EXTERNAL UNCERTAINTY AS A DRIVER OF STRUCTURAL CHANGE IN REAL ESTATE DECISION FACTORS

AN EXPLORATIVE STUDY

Graduation report – Final version

Sybren Geldof – 4146662
Lab: Structural change in Corporate Real Estate Management
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TU Delft

Personal
S. K. (Sybren) Geldof
4146662

A:
P:
T:
E.

Lab
Structural Change in Corporate Real Estate Management

Mentors
Lab coordinator: ir. Herman van de Putte
First mentor: ir. Herman van de Putte
Second mentor: dr. ir. Ruud Binnekamp
Third commissioner: dr. ir. Franklin van der Hoeven

Title
External Uncertainty as a Driver of Structural Change in Real Estate Decision Factors – an explorative study

Research question
"To what extent does external uncertainty change the decision factors for accommodation of multinational corporations?"

Front page picture: (Tompsett, M. n.d.)

Preface

This report consists of my graduation thesis at the faculty of Architecture at Delft University of Technology. For the last 10 months, I worked on this research, resulting in this final graduation report.

The choice of my graduation research started with my personal interest in corporate real estate and the combination of some recent developments I read in the news. I've always been interested in the creative process of CREM and solving the puzzle of core business strategies, emerging trends the related CRE strategies accordingly. In addition, I think that politics, economics and their interrelationships are interesting and I see some current political and economic developments in the Netherlands, Europe and the rest of the world that are possible threats to current practices in real estate. Since I wanted to do research on a recent subject, to contribute to a current problem, I combined both my interests in this research subject.

The last 10 months were probably the most intense ones in my university career; and this was solely my fault. Combining the graduation curriculum with electives, being the chairman of the board of B.O.S.S. and doing an internship at Cairn Real Estate resulted in a very challenging palette of activities. Of course I want to thank everyone who helped me accomplishing all these tasks.

First I want to thank both mentors, Herman vande Putte and Ruud Binnekamp, who always responded positively and supportive to my ideas and developments and guided me actively through this process. Secondly, I want to thank my colleagues at Cairn Real Estate for the interesting internship, but above all the help with finding interview candidates. This speeded up my graduation process very much. Also I want to thank all my fellow board members, since they understood the priorities and considerations I had to make in finishing this graduation. I tried to be there as much as possible! Also I want to thank my parents and brother for showing their insights and (scientific) knowledge, and for showing their support all the time. And last but not least, I want to thank my girlfriend Lisa, who was willing to discuss my subject endlessly, shared her knowledge, and trusted my progress and above all, who helped me to relax and distract my thoughts when needed.

I hope this research is as interesting for the readers as it was for me and I look forward to start my career at KPMG, where I get the chance to put the exact topic of this research into practice. To conclude, I hope that all readers will enjoy the report and I would like to thank everyone for reading in advance.

Sybren Geldof
Delft, June 29, 2017

Executive summary

Introduction

The last decade can be characterised by several events with a severe global impact. The financial crisis, since 2007, has shown the world how countries, businesses and people can be extremely harmed (The Guardian, 2011; Planbureau voor de Leefomgeving, 2013). The results of this are still visible today. At the same time new problems are awaiting. Newspapers from over the world describe the changing political climate all over the world (Van Raaij & Dekker, 2016; De Ruyter, 2016; Van IJzendoorn, 2016; Hunt & Wheeler, 2016; De Waard, 2016). This new volatile political climate and the past years of economic challenges can be assessed as an ongoing source of *uncertainty*; an aspect were businesses had to deal with, and will do so in the coming years, albeit in a different way.

The past has shown businesses to change in order to adapt when a new external situation came around. The role of real estate for these businesses changed simultaneously with the business (Krumm, Dewulf and De Jonge, 1999; Roulac, 2001). After all, real estate has to support the business strategy. Therefore, it can be expected that real estate, and its decision-making for long-term (or accommodation) investments has changed during the last decade again, as a result of this ongoing uncertainty.

These trends affect every corporation. Especially the global presence of these trends should create awareness for companies to rethink or re-evaluate their way of decision-making and the use of criteria since uncertainty can be a major cause of wrong decision-making which, especially in real estate, can lead to disasters again, like those happened during the financial crisis.

Methodology

This problem analysis and its widespread impact leads to the question if this external situation of uncertainty caused a change in corporate real estate accommodation decision-making. This is formulated in the following research question and sub-questions:

"To what extent does external uncertainty change the decision factors for accommodation of multinational corporations?"

This question refers to the criteria that are used in decision-making; the aspect of change during the last decade and the role of uncertainty in the establishment of this change. These topics are therefore translated to the following sub-questions:

- *What criteria are leading in accommodation decision-making?*
- *Have accommodation criteria changed between 2007 and 2017?*
- *Can this change be regarded as structural?*
- *What is the role of uncertainty in this structural change?*

To answer these questions the research is set-up in the following way. In general the research is empirical. The aim is to develop an explorative insight and understanding about the topic and a dissertation about the change in *accommodation decision-making* between 2007 and 2017 is given. First, a literature review is done on the state of the art in accommodation criteria, decision-making, uncertainty and uncertainty in decision-making. Subsequent, 5 semi-structured interviews are done with multinational corporations, since those are prone to global trends and events. In these interviews, accommodation projects then (2007) and now (2017) are discussed, focusing on the criteria that were used, and the weighing that was assigned accordingly. This data is reconstructed in Tetra, a decision-making model, which can reconstruct the decision-making process of the companies. This is done to verify the acquired information, and to enable the appointment of changes over

time. These changes in and criteria are eventually related to external uncertainty as a cause, and answer the research question. It is important to understand that the amount of interviewed companies is limited. Therefore, no generalisation can be made yet. This explorative study, however, develops a methodology to conduct research in this novel combination of topics. The conclusions are therefore aimed at giving an inductive explanation, meaning that the correlation between researched topics is regarded as leading so far, as long as no counter argument is established. Moreover, the procedure to execute an eventually generalizable research is now provided.

In the literature review, a list of criteria on which accommodation project decisions can be based was set up. The criteria were extracted from a broad amount of articles. These criteria are subsequently placed in time to reveal the typical emphasis on certain criteria before 2007, and after 2007. The individual criteria, however, are too varied to be comparable. Therefore a structure is needed to organise them and assess them. For this, the structure of Gibler and Lindholm (2012) is used. Their structure distinguishes the eight core pillars of corporate real estate management (CREM). These pillars are the focal points of delivering quality, or added value, to the business, which is served by the corporate real estate. The eight pillars are (Gibler & Lindholm, 2012):

1. Increasing the value of organisation's real estate assets
2. Promoting marketing, sales and organisational brand
3. Encouraging and supporting employee innovation and creativity
4. Supporting environmental sustainability
5. Enhancing employee wellbeing and satisfaction
6. Increasing employee efficiency and productivity
7. Enabling flexibility
8. Reducing real estate related costs

If the list with criteria is organised among the 8 pillars, some shifts in focus between 2007 and 2017 were recognisable among the criteria:

1. A decline in the use of *costs-related* criteria was visible
2. An increase of the *employee satisfaction* criteria was visible

These preliminary conclusions created some expectations on the practical research that is conducted to measure the same aspects. Together, more consolidated conclusions can be drawn.

In order to find criteria that are used in practical decision-making, the literature research was focused on the measurement of preference; since making decisions is based on what is preferred. To measure preference, and reconstruct it, *scales* are used to reflect reality into a model. Modelling is done in this research to check the validity of the acquired data. If the outcome of a model aligns with the actual outcome, the decision-making criteria that are provided during the interviews are a good reflection of decision-making in reality, which verifies the acquired data.

A reconstruction model needs to use *proper* scales, since this type of scale is suitable for mapping preference, and to use in mathematical calculations and models. Additional research into decision-making models is conducted, to indicate a model that could reconstruct the decision-making procedure that the interview companies had followed. Preference Function Modelling (PFM) is a methodology that uses *proper* scales. This methodology can help decision-makers to choose from a set of *existing* alternatives. PFM is therefore suitable for the (*a posteriori*) check of decision-making procedures, like is needed for this research.

Beside research on decision-making models, literature also showed that the human factor, in judgement and experience, is present in decision-making, and can have an influence on the outcomes of decision-making. This influence should not be forgotten, and will be evaluated after the data acquisition.

Literature research on *uncertainty* indicates a definition of uncertainty. *Uncertainty* is different from *risk*, since the latter one can be measured and the earlier one can only be estimated with probability or chance. In addition, a table incorporating the most important trends and events that characterised the last decade is included. These trends and events are all forms of uncertainty, since they all incorporate some aspects that makes them unmeasurable. Examples of these aspects are: elements of surprise, complexities, novelties and volatilities.

In general, the trends and events can be subdivided among five topics of uncertainty: political uncertainty, (macro-)economic uncertainty, demographic uncertainty, technological uncertainty and environmental uncertainty. As expected in the research question, political and (macro-)economic uncertainty are expected as causes of change in accommodations decision-making.

As a response to uncertainty, and in particular economic uncertainty, Singer (2005) distinguishes some real estate strategies that respond to the amount of external uncertainty. When uncertainty is low, the real estate strategies are supposed to be *standardized*; when uncertainty is moderate, the real estate strategies are supposed to be *value-based* and when the level of uncertainty is severe, the real estate strategies are supposed to be *incremental*. Expected is, that the strategies, as a result of a great amount of external uncertainty, are *incremental*, and focused on a step by step reaction on the portfolio demand.

Data collection and interpretation

To acquire the data to answer the research question, interviews are set up with 5 companies. The companies that were interviewed are anonymised in this research for privacy reasons. The focus point *uncertainty* as the driver for change was not mentioned, so the companies wouldn't be biased with this aspect. All of the companies have an international origin, crossborder management or international activities. Moreover, the interviewees are all on the position as CRE manager for the full period of investigation, to guarantee their presence and involvement during the projects.

Company 1 is in the construction sector and performs consultancy services, engineering services and project management in infrastructure, (water) engineering and real estate. It is active in over 70 countries worldwide, with over 25.000 employees. The headquarters are located in the Netherlands.

Company 2 is in the real estate investment industry. The company origins in Germany; where it was established as an investment manager for real estate, shipping, infrastructure and logistics. Clients are from Germany, the Netherlands, the UK, the United States and across Asia. In the Netherlands only, company 2 manages over 800.000 m2 of real estate, with a total worth just under 1 billion euros.

Company 3 is in the computer technology (IT) industry and is among the 5 leading IT firms globally. The company makes software, hardware and provides services complementing them. Numerous offices are located all over the world, with corporate headquarters in the United States.

Company 4 is active in the human resources (HR) industry, and has businesses in 8 European countries. The company origins in the Netherlands and its headquarters are located there today as well.

Company 5 is in the food industry, and is among the top fast-food chains worldwide. Company 5 is active in more than 100 countries but originates in the US, where its headquarters are still located today. The company owns numerous restaurants around the world, but the interview was about the corporate offices instead of the restaurants.

These interviews resulted in lists of criteria for around 2007 and around 2017, for all individual companies. But since the criteria are so diversified, just like the criteria that were found in literature, the lists are organised among the structure of Gibler and Lindholm (2012). This structure tells more about the focus of the criteria and the weighing (importance) that was assigned by the companies. Both the count and the weighing are important aspects since these reveal the division of attention but also the evolution of criteria over time.

Topics	% counted around 2007	% counted around 2017
Reducing real estate related costs	35%	17%
Increasing employee/organisation's efficiency and productivity	35%	21%
Promoting market, sales and organisational brand	19%	24%
Enabling flexibility	8%	7%
Increasing value of organisation's real estate assets	4%	2%
Enhancing employee wellbeing and satisfaction	0%	21%
Encouraging and support employee innovation and creativity	0%	0%
Supporting environmental sustainability	0%	7%

Table: 1 Counted criteria for 2007 and 2017

Topics	% of weighing in 2007	% of weighing in 2017
Promoting market, sales and organisational brand	11%	14%
Increasing employee/organisation's efficiency and productivity	40%	36%
Reducing real estate related costs	38%	20%
Enabling flexibility	6%	3%
Increasing value of organisation's real estate assets	5%	4%
Enhancing employee wellbeing and satisfaction	0%	18%
Supporting environmental sustainability	0%	5%
Encouraging and support employee innovation and creativity	0%	0%

Table: 2 Weighed of criteria for 2007 and 2017

Discussion and conclusion

The tables above indicate some shift in count and attention. Together with the changes that were indicated in literature, the list of changes can be set-up below:

1. The variety of accommodation criteria in general became bigger after 2007
2. Costs-criteria showed a drop in mentioning after 2007
3. Employee satisfaction and wellbeing were not mentioned around 2007, but became one of the most mentioned criteria around 2017
4. The variety of assigned weighing became wider after 2007; importance is divided wider
5. Practical criteria outweigh other criteria before 2007, but decline around 2017
6. Employee wellbeing and satisfaction go from 0% around 2007 to 18% around 2017, which is the biggest change among the companies
7. Branding shows an increase in weighing and thus importance

To determine whether or not these changes are structural, the occurrence of the changes is measured with each company. This implies that for each change is investigated at which companies it occurred. If a change is recognisable in all companies, a structural change can be indicated. If a change is only recognisable in one company, there is no *structural* change. For this matter, the definition of *structural* is as follows: "*a change in*

the way how parts of a coherent system are arranged". With structure, this research refers to the structure that is used to organise the criteria (parts) under the eight pillars of corporate real estate management by Gibler & Lindholm (2012, p. 36). Therefore, this structure and a *change* within this structure's elements will be subject to the assessment of *structural change*.

Change	Comp.1	Comp. 2	Comp. 3	Comp. 4	Comp. 5
Increasing criteria variety after 2007	✓		✓	✓	✓
~~Costs-criteria showed a drop in mentioning after 2007~~			✓	✓	
Employee satisfaction and wellbeing show sudden emerge	✓	✓	✓	✓	✓
Branding shows an increase in importance	✓	✓	✓	✓	✓
Division of weighing becomes wider after 2007	✓	✓	✓	✓	✓
Practical criteria show drop in importance	✓	✓	✓	✓	✓
Employee satisfaction and wellbeing show sudden big importance	✓	✓	✓	✓	✓

Table: 3 Coverage of changes at companies

Almost all changes were indeed recognised at the companies; except one. The change *costs criteria show a drop in importance* is not recognised among all the companies. This is related to the criteria of company 3. This company focused solely on costs around 2007, which brought the ratio of costs a bit out of proportion. Therefore, there is no coverage visible at the other companies. Moreover, when looking at the division of weighing, costs still account for a great deal of importance division around 2017. It can be assumed that costs are still high on the agenda of companies, but that companies are now willing to pay more for quality, both in quality of the building as in quality for the employees and branding, since those aspects show an increase in importance and count.

To answer the research question, all forms of uncertainty are linked to the acquired data. Also the opinion of the interviewees was reviewed. In the interview protocol, the question was asked to the interviewees, whether or not they thought that uncertainty was the cause of a change in decision-making. The answers of the interviewees were all somewhat alike. Overall, no direct relationship was found by the interviewees. However, the answers the provided are indeed related to some uncertain factors or uncertain *legacy*, but they were simply not aware of it. The companies' responses were mainly related to (macro-)economic changes, such as the implementation of flexible lease contracts and the double check on partners' compliances before setting up contracts.

Out of the answers that were given by the interviewees and the criteria and changes that were discovered, no single relation with the *political uncertain* environment was recognised, however. The probable cause of this, is related to the moment at which *political-influenced* choices are made. A *political-influenced* choice is the expansion for the business to a new country or location with another political climate. For businesses, the choice to expand is made as a strategic (expansion) choice. This choice is never solely triggered by a CRE department since the real estate of businesses follows the business choice and therefore the choice for expansion to a new location with a new political climate is already made when the CRE queries arise. In other words: political issues are already dealt with when the choice for accommodation is made.

Among the criteria and changes that were discovered, and among the explanations that were given by the companies, no link was revealed with *demographic uncertainty*, as was expected in the design of this research.

For *technological uncertainty*, the same applies as for demographic uncertainty. Although it is a cause of external uncertainty, it was not expected to have influenced the accommodation decision-making for multinationals in this research.

Environmental uncertainty was also assessed as a general influencer of uncertainty during the last decade, although its influence wasn't expected to reach the accommodation decision-making in this research. Environmental criteria *were* mentioned among the interviewed companies, but this was never related directly to environmental uncertainty. The companies that focused more on environmental responsibility mainly did this to be more competitive compared to other companies, or to get the right image (also in comparison to other companies).

Only *(macro-)economic uncertainty* shows a clear link with the changing accommodation criteria. Some links with the (aftermath of) the crisis were recognised in the answers of the companies. It was expected, based on literature, newspapers and journals from practice, that political uncertainty and economic uncertainty were together the biggest influencer on change. Additionally, it was expected that these causes of uncertainty led to a *very* uncertain strategic climate. At the beginning of this research, the assumption was that this uncertainty was in the middle of its severity.

