van initiatief van beleggen tot de daadwerkelijke belegging?
- Betreffend RI van vastgoedfondsen; wat voor projecten financieren institutionele beleggers met een dergelijk fonds?

Circulaire Economie

- Wat is uw visie op de circulaire economie? Hoe definieert u het? Hoe definieert u het in vastgoed?
- Op welke wijze heeft de context van de CE invloed op de doelstellingen en strategie van uw organisatie gehad?
- Hoe speelt uw organisatie in op de onzekerheden rondom de CE?
- Op welke wijze zet uw organisatie strategie in om in te spelen op veranderende omgeving betreffend de CE?
- Zijn er voorbeelden waar institutionele beleggers hebben belegd in een circulair project?
  (Hoeft niet alleen vastgoed te zijn, wel gerelateerd aan gebiedsontwikkeling)
- Ziet u mogelijkheden voor institutionele beleggers/asset managers om te beleggen in het circulaire herontwikkelen van bestaand vastgoed?
- Wat zou de doorslag geven voor institutionele beleggers om in dit soort projecten te investeren?
  (Financieel, maatschappelijk, etc + triggers; Welke voorwaarden stellen institutionele beleggers aan een investering in duurzaamheid?)
- Zijn er maatregelen getroffen door overheid/gemeente/andere partijen om het investeren in circulaire economie te stimuleren?
- Hoe moet de vastgoedsector deze (mogelijke) veranderende marktsituatie aanpakken?

Strategie

- Hoe wordt binnen uw organisatie strategie opgevat? Ziet u het als een proces, buisness model, positie?
- Wie bakent en richt de activiteiten die uw organisatie nastreeft af/in?
- Hoe komt de strategie binnen uw organisatie tot stand (top-down, emergent, bottum-up)?
- Wat zijn volgens u de belangrijkste macroveranderingen om een strategie te wijzigen?
- Welke andere veranderingen zouden van invloed zijn om een strategie te kunnen veranderen?
- Hoe dient volgens u een nieuw geformuleerde strategie in een organisatie te aarden?

Slotvragen

- Zijn er mensen in u netwerk die ik nader kan benaderen over circulaire ontwikkeling van bestaand vastgoed?
- Ben ik iets vergeten te vragen?

Appendix 4: Summaries of the Delphi Rounds (Dutch)

Results Delphi Round I

Vraag 1:
Welke vastgoedgebonden aspecten vindt u als investeerder belangrijk bij het investeren in kantorenvastgoed en hoe zwaar tellen deze aspecten mee? Geef per aspect toelichting waarom het belangrijk is en waarom het een bepaalde weging heeft.

Veel genoemde aspecten zijn locatie, flexibiliteit (van ruimte-indeling & installaties) en duurzaamheid. Ook de grootte, kwaliteit en architectuur van het gebouw worden een aantal keer genoemd. Financiële aspecten worden maar beperkt benoemd. Eenmalig naar voren komende aspecten als capex, opex, financiële parameters en risicokwalificaties vallen hieronder. Ten slotte worden de aspecten toepasbaarheid op smart gebruik, inspeelbaarheid op health & well-being en parkeerplaatsen nog genoemd (allen 1x). In de bijlage vindt u een toelichting op elk van deze aspecten.

Vraag 2:
Welke vastgoedgebonden aspecten vindt u als investeerder belangrijk bij de renovatie/ revitalisering/ reparatie van een kantorengebouw die in uw bezit is? Geef per aspect toelichting waarom dit belangrijk is.

Meerdere participanten hebben aangegeven dat hun antwoord op deze vraag overeenkomt met het antwoord op de eerste vraag (zie hierboven). Locatie wordt hier echter niet meer genoemd. Het aspect duurzaamheid wel. Het staat bovenaan in het aantal keer dat het genoemd is. Hierbij wordt vooral gedacht aan energiebesparing, duurzame energieopwekking en materiaalhergebruik. Na duurzaamheid volgen aspecten als flexibiliteit (van ruimte-indeling), health & well-being en mogelijkheid tot herpositionering van het gebouw. Het laatste aspect dat genoemd wordt (1x) is rendement-risicoverhouding, een financiële parameter. In de bijlage vindt u een toelichting op elk van deze aspecten.

Vraag 3:
In hoeverre komt het CSR of RI (Responsible Investment) beleid van uw bedrijf in de bovengenoemde aspecten terug? Geef een toelichting waarom en hoe dit terugkomt.