However, after the conclusion that *political uncertainty* doesn't play such a big role, only *(macro-)economic uncertainty* remains as major influencer of change in decision-making among the researched companies. And since the economic environment, now the worst part of the financial crisis is over, is improving, the total amount of strategic uncertainty that is experienced by the interviewees is not *high,* but more in the direction of *moderate*. If looked back to the scheme by Singer (2005), based on O'Mara (1999), it can be seen that the typical real estate reaction to the *moderate* level of uncertainty is different than expected. Expected was, that the high level of uncertainty would cause the real estate reaction to be *incremental*. But since this level (economic) is assessed as moderate at the moment, the real estate reaction to this level of uncertainty is *value-based*.

The characteristics of a *value-based* strategy according to O'Mara (1999) and described later by Singer (2005) are:

- *"Expresses the values and strategic direction of the company*
- *Recognizes that people construct social meaning out of their physical environment*
- *Is proactive about using the inherent power of the physical setting to symbolize values and influence behaviour*
- *Embraces and utilizes the setting's communicative powers to the organization's advantage*
- *Considers the company's relationship with its customers, employees and the community"*

The statements above are related to both *promoting organisational brand* and *embracing employee satisfaction and wellbeing* out of the structure by Gibler and Lindholm (2012). These are the topics that were mentioned most among the interviewed companies and among the articles that were reviewed. Given this, it can be confirmed that the current strategy is based on a *value-based* approach and that the current strategic uncertainty context is indeed "moderate".

To discover today's origin of a focus on *employee wellbeing and satisfaction* it is investigated additionally. Apparently, some sort of understanding of a new office space, or a different workplace with the focus on the a pleasant, comfortable and diverse atmosphere with varied amenities is present among corporate real estate managers. Wouter Spijkerman, urban area developer, describes a new type of space that shows great similarities with the type of space that was mentioned by the interviewees in their search for a building with high focus on *employee wellbeing and satisfaction.* This space is called *third space* (Spijkerman, 2016). Naturally, there is also a *first space* (home) and *second space* (the office), and the *third space* is the working space in between. Spijkerman describes it as follows:

"Certain commercial places, such as restaurants, bookstores, and bars, took on a special meaning for their customers, representing places to which they could retreat to unwind, relax and talk with friends and even

strangers. This was a place that was neither home nor work, a place where customers just felt comfortable… a Third Place" (Spijkerman, 2016).

E. Beekman, head of tenant representation at Savills, acknowledges the demand for such a space today. According to him, the aftermath of the financial crisis, created an upcoming economy, but with an unknown and uncertain ending point. Therefore, companies try to acquire the best competitive position to remain resilient in possible downturns. Retaining and attracting the best employees is therefore on the top of the agenda. This is done by focusing on the wellbeing of them, with varied amenities and with the inclusion of varied types of workspaces *within* the office space. Two other experts, P. van der Peet from Cushman & Wakefield and E. Hoet from Jones Lang LaSalle, agree. They indicate that the current demand for office space is very different with a decade ago. The demand shifted from practical, pure accommodation use, to use that is focused on the attraction and retention of employees and talent. Real estate is used by companies to become the best employer around, especially in times of economic upturn and a growing market.

Hypothesis

So the hypothesis *"real estate accommodation decision-making has changed due to external uncertainty, caused by (macro-)economic and political volatility, during the last decade"* can be confirmed partly. As is appears, no influences of political uncertainty were recognised, probably due to the characteristic that they play a meaningful role earlier in the process and already at the business side. Economic uncertainty, mostly fed by the financial crisis and the events that is caused, can be recognised as driver of change, on the other hand. This change can be explained in twofold: first, multinational corporations learned from economic challenging times and are now more cautious in acquiring corporate real estate, hereby for example focussing on flexible contracts and the compliance of landlords. Second, the eventual aftermath of the financial crisis, or in other words *recovering*, introduced an economic landscape in which competition, culture and societal changes force corporations to *follow* in order to stay ahead of others and so competitive advantageous. Making use of marketing, branding, employee attraction and retaining by the creation of satisfaction in real estate and its amenities is now a used measure. Adding value to the company is the key-term to describe these current real estate focusses.

Samenvatting

Introductie

Het laatste decennium werd gekenmerkt door een aantal gebeurtenissen met een grote mondiale impact. De financiële crisis, sinds 2007, heeft de wereld laten zien hoe landen, bedrijven en mensen extreem geraakt kunnen worden (The Guardian, 2011, Planbureau voor de Leefomgeving, 2013). De resultaten hiervan zijn nog steeds zichtbaar. Tegelijkertijd staan ons nieuwe problemen te wachten. Kranten uit de hele wereld beschrijven het veranderende politieke klimaat (Van Raaij & Dekker, 2016; De Ruyter, 2016; Van IJzendoorn, 2016; Hunt & Wheeler, 2016; De Waard, 2016). Dit nieuwe schommelende politieke klimaat, met daarbij de jaren van economische uitdagingen kunnen worden beschouwd als een voortdurende aanwas van externe onzekerheid; een aspect waar bedrijven mee om moesten gaan en mee om zullen moeten gaan de komende jaren.

Het verleden heeft aangetoond dat bedrijven veranderen om zich aan te passen aan een nieuwe externe situatie. De rol van vastgoed voor deze bedrijven veranderde met het bedrijf mee (Krumm, Dewulf en De Jonge, 1999; Roulac, 2001). Immers, vastgoed moet de bedrijfsstrategie ondersteunen. Daarom kan worden gesteld dat vastgoed, en de besluitvorming rondom, de afgelopen tien jaar wederom zijn veranderd als gevolg van deze bronnen van onzekerheid.

De voorgenoemde trends hebben invloed op elk bedrijf. Vooral het feit dat ze wereldwijd aanwezigheid zijn, zou het bedrijfsleven bewust moeten maken om hun besluitvorming en het gebruik van criteria voor huisvesting te heroverwegen, aangezien onzekerheid een belangrijke oorzaak kan zijn van verkeerde besluitvorming. Met name in vastgoed kan dit opnieuw leiden tot ernstige problemen, zoals gebeurde tijdens de financiële crisis.

Methodologie

Deze probleemanalyse oppert de vraag of deze externe situatie van onzekerheid een wijziging in de vastgoedbeslissingen van bedrijven tot gevolg heeft gehad. Om dit the onderzoeken, zijn de volgende onderzoeksvraag en subvragen geformuleerd:

"In hoeverre verandert externe onzekerheid de beslissingsfactoren voor huisvestingsvraagstukken van multinationale bedrijven?"

Deze vraag heeft betrekking op de criteria die in de besluitvorming worden gebruikt; het aspect verandering in de afgelopen tien jaar en de rol van onzekerheid bij de totstandkoming van deze verandering. Deze onderwerpen zijn vertaald naar de volgende subvragen:

- *Welke criteria zijn leidend in de besluitvorming omtrent accommodatie?*
- *Zijn accommodatiecriteria veranderd tussen 2007 en 2017?*
- *Kan deze verandering als structureel worden beschouwd?*
- *Wat is de rol van onzekerheid in deze structurele verandering?*

Om deze vragen te beantwoorden is het onderzoek op de volgende manier opgesteld. In het algemeen is het onderzoek empirisch. Het doel is een exploratief inzicht en begrip te ontwikkelen over het onderwerp waarbij een uiteenzetting over de verandering in *huisvestingsbesluitvorming* tussen 2007 en 2017 wordt gegeven. Ten eerste wordt een literatuuronderzoek gedaan op basis accommodatiecriteria, besluitvorming, onzekerheid en besluitvorming in onzekere situaties. Vervolgens worden 5 semi-gestructureerde interviews gedaan met multinationale bedrijven, aangezien deze bedrijven meer invloed ervaren van de wereldwijde trends en gebeurtenissen dan nationale. In deze interviews worden de accommodatieprojecten van nu (2007) en toen

(2017) besproken, waarbij de nadruk ligt op de criteria die werden gebruikt en de weging die eraan werd gegeven. Deze gegevens worden gereconstrueerd in Tetra, een beslissingsmodel, dat het besluitvormingsproces van de bedrijven kan reconstrueren. Dit is gedaan om de verworven informatie te verifiëren en om verandering in de loop van de tijd aan te duiden. Deze veranderingen en criteria zijn uiteindelijk gerelateerd aan externe onzekerheid als oorzaak, en beantwoorden zo de onderzoeksvraag. Het is belangrijk om te noemen dat het aantal geïnterviewde bedrijven beperkt is. Daarom kan er nog geen enkele generalisatie gemaakt worden. Deze exploratieve studie ontwikkelt echter een methodologie om onderzoek te verrichten in deze nieuwe combinatie van onderwerpen. De conclusies zijn derhalve gericht op een inductieve uitleg, wat betekent dat de correlatie tussen onderzochte onderwerpen vooralsnog als leidend wordt beschouwd. Zolang er geen tegenargument of verfijning is vastgesteld houdt deze correlatie stand. Bovendien is nu de procedure voor het uitvoeren van een dergelijk onderzoek ontwikkeld.

Literatuuronderzoek

In het literatuuronderzoek is een lijst van criteria opgesteld waarop projectbeslissingen kunnen worden gebaseerd. De criteria zijn uit een breed aantal artikelen onttrokken. Deze criteria worden vervolgens in de tijd geplaatst om de nadruk op bepaalde criteria voor 2007 en na 2007 te bepalen. De individuele criteria zijn echter te gevarieerd om vergelijkbaar te zijn. Daarom is er een structuur nodig om ze te organiseren en te kunnen vergelijken. Hiervoor wordt de structuur van Gibler en Lindholm (2012) gebruikt. Hun structuur onderscheidt de acht kernpijlers van het vastgoedmanagement (CREM). Deze pijlers zijn de acht middelen om kwaliteit, of toegevoegde waarde, te leveren aan het bedrijf, doormiddel van vastgoed. Deze acht pijlers zijn (Gibler & Lindholm, 2012):

1. Verhoging van de waarde van het vastgoed van de organisatie
2. Bevordering van marketing, verkoop en merknaam
3. Aanmoedigen en ondersteunen van de innovatie en creativiteit van werknemers
4. Ondersteuning van duurzaamheid en milieu
5. Verbeteren van het welzijn en de tevredenheid van de werknemers
6. Verhoging van de efficiëntie en productiviteit van de werknemers
7. Flexibiliteit
8. Vermindering van vastgoed-gerelateerde kosten

Als de lijst met criteria is verdeeld onder de 8 pijlers, zijn er enkele verschuivingen in criteria focus tussen 2007 en 2017 zichtbaar:

1. Een daling van het gebruik van kostengerelateerde criteria
2. Een stijging van de welzijn en de tevredenheidscriteria voor werknemers

Deze voorlopige conclusies creëeren een aantal verwachtingen voor het praktische onderzoek dat wordt uitgevoerd om dezelfde aspecten te meten. Samen kunnen meer geconsolideerde conclusies worden getrokken.

Om criteria te vinden die in de praktische besluitvorming worden gebruikt, is het literatuuronderzoek gericht op het meten van voorkeur; aangezien het maken van beslissingen is gebaseerd op wat de voorkeur heeft. Om de voorkeur te meten en te reconstrueren, worden *schalen* gebruikt om de werkelijkheid in een model te reflecteren. Modellering is in dit onderzoek gedaan om de validiteit van de verworven gegevens te controleren. Als de uitkomst van een model overeenkomt met het werkelijke resultaat, zijn de besluitvormingscriteria die tijdens de interviews worden gegeven, een goede afspiegeling van de besluitvorming in werkelijkheid.

Een reconstructiemodel moet een *propere schaal* gebruiken, aangezien dit type schaal geschikt is voor de reconstructie in modellen en het toepassen van wiskundige berekeningen. Aanvullend onderzoek naar

beslissingsmodellen is uitgevoerd om een model te kiezen dat de besluitvormingsprocedure van de bedrijven kan reconstrueren. Preference Function Modeling (PFM) is een methodologie die gebruik maakt van *propere schalen*. Deze methodologie kan besluitnemers helpen om uit een reeks bestaande alternatieven te kiezen. PFM is dus geschikt voor de (*naderhand*) controle van de besluitvormingsprocedures, zoals nodig is in dit onderzoek.

Naast onderzoek over besluitvormingsmodellen bleek ook dat de menselijke factor aanwezig is in de besluitvorming en invloed kan hebben op de resultaten van de besluitvorming. Deze invloed moet niet vergeten worden en wordt na de data-acquisitie geëvalueerd.

Literatuuronderzoek over *onzekerheid* duidt op een definitie van *onzekerheid*. *Onzekerheid* is anders dan *risico*, aangezien de laatste kan worden gemeten en de eerste kan slechts met een waarschijnlijkheid of kans worden geschat. In het onderzoek is een tabel opgenomen met de belangrijkste trends en gebeurtenissen die het afgelopen decennium hebben gekenmerkt. Deze trends en gebeurtenissen zijn alle vormen van *onzekerheid*, omdat ze allemaal een van de aspecten bevatten die hen onmeetbaar maken. Voorbeelden van deze aspecten zijn: verrassing, complexiteit nieuwigheid en volatiliteit.
In het algemeen kunnen de trends en gebeurtenissen onderverdeeld worden onder vijf onzekerheidstypes: politieke onzekerheid, (macro-)economische onzekerheid, demografische onzekerheid, technologische onzekerheid en mileu onzekerheid. Zoals verwacht in de onderzoeksvraag, worden politieke en (macro-)economische onzekerheden verwacht als de belangrijkste oorzaken van veranderingen in de accommodatiesbeslissingen.

In een reactie op de onzekerheid, en met name economische onzekerheid, onderscheidt Singer (2005) enkele vastgoedstrategieën die reageren op de mate van externe onzekerheid. Wanneer de onzekerheid laag is, zijn vastgoedstrategieën *gestandaardiseerd*; wanneer onzekerheid gematigd is, zijn de vastgoedstrategieën *waarde-gerelateerd* en wanneer het onzekerheidsniveau hoog is, zijn vastgoedstrategieën *incrementeel* zijn. Verwacht wordt dat de strategieën, als gevolg van een grote hoeveelheid externe onzekerheid, *incrementeel* zijn en gericht zijn op een stap voor stap reactie op de vraag vanuit de portefeuille.

Gegevensverzameling en interpretatie

Om de gegevens te verkrijgen die de onderzoeksvraag kunnen beantwoorden, zijn interviews opgezet met 5 bedrijven. De bedrijven die geïnterviewd zijn, zijn geanonimeerd in dit onderzoek om privacy redenen. Het focuspunt *onzekerheid* als aanstichter voor verandering werd niet genoemd in het interview, om ze niet te sturen in hun antwoorden. Alle bedrijven hebben een internationale afkomst, grensoverschrijdend management of internationale activiteiten. Bovendien waren de geïnterviewden allemaal in de functie van CRE-manager tijdens de volledige onderzoeksperiode, om hun aanwezigheid en betrokkenheid tijdens de projecten te waarborgen.

Bedrijf 1 is in de bouwsector actief en verricht advieswerkzaamheden, engineering en projectmanagement in infrastructuur, waterbouw en vastgoed. Het is actief in meer dan 70 landen wereldwijd, met meer dan 25.000 medewerkers. Het hoofdkantoor bevindt zich in Nederland.

Bedrijf 2 is actief in de vastgoedbeleggingsindustrie. Het bedrijf komt uit Duitsland; waar het werd opgericht als beleggingsmanager voor vastgoed, scheepvaart, infrastructuur en logistiek. Klanten komen uit Duitsland, Nederland, het Verenigd Koninkrijk, de Verenigde Staten en in heel Azië. In Nederland beheert het bedrijf meer dan 800.000 m2 vastgoed, met een totale waarde van net minder dan 1 miljard euro.

Bedrijf 3 is actief in de computertechnologie (IT) en behoort tot de 5 wereldleiders in IT. Het bedrijf maakt software, hardware en biedt ondersteunende diensten. Het bedrijf heeft meerdere kantoren over de hele wereld, met een hoofdkantoor in de Verenigde Staten.

Bedrijf 4 is actief in de HR-industrie en heeft bedrijven in 8 Europese landen. Het bedrijf is gevestigd in Nederland en het hoofdkantoor bevindt zich hier ook.

Bedrijf 5 is actief in de voedingsindustrie en behoort tot de top fast-food ketens wereldwijd. Bedrijf 5 is actief in meer dan 100 landen, maar is afkomstig uit de VS, waar het hoofdkantoor nog steeds is gevestigd. Het bedrijf heeft talloze restaurants over de hele wereld, maar het interview focuste op de kantoren.

Deze interviews resulteerden in lijsten van criteria voor rond 2007 en rond 2017, voor alle individuele bedrijven. Maar gezien de criteria zo divers zijn, net zoals de criteria die in de literatuur werden gevonden, zijn de lijsten geordend onder de structuur van Gibler en Lindholm (2012). Deze structuur vertelt meer over de focus van de criteria en het gewicht (belang) dat door de bedrijven werd toegewezen. Zowel de telling als de weging zijn belangrijke aspecten, gezien dit de verdeling van de *aandacht* onthult, maar ook de *evolutie* van de criteria door de tijd heen.