Uitspraken die gegeven zijn:

"Ons CSR beleid vloeit door in alles wat we doen, dus ook in onze portefeuille en ons aankoopbeleid. Bij elke aankoop doen we een uitgebreid assessment wat de mogelijkheden zijn voor het verduurzamen van het kantoor. Daarbij geldt dat elk gebouw duurzaam moet zijn in termen van BREEAM of de potentie moet hebben om een duurzaam gebouw te worden. Bij elke renovatie wordt gekeken naar hoe we het gebouw duurzamer kunnen maken."

"Een aantal voorbeelden over hoe onze RI-beleid terugkomt:
- Belegger met langetermijn visie.
- Betrokken bij verbetering van de omgeving, waarin het gebouw staat (gebiedsmanagement).
- Concrete doelen voor GRESB-score, BREEAM-certificering, vermindering energieverbruik, aantal te sluiten green-leases, etc."

"Wij hebben als organisatie ons duurzaamheidsbeleid geformuleerd vanuit een drietal perspectieven: Environment, Social en Governance. Wij zijn van mening dat wij als kantoorbelegger een significante impact kunnen maken en duurzaam en toekomstig beleid leidt tot beter resultaten. Het is onze kerntaak om het best mogelijke rendement op beleggingen voor onze aandeelhouders te bereiken door middel van pro-

actief asset management, value add-initiatieven en actieve kapitaalherwinning. Wij streven naar een waardevolle creatie op lange termijn. Door prestaties te combineren met duurzaamheid, streven we naar waardevolle creatie op lange termijn. Onze ambitie op het terrein van duurzaamheid is complementair aan onze kernactiviteiten. Daarom is de duurzaamheidsstrategie in onze processen verankerd. Wij zijn toegewijd aan duurzaamheid en geloven dat we geen investering zullen maken als het geen positieve impact heeft op de duurzaamheidsstrategie. Daarom is in onze investeringsbeslissing de duurzaamheidsstrategie essentieel in de besluitvorming. Op operationeel / portefeuilleniveau geloven wij dat we jaarlijks een ambitie moeten stellen om onze carbon footprint te verminderen."

"Als Responsible Investor integreren we ESG-beleid in ons volledige investeringsproces. Tegelijkertijd zijn wij zelf nooit 100% eigenaar van vastgoed. Wij stellen dan ook voorafgaand aan een investering vast of het beleid van partners overeenkomt met onze visie en oefenen als investeerder/ aandeelhouder druk uit op de partijen die verantwoordelijk zijn voor bovengenoemde aspecten om het maximaal haalbare te realiseren op het vlak van duurzaamheid."

"Ons beleid zit voor een groot deel in het scoren van een hoog BREEAM-label, daarmee wordt een groot deel van de duurzaamheidsvoorwaarden gerealiseerd"

"Het CSR-beleid van onze onderneming komt in al deze aspecten terug. Indien het hier niet aan voldoet kunnen wij niet overgaan tot een koop of investering."

"CRI is een doelstelling op portefeuilleniveau. Bij individuele investeringen wordt daar alleen zijdelings naar gekeken."

Aspecten bij vraag 1:
Welke vastgoedgebonden aspecten vindt u als investeerder belangrijk bij het investeren in kantorenvastgoed en hoe zwaar tellen deze aspecten mee? Geef per aspect toelichting waarom het belangrijk is en waarom het een bepaalde weging heeft.

- **Locatie (6x)**
  Dit aspect is lastig maakbaar en daarom zeer belangrijk. Met behulp van big data en vastgoed analyses zijn targetmarkets vastgesteld. Er wordt hierbij ook gekeken naar verschillende deelmarkten in een gemeente. Locatie wordt vaak bekeken in combinatie met het gebouw en huursituatie om te zorgen voor succesvolle verhuur en rendement. Daarnaast zorgt diversiteit van functies en verschillende mensen in de directe omgeving voor een goede basis voor een inspirerend werkklimaat. Een mix van sport, cultuur, opleidingen, en activiteiten. Goede bereikbaarheid door auto en OV alsook een hoog voorzieningenniveau zijn van belang. Er wordt door één partij alleen nog geïnvesteerd in kantoren die in de 4 grote steden liggen en daarbinnen alleen nog maar op specifieke locaties waar de meeste groei wordt verwacht.
- **Flexibele indeelbaarheid van ruimten (6x)**
  Dit aspect telt zwaar mee om multi-tenant invulling te kunnen realiseren. Verschillende huurders met uiteenlopende expiratiedata van contracten in één gebouw beperkt het risico op grootschalige leegstand. Zowel omdat dit de kans kleiner maakt dat het gebouw in één keer leegkomt door expiratiedata van huurcontracten, als het feit dat er spreiding is in de kwaliteit van huurders, het geen het debiteurenrisico verkleint. Verschillende huurders hebben andere eisen. Het gebouw moet deze zoveel mogelijk kunnen bedienen.
- **Duurzaamheid (5x)**
  Er is steeds meer vraag naar duurzame gebouwen (zowel bij investeerders als gebruikers). Duurzame gebouwen leveren een hoger rendement op lange termijn. De mate van duurzaamheid gaat hand in hand met de benodigde capex. De mate van de uiteindelijk gewenste duurzaamheid is belangrijk voor het fonds, maar telt niet zozeer mee in de aanschaf. Met voldoende investeringen is ieder object duurzaam te maken.

- **Groote van het gebouw / Vloeroppervlakte/ maatvoering (3x)**
  Het volume van het gebouw moet passen in de "take-up" van een bepaald gebied. Het product moet in breedte, hoogte, oppervlakte passen bij wat de markt vraagt.
- **Kwaliteit van het gebouw (3x)**
  De kwaliteit van het gebouw moet hoog zijn. Dit wordt bekeken vanuit verschillende perspectieven (technisch, toegankelijkheid, comfort, toekomstbestendigheid, gebruiker, en kantoorconcepten).
- **Architectuur (2x)**
  Het gebouw moet modern zijn, passend in de omgeving en de tijdsgeest. Dit heeft te maken met het verkrijgen van een omgevingsvergunning en het behouden van de kwaliteit van een gebied.
- **Flexibiliteit in de installaties (1x)**
  Flexibiliteit is nodig omdat huurders komen en gaan en allemaal andere eisen hebben.
- **Toepasbaarheid op smart gebruik (1x),**
  Dit is nodig omdat huurders daar om (gaan) vragen.
- **Inspeelbaarheid op het onderwerp Health & Well-being (1x)**
  Dit is nodig omdat huurders daar om (gaan) vragen.
- **Aantal parkeerplaatsen (1x)**
  Het gebouw dient voldoende parkeerplaatsen te hebben (e.e.a. afhankelijk van de ligging en ov-mogelijkheden in de buurt).
- **Verwachte Opex (1x)**
  Indien het gebouw hogere operationele kosten heeft dan andere vergelijkbare gebouwen, zal dit minder rendement opleveren.
- **Benodigde Capex (1x)**
  De benodigde investeringen zullen worden meegenomen in de rekensommen van de acquisitie. Tellen niet heel zwaar mee omdat ze worden beschouwd als investering en kunnen dus worden gezien als een meerwaarde voor je object.
- **Materiaalgebruik (1x)**
  Materiaalgebruik dat leidt tot een zo hoog mogelijk BREEAM-NL label (minimaal 'excellent', het liefst 'outstanding') dan wel voor bestaande bouw BREEAM-in-use (minimaal 'very good', het liefst 'excellent').
- **Huursituatie (1x),** geen toelichting.
- **Risicokwalificaties (1x),** geen toelichting
- **Financiële parameters (1x),** geen toelichting

Aspecten bij vraag 2:
Welke vastgoed-gebonden aspecten vindt u als investeerder belangrijk bij de renovatie/ revitalisering/ reparatie van een kantorengebouw die in uw bezit is? Geef per aspect toelichting waarom dit belangrijk is.

- **Duurzaamheid (7x)**
  Een deel van de kwaliteit wordt bepaald door de duurzaamheid van het gebouw indien dat zorgt voor lagere lasten voor huurders, denk aan energielasten. Aandacht gaat uit naar (4x) de mogelijkheden om (fors) energie te besparen, (1x) duurzame energieopwekking, en (3x) materiaal(her)gebruik. Veelal wordt een bepaalde duurzaamheidscertificering ten doel gesteld, denk aan BREEAM (3x).
- **Materiaal (her)gebruik (4x)**
  Dit aspect betreft de vloer, gevel en dak (trias energetica). Er wordt gekozen voor de meest duurzame installatie door energetisch zuinig met energie om te gaan. Zoals variabele volume systemen. Installaties voorzien van regelaars zodat huurders individueel hun comfort kunnen regelen. Wat betreft de akoestiek, worden materiaalsoorten geselecteerd die geluidsoverdracht

minimaliseren en geluidsabsorptie maximaliseren. Verlichting: led verlichting die door daglicht en beweging worden gedimd / geactiveerd.