Onderwerpen	% geteld rond 2007	% geteld rond 2017
Vermindering van vastgoed-gerelateerde kosten	35%	17%
Verhoging van de efficiëntie en productiviteit van de werknemers	35%	21%
Bevordering van marketing, verkoop en merknaam	19%	24%
Flexibiliteit	8%	7%
Verhoging van de waarde van het vastgoed van de organisatie	4%	2%
Verbeteren van het welzijn en de tevredenheid van de werknemers	0%	21%
Aanmoedigen en ondersteunen van de innovatie en creativiteit van werknemers	0%	0%
Ondersteuning van duurzaamheid en milieu	0%	7%

Tabel: 1 Getelde criteria in 2007 en 2017

Onderwerpen	% weging in 2007	% weging in 2017
Bevordering van marketing, verkoop en merknaam	11%	14%
Verhoging van de efficiëntie en productiviteit van de werknemers	40%	36%
Vermindering van vastgoed-gerelateerde kosten	38%	20%
Flexibiliteit	6%	3%
Verhoging van de waarde van het vastgoed van de organisatie	5%	4%
Verbeteren van het welzijn en de tevredenheid van de werknemers	0%	18%
Ondersteuning van duurzaamheid en milieu	0%	5%
Aanmoedigen en ondersteunen van de innovatie en creativiteit van werknemers	0%	0%

Tabel: 2 Weging van criteria in 2007 en 2017

Discussie en conclusie

De bovenstaande tabellen geven aan dat er een verschuiving is in het aantal keer dat criteria worden genoemd en de weging die eraan wordt gegeven. Samen met de veranderingen die in literatuur werden gevonden, kan een lijst van veranderingen worden opgesteld:

1. De verscheidenheid van accommodatiecriteria is groter na 2007
2. Kostencriteria lieten na 2007 een daling zien in de vermelding

3. *Welzijn en de tevredenheid van de werknemers* werden omstreeks 2007 vrijwel niet genoemd, maar werden rond 2017 een van de meest genoemde criteria
4. De verscheidenheid van toegewezen weging werd na 2007 breder; de aandacht is meer verdeeld
5. Praktische criteria wogen zwaarder dan andere criteria voor 2007, maar daalden rond 2017
6. *Welzijn en de tevredenheid van de werknemers* gaan van 0% rond 2007 tot 18% rond 2017, wat de grootste verandering is
7. *Bevordering van marketing, verkoop en merknaam* toont een toename van het gewicht en daarmee ook de aandacht die eraan wordt gegeven

Om te bepalen of deze wijzigingen structureel zijn of niet, worden de veranderingen terug gerelateerd naar elk bedrijf. Dit houdt in dat voor elke wijziging wordt onderzocht bij welke bedrijven het zich heeft voorgedaan. Als een verandering bij alle bedrijven te vinden is, kan een structurele verandering worden aangegeven. Als een verandering alleen in één bedrijf herkenbaar is, is er geen structurele verandering. Voor deze kwestie is de definitie van structurele verandering is als volgt: *"een verandering in de manier waarop delen van een samenhangend systeem worden ingevuld"*. Met structuur verwijst dit onderzoek naar de structuur die wordt gebruikt om de criteria te organiseren onder de acht pijlers van vastgoedmanagement door Gibler & Lindholm (2012, blz. 36). Daarom is deze structuur en een verandering binnen de elementen van deze structuur leidend in de beoordeling van structurele veranderingen.

Verandering	Bedrijf 1	Bedrijf 2	Bedrijf 3	Bedrijf 4	Bedrijf 5
Grotere criteria variëteit na 2007	X		X	X	X
Aantal kosten-gerelateerde criteria laten een daling zien na 2007			X	X	
Welzijn en tevredenheid van werknemers laat een stijging na 2007	X	X	X	X	X
Marketing en merknaam stijgen in aandacht	X	X	X	X	X
Verdeling van weging wordt breder na 2007	X		X	X	X
Praktische criteria dalen in aandacht	X		X	X	X
Welzijn en tevredenheid van werknemers hebben plotselinge hoge aandacht	X		X	X	X

Tabel: 3 Dekking van veranderingen bij de bedrijven

Bijna alle veranderingen waren inderdaad terug te zien bij de bedrijven; behalve een. De daling in *kostencriteria* wordt niet bij alle bedrijven herkend. Dit heeft te maken met de genoemde criteria van bedrijf 3 in de periode rond 2007. Dit bedrijf richtte zich uitsluitend op kosten rond 2007, waardoor de verhouding van de *kostencriteria* enigszins uit balans is gebracht. Daarom is er geen dekking zichtbaar bij de andere bedrijven. Bovendien zien we bij de verdeling van weging nog steeds een belangrijk aandacht voor *kostencriteria* rond 2017. Men kan ervan uitgaan dat de kosten nog steeds hoog op de agenda van bedrijven staan, maar dat bedrijven nu bereid zijn meer te betalen voor kwaliteit, zowel voor de kwaliteit van het gebouw als in de kwaliteit van de medewerkerservating en marketing, aangezien deze aspecten een toename van belang en telling laten zien.

Om de onderzoeksvraag te beantwoorden, zijn alle vormen van onzekerheid gekoppeld aan de verworven gegevens. Ook is de mening van de ondervraagden beoordeeld. In het interviewprotocol werd de vraag aan de geïnterviewden gevraagd, of ze dachten dat onzekerheid de oorzaak was van een verandering in de besluitvorming. De antwoorden van de ondervraagden waren allemaal ongeveer gelijk. Over het algemeen werd geen directe relatie gevonden door de geïnterviewden. Echter, de antwoorden die werden gegeven zijn toch gerelateerd aan een aantal factoren van *onzekerheid* of gevolgen van zulke *onzekerheid*, maar ze waren er zich gewoon niet van bewust. De reacties van de bedrijven waren hoofdzakelijk gerelateerd aan (macro-)economische veranderingen, zoals de implementatie van flexibele huurcontracten en de dubbele controle op de naleving van zakenpartners.

Uit de antwoorden die door de geïnterviewden werden gegeven en de criteria en veranderingen die werden ontdekt, is echter geen enkele relatie met *politieke onzekerheid* gevonden. De waarschijnlijke oorzaak hiervan is dat het moment waarop politiek invloed heeft, voorafgaand plaatsvindt aan het pure accommodatie vraagstuk. Een politiek beïnvloedde keuze is bijvoorbeeld de uitbreiding van het bedrijf naar een nieuw land of locatie met een ander politiek klimaat. Voor bedrijven is deze keuze om uit te breiden een strategische keuze. Deze keuze wordt nooit alleen gemaakt door een CRE-afdeling, aangezien het vastgoed van bedrijven de bedrijfsstrategie volgt en daarom is de keuze voor uitbreiding naar een nieuwe locatie, met een nieuw politiek klimaat, al gemaakt voordat de CRE-afdeling betrokken wordt. Met andere woorden: politieke kwesties zijn al de revue gepasseerd op het moment dat de keuze voor accommodatie wordt gemaakt.

Onder de criteria en veranderingen die werden blootgelegd, en onder de verklaringen die door de bedrijven werden gegeven, werd er geen enkele link gelegd met *demografische onzekerheid*, zoals dit ook verwacht was bij het opzetten van dit onderzoek.

Voor *technologische onzekerheid* geldt hetzelfde als voor demografische onzekerheid. Hoewel het een oorzaak is van externe onzekerheid gedurende de jaren heen, werd niet verwacht dat de accommodatiebesluiten voor multinationals hierdoor werden beïnvloed. Dit type onzekerheid blijkt uit het onderzoek inderdaad niet naar voren te komen.

Milieu onzekerheid werd ook beschouwd als een algemene oorzaak van onzekerheid, alhoewel de invloed ervan niet verwacht werd als oorzaak van een verandering in accommodatie beslisfactoren. Alhoewerl milieu-gerelateerde criteria werden vermeld door de geïnterviewde bedrijven, was nooit direct gerelateerd aan milieu onzekerheid. De bedrijven die zich richtten op milieuv en duurzaamheidsaspecten hebben dit voornamelijk gedaan vanuit concurrerend oogpunt.

Alleen (macro-)economische onzekerheid laat een duidelijke koppeling zien met de veranderende accommodatiecriteria. Enkele links met de (nasleep van) de financiële crisis werden terug gevonden in de antwoorden van de bedrijven. Op basis van literatuur, kranten en andere documenten uit de praktijk werd verwacht dat *politieke onzekerheid* en *economische onzekerheid* samen de grootste invloed op verandering waren. Daarnaast werd verwacht dat deze oorzaken van onzekerheid tot een zeer onzeker strategisch klimaat zouden leiden. De veronderstelling was, dat deze onzekerheid op zijn hoogtepunt was.

Na de conclusie dat *politieke onzekerheid* echter niet zo'n grote rol speelt, blijft alleen (macro-)economische onzekerheid over als een belangrijke invloed op de verandering van de besluitvorming. En gezien de economische omgeving, nu het ergste deel van de financiële crisis voorbij is, aan het verbteren is, is het level van strategische onzekerheid die de ondervraagden ervaren niet *hoog*, maar meer in de richting van *gemiddeld*. Als we nu naar de schema terugkijken van Singer (2005), gebaseerd op O'Mara (1999), blijkt dat de typische strategische reactie op het gemiddelde niveau van onzekerheid verschilt van wat was verondersteld. Verwacht was dat de hoge mate van onzekerheid zou leiden tot een incrementele vastgoedstrategie. Maar aangezien het onderzekerheidsniveau (economisch gezien) op dit moment als *gemiddeld* wordt beoordeeld, is de vastgoedreactie eigenlijk *waarde-gerelateerd*.

De kenmerkenen van *waarde-gerelateerde* strategieën volgens O'Mara (1999) en later beschreven door Singer (2005) zijn:

- *"Geeft de waarden en strategische richting van het bedrijf aan*
- *Erkenkt dat mensen sociale betekenis uit hun fysieke omgeving onttrekken*
- *Is proactief over het gebruik van de fysieke omgeving om de waarden te symboliseren en gedrag te beïnvloeden*
- *Omarmt en gebruikt de communicatieve mogelijkheden van de omgeving in het voordeel van de organisatie*
- *Neemt de relatie met haar klanten, medewerkers en de gemeenschap in acht"*

De bovenstaande uitspraken hebben betrekking op zowel het bevorderen van *marketing en de naam van de organisatie* als het *benadrukken van de medewerkerstevredenheid en het welzijn*, uit de structuur van Gibler en Lindholm (2012). Dit zijn onderwerpen die veel genoemd werden door de geïnterviewde bedrijven en in de artikelen die werden beschouwd. Op basis van deze overeenstemming kan worden bevestigd dat de huidige strategieën zijn gebaseerd op een *waarde-gerelateerde* aanpak en dat de huidige strategische onzekerheids- context inderdaad 'gemiddeld' is.

Om de huidige herkomst van de grote focus op het *welzijn en de tevredenheid van de medewerkers* te ontdekken, is het verder onderzocht. Blijkbaar is een soort overtuiging van een nieuw soort kantoorruimte of een andersoortige werkplek met nadruk op een aangename, comfortabele en gevarieerde sfeer met gevarieerde voorzieningen aanwezig onder de CRE-managers. Wouter Spijkerman, stedelijk gebiedsontwikkelaar, beschrijft een nieuw type ruimte die grote gelijkenis toont met het type ruimte dat door de geïnterviewden werd genoemd in hun zoektocht naar een gebouw met een hoge focus op het *welzijn en de tevredenheid van de medewerkers*. Deze ruimte heet de *derde ruimte* (Spijkerman, 2016). Natuurlijk is er ook een *eerste ruimte* (thuis) en *tweede ruimte* (het kantoor), en de *derde ruimte* is de werkruimte tussenin. Spijkerman beschrijft het als volgt:

"Bepaalde commerciele plekken, zoals restaurants, boekhandels en bars, hebben voor klanten een bijzondere betekenis gekregen; als plaatsen waar ze zich kunnen terugtrekken om te ontspannen en met vrienden en zelfs vreemden kunnen praten. Dit was een plaats die niet thuis was of op werk, maar een andere plek waar mensen zich gewoon comfortabel voelen … een derde plaats*"*(Spijkerman, 2016).

E. Beekman, hoofd verhuur(ders) bij Savills, herkent de huidige vraag naar zo'n type ruimte. Volgens hem, creëerde de nasleep van de financiële crisis een opkomende economie, maar met een onbekend en onzeker eindpunt. Daarom proberen de bedrijven de beste concurrentiepositie te verwerven om veerkrachtig te blijven in mogelijke nieuwe schommelingen. Het behouden en aantrekken van de beste medewerkers staat daarom hoog op de agenda. Dit wordt gedaan door de concentratie op het welzijn van de medewerkers, met een groot scala aan voorzieningen en met het opnemen van een zeer grote variëteit aan werkruimten binnen het kantoor. Twee andere experts, P. van der Peet van Cushman & Wakefield en E. Hoet vanm Jones Lang LaSalle, zijn het hier mee eens. Zij gaven aan dat de huidige vraag naar kantoorruimte anders is dan zo'n 10 jaar geleden. De vraag is veranderd van een pure focus op huisvesting naar een vraag die is gefocust op het aantrekken en behouden van de beste werknemers en talent. Bedrijfshuisvesting wordt gebruikt door bedrijven om the beste werkgever te zijn op de markt, zeker in deze tijden van economische bloei met een markt vol nieuwe kansen.

Hypothese

Dus de hypothese *"de besluitvorming over bedrijfshuisvesting is veranderd door externe onzekerheid, veroorzaakt door (macro-)economische en politieke volatiliteit, gedurende de afgelopen tien jaar"* kan gedeeltelijk worden bevestigd. Zoals blijkt, werden geen invloeden van *politieke onzekerheid* teruggevonden, waarschijnlijk door het feit dat ze al eerder een rol spelen als onderdeel van de bedrijfsstrategie. *Economische onzekerheid*, daarentegen, meestal gelinkt aan de financiële crisis en de daaropvolgende problemen, kunnen als aanstichter van verandering worden beschouwd. Deze verandering kan in tweevoud worden verklaard: ten eerste hebben multinationale bedrijven geleerd van de economisch uitdagende tijden en zijn en nu voorzichtiger bij de besluitvorming rondom bedrijfshuisvesting, bij voorbeeld door te richten op flexibele contracten en de betrouwbaarheid van verhuurders. Ten tweede, heeft de nasleep van de financiële crisis, en juist het daaropvolgende herstel, een economisch landschap geïntroduceerd waarin concurrentie, cultuur en maatschappelijke veranderingen de bedrijven dwingen concurrerend te blijven en zich te weren tegen nieuwe uitdagingen. Gebruik maken van marketing, branding en de aantrekkingskracht voor werknemers door het creëren van tevredenheid zijn nu veelgebruikte maatregelen. Het *toevoegen van waarde* aan het bedrijf beschrijft deze huidige vastgoedfocus.

Readers guide

This report is set up in the following way: first an introduction (1) about the research is given. This introduction includes the motivation for this subject. In the subsequent chapter, the methodology (2) to further investigate this topic will be set out. This methodology consists of the actual problem analysis, the questions that derive from the problem, the research methods and the expected deliverables.

In the following chapter, the theoretical framework (3) is investigated and explained. This theoretical framework is used to underpin the data collection and basic knowledge about the subject and research in general. Within the theoretical framework, the scientific knowledge about the investigated problem is laid down, to determine the focus of the actual data collection. Consequently, this data collection (4) chapter is the chapter that comes after, including the explanation of the interviews that were conducted and the data collection that resulted.

The combining and explaining of the acquired data is part of the data interpretation (5) chapter. In the discussion (6) the acquired information will be explained further and linked to literature in order to draw up findings. In the conclusions and recommendations (7) chapter, the conclusions on the research questions is given, as well as recommendations for reproducing this research or recommendations for follow-up researches. The report ends with the used literature and the list of appendices.

Table of content

INTRODUCTION

1. Introduction

The last decade can be characterised by several events with a severe global impact. The financial crisis since 2007 has shown the world how the global interweaving of countries works like a domino effect, when one single country stagnates economically. In the years that followed, numerous countries, companies and people experienced the difficulties of these volatile markets, in some cases leading to bankruptcy (The Guardian, 2011; Planbureau voor de Leefomgeving, 2013). Still, the effects of the financial crisis are visible, but at the same time new problems are awaiting. Newspapers from over the world describe the changing political climate, not only in Europe, but also in the United States and Russia for example (Van Raaij & Dekker, 2016; De Ruyter, 2016; Van IJzendoorn, 2016; Hunt & Wheeler, 2016; De Waard, 2016). This new volatile political climate and the past years of economic challenges can be assessed as an ongoing source of *uncertainty*; an aspect were businesses had to deal with, and will do so in the coming years, albeit in a different way.