- **Indeelbaarheid (4x)**

  Het gebouw moet courante vloeren kunnen bieden. Multi-tenant heeft hierin de voorkeur. Het moet makkelijk indeelbaar zijn voor allerlei workplace solutions: omdat huurders komen en gaan en allemaal andere eisen hebben.
- **Health and well-being (3x)**

  Het gebouw moet het werkklimaat, sfeer en het imago ten goede komen. Rustige werkplekken, maar dynamiek in algemene ruimten.
- **(Her)positionering van het gebouw (3x)**

  Het gebouw moet kunnen worden geüpgraded tot een prime gebouw met de kwaliteit die de markt verwacht. Het moet de wensen vervullen van de toekomstige gebruiker, anders trekt het geen huurders meer aan. De gebruiker moet centraal staan, die betaalt de huur. Het kan ook nadrukkelijk het doel zijn om het kantoor na herontwikkeling en verhuur te verkopen, om de waarde die is toegevoegd te gelde te maken. Het toepassen van / voorbereiden op smart building toepassingen wordt ook genoemd. Hier gaan huurders naar vragen.
- **Rendement-risico-verhouding (1x)**

  Er moet een positieve business case zijn.

Results Delphi Round 2

Vraag 1:
In de eerste ronde zijn financiële parameters (zoals rendement) nauwelijks genoemd. Zou u kunnen toelichten waarom dit het geval is? Wat is het belang van financiële parameters ten opzichte van de door u genoemde parameters?

Een veel genoemde reden is dat de vraagstelling dusdanig op de fysieke kenmerken van een vastgoed object wees, en niet naar overig vastgoed gerelateerde parameters. Echter werd door iedere partij bevestigd dat financiële parameters zoals risico en rendement zeer belangrijke; al dan niet de belangrijkste; uitgangspunten zijn bij een investering in kantoren vastgoed.

Vraag 2:
Wat zijn uw doelstellingen / targets op het gebied van duurzaamheid zoals vastgesteld in uw CSR/RI beleid en hoe vertaalt zich dit naar de praktijk? Kunt u hier concrete voorbeelden van geven?

Meerdere participanten hebben bij de beantwoording van deze vraag concrete voorbeelden gegeven wat betreft targets op het gebied van duurzaamheid. Daarbij zijn de gegeven antwoorden op verschillende niveaus gegeven, waaronder op gebouwniveau als op portefeuille- en bedrijfsniveau. Ook zijn de verschillende target in te delen op korte en lange termijn. Door de vertrouwelijkheid van deze informatie kunnen exacte details niet worden gedeeld.

Targets die op bedrijfsniveau genoemd werden zijn:
- Klimaatneutraliteit;
- Vermindering van de gemiddelde impact op het milieu;
- Zero waste;
- Zero carbon emissies;
- Eigen energieopwekking;
- Verminderen van energie gebruik

Targets die op portefeuilleniveau genoemd werden zijn:
- Het behalen van een GRESB[1] score;
- Outperforming peer group.

Targets die op gebouwniveau genoemd werden zijn:
- Het behalen van BREEAM-NL[2] labels (In-Use);
- Het behalen van EPC-labels[3]
- Het installeren van WKO's.

Het behalen van green- en energielabels/certificaten worden beide op portefeuille- als op gebouwniveau als target meegenomen.

Ook op 'stakeholderniveau' worden target genoemd, waaronder:
- Optimaal engagement van partners in de keten
- Het periodiek meten van CSR doelen
- Huurderstevredenheid

[1] GRESB – Global Real Estate Sustainability Benchmarks
[2] BREEAM - Building Research Establishment Environmental Assessment Method
[3] EPC – Electronic Product Code

- Marktconform ESG-beleid van huurders
- Green leases (huurcontracten die het verduurzamen van het gebouw aantrekkelijk maken voor de huurder als de verhuurder)
- Duurzame beheer- en onderhoudscontracten
- Customer Due Diligence ter behoeve van het selecteren van integere business partners en het opnemen van duurzaamheidsclausules in nieuwe contracten.

Vraag 3:
Wat is uw definitie van circulariteit in herontwikkeling van bestaand vastgoed?

Uitspraken die gegeven zijn:

“Het toepassen van materialen die hergebruikt kunnen worden.”

“In het kort: gebruik van herbruikbare materialen en oplossingen.”

“Wij hanteren geen eigen definitie hiervoor. Het herontwikkelen an sich getuigt al van circulariteit. Het vervolgens hergebruiken van materialen in de herontwikkeling idem. Daarnaast het toepassen van nieuwe componenten die op hun beurt circulair zijn.”

“Het op een zo efficiënt en duurzame manier hergebruiken van grondstoffen en materialen voor het te herontwikkelen gebouw of voor andere gebouwen in de omgeving.”

“Het zo veel als mogelijk gebruik maken van al aanwezige bronnen en materialen in zowel de exploitatie als de realisatie van vastgoed.”

“Zo maximaal mogelijk gebruik maken van reeds gebruikte grondstoffen; waarbij idealiter een zo klein mogelijk kringloop wordt aangehouden zodat er zo weinig mogelijk grondstof en waarde verloren gaat.”

Naar aanleiding van de bovenstaande uitspraken valt het op dat er veel antwoorden nagenoeg hetzelfde zijn. Een veel voorkomend antwoord is het hergebruik van materialen. Echter zijn er geen grote verschillen zichtbaar. De verschillen die er zijn zitten in de nuances om het hergebruik te omschrijven. In essentie, op basis van de gegeven uitspraken, zitten alle partijen op dezelfde lijn.

Vraag 4:
Wat zijn uw verwachtingen van de invloed van de circulaire economie op bestaand vastgoed in de komende 10 jaar?

Er zijn geen grote verschillen in de verwachtingen die de participanten hebben ten aanzien van de invloed van de circulaire economie op bestaand vastgoed. De noodzaak om materialen en grondstoffen uit bestaande gebouwen te hergebruiken zal toenemen door de toenemende schaarste van grondstoffen. Men verwacht ook dat opdrachtgevers in de gebouwde omgeving steeds meer zullen vragen naar circulaire alternatieven. Mits er marktpartijen zijn die deze circulaire alternatieven kunnen aanbieden zullen opdrachtgevers daar vaker voor kiezen.

Opdrachtgevers zullen voornamelijk kaders stellen in de opdrachten die zij uitzetten om zo maximale circulariteit na te streven. Bij onderhoud en herontwikkeling verwachten de participanten daarom meer eisen, regels en verantwoording. Adviserende en uitvoerende partijen zullen voor de versnelling van het circulair denken innovatief te werk gaan. Er wordt nu al begonnen met icoongebouwen en het opzetten van marktplaatsen voor materialen; dit zal de kennis van circulariteit vergroten en het

uitwisselen van grondstoffen versnellen. Enkele participanten verwachten dat de circulaire economie als concept zich nog zal moeten bewijzen, zowel op hoe duurzaam het is als op hoe rendabel het is. Het 'mainstream-maken' van het concept moet nog grote stappen maken wil het goed toegepast kunnen worden.

Vraag 5:
Wat moet er gebeuren om circulariteit als randvoorwaarde mee te nemen in uw investeringsbesluit voor herontwikkeling van vastgoed? Kunt u hier voorbeelden van geven?

Uitspraken die gegeven zijn:

"Circulariteit moet onderdeel uitmaken van de het businessplan en moet verwerkt worden in het uiteindelijke design."

"Circulariteit moet credits krijgen binnen duurzaamheidsmeetlatten zoals BREAAM en GRESB. Deze certificering kan gebruikt worden om circulariteit te belonen. Mede door deze certificering dienen succesvolle voorbeeldprojecten te ontstaan met verhoogde rendementen (dat voort komt uit circulariteit) waardoor het onderwerp meer publiciteit krijgt."

"Opdrachtgevers/eigenaren dienen vooral kaderstellend/richtinggevend te zijn door de opdracht te geven om, binnen gestelde budgetten, naar maximale circulariteit te streven."

"Circulariteit binnen het bredere kader van ESG is nog een relatief onbekend onderwerp. Veel bedrijven zijn er al impliciet mee bezig maar niet expliciet. Het zou dus goed zijn als circulariteit bredere aandacht krijgt, er best practices komen van circulariteit en er meetbare criteria komen om de mate van circulariteit te meten."