Times of uncertainty and crisis in the past have shown businesses to change in order to adapt to the new external situation. The role of real estate for these businesses changed accordingly (Krumm, Dewulf and De Jonge, 1999; Roulac, 2001). Expected can be, that businesses and the role of real estate has changed during the last decade again as a response to these new and volatile situations. But the question is: to what extent? Businesses and people should be aware of the influence of external uncertainty and the way it affects a corporation and the supportive role of real estate. To investigate the changing role of corporate real estate in the accommodation of businesses, a research question is formulated: *"To what extent does external uncertainty change the decision factors for accommodation of multinational corporations?"* This question will be investigated empirically to gain an insight and understanding about uncertainty as driver of change in corporate real estate management (CREM). Sub-questions to answer this research questions are: *"what criteria are leading in accommodation decision-making?"* And *"have accommodation criteria changed between 2007 and 2017?"*. If a change is indicated, the question *"can this change be regarded as structural?"* comes up. Eventually *the role of uncertainty in this structural change* will be researched. This will result in an answer on the main research question.

The research subject, the rising economic and political uncertainty and its influence on accommodation decision-making, is a problem that affects every corporation. Especially the global presence of these trends should create awareness for companies to rethink or re-evaluate their way of decision-making since uncertainty can be a major cause of wrong investments which, especially in real estate, can lead to disasters like during the financial crisis again. This global presence and potential big impact emphasizes the importance of the research.

To answer the questions posed above, first a literature review on the state of the art will be done. This is described in the chapter *Theoretical framework*. Subsequently, (multinational) corporations will be interviewed, using a semi-structured protocol, to discover the criteria, weighing and rating that are used to make decisions for accommodation purposes. Modelling these inputs generates a model that helps indicating changes in criteria and their importance over time. This change in decision-making will be assessed and related to *external uncertainty* as a possible driver which eventually will answer the main research question.

This research eventually results in an insight on the influence of *external uncertainty* as driver of change in corporate accommodation projects during the last decade. Creating such an insight can help corporates questioning and directing their corporate real estate accommodation strategies. No model or artefact will be produced, but an empirical understanding about the topic.

2. Methodology

2.1 Introduction

This chapter will elaborate further on the problem analysis on which the research of this graduation thesis is based. As described in the main introduction, increasing uncertainty due to political and (macro-)economic changes has shown to affect corporate real estate management over time. In the following section this problem will be described extensively, followed by the research questions and the according research methods. This chapter ends with and explanation of the deliverables of this research.

2.2 Problem Analysis

The starting point of this research was the recent statement by PwC (2016a, p. 7) about emerging trends for the real estate markets. They state: *"no-one expects unbridled growth. There is a significant undercurrent of caution across Europe as a result of geopolitical issues, political uncertainty and economic decline elsewhere, all of which could escalate and impact on real estate"* (PwC, 2016a, p. 7). With this statement, PwC foresees possible new external influences that change the current situation in the real estate markets. Clearly, political and geo-political issues are emerging, and as an example they pose the Brexit, which can destabilise the current practices in the UK, but has also its effects on the rest of Europe and the world. This is not just applicable to established markets, but also the emerging ones: *"elections in key emerging markets are heightening uncertainty"* (PwC, 2016b), referring to elections that are currently taking place, or have currently taken place such as in the US, Germany, France and the Netherlands. The figure below shows the results of a survey on environmental (external) impacts on business and consequential real estate (PwC, 2016a, p. 8). To illustrate this statement: political uncertainty pops out to have a severely worsened prospect.
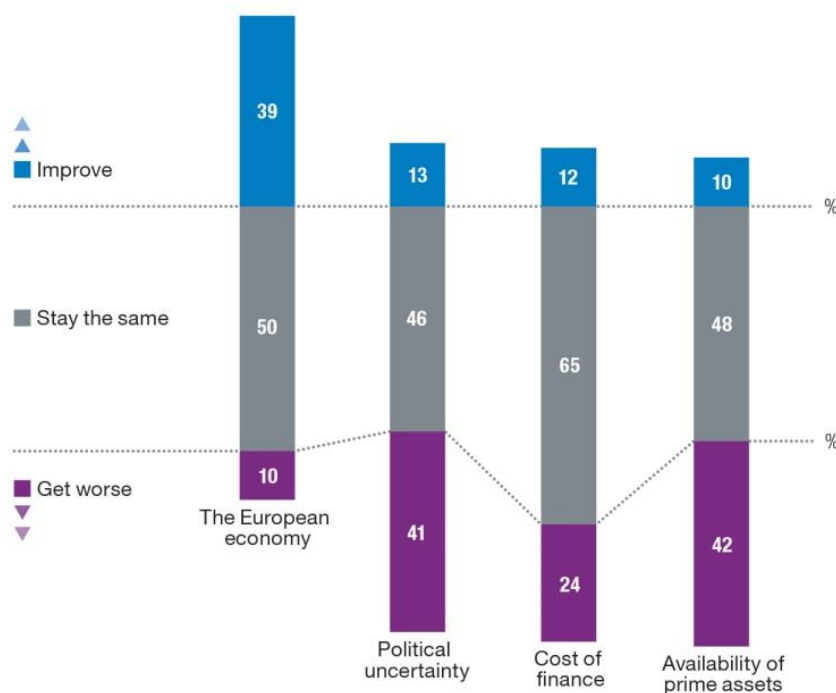
Figure 1: Business environment 2016 (PwC, 2016a)

These comments on changing, or worsening, political climate are not limited to publications by PwC, but are increasingly present in the media and papers. The Dutch newspaper De Volkskrant wrote about the expectations for a *"disastrous year 2017"* (Van Raaij & Dekker, 2016, p. 1) due to increasing political tensions and rising populism. Reason for this statement, were conversations with the top 200 most powerful businessmen in the Netherlands. They stated that the government should address the political discord.

Moreover, plans should be made to give people *"smart mobility and safety […] jobs and perspective in uncertain times"* (Van Raaij & Dekker, 2016, p. 2) that are currently lacking. Also a Belgian newspaper reports on this issue. In De Standaard, De Ruyter describes how the German government has called upon the creation of an emergency stock of food. In addition, they have been thinking to reset the military service again (De Ruyter, 2016, p. 1). This is not solely motivated by political tensions, but the measures resemble periods in the last century where the same types of stress were noticeable. Also from England there are signs that suggest the same. In a call to the country, Prince Charles compares the current political situation with the 30s of the last century (Van IJzendoorn, 2016, p. 1), described by De Volkskrant. Apparently, the current political situation and the according safety and certainty are being questioned at this time.

But not only political tensions are currently recognised as a cause for concern. Also the economic situation is described as not stable and trustworthy. A quote by PwC (2016b) again: *"although it may seem like the eurozone crisis has ended, businesses must be ready to deal with future eurozone shocks. And very loose monetary policy in the US and UK could blow up asset bubbles and destabilise the recovery".* This statement implies that the global financial crisis and the subsequent Eurozone crisis may seem over, but that the aftermath is not stable. This situation can be described as *volatile*. Volatile means that the market has ups and downs, but that the true direction is hard to predict. Especially volatile cycles cause much uncertainty in future predictions, in contrast to long ups and downs. This can be illustrated by the calculation for *volatility* in the financial sectors. Volatility is calculated by the square root of variation, and variation is the difference between two timeslots. If this difference is headed in one direction (up or down), there is *some* volatility, but at least the sign (+ or -) is the same. Volatile situations, on the other hand, are characterised by both ups and downs, implying that besides the volatility value, also the sign is subject to change. This explanation again indicates that volatility is the cause of (extreme) uncertainty in the market.

Apparently both political and economic instability are currently causing the market to be uncertain, unreliable and maybe even unsafe. To illustrate briefly what the impact of this could be, the Triangle of Maslow can be used. This shows the importance of *safety, stability* and *certainty* in its lower levels. The lower the level is, the more important. This implies that the levels above are not pursued if the lower levels are not yet achieved (Maslow, 1943) and that safety and certainty are basic needs, having a great impact on all the upper processes.

Figure 2: Maslow's Triangle (www.broadreachtraining.com, 2016)

This uncertain, volatile climate makes it hard for corporations to "predict" the future situation. Adjusting business to be future-proof is therefore hard. With low levels of certainty, or in other words with uncertainty, decision-making is a risky issue. So, how do corporations respond to this problem? How can a corporation make decisions for the long-term without having a clear prospect?

The idea that uncertainty and unreliability are triggers for change is described in literature as well. Krumm, Dewulf and De Jonge (1999, p. 61), stated that earlier economic problems caused the *raison d'etre* of corporate real estate management to be questioned. Crises, both internal and external, were causes for reconsidering the current practices. In addition, Roulac (2001, p. 138) wrote: *"the real properties of business – the places and spaces in which a business operates – are derivative of old organization thinking, which is increasingly challenged by the new economy"*. This implies that change in economic situation can be a driver for change in organisational focus. He goes on: *"more dramatic and rapid economic evolution suggests increasing need to adapt workspaces and places – as well as management thinking"* (Roulac, 2001, p. 138).

All the above mentioned aspects trigger the question whether the political and economic problems of the last decade have changed organisational thinking and the according corporate real estate management approaches. Looking at the statements of Roulac (2001) and Krumm, Dewulf and De Jonge (1999), it should have. Therefore the following hypothesis is formulated: *real estate accommodation decision-making has changed due to external uncertainty, caused by (macro-)economic and political volatility, during the last decade.*

2.3 Research questions

In order to confirm or reject the hypothesis mentioned before, a main research question derived from this. This question is formulated as follows:

To what extent does external uncertainty change the decision factors for accommodation of multinational corporations?

This question will be answered in the following chapters. In order to answer this question, additional research on the state of the art in this topic will be done. This main question can be split into several sub-questions, which will be subject to this additional research. If the main question is analysed, the topics of interest are: CREM accommodation decision-criteria, decision-making and dealing with uncertainty. These topics will therefore formulate the sub-questions of this research as follows:

- *What criteria are leading in accommodation decision-making?*
- *Have accommodation criteria changed between 2007 and 2017?*
- *Can this change be regarded as structural?*
- *What is the role of uncertainty in this structural change?*

These questions will first be the focus of the literature review. And second, for the actual (practical) research on this topic, to be described in the following sections, the same sub-questions will apply. By combining the findings from literature with the findings from practice, an answer will be given to the main question.

2.4 Research methods

To conduct the research and answer the research questions that are described before, several steps will be taken. In short, a literature study will be done, followed by interviews with corporations. The acquired data will be modelled to verify them, which will eventually lead to the findings and an explorative answer to the research question.

The overall research will be empirical, so it will have a focus on understanding the topic, rather than an operational research with a focus on developing a model or artefact. The choice for this explorative study related to the characteristics of the problem analysis; namely, change in a past situation and the understanding of its consequences, out of which a hypothesis was formulated. These aspects are typical for empirical research (Barendse, Binnekamp, De Graaf, Van Gunsteren, Van Loon, 2012, p. 1). Additionally, the research will be conducted in a deductive and quantitative way. This relates again to the characteristics of the research. As stressed out by Bryman (2012, p. 711), deductive research is *"an approach to the relationship between theory*

and research in which the latter is conducted with reference to hypotheses and ideas inferred from the former". The research in this report is based on a hypothesis, which will be (partly) rejected of confirmed. This flow of steps, from the hypothesis, to the research design, to the acquiring and processing of data, to writing of conclusion, is typical for quantitative research (Bryman, 2012, p. 161). Although the overall research set-up is deductive, the conclusions will be based on inductive reasoning. This relates to the fact that a limited sample can be reviewed in this research and that therefore a possible generalization is precluded. The conclusions that can be drawn upon the reviewed sample, relate in fact only to the exact same sample. Inductive reasoning, however, uses the correlation between the premises (data) and the statement (conclusion) to predict the *probable* outcome, when a next sample is reviewed. By this, the statement (conclusion) endures until a disproof or redefining is done (Vickers, 2006, p.1).

These steps are now described extensively and the relation between the topics is illustrated in the scope of research in the next section.

2.4.1   Scope of research

The scope of this research is indicated with blue. The line from external uncertainty, into the business, is eventually translated to a (changing) set of criteria. This set is subsequently subject to decision-making, which will eventually lead to a real estate strategy that supports the business goals. This research is limited to the aspects *uncertainty* its influence on *criteria* and *decision-making* and the *real estate strategy* that follows.
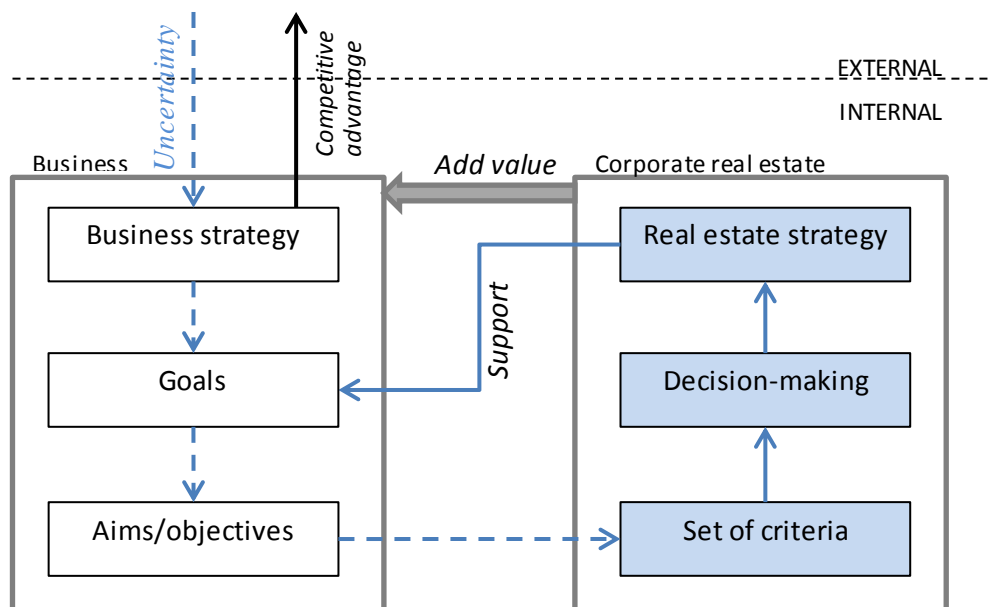
Figure 3: Scope of research (own illustration)

2.4.2   Literature review

The research will be empirical, and focus on the explanation and assessment of the hypothesis: *"real estate accommodation decision-making has changed due to external uncertainty, caused by (macro-)economic and political volatility, during the last decade"*. In order to do the research, first an explorative literature research will be done, based on the sub-questions mentioned before. This literature review focuses on the topics *corporate real estate management* in general, *decision-making (criteria)* and *dealing with uncertainty*. By doing this literature research, a solid background and theoretical framework is made, which will be used to gather insight in the wide spectrum of these topics and additionally to develop the needed knowledge to conduct the practical research. Besides, the background information will be used after the interviews as well, to assess, understand and discuss the data obtained from the companies. This gives an answer to the research question.

The practical research will be done by interviewing corporations. The purpose of these interviews is to learn and report how corporations decide between accommodation alternatives and how this may have changed over time. The interviews will semi-structured. The reason for a semi-structured interview is based on the following aspects: first, the interviews will be done in a structured form to guarantee a comprehensive and complete list of questions that has the same set-up for the different corporations. Using the same set-up increases the comparability and thus the processing of the data. Second, the interviews are *semi*-structured, instead of structured, due to the different nature of companies. Since the sectors (see *sample*) and alternatives (see *interview protocol)* that are interviewed are very different, some flexibility in asking the questions and adapting to specific situations is needed. This is also the reason that a regular questionnaire is not adequate for this research. The uniqueness of the corporations requires flexibility. Using a semi-structured interview guarantees that all topics are covered, but that there is a great deal to respond (Bryman, 2012, p. 471. The following sections will elaborate on the sample, the set-up of the interview questions, the timeframe and the way the data will be processed.

2.4.3.1   Timeframe

The practical research will focus on the aspect *change* within corporation's real estate strategies. This affects their way of decision-making for long-term investments for accommodation. A comparison of decision-making then, 10 years ago (2007) and now (2017), is made. These moments in time are chosen for multiple reasons. First, the year 2007 was just before the global financial crisis hit the (real estate) markets. As indicated in the introduction of this research, economic volatility has a great impact on business strategies and the according real estate strategies. It can be expected that this event has shifted the focus and emphasis in real estate strategies, which is of interest to this research. This is the reason for including this event in the research's timeframe. Second, to investigate the aspect *change* in a scientific way, it is important to gather information from similar sources. In other words, the same person within a company should have witnessed both moments in order to get data from a similar quality. Focusing on the change between for example 1997 and 2017, will decrease the amount of suitable companies to investigate, since the people working there have a greater chance of being replaced. A timeframe of 10 years will therefore be the minimum amount of years to investigate, which does include the event mentioned before.