"Circulariteit moet bijdragen aan de rentabiliteit door bijvoorbeeld, naast verduurzaming, ook een verhoging van het comfort te geven. Zodra circulariteit een dubbele functie gaat vervullen, zal het eerder als randvoorwaarde worden meegenomen door institutionele beleggers."

"Circulariteit moet kwalitatief even goed zijn; het moet niet (veel) meer kosten; het moet voorradig zijn; partners moeten er ook mee werken (het moet mainstream worden)"

De bovenstaande uitspraken lopen redelijk uiteen. Echter zijn er enkele onderwerpen die in meerdere uitspraken direct of indirect terug komen. Dit zijn onderwerpen met betrekking tot het meetbaar maken, het inzichtelijk maken van de toegevoegde waarde en het bekend maken van circulariteit in de herontwikkeling van vastgoed.

Results Delphi Round 3

Vraag 1:
In de tweede ronde hebben enkele partijen duurzaamheidstargets aangegeven op zowel gebouwniveau als op portefeuilleniveau. Heeft uw partij deze verdeling ook? Zo ja, kunt u deze targets toelichten?

Ter aanvulling van de voorbeelden die gegeven zijn wat betreft targets op het gebied van duurzaamheid, zijn de volgende antwoorden gegeven:

Targets die op bedrijfsniveau genoemd werden zijn:
- Klimaatneutraliteit;
- Vermindering van de gemiddelde impact op het milieu;
- Zero waste;
- Zero carbon emissies;
- Eigen energieopwekking;
- Verminderen van energie gebruik;
- Verminderen van water gebruik

Targets die op portefeuilleniveau genoemd werden zijn:
- Het behalen van een GRESB[4] score;
- Outperforming peer group.

Targets die op gebouwniveau genoemd werden zijn:
- Het behalen van BREEAM-NL[5] labels (In-Use);
- Het behalen van EPC-labels[6];
- Het behalen van WELL-certificaat ;
- Het installeren van WKO's

Het behalen van green- en energielabels/certificaten worden beide op portefeuille- als op gebouwniveau als target meegenomen.

Ook op 'stakeholderniveau' worden target genoemd, waaronder:
- Optimaal engagement van partners in de keten;
- Het periodiek meten van CSR doelen;
- Huurderstevredenheid;
- Marktconform ESG-beleid van huurders;
- Green leases (huurcontracten die het verduurzamen van het gebouw aantrekkelijk maken voor de huurder als de verhuurder);
- Duurzame beheer- en onderhoudscontracten;
- Customer Due Diligence ter behoeve van het selecteren van integere business partners en het opnemen van duurzaamheidsclausules in nieuwe contracten;
- Samenwerken met start-ups voor duurzame innovaties

[4] GRESB – Global Real Estate Sustainability Benchmarks
[5] BREEAM - Building Research Establishment Environmental Assessment Method
[6] EPC – Energie Prestatie Coëfficiënt

Vraag 2:
Wat zijn de barrières die er voor zorgen dat de investering in het circulair maken van bestaand vastgoed momenteel niet mogelijk maakt? Kunt u hier concrete voorbeelden van geven?

De antwoorden die door respondenten gegeven zijn komen vrijwel overeen met elkaar. De volgende barrières zijn genoemd:

- Onduidelijkheid betreffend het begrip circulariteit in bestaand vastgoed;
- Ontbreken van een meetlat;
- Complexiteit in het toepassen in bestaand vastgoed (tijdsdruk bij herontwikkeling);
- Te weinig voorbeeldprojecten, bekendheid;
- Gebrek aan inzicht van financiële voordelen;
- Gebrek aan inzicht in mogelijkheden van hergebruik van materialen;
- Gebrek aan inzicht in gebruikte materialen;
- Gebrek aan specialistische partijen (kennis);
- Gebrek aan beleid vanuit beleggers

Een partij is onder de veronderstelling dat het organiseren van circulariteit niet op gebouwniveau, maar voornamelijk op gebiedsniveau moet worden georganiseerd. Welke partij hier de regisserende rol moet nemen is nog onduidelijk.

Vraag 3:
Naar uw mening, wat zou deze barrières kunnen wegnemen?