2.4.3.2   Sample

The interviews will be conducted at 5 companies. All companies will be interviewed in the same way, in the same depth and with the same (semi-structured) interview protocol (see *interview protocol*). Using the same set-up will reduce the error in acquiring data (Bryman, 2012, p. 229). To get a good overall view on the practical implementation of decision-making and criteria, all companies will be assessed as equally interesting.

The sample of corporations that will be interviewed is based on several preferred criteria. (1) First, the corporations are preferred to be multinationals. This is in the sense that the companies should have an international origin, crossborder management or international activities. This is due to their higher focus on international economy and international political influences. It can be expected that especially the political volatilities are reflected in their business strategy and therefore their real estate decision-making. The same applies for economic struggles, although these are also more perceptible at national level. (2) A second criterion is that the interviewee, the corporate real estate manager, is preferred to have witnessed both periods of time that are being investigated. As explained in the previous section, the use of the *same* corporate real estate manager will increase the validity and thus quality of the answers. (3) Third the choice for companies will be based on the sectors they are in. Preferably, a broad spectrum of companies is researched, all in different sectors. Examples can be the IT/telecom sector, retail sector, banking sector, financial services sector, construction sector, logistic sector etc.

Finding companies that are different will provide the broadest insight in the different decision-making procedures and the different changes over time for the different sectors. This sample choice implies a research

in wide extent, focussing on the full spectrum. The focus on 5 different sectors is done to get a first, new and comprehensive understanding of the influence of *external uncertainty* on the full industry. It is, on the other hand, therefore the case that the conclusions will be widespread and only applicable to the interviewed companies. Like was stated in the *research methods*, the goal is to get this first understanding about the correlation between the investigated aspects, which will derive an inductive view. The method, however, that is used in this research, and is applicable to the full industry, is the measure to reproduce this research until the threshold of generalisation is reached.

Important notes: if, however, the availability of companies in such sectors is not sufficient, the sample will be formulated differently (plan B1). If only a selection of sectors is available (instead of 5 different), the sample will focus on the comparison of only two sectors. This shift implies that not the full spectrum is investigated but that an extra factor will be added to the investigation: the comparison between two sectors. Since understanding the full spectrum is no longer an option, this other point of interest takes it over. Additionally, if there is no possibility to interview multinationals, a shift will be made to national companies (plan B2). An important remark for this option is that the influence of political uncertainties will be less within a single country. So, parallel to the shift to national companies, there will be a simultaneous shift to economic emphasis, since this trend is present in greater extent than politics, on national level. Putting a greater emphasis on economic trends will therefore leave its mark on the final results of the research. This is important to take into account.

2.4.3.3 Interview protocol

During these interviews the corporations will be asked how, and based on what, they made decisions for the company's accommodation in the past (around 2007) and how they do this right now (around 2017). No emphasis will be drawn on the aspect uncertainty, and the possible influence of uncertainty on the change of decision-making. This is the element that will be investigated and therefore no bias in answering the questions is desirable. However, the final question of the interview *will* be about the influence of external uncertainty in general. This question, the so called *check-up* question, will include the view or opinion of the interviewees on the subject. This can be used to assess any found changes as a result of the interview data.

In the interview protocol, the "right" line of thought is addressed, by focusing on existing (past) situations. This means that the questions that are asked are related to an actual process of decision-making for accommodation alternatives of the specific company. The reason to use an existing example is that the answers that will be given are detailed an in-depth. To illustrate: if criteria are asked that are important to a company *in general*, the result will be a list of very common and general criteria like *low costs* and *proper image*. For this research, however, specific and more detailed criteria are desirable. In order to let the interviewee say the right things, he should be forced in a certain line of thought, without biasing him by proposing examples. Getting the interviewees in the right line of thought is therefore done by the use of an existing, real situation in their own corporation. By this measure, the interviewee doesn't have to "come up" with criteria, but he can relate back to a specific example he or she remembers. This will improve the quality and relevance of the answers given.

Furthermore, the protocol is set-up in the following way. First, a *recent* example of decision-making will be addressed. A recent example is still fresh in memory and is therefore easy to use. If the criteria and according weighing are extracted, the same questions will be asked for a *past* example. Conducting the research in this order makes it easier for the interviewee to get the purpose of the interview, since the first question is easy to understand. The following questions will then be logical and understandable.

For the full *interview protocol*, see appendix 3.

2.4.4 Processing data

The answers of the interview, the outcomes, will be documented and processed in tables *during* the interview, and will be set-up and checked in collaboration with the interviewee. The criteria, scores and weighing for the selection of alternatives will then be reconstructed in Tetra (see *theoretical framework*) to model the decision-making procedure of the different companies. According to the received information, the decision-making process can be reconstructed and checked for its validity. In other words: check whether the input generates the (actual implemented) output. This recalculating can reveal the actual decision-making process of the companies, and discover flaws or differences in their preference or intuition. Subsequently, the results can indicate a change in decision-making criteria over time, and eventually the results can be assessed according to their relation with external uncertainty. This will be done by the assessment of the input criteria and the according weighing. This will eventually answer the research question; whether external uncertainty has changed the input (criteria) of real estate accommodation processes.

2.4.4.1 Example tables

An example table is included below: for T1 (2007). In the actual research, for 2017, the same table will be constructed. In addition, a pie chart for the time period is included as well. This indicates the weighing that is given to the criteria. This product will be the result of the interviews for around 2007 and another for around 2017, and can be used to model the decision-making process of the specific projects. These models (inputs) can subsequently be compared and assessed.

In the table, the relative rating of alternatives on each criterion are shown. For this example, T1 and T2 are assumed to have the same criteria and the same alternatives. Also the ratings are the same. The pie charts, however, are different. The pie charts indicate the weighing of importance of the criteria. As can be seen, the importance of the criterion *costs* and the criterion *flexibility* changed. This difference in weight can generate a different *best alternative* when included in tetra. For example, in T1, Alternative 2 may be the best alternative, while in T2, Alternative 3 can be the best alternative due to the changed weighing of criteria. Moreover, after doing the interviews, the criteria itself may show changes as well. If this is the case, the whole model and the outcome will be totally different. A change in *best alternative* outcome can be generated by a change in criteria, rating or weighing.

T1 (2007)	Criterion costs	Criterion flexibility	Criterion image
Alternative 1	0	45	100
Alternative 2	100	0	15
Alternative 3	30	100	20
Alternative 4	20	80	0

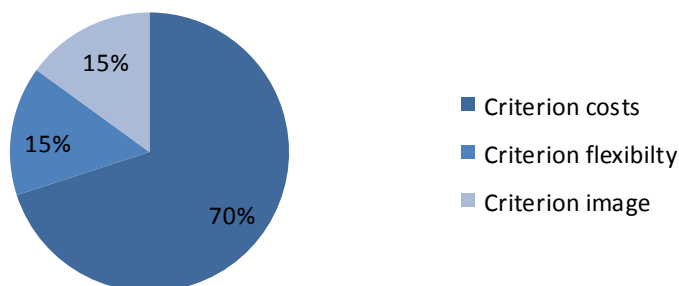Table 1: Example criteria and alternative scores T1 and T2 (own table)

Chart 1: Example criterion weighing T1 (own chart)

2.5 Deliverables

As a result of this research, an answer on the research question, and a (partial) confirmation or rejection of the main theses is given. The result will be an insight in the theoretical knowledge on decision-making and uncertainty in combination with the practical application and understanding of multinational corporations with a (former) accommodation demand.

In general, no artefact or generalization will be made since the amount of researchable companies, in this graduation thesis, is limited and no statistical evidence can be extracted from that. The result will therefore be an empirical understanding of the specific researched companies and the relation of their situation with the main research question. This understanding is new and includes recent developments. Therefore, the conclusions will be the assessed inductively, meaning that the relation between researched aspects will be regarded as true so far, until further generalizable assessment is done. Possibly, future recommendations can be drawn up if suspicions arise that there is a certain correlation between the researched factors. If this correlation is found, future research can be adjusted to measure the *strength* of the correlation, and even focus on proving a causal relationship. This research is the first step in appointing a certain relationship between *external uncertainty* and the extent to which it *changes CRE accommodation decision-making*.

More specific, this research will give insight in the decision-making procedures and the underlying criteria and importance for corporations with an accommodation demand, and how these aspects changed between 2007 and 2017. To assess the different decision-making approaches, models (on existing methods) will be reconstructed for each investigated company (see section Research Methods). By *filling in* this same model with the data from these different companies, a tangible and comparable view is provided on the practical implementation of the research topic. Additionally, by using this model, it is possible to *check* if the stated criteria and weighing of the companies are actually used in their actual accommodation choice. In other words, the companies' criteria and their importance can be compared with their choice for accommodation. By reconstructing their line of thought in the model, the outcome for a certain accommodation alternative (output) can be compared with the criteria and weighing (input). Possibly, differences can be discovered in the chosen alternative and the calculated "best" alternative. These differences will then be explained. By filling in this model and reconstructing the decision-making procedure, the reflection of reality can be determined, which results in valid data.

More important, the verified given input can eventually answer the main research question since criteria and the according importance for accommodation issues can indicate a change over time. This change in decision-making will eventually be analysed and explained in light of uncertainty as possible driver.

The result of this research is of interest to corporations that deal with accommodation issues and external uncertainty in the coming future. Since this applies to nearly every corporation and organisation, the results can be useful to a wide arrange of companies. Although the research assesses only a handful of corporations, the practical differences and similarities related to uncertainty queries can be helpful in understanding and improving decision-making for individual situations. The conclusions from the data will be assessed inductively, meaning that the outcomes will be regarded as the probable chance that the input and output are interrelated. As long as no counter argument exists, this relation will stand. This inductive assessment characterizes the fact that more research can establish long-lasting support, but the framework to acquire such support is available and therefore reproducible.

THEORETICAL FRAMEWORK

3. Theoretical framework

3.1 Introduction

In order to set up a research methodology to answer the research question, background information on the specific subjects is needed. Conducting an investigation on corporate real estate management, accommodation decision-making criteria and uncertainty, opens a broad spectrum of topics. All of these topics will be discussed in full extent, to eventually come down to a defined scope, or in other words: the theoretical framework of this research. The theoretical framework can therefore be seen as the backbone of this research.

The research problem was defined as the presence of external uncertainty, due to economic and political volatility during the last decade which showed to have changed CREM in the past. This problem relates to several topics, as mentioned before, namely *corporate real estate management, decision-making* (as practice in CREM) and *uncertainty*. The topic management or acquisition of corporate real estate (CREM) is the topic in which the other topics are embedded in this research. However, the regular *decision-making* and *uncertainty* literature will be reviewed separately and independently, and not already within the CREM field. With this approach, the full spectrum of literature can be reviewed, without narrowing down too much in an early stage by solely searching for literature that already combines the topics.

First of all, an introduction to corporate real estate management will be given, emphasizing its goals and objectives and models that are known in literature. Then the relationship between real estate strategies and the corporate strategy is described. This will result in a list of criteria that are mentioned in literature and that are used by corporates to serve their business goals by means of real estate management. This is followed by a research on decision-making literature which elaborates on the process of weighing and choosing alternatives to reach the optimum solution. Subsequently a general definition of uncertainty will be given, accompanied by the influence of uncertainty on the decision-making process.

3.2 Corporate real estate management

Corporate real estate management, or CREM, is an expertise with a relatively short history (Heywood, Kenley, Waddell, 2009, p. 10) that became more comprehensive and complex during the last decades (Roulac, 2001, p. 131). According to Krumm, Dewulf and De Jonge (1999, p. 59), the role of corporate real estate management shifted from a focus just on real estate transactions, by the founder or director of the company, to a focus on maximizing value for the company as a professional department. Corporate real estate management became, therefore, a core discipline of companies. But where CREM departments were centralised in the corporate headquarters, close to the core business, there were some influences that changed this set-up. International expansion, as driver for competitive advantage, and the rising costs of real estate during the 80's, triggered the question whether the activities of real estate management could be outsourced to cheaper professional service providers. Due to this shift, the role of the corporate real estate manager was point of discussion in many corporations (Krumm, Dewulf, de Jonge, 1999, p. 59). In relation to the former, the authors state the following about the role of the CRE departments (Krumm, Dewulf, de Jonge, 1999, p. 66):

"Increasing geographical and/or product diversity within the business activities of a corporation precipitates a separation between local operational activities and strategic/financial activities at corporate headquarters".

This statement implies that the role of the corporate real estate manager changed to a more mediating function between local operations and central business activities. The goal of this mediating function of the CRE department is to add value to the company by aligning business strategies with operating activities *through* real estate strategies. The authors assess this process as key element in providing the competitive advantage for corporates (Krumm, Dewulf, de Jonge, 1999, p. 67):

"Alignment and coordination of internal resources and capabilities to improve the corporate performance can and should no longer be regarded as an option but as a necessity; it's the entry ticket to the next millennium's competitive market".

Adding value to the company or in other words, increase the performance of the company is the main goal of corporate real estate managers. In literature, this goal is described often, but sometimes with other words. Ting Kien Hwa (2008, p. 122) mentions the goal *maximizing wealth* for the company, and a similar explanation is given by Gibler and Lindholm (2012, p. 29) and Roulac (2001, p. 130): *maximizing wealth of shareholders*, referring to the financial underpinnings of the company. Also De Jonge (1994) explains that the goal of CREM is to optimally attune corporate accommodation to the business performance, to add value and generate income. All of the authors, however, agree on the ultimate goal for CREM: *support the core business of the corporation as to add value to the company by the optimal attuning of real estate strategies to the business strategy.*

This keyword *optimal* indicates that corporate real estate management is a normative discipline. Meaning that CREM focuses on the optimization of a certain (or more than one) norm; a norm that can be defined, measured, benchmarked, modelled and thus improved. These norms can be interpreted as *criteria* or *performance indicators*. More on criteria will be explained in subsection *3.3.2*.

3.3 Aligning corporate strategy with real estate strategy

Back in 2001, Stephen Roulac (2001, p. 130) argued that those are working in corporate real estate management, have had too limited relationships with the corporate business strategy in the decades before. This was due to the limited researches and insights that were provided by academia. The discipline was too narrow in its perspective and focused solely on real estate issues, without the implementation of business issues. Parallel on this matter, the corporate strategic management researchers did also not take into account the benefits and possibilities of the management of accommodation of the business (Roulac, 2001, p. 130). Both disciplines were disconnected. The position where CREM should be, however, was already known and described by De Jonge in 1994. He positions CREM as the match between business (demand side) and real estate (supply side) (De Jonge, 1994). Although the discipline CREM was already recognised in the 1990's, and the position of CREM was already known, the actual alignment in literature and practice was clearly not widely appreciated yet.

Nowadays, numerous articles and books are published that try to connect the disciplines, to gain the benefits of proper corporate real estate management: creating wealth for the company and its shareholders. This alignment of corporate strategy and business strategy was illustrated among the first by Alan White (1999, p. 68). His model tries to translate the key disciplines and business processes to a real estate need. This need is subsequently analysed and matched to current preferences. This match is then translated to options and a real estate plan. See figure 4. In this model, a clear relation between the corporate strategy and a real estate solution, or real estate response is sought. This is done by the subdivision of the corporate structure and by finding the specific real estate needs per part. These needs are then compared with the existing portfolio to define what is lacking and should be acquired or divested. In this model the left side is part of the corporate level, and the right side is part of the real estate strategy level. They meet in the middle.
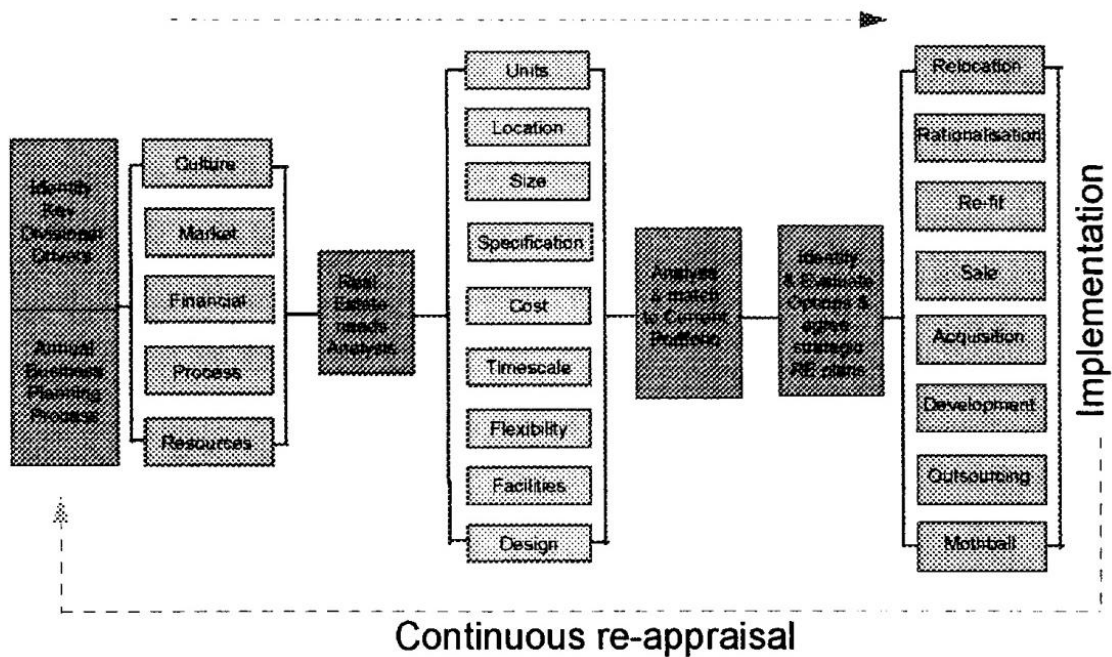
Figure 4: from business strategy to real estate strategy (White, 1999, p. 68)

Several years later, Gibler and Lindholm (2012, p. 36) presented a model that tries to capture the relationship between corporate strategies and real estate strategies as well, but in this model the side of the real estate strategy level is much more extensive than the side of the corporate business level. See figure 5. In fact, both models house the same elements, but illustrated differently. Aspects as flexibility, costs and resources (albeit in a different level of detail) are included in both models, but in the model of Gibler and Lindholm the core performance elements are implemented *in* the real estate strategy level. Apparently, within the 12 years since the model of White was published, some researchers see the real estate strategy as main discipline to directly support the core business performance. This can be a result of the ongoing development of the corporate real estate research and the maturing of the discipline.