Een veel genoemde oplossing is het aantoonbaar maken van hoe circulariteit kan worden toegepast, wat de voordelen zijn, en het opzetten van richtlijnen. Dit kan mede gedaan worden door:

- Het opzetten van een duidelijke meetlat voor bestaande bouw;
- Circulariteit als vast onderdeel meenemen in renovatie en onderhoud;
- Iconische projecten met toonaangevende stakeholders opzetten;
- Het aantoonbaar maken van de toegevoegde waarde op de samenleving en gebruikers;
- Het inzichtelijk maken hoe circulariteit bijdraagt aan de doelstellingen van Parijs

Een partij is van mening dat taxateurs een belangrijke rol kunnen spelen door aan te tonen dat het circulair maken van bestaand vastgoed meer positievere waarde effecten heeft dan een traditionele aanpak. Meerdere participanten hebben gedurende het onderzoek een aantal keer aangegeven dat voorbeelden van belang zijn. Dit zijn voorbeelden betreffend het vastgoed zelf, het vormgeven van het beleid en tot slot nieuwe verdienmodellen.

Vraag 4:
Verwacht u dat vermogensbeheerders het initiatief willen of moeten nemen, om circulariteit een kans te geven om zichzelf te bewijzen? Of moeten andere marktpartijen dat doen? En zo ja, welke dan en waarom?

Ondanks dat vrijwel iedere partij beseft dat zij als vermogensbeheerder zelf invloed hebben om circulariteit een kans te geven, wordt er verwacht dat er samenwerking (tussen investeerders, beheerders, ontwikkelaars en de overheid) noodzakelijk is. Hierbij worden publieke partijen voornamelijk door de participanten genoemd, waaronder het Rijksvastgoedbedrijf, gemeenten en andere overheidsinstanties. Een voorbeeld die gegeven is, is de manier waarop het BREEAM certificaat in Nederland is opgezet. Een eenmalig naar voren gekomen antwoord is dat partijen elkaar moeten meenemen in het proces en ze allen moeten investeren in het onderzoek naar de mogelijkheden in

plaats van de vinger naar elkaar te wijzen. Een kritisch punt is de rol van de aandeelhouder die wellicht ook invloed zou kunnen hebben op het toepassen van circulariteit. Slechts één partij stelt de vraag over wat de aandeelhouder wil met betrekking tot dit onderwerp.

Vraag 5:
Wat is er nodig om te zorgen dat de vermogensbeheerder de initiatiefnemer wordt bij het toepassen van circulariteit in herontwikkeling van hun portefeuille?

Vrijwel iedere partij heeft behoefte aan voorbeelden en inzichten van anderen partijen om vervolgens zelf aan de slag te gaan met circulariteit in de bestaande bouw. Dit zijn deels ook de barrières die bij de eerdere vragen benoemd zijn. Enkel een partij noemt dat een object op een dusdanige goede locatie loont om het te blijven herontwikkelen en aan te passen op de behoefte van gebruikers.

Results Delphi Round 4

Vraag 1:
In de voorgaande rondes is het belang van voorbeeldprojecten benadrukt. Één partij gaf aan al bezig te zijn met een circulair pilot. Heeft u een of meerdere voorbeelden van wat u kan bijdragen aan een dergelijk 'experimenteel' voorbeeldproject? Licht deze toe.

Zes van de zeven participanten geven aan nog geen concrete voorbeelden te hebben als circulaire pilot. De andere heeft het project genoemd maar door de aard van het project wordt deze niet genoemd omdat dan de participant kan worden herleidt. Sommige deelnemers geven aan wel bezig te zijn om stappen te zetten in circulariteit, zoals het opstellen van circulaire notitie om toekomstige adviseurs en leveranciers te verplichten aan te geven hoe circulair ze zijn. Tot slot noemt een participant dat er niet in experimentele pilots wordt geïnvesteerd maar dat het altijd een onderbouwde business case moet zijn.

Vraag 2:
Wordt CSR/RI beleid beïnvloed door de vraag van uw huurders (de gebruikers)? Merkt u dat vanuit deze groep de vraag naar circulariteit steeds groter wordt en hoe reageert u hierop?

De antwoorden die door respondenten gegeven zijn komen vrijwel overeen met elkaar. De volgende antwoorden werden gegeven:

- Geldt alleen voor kantoren, grote corporaties vragen alleen om energie zuinig gebouw
- Beleid wordt zeker beïnvloed met name op duurzame gebouwen. De vraag naar circulaire gebouwen is echter nog niet expliciet aanwezig;
- Wij hebben niet direct contact met huurders maar horen wel via externe managers inderdaad steeds meer vraag naar ESG/CSR/RI, maar niet specifiek naar circulariteit;
- Feitelijk nog niet;
- Slechts een gering deel van de huurders heeft vragen die ons CSR/RI beleid raken. Er is nog nooit een vraag/verzoek m.b.t. circulariteit gekomen;
- Meer vraag, maar beleid veranderd niet echt omdat vraag en beleid vaak al overeenkomen. Doelen zijn nog weinig over circulariteit maar meer over energie, groen en in mindere mate van materiaalgebruik;
- In beperkte mate. Slecht een klein deel van onze huurders informeert zelf naar de manier waarop wij invulling geven aan het verduurzamen van onze gebouwen. Binnen de algehele verduurzaming komt circulariteit heel weinig aan de orde.