In the model of Gibler and Lindholm (2012, p. 36), the ultimate goal of the core business is the starting point of the alignment. This goal is, as discussed before, the maximisation of the wealth of shareholders. This aspect is not changed since the publications of Roulac (2001) and Krumm, Dewulf and de Jonge (1999). The maximization of wealth is done in twofold: by a growth in revenues and by grow in profitability. These aspects are both in the level of the core business performance. On the level of real estate strategies, several pillars are identified that support the two growth aspects. For revenue growth, these pillars are: (1) increasing the value of organisation's real estate assets, (2) promoting marketing, sales and organisation brand, (3) encouraging and supporting employee innovation and creativity, (4) supporting environmental sustainability and (5) enhancing employee wellbeing and satisfaction. For profitability growth, these pillars are: (6) increasing employee efficiency and productivity, (7) enabling flexibility and (8) reducing real estate related costs. See figure 5.
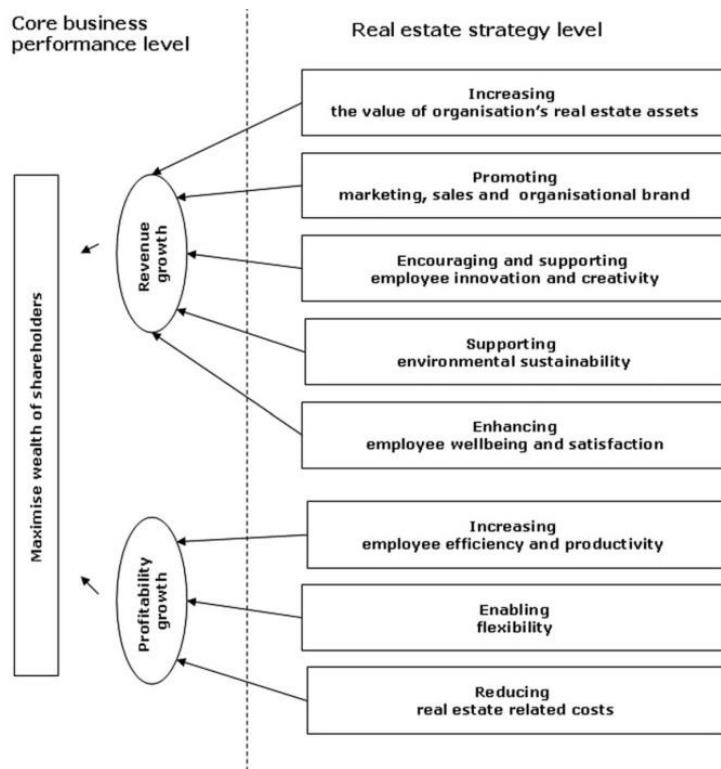
Figure 5: Relationship of corporate real estate strategies to core business strategy (Gibler & Lindholm, 2012, p. 36)

Another model that translates the corporate strategy to a real estate need is called the DAS-frame, referring to a framework for Designing an Accommodation Strategy (DAS); see figure 6 (De Jonge, Arkesteijn, Den Heijer, Vande Putte, De Vries, Van der Zwart, 2009, p. 3). This model also aligns the demand from the business level (upper side) with the supply from the real estate level (lower side). In this sense, this model is comparable to the two aforementioned models. The difference, however, is the aspects *change* in the demand and supply level. Besides a possible mismatch between the current demand and current supply, the models also takes into account a possible mismatch between a future demand and the current supply. This is an example of strategic planning, or scenario planning. This is different from the aforementioned models that basically focus on one single moment in time. Defining a future demand requires the making of assumptions or predictions for future changes in business strategy, taken into account future trends, both internal and external. The alignment of the real estate supply with the demand from the business is done after taking into account the current and future demand of the business.
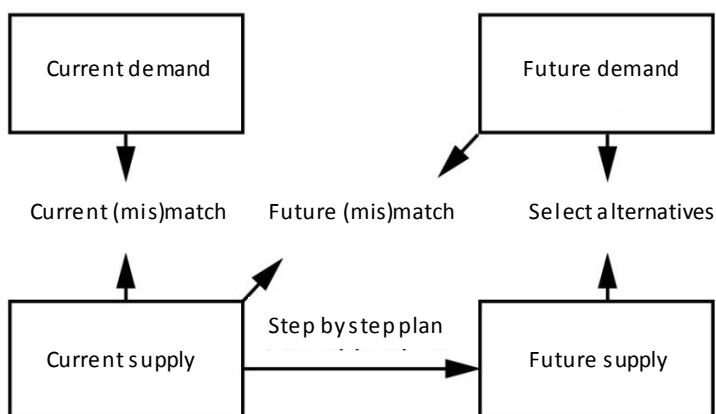
Figure 6: DAS-frame (De Jonge, Arkesteijn et al., 2009, p. 3, adjusted)

3.3.1 Choosing among accommodation alternatives

The actual execution of this alignment can be found in the part *select alternatives* (De Jonge, Arkesteijn et al., 2009, p. 3). Defining the criteria to make this alignment is the critical element in the matching of business strategy and real estate strategy; this is done just before in the part *define future demand*. Here the demand is translated to the criteria for real estate, which are then used to select the most suitable real estate solution among alternatives. Setting up these criteria and the according importance, or weight, is the direct translation of the core business into the real estate strategy. The addition of weight to certain criteria, in order to put emphasis on certain preferences, shows again the normative nature of corporate real estate management. An ongoing focus on optimization of the selection criteria into an accommodation alternative is pursued.

3.3.2 Criteria for the selection of alternatives

To give insight in the possible criteria that are used in real estate accommodation and acquisition strategies, multiple articles have been analysed. This is done in collaboration with Jeroen Paul Meijler, currently conducting a research on the Preference Accommodation Strategy corporate real estate management. The full list of criteria that is found in literature is included in appendix 1; but some important remarks are mentioned here.

3.3.2.1 Criteria scale levels

In literature, many scale levels for criteria were discovered. Criteria to choose among alternatives can be implemented on several levels of the building portfolio. First of all, criteria can only focus on the workplace level (1). This is often used by facility management (FM) departments within an organisation. Examples of such criteria are the amount of daylight per workspace, the amount of desks per employee and the amount of space per employee.

On a broader level, criteria can also focus on the building level (2). These criteria have impact on the building as a whole, its occupants, its performance and its direct surroundings. Examples of such criteria are the total occupancy costs, the total energy use and the price of land.

Even broader, the portfolio level (3) is characterised by certain criteria as well. On the portfolio level, the amount buildings as a whole are point of interest. Typical criteria are not only focussed on a single building, but are always seen in light of total portfolio performance and the relation between the single buildings. Examples of such criteria are the liquidity of the portfolio, the international ranking of the portfolio and coverage of possible sales areas.

Some criteria are not solely bound to one scale level. These criteria have a focus on all levels, or only two of them. Water consumption, for example, is a criterion that is relevant for both the building level and the portfolio level (even the workplace level can be argued). For this research, all scale levels are assumed to be relevant since the choice for new accommodation can be triggered by and focused on all of them or a combination. No exclusion has been made on the scale levels in the list of criteria, but in the interviews the different scale levels are used as "following-up questions" to point the CRE managers in the right direction when answering the questions about the criteria. By proposing scale levels, no biasing takes place (see *Interview protocol*).

3.3.2.2 Criteria purposes

Besides the division between certain scale levels, another division can be made in the purpose of selecting an alternative. Purpose refers here to the *goal* or the *use* of the acquisition of a building or a portfolio. Acquisition can be done in order to accommodate the acquired building by a corporation. Besides, acquisition can also be done for financial or investment purposes. In the last case, the building is not occupied or used by the acquainting party, but only held as investments. Seeing a building or a portfolio as a financial tool or source of income, produces different criteria for acquisition than if the building is acquired for own use; as occupier. This distinction is made in the criteria analysis. For this research, only the acquisition criteria for own occupation are used (see full table in *appendix 1*).

3.3.2.3   Criteria in time

The criteria can also be placed in time. Organising the criteria by the date they were published in an article, can give an insight in the development of real estate criteria over time. It can be expected that the spectrum of criteria developed and increased over time, and that emphasis on criteria could have been shifted due to (external) developments in the market. The tables below are a summary of the full table. This table indicates the amount of times a certain category is mentioned in literature before 2007, and after 2007. These categories are based on the model of Gibler & Lindholm (2012, p. 36) and indicate the relation between the core business of the company and the real estate strategies. The first table shows the amount of times the categories were mentioned in 2007 and before, and the second table shows the amount of times the categories were mentioned after 2007. For finding the criteria, a very broad spectrum of articles is investigated. This is done in order to get a generalised view of criteria in literature. A total of 275 criteria were found and incorporated, spread over around 15 articles. One researched article, however, contained the input from over 10 different other authors, adding up to a total of around 25 articles. These are named in the full table in the appendix. For making the distinction between before and after 2007, the *original* publishing date of these criteria is used. By doing this, an insight is given in the importance of criteria over time. This difference can be used understand how *uncertainty* may have changed decision-making during the last decade. Some interesting points can be recognised in the criteria tables, which are summed up below. These are the most significant changes in the tables.

Category	Amount	Ratio
Enabling flexibility	22	12%
Encouraging and support employee innovation and creativity	3	2%
Enhancing employee wellbeing and satisfaction	61	34%
Increasing employee/organisation's efficiency and productivity	17	9%
Increasing value of organisation's real estate assets	10	6%
Promoting market, sales and organisational brand	18	10%
Reducing real estate related costs	45	25%
Supporting environmental sustainability	5	3%
Total	181	

Table 2: Criteria count 2007 and before (own table)

Category	Amount	Ratio
Enabling flexibility	7	7%
Encouraging and support employee innovation and creativity	7	7%
Enhancing employee wellbeing and satisfaction	43	46%
Increasing employee/organisation's efficiency and productivity	3	3%
Increasing value of organisation's real estate assets	6	6%
Promoting market, sales and organisational brand	6	6%
Reducing real estate related costs	17	18%
Supporting environmental sustainability	5	5%
Total	94	

Table 3: Criteria count after 2007 (own table)

Changes from literature
1. A big emphasis can be seen on the wellbeing and satisfaction of employees in both time periods. After 2007, however, the share of employee satisfaction became even bigger
2. Reducing real estate costs shows a big emphasis as well, although in decreased after 2007

Table 4: Most remarkable changes from literature

The changes and new criteria that were discussed above are based on are very broad amount of articles. The "new" criteria that were extracted from these articles, and indicated a change, form therefore a representative basis of the full spectrum of articles. The criteria, however, are organised by their year of publishing in articles. Since it takes time for articles to be published, and since the information in articles is not always the most recent information, some delay is included in the publishing of the criteria and the actual awareness of the criteria in practice. In other words: the arise of awareness for some new criteria has most likely happened some time earlier than the publishing date of the articles in which they are described.

On the other hand, before companies implement a new set of criteria, some time passes as well: some delay in the awareness of criteria and the actual implementation is present in practice as well. Based on these arguments, for this research it is assumed that the publishing date of the articles and the actual implementation of "newly erected" criteria have happened around the same time. Therefore, the year of publishing is used in this research to give an indication of the practical and scientific presence of newly erected criteria.

3.4 Decision-making

The previous section showed that the spectrum of possible criteria for real estate decision-making is very broad. The focus, the level of detail and the goals to be served are very different. Still, most real estate decision-making processes include more than one criterion and one or more decision-maker. Criteria will therefore almost never be applied alone. This implies that the right balance should be found between the diverse criteria and from various decision-makers to find the most suitable solution for real estate decision-making issues. In other words, the solution with the best performance should be found. Additionally, the term *performance* assumes also a rating, weighing or preference for the various criteria. This should be included in the decision-making process as well. Arkesteijn and Binnekamp (2012) describe this as the *"aggregation of the performance rating of alternatives on different criteria into an overall performance rating".* Methodologies to conduct such performance ratings are known as Multiple Criteria Decision Analysis (MCDA) approaches. MCDA approaches can be applied to discover the right intervention or select the best alternative (Arkesteijn & Binnekamp, 2012). *"Selection means making choices and choice is synonymous to preference since we choose objects that are preferred"* (Binnekamp, 2007, p. 3). This statement implies that in order to make a choice, preference should be determined. In order to do so, preference has to be measured.

3.4.1   Measurement of preference

For proper decision-making with multiple stakeholders, the preference or interest of all stakeholders should be integrated to come to the optimal solution. This optimal solution serves the ultimate goal to add value to the corporation or organisation (Arkesteijn & Binnekamp, 2012, p. 4).

In order to include the aspect preference in decision-making, preferences (from an empirical system) should be translated to a numeral version (a mathematical system) to enable the use of calculus and algebra on the specific preferences. In other words, preference should be expressed in units (Barzilai, 2005, p. 173; Binnekamp, 2010, p. 1; Arkesteijn & Binnekamp, 2012, p. 2). This is done by *mapping* the objects from an empirical system to a mathematical system. Using a scale, the objects (empirical system) are expressed by numbers (mathematical system), see figure 7. This enables objects to be calculated with (Stevens, 1946). Applying calculus and algebra on preference objects, however, cannot always be done, since this depends on the scale that is used to map the objects (Barzilai, 2005, p. 174; Binnekamp, 2010, p. 24).
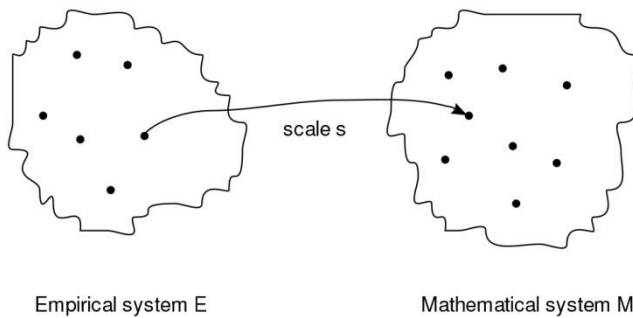
Figure 7: Mapping by a scale (Binnekamp, 2010)

Several types of scales are known and described in literature, all differing in deployability and use. These scales will be discussed briefly, based on the article of Stevens (1946) and the assessment of Binnekamp (2010) on the same article:

Nominal scale

This scale level can be described as the assignment of labels to individual entities. By labelling these entities, it is possible to group and compare them. The labels, however, have no numeral value and can therefore not be used in calculations since there is no relationship between the labels. Calculating with nominal scales will therefore result in meaningless results. An example of a nominal scale is the labelling of different animals. They all have a different name, and cannot be compared solely based on this name.

Ordinal scale

This scale level allows the same as the nominal scale, but can additionally assess a rank certain order in the labels. Higher or lower, and greater and less are comparisons that can be made using the ordinal scale. These scale levels, however, still do not have any mathematical foundation since the numbers or labels that are used have no numeral value, like first place, second place and third place on a scoreboard. Calculating with these numbers is therefore not possible.

Interval scale

This scale level can indicate a degree of difference in the entities. For example: the scale of degrees Celsius. The interval scale can be seen as an affine line, meaning that there is no absolute zero point, but the points on the line are divided in a constant interval. This scale level allows calculations in sense of addition and multiplication.

Ratio scale

This scale level is slightly the same as the interval scale, but the ratio scale has an absolute zero point, allowing the intervals to be used in ratio calculations. The relative distance between intervals is known, so calculations can include statements as "twice the size" or "half as warm". The Kelvin scale is an example of the ratio scale, since this scale has an absolute zero point.

The discussed scales, however, are assessed as *weak* scales by Barzilai (2005, p. 174) and later by Binnekamp (2010, p. 27). *Weak* implies that the scales do not allow any mathematical calculations. Barzilai (2005, p. 178) states about this subject: *"we see again that the models of the classical theory are weak: since that theory contains neither a definition of units nor the sets and operations necessary to define units, the classical models constitute measurement without units"*. The according explanation of this statement is in a detail level that goes beyond the purpose of this research. The conclusion about the aforementioned scale levels is that, although they allow some form of comparison, they cannot be implemented as solid mathematical foundation in the measurement of preference.

Proper scale

Barzilai presents on the other hand, a scale that *does* enable the use of calculus and algebra. This scale is called a *proper* scale (Barzilai, 2005, pp. 178-179; Binnekamp, 2010, p. 29; Barzilai, 2010, p. 75). The difference with the aforementioned scales lies in the origin of the scale. As can be seen in figure 7, elements in the empirical system need to be reflected in a mathematical system. Since preference has no absolute zero, nor an absolute one (or at least, it isn't found yet), it should be constructed in a one-dimensional affine space (see table 5, and for further reading: Barzilai (2005)). This can be illustrated best with an example: if a choice should be made for a particular car (i.e. preference), and the criterion *beauty* is concerned, it is not possible or accurate to say: "this car is twice as beautiful as the other". This is due to the fact that *beauty* has no "top" or "bottom", so a particular car cannot be "twice as beautiful". The ratio of the two points, as well as the sum of the two points are undefined. In order to apply these type of comparisons, reference points should be set up: a reference point for "beautiful" for example should be set (let's say 150 in the mathematical system), as well as a reference point for "ugly" (let's say 50 in the mathematical system) for example. By placing two other cars somewhere on the line between the two reference points (for example on 80 and 110), it is possible to compare the beauty of the cars and statements as "car *a* is x times more beautiful than car *b*". This proper scale is the only scale that enables the application of calculus and algebra, so this is the scale that will be used in this research.

Empirical system	Mathematical system
Has an absolute 0 and 1	Field
Has an absolute 0 but no absolute 1	One-dimensional vector space
Has no absolute 0 or 1	One-dimensional affine space

Table 5: Properties and models, based on: Barzilai (2005) & Binnekamp (2010)

The way to actually measure preference and apply it in a mathematical way to decision-making procedures is also point of discussion in literature (Arkesteijn & Binnekamp, 2012; Barzilai, 2005; Barzilai, 2010). To enable group decision-making, and the use of any decision-making methodology, the mathematical foundations of the methodology must be solid and sound. Many methodologies, however, are based on weak scales, and are therefore not mathematically underpinned. Lacking a proper mathematical foundation deprives the opportunity to deploy such methods since the numbers that are used are meaningless (Barzilai, 2005, p. 176). In the next subchapter, MCDA approaches and the according preference measurement scales will be discussed on their applicability in multi-criteria decision-making.

3.4.2   Multi Criteria Decision Analysis approaches

As described earlier, Multi Criteria Decision Analysis (MCDA) approaches take into account multiple criteria and the according preferences in decision-making processes. This is in many situations caused by the presence of multiple stakeholders in the decision-making (Multi Actor Decision-Making). More than one decision-maker decides which intervention is needed, all having different preferences and points of interest. This makes decision-making a complex process (Arkesteijn & Binnekamp, 2012, p. 1).

To deal with the complexity of multi criteria decision making, several approaches have been developed that try to model this process. Many of these approaches are described in the book *Multiple Criteria Decision Analysis* by Belton and Stewart, and described in the doctoral dissertation of Ruud Binnekamp (2010). In *Preference-based design in architecture*, Binnekamp (2010, p. 37) distinguishes 3 typologies in MCDA approaches. First, there are *value measurement* methodologies. Second, there are *goal, aspiration and reference level* methodologies. And third, there are *outranking* methodologies. Additionally, Binnekamp (2010, p. 85) adds a new typology, namely the *design methodologies.* These different methodologies will be described briefly to give an insight in the spectrum of possibilities and applicability, based on (Binnekamp, 2010) and (Arkesteijn & Binnekamp, 2012).

Value measurement approaches are characterised by the additive preference function that is used to come to the best alternative of all decision-maker's preferences. This implies that all criteria are taken into account, all including their according weight; relative to the others.

Multi Attribute Value Function (MAVF)

In this methodology, each alternative is assessed to generate its according performance. The alternative with the highest performance value is the best. To generate the individual performance for each alternative, the scores on the underlying criteria are multiplied by the weight for each criterion. Addition of the criteria scores gives the performance of the alternatives.

- $Performance\ of\ Alternative = \sum(Score\ on\ criteria * Weight\ of\ criteria)$

- The *weights* of the individual criteria are based on a relative division with the other criteria. In other words: a total weight of 100% is divided among the different criteria. So criterion *x* can have the weight of 70% and criterion *y* and *z* can both have a weight of 15%, together making the full 100%.

- The *scores* of the individual criteria are assessed according to an interval scale between 0 and 100.

This approach uses, as discussed above, an interval scale. As described in the former subchapter, an interval scale is not suitable for calculation of this kind. Therefore, this approach generates numbers that are meaningless.

Analytical Hierarchy Process (AHP)

This methodology is very similar to the Multi Attribute Value Function methodology. The difference lies in the method to assign scores to the individual criteria. No interval scale is used, but a ratio scale; originally based on a 5 point scale. This semantic 5 point scale is than translated to a numeric variant, but as discussed in the previous subchapter, this scale has no mathematical value. The numbers that are generated in this methodology are therefore meaningless as well.

Preference Function Modelling (PFM)

This methodology was developed by Barzilai (2010) and is assessed by Binnekamp (2010, p. 54) as "*the only decision theoretical methodology that enables the construction of measurement scales to which linear algebra and calculus are applicable*". The functioning of PFM is similar to MAVF and AHP, but the scale that is used is proper and not weak, like the scales used in the other methodologies. Preference Function Modelling is basically an evaluation methodology to aid decision-making. This methodology can help decision-makers to choose from a set of *existing* alternatives. Since this methodology is based on proper scales, and has thus mathematically foundation, PFM is suitable for the (*a posteriori*) check of decision-making procedures. When criteria, scores and relative weighing (based on known alternatives), it is possible to regenerate the decision-making procedure by the use of this methodology. Therefore, this methodology will be used in this research to model the decision-making processes of interviewed companies. A tool to use this methodology is Tetra. Tetra is described as: "*a tool which implements the Preference Function Modeling methodology for subjective measurement and multi-criteria decision analysis*" (www.scientificmetrics.com, 2017). This is exactly the focus point of this research in the processing of data.

Goal, aspiration or reference level approaches are characterised by their use of constraints, goals and objectives. The idea behind these approaches is that, when designing on the basis of a function, so many alternatives can be generated, that it is too hard and time-consuming to assess them all. Goal, aspiration and

reference level approaches make use of a *design space*, wherein all alternatives lie. Using constraints, goals and objectives makes it possible to optimize the process of generating alternatives.

Linear Programming (LP)

Linear programming is used to maximize of minimize (in other words: optimize) a certain function, which is subject to constraints. Within this function, (decision-) variables are included, that represent numeric equivalents of a certain empirical variable, for example amount of square meters. In linear programming, all variables and constraints are expected to be linear. In linear programming a single goal or outcome is generated.

To implement linear programming as multi-criteria decision analysis method, all stakeholders' demands should be translated to a function, which should be optimized. From all outcomes (if there are any feasible) a preferred one should be selected.

Goal Programming (GP)

This methodology is similar to linear programming, although goal programming can implement multiple objectives. This is done by formulating the constraints as separate functions that must be satisfied as well.

Just like linear programming, goal programming generates only single solutions and is therefore hard to use as a methodology for multi-actor decision-making. Besides, the use of scales should be considered as important, since the use of ordinal, interval and ratio scales has no mathematical foundation.

Linear Multi Objective Programming (LMOP)

LMOP is considered to be the only method to successfully deal with multiple objective programming. Although goal programming was able to do the same, both linear and goal programming generate a single solution. LMOP can generate, so called, non-dominated solutions. This means that beside a single solution, at least one other solution can be generated. The LMOP method works similar to goal and linear programming, with the use of objectives and constraints. The method is able to present more than one (compromise) solution, though the choosing between the solutions is not supported.

3.4.2.3   Outranking methods

Outranking methods are characterised by their different approach, compared to the two former methods. The best alternative is selected based on the outranking of others, instead of assigning a value to the alternatives like in the value measurement methods. If alternative *a* is better than alternative *b*, and no sound counter argument is available, than alternative *a* gets priority over alternative *b*.

ELECTRE

ELECTRE can be characterised by its use of matrices to compare pairs of alternatives. The alternatives are compared based on their performance on certain weighed variables. The matrices are used to test whether or not the hypothesis that value *a* is bigger than *b* is true, by comparing the pro and contra evidence. These variables are weighed according to a verbal or an ordinal scale, with no mathematical origin. The results of the ELECTRE method have thus no numeral value and are therefore not suitable for calculations.

PROMETHEE

This methodology is quite similar to ELECTRE, although the rating of the criteria and alternatives is done in various ways. It can be done by a partial value function, a verbal scale or by direct rating. The same comments as with ELECTRE apply here: the weighing is done in a non-mathematical way, so the outcomes are meaningless

3.4.2.4   Design methods

A new category in multi-criteria decision-analysis methodologies is the *design methods* approach. This approach was described by Binnekamp (2010) and later developed further (Arkesteijn & Binnekamp, 2012) to follow up on the need for the design of *multiple* alternatives instead of the generation of a *single* one.

Preference-Based Design (PBD) and Preference-Based Portfolio Design (PBPD) are examples of this method. Since these methods focus on the generation of multiple alternatives, which are not relevant for this research, no further explanation will be given. For further reading see: Binnekamp (2010) and Arkesteijn and Binnekamp (2012).

3.4.3 Behaviour or characteristics of decision-makers

The previous subchapters describe the rational methods that aid decision-making processes. The fact that these methods are developed and described indicates that there is a practical need for such methods. Although these approaches are helpful in decision-making due to their structure, simplicity and sometimes broad applicability, it doesn't mean that the *human touch* is not present in decision-making anymore. On the contrary, many of the described methods used an ordinal or interval scale for rating criteria. As discussed earlier, these scales have no mathematical foundation. The mentioned scales are highly sensitive to human influences and subjective preference. The role of human behaviour, sometimes led by emotions and intuition, should therefore be pointed out as well.

3.4.3.1 Human judgement

The importance of this matter is present in literature as well. Valerie Belton (2005, p. 159), known for her research into multi-criteria decision-making methodologies, poses the question *"what is the interplay between emotion, values and reason?"*. By asking this question, among others, she aims to raise awareness for the presence of emotion in multi-criteria decision-making, and even the possible existence of an emotionally intelligent MCDA (Belton, 2005, p. 159). Apparently awareness is needed for this matter.

Nick French confirmed the presence and influence of human intuition or emotion in decision-making: *"expectations are based on a number of different information sources, historic data, current market price, market sentiment and personal intuition"* (French, 2001, p. 402). This statement applies to decision-making in investment fund management; a discipline that is similar to portfolio or accommodation decision-making. Also, Loizou and French (2012, p. 207) conducted a research on decision-tools. They concluded however, that although this tool may be helpful, it is heavily biased by human actions. They state: *"the key criticism to mathematical modelling lies in the fact that it bases its calculations on highly restrictive assumptions. These underlying assumptions, however, can in no way be accurately defined, as they are parameters directly related to human actions and interactions which are difficult to comprehend, let alone quantify"* (Loizou & French, 2012, p. 207). In addition, they explain the characteristics of management and decision-making in the real estate and construction industry. This industry is heavily dependent on the *"highly complex human relationships"* (Loizou & French, 2012, p. 204). The aspect of assumptions that are hard to implement in calculations is in some way covered by the development of *proper scales*. But defining assumptions in general, and being aware of the fact that a human judgement is being made is again complex and not expressible in values. In the chapter *decision-making under uncertainty* some typical ways of decision-making, based on human judgement are highlighted.

3.4.3.2 Human experience

Besides the human judgement as factor, human experience is described as decision-making influencer as well. Amgoud and Prade explain the connection between experience and decision-making: *"on the basis of decisions experienced in the past in situations which are similar to the current one, some decisions for this new case can be [made]"* (Amgoud & Prade, 2004, p. 1531). This implies that decision-makers use their experience in making decisions in new situations. This seems obvious, and is probably done multiple times a day, even by yourself, but using your own experience has no scientific or mathematical foundation.

Experience as influencer is also described as follows: *"when a decision-maker has some knowledge regarding the state of nature, he/she may be able to assign subjective probability for the occurrence of each state of nature"* (Taghavifard, Damghani, Moghaddam, 2009, p. 4). This behaviour can be, for example, optimistic,

pessimistic or focus on the *least regret* option, they state. All of this human behaviour is influenced by experience, emotion, intuition etc. Here, intuition is again assessed as driver for human decision-making.

The aspect described above is similar to the topic of *Thinking fast and slow* by Daniel Kahneman (2012). In his book, Kahneman explains the way people make decisions: intuitively and deliberate. Although the arguments mentioned before may indicate that intuition is not scientific and mathematically substantiated, Kahneman concludes that the choices made by intuition, are often highly accurate since they are based on earlier experiences. He even questions choices being made by extensive thinking. He states that errors can occur by overthinking situations. Still, experience is not a guarantee for success, but intuition does not generally imply that a choice is wrong or unsatisfying. Brady, Davies and Nightingale (2012, p. 730) support the trust on intuition and experience. They state: *"high quality project managers are [...] men and women who have the judgement and experience to manage conflicting stakeholders' aims and objectives and act effectively in the face of a constant stream of unpredictable events"* (Brady, Davies & Nightingale, 2012, p. 730).

All in all, we can state that the fact that human actions and the making of assumption (or subjectivity in general) generates a kind of *uncertainty* (Belton, 2005, p. 159; Amgoud & Prade, 2004, p. 1531). Since this aspect will always be present within human interaction and collaboration, decision-making will be in some way biased by the human factor. So, not only external uncertainty can be a parameter in decision-making, but also uncertainty by the decision-makers themselves. The fact that humans can influence decision-making will be taken into account when discussing the interview outcomes.

3.5 Decision-making under uncertainty

As discussed in the problem analysis, uncertainty is a result of volatility and other problems in the market and in politics. When practicing corporate real estate management, situations with uncertainty are encountered often. But what is the cause of uncertainty? How is uncertainty implemented in decision-making in general? This chapter will elaborate on the aspect external uncertainty and internal uncertainty and their role in decision-making. External uncertainty relates to the external influences that need to be tackled by the business to deliver *competitive advantage* (see *scope of research*). This section will not elaborate on the way uncertain factors are discovered or predicted, but on the *causes* of external uncertainty and how corporates can *respond* in decision-making. Internal uncertainty relates to uncertainty that is present in decision-making as a process, often caused by decision-makers. For this research, a change in decision-making is investigated. This change can be caused by changing external influences or a change by internal influences. These two aspects will therefore be the focus points of this chapter, including ways to respond, but first, a definition of uncertainty will be given.

3.5.1 Definition uncertainty

Uncertainty is an aspect that affects people continuously, and is dealt with numerous times a day. Uncertainty exists on different scale levels and in endless different forms. But what is uncertainty actually? Besides obvious explanations as *"something that is doubtful or unknown"* (www.merriam-webster.com, 2016), more sophisticated explanations exist as well.

"Uncertainty is a situation which involves imperfect and/or unknown information" (www.wikipedia.com, 2016). This definition includes the term (imperfect) information, which is basically the lacking of complete information or the lack of information at all.

Another definition is: *"a situation where [...] the consequences, extent, or magnitude of circumstances, conditions, or events is unpredictable"* (www.businessdictionary.com, 2016). This definition described uncertainty as a process of which the outcome is unpredictable. Basically this definition assumes that a certain *change* is going on, of which the result is unknown.

Another definition is: *"the degree to which available choices or the outcomes of possible alternatives are free from constraints"* (www.businessdictionary.com, 2016). This definition uses the term constraints. This means that constraints are able to diminish uncertainty in some way, since they can exclude certain possibilities or situations. Using constraints is a way to frame uncertainty.

The last definition is used in statistics, and is formulated as follows: *"the estimated amount or percentage by which an estimated or calculated value may differ from the true value"* (www.thefreedictionary.com, 2016). An important distinction that is made here is the difference between expectation and reality.

To sum up, uncertainty can be described as:
- The lack of information
- The incompleteness of information
- A process with unknown result
- Resulting space in a constrained field
- The difference between expectation and reality

Risk, however, is often seen in relation to uncertainty, but the terms are different. Risks are defined as *"unknowns that have measurable probabilities"* while uncertainty *"involves unknowns with no measurable probability"* (www.reference.com, 2017). So, risk can be measured, but uncertainty not. This doesn't imply, however, that uncertainty cannot be expected or estimated. There are just no ways to *measure* the (exact) amount. In this research, the aspect *uncertainty* is used. The focus point of this chapter is therefore on the unmeasurable aspects, and not about the ways to measure or calculate risk. In other words: risk will not be discussed further in this research, since the focus is on the unmeasurable aspects.