Vraag 3:
Wat verwacht u van de overheid tijdens de samenwerking bij het toepassen van circulariteit in de bestaande bouw? Welke rol ziet u graag die zij moeten innemen?

De antwoorden met betrekking tot de verwachting van de overheid op dit gebied lopen er uiteen, al wordt er in essentie telkens verwezen naar een stimulerende rol. De antwoorden zijn als volgt:

- Opstellen van eisen t.a.v. duurzaamheid
- Stimulerende rol en geen beperkende rol door wet- en regelgeving
- In het algemeen zou een overheid zich erin moeten mengen als de markt het niet zelf oplost. Uiteraard kan de overheid toepassing van circulariteit vereisen bij projecten die voor de overheid gerealiseerd worden. De overheid was ook voortrekker in het eisen van energielabels voor de gebouwen die zij huurt.
- Een rol met name vanuit de samenwerking met marktpartijen

- Aantonen nut en noodzaak, voorbeeldprojecten, Rijksvastgoedbedrijf als stimulator en voorbeeldgever
- in het algemeen: duurzame/circulaire toepassingen moeten financieel interessanter worden dan grijze/fossiele oplossingen. hiervoor is beboeten van 'vervuilend/uitputtend' mijns inziens beter dan subsidie op 'energiezuining/circulair'. Daarnaast is het belangrijk dat er goede wetgeving met minimaal eisen komt. Ik merk dat wetgeving goed werkt, dan moet iedereen en doet het minder met je concurrentiepositie.
- Stimulering door subsidies of fiscale voordelen. Een podium geven voor goede voorbeelden.

Vraag 4:
Kunt u de barrières en oplossing in de onderstaande lijst rangschikken? (barrières van 1 t/m 9 waarbij 1 de grootste is en de oplossingen van 1 t/m 5 waarbij 1 de belangrijkste is)

De rangschikking voor de barrières is als volgt:

Barrière: *Participant:*	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Onduidelijkheid begrip circulariteit	9	1	6	4	2	2	9
Ontbreken meetlat	4	2	5	5	3	4	8
Complexiteit in de toepassing	6	3	4	6	6	1	2
Te weinig voorbeeldprojecten	8	5	8	3	4	6	3
Gebrek aan inzicht van financiële voordelen	2	4	1	7	1	7	1
Gebrek aan inzicht m.b.t. hergebruik van materialen	5	6	2	9	8	3	4
Gebrek aan inzicht van al gebruikte materialen in de objecten	7	7	3	8	9	5	5
Gebrek aan specialistische partijen	3	8	7	1	5	8	6
Gebrek aan beleid vanuit de belegger	1	9	9	2	7	9	7

De rangschikking voor de oplossingen is als volgt:

Oplossing: *Participant:*	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Opzetten van een meetlat	5	1	4	4	3	1	4
Circulariteit als vast onderdeel meenemen bij herontwikkeling en onderhoud	2	4	3	3	2	2	5
Opzetten iconische voorbeeldprojecten	4	3	5	1	4	3	3
Aantoonbaar maken van toegevoegde waarde op samenleving en gebruikers	1	2	1	2	1	4	1
Inzichtelijk maken wat circulariteit bijdraagt aan Parijs doelstellingen	3	5	2	5	5	5	2

Appendix 5: List of all interview participants

Attached pdf.

Appendix 6: Interview recordings

Attached digital media file.

"Denk aan de toekomst van deze wereld, en wat voor rol u daar in wil spelen. Denkt u dat u verantwoordelijkheid heeft? Denkt u dat u power heeft in deze wereld? Ik denk het wel. Maar als u de wil heeft, om deze wereld een andere kant op sturen? Dat is aan u."

Feike Sijbesma
CEO of Royal DSM
At the meeting PGGM Pensioendialoog: Circulaire Economie
Zeist, 2014