In this sense, the difference between deterministic and probabilistic can be explained as well. Deterministic means that the data is known beforehand. Outcomes can therefore be calculated. Probabilistic means that the data is not known upfront, and the outcomes can only be estimated by an element of chance. Uncertainty is therefore related to the probabilistic side, unless all information is known or can be calculated (then it is a risk) because then it is at the deterministic side (Taghavifard, Damghani and Moghaddam, 2009, p. 2).

3.5.2 Causes of external uncertainty

Corporates pursue competitive advantage over other corporates, and therefore need to adapt to external trends and events to remain profitable. Another way to express trends and events is *opportunities* or *threats*. A changing external environment with ongoing trends and events, however, can be described as an uncertain environment as well. Change is new, and therefore uncertain. But what are the trends and events that influenced corporates during the last 10 years? What new inventions, shifts and developments had the corporates to deal with? A table is developed that includes external factors that caused a changed situation, or uncertainty for corporations. In appendix 2, the full table of trends and events is included.

3.5.2.1 Why uncertain?

If the trends and events from appendix 2 are reviewed, it becomes clear why these trends and events are causes of *uncertainty*. As stressed out earlier this chapter, there is a difference between risk and uncertainty. This difference was summarized as follows: risks are defined as *"unknowns that have measurable probabilities"* while uncertainty *"involves unknowns with no measurable probability"*. The main element of this explanation is related to the measurable aspects of the events and trends. In the table in the appendix, a brief explanation of every trend and event is given. In setting up this table, a critical look on the measureable aspects was given. Among the trends and events that were included, the overall recurring aspects, that make these trends and events *unmeasurable* are:

- *Elements of surprise* (not expected), e.g. Brexit, the election of Trump. Expectations were different, but apparently, the elements of the events were such, that no solid and realistic outcome could be generated. Although "measurable" elements were used to make an estimation of the outcomes of both events, the "measurable" elements appear not to be the right ones. The surprise reaction that followed should be taken into account when assessing similar polls, elections, referenda, etc.: apparently the cases were not measurable at all.
- *Complexity* (impermeable amount of individual factors), so many factors are part of the coherent element, but its amount is too large to understand or measure. Even though (some) factors are known, there are still factors to be revealed: *it is not known what should be measured, and what is known, is too much to be measured.* Often, such events and trends are so big and overwhelming, that the precise affected area cannot be estimated as well, e.g. globalisation or the Arabic Spring: it is known that changes will happen and it is known that in some way people (in general) will be affected. The exact way in which this will happen is not known: in this sense, we deal with a *feeling,* an aspect that triggers people to respond but also an aspect that cannot be expressed in numbers for example. These characteristics make complex events and trends unmeasurable and therefore uncertain.
- *Novelties* (not happened before), e.g. technological developments open up new areas of thinking, working, acting and learning. Since new technologies, understanding, scientific research or evolving insights are part of uncovered ground, the option to measure it decently doesn't exist. In some sense, these novelties can lead to the aforementioned elements of surprise.
- *Volatilities* are the aspect that go up and down but without a stable or repeating movement. Basically the up and down movement includes the *elements of surprise*.

3.5.2.2   Categories of uncertainty

If the characterising trends and events from appendix 2 are organised, 5 different types of uncertainty can be seen. These types are:

- (Macro-)economic uncertainty
- Political uncertainty
- Demographic uncertainty
- Technological uncertainty
- Environmental uncertainty

As stressed out before, for this research, based on literature and news, the types of uncertainty that are expected to be major influences are: political uncertainty and economic uncertainty. Although other categories characterised the last decade as well, it is expected that the only ones of influence on corporate accommodation decision-making are political and (macro-)economical. Whether or not this is true, and to what extent uncertainty was in general a driver of change will be concluded at the end of the research.

3.5.3   Decision-making under internal uncertainty

Situations without uncertainty are hard to find. Almost every decision made, involves some uncertainty. The way to deal with it, however, can differ a lot. The same applies to the level of uncertainty in the decision-making aspect by the amount of information that is available. This section will go into different decision-making procedures involving internal risk.

According to Taghavifard, Damghani and Moghaddam (2009, p. 4), decision-making under uncertainty can be divided into three levels of knowledge. When there is absolutely no information on the states of nature, this level is called *decision-making under pure uncertainty.* When there is knowledge or chance, but no perfect information (probalistic) this level is called *decision-making under risk.* The use of the term *risk* here, however, is not correct, since this level is not about the measuring of uncertainty, like discussed in the previous section. The last level is a derivative from the latter; it is based on the buying of information to acquire knowledge. In

practice, this is done by the use of a consultant or expert that can provide new knowledge. This level is called the *Bayesian approach*.

3.5.3.1 Decision-making under pure uncertainty

Decision-making under pure uncertainty means that there is absolutely no information available on the states of nature (no probability) or that it is too costly to buy additional information. This implies that decisions made, are only dependent on the personality of the decision-maker. This is explained earlier in the chapter *behaviour characteristics of decision-makers*, but some typical human characteristics, incorporated as decision-making aspects will be discussed here.

- Personalities differ a lot. The same applies for the way people choose. In decision-making several types can be distinct. A well-known version is the *pessimist*. He or she will always assume the option with the lower possible return (not to be confused with probability).
- The *optimist* does, obviously, the opposite. Their credos are respectively: "bad things always happen to me" and "good things always happen to me" (Taghavifard, Damghani and Moghaddam, 2009, p. 4).
- A personality version in between is called the *Hurwicz's index*. This personality sees himself somewhere between 0 and 1 (assume bad things and assume good things), and multiplies the possible actions with this amount (e.g. 0,6).
- Another type is characterised by the fear for disappointment or regret, also known in decision-making as *Savag's Opportunity Loss*. His credo is "I hate regret and therefore I want to minimize any new regrets". Regret can be seen as the difference between the best alternative (in hindsight) and the actual chosen alternative. As a result of this personality, this decision-maker will always choose for actions which show the least accumulated difference between expected outcome and highest possible outcome (Taghavifard, Damghani and Moghaddam, 2009, p. 7).

Decision-making under pure uncertainty is not present in reality a lot. Almost every situation includes the option to acquire extra information or to determine some probability among the actions. The situation *pure uncertainty*, however, does illustrate the pure result of personality in decision-making. The influence of personality on choosing alternatives should not be underestimated. As has been discussed in the previous chapter, it is still very hard, or even impossible to model or quantify the human factor. Decision-makers should be aware of this.

3.5.3.2 Decision-making under probalistic uncertainty

If some knowledge is present about the probability of a certain uncertainty, we speak of a *probabilistic* uncertainty. This type of uncertainty is dealt with by the calculation of alternatives, based on their probability.

- One way of doing this, is assessing on their *pay-off* and chance of happening. This type of decision-making is also described in the chapter *decision-making*.
- Another way for decision-making under risk is *the most probable state of nature.* This decision-making procedure picks the state of nature with the highest probability, and subsequently picks the action with the highest pay-off; in that specific order.
- The *Expected Opportunity Loss (EOL)* the opposite of choosing the highest pay-off of done. The probability and loss are multiplied, and the solution with the lowest overall loss is selected.
- With the *Expected Value of Perfect Information* (EVPI), the maximum amount that should be paid for additional information is calculated. This is done on the same way as EOL, but here the EOL is used to determine how much money is worth the opportunity to buy extra information.
- The *Laplace Equal Likelihood Principle* is characterised by the use of an equal number for probability in the calculation of the expected pay-off. The action with the highest accumulated pay-off is chosen as the right action (Taghavifard, Damghani and Moghaddam, 2009, p. 11).

The approach that includes the acquiring of information is called the Bayesian approach. An expert's judgement or advice can be helpful in decision-making. This situation has two types of probabilities; the *prior* probabilities and the probabilities after the hire of a consultant. In order to calculate the best decision, a *decision tree* should be drawn. A decision tree includes all possible solutions and the according probabilities. When the tree is calculated from the nodes to the root, the best solution will come up. The reason why a tree is used is because this decision-making procedure includes several steps after the ones before. Making use of just a table or matrix cannot implement the different steps at different moments in time (Taghavifard, Damghani and Moghaddam, 2009, pp. 13-17). The Bayesian approach is very similar to real time decision-making, since a complete decision will not be made at one moment in time and without the consult of an expert of another information source.

3.6 Response to uncertainty

As discussed before, multiple ways to deal with uncertainty are distinct in literature. Brady, Davies and Nightingale (2012, pp. 729-730) name the two ways of responding to risk and uncertainty as follows: the *analytical approach* requires mathematical and statistical techniques, such as the discussed models that include probability and quantified preference. The *intuitive approach*, on the other hand, is based on the trial and error for selecting actions. This is for example recognisable in the pure uncertainty environment which is solely based on personality. In literature, some "survival techniques" for CREM are discussed. These approaches may be used by the companies that will be interviewed in this research. Knowing possible actions that they have undertaken, improves the understanding of their way to deal with uncertainty. These approaches will be described now briefly.

First, of all, the decision-maker needs to know how much risk or uncertainty he can tolerate, what the expected return has to be (both in monetary and non-monetary sense) and in what time-frame this has to happen (D'Alpaos & Canesi, 2014, p. 370). This relates both to investment decision-making, as decision-making for own occupation. Subsequently a list of 10 "best guidance" aspects should be taken into account. This list consists of the following aspects (Cooke, 2002, pp. 371-374):

1. *Accurate data:* if the information is not accurate, complete enough or up to date, no good decisions can be made
2. *Review the corporate real estate strategy:* the overall strategy needs to be flexible enough to respond to changes, both internal and external, immediately.
3. *Delay acquisitions:* delay the acquisition of a new accommodation. If you wait, you have a more competitive position and you are able to achieve better terms on your lease. Don't let the landlord know you are eager for a certain building.
4. *Seek flexibility:* focus on break clauses in acquisition and in the current portfolio.
5. *Bring forward disposals:* make sure disposals are done as soon as possible when the market allows to, in order to avoid purchasers to renegotiate the terms.
6. *Develop a strategy for breaks and lease expiries:* paying for flexibility can be more profitable than paying for holding empty assets.
7. *Look for property investment bargains:* acquiring assets at a cheap price can give you material advantage over competitors; only if your own portfolio is in good shape.
8. *Actively manage rent collection and maintenance:* maintain the income generation and minimise its costs to the business. This is desirable when cash generation may become harder over time.
9. *Reassess the risk profile:* deal with the bad things during strong periods, to avoid setbacks during bad periods.
10. *Let real estate underpin the business and vice versa:* this seems quite obvious, but real estate and business can help each other out when one of them is lacking quality. Sale and lease back may for example be an option to release cash for the business.

Although this list may seem a bit obvious, and not just applicable in uncertain times, but also in normal times, it still can be used to relate back to after the interviews are done. Comparing a possible discovered *change* in decision-making, with the steps mentioned above, may indicate how the specific company acted during the years of uncertainty.

3.6.1   Generic strategies

Singer (2005), based on O'Mara (1999) distinguishes different generic strategies for real estate when it comes to the level of strategic uncertainty. Since it is reasoned that the current external climate is very uncertain, due to political shifts, economic challenges and other trends and events, the strategic uncertainty at the moment is assumed to be *high*. According to Singer (2005), expected is, that the real estate accommodation strategies that will be investigated during the interviews, will be focused on *incremental* strategies, since recent newspapers assess the current external situation as highly uncertain. The characteristics of *incremental* strategies are (Singer, 2005):

- *"Space is acquired in bits and pieces over time*
- *Delay major commitments until either better information or a clearer vision is available*
- *The primary concern of the company is to meet the physical requirements of the work to be done*
- *Rarely put much emphasis on employee amenities or visual aesthetics"*
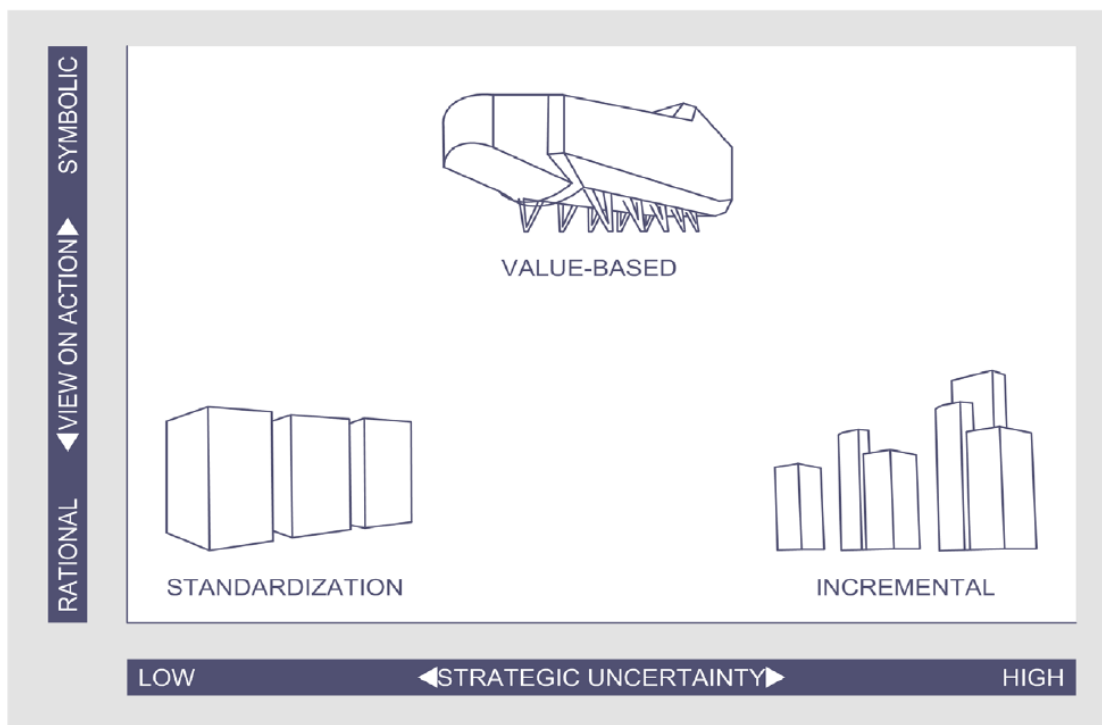
Figure 8: Generic corporate real estate strategies (Singer, 2005; based on O'Mara, 1999)

Now the background information about the research topics is known, the collection of data is the next step. The next chapter described the process of selecting companies to interview, conducting the interviews and the verification of the acquired data. The information of the theoretical framework chapter will be used during these interviews and in interpreting the outcomes of the interviews.

DATA COLLECTION

4. Data collection

4.1 Introduction

In order to acquire the data to answer the research question, interviews are set up with 5 companies. These interviews were conducted in March of 2017 at the offices of the specific companies. The selection and contacting of the companies is described in the next subchapter.

To prepare the interviews, a description of the topics and focus points of the research was sent to the participants earlier. The focus point *external uncertainty* as the driver for change was not mentioned however, so the companies wouldn't be biased with this aspect. The preparation information was sent by email and consisted of a description of the timeframe (around 2007 and around 2017), a description of the information that was required (alternative accommodation options and selection criteria) and some general information about anonymity and the recording of the interview. By sending this information, the companies were able to prepare the interview and bring the right information to the interview. This speeded up the process during the interview because the research and its purpose were already explained.

The companies that were interviewed are anonymised in this research for privacy reasons. The names and employee names of the companies will not be described and published publically. Those who are interested in the specific names, for educational purposes for example, can contact the author of this research. This information will only be provided after approval by the author, the mentors of this research, Delft University of Technology and the contact person within the specific companies.

The set-up of this chapter will be as follows. Every subchapter describes a single company that was interviewed. For every company, some general background information will be provided, but in an abstract way, since too much detail will disclose too much information which can hamper the privacy of the companies. After the background description, the interview itself will be described. This part will consist of some specific information about the current position and (strategic) context of the companies, which is useful in understanding or valuing the choices they made.

After this section, the acquired data will be provided, that was gathered during the interviews. In order to check the validity of the data, the decision-making process will be reconstructed in Tetra, as described in the methodology chapter. The decision-making process of the companies is reconstructed based on the criteria, the weighing of the criteria and the alternative accommodation options. By reconstructing this process, the Tetra model can check whether the processes the interviewees describe align with the values they indicate. If the number don't add up in the model, the values from the interviewee are not right. By doing this, the values can be made as realistic as possible, since the Tetra model is a reflection of decision-making in reality. The next chapter will elaborate on the interpretation of this data.

4.2 Company selection procedure

As has been described in the methodology chapter, interviews with 5 companies will be held. These companies were selected according to several criteria. First of all, the companies were desired to be in all different industries or sectors. This would give a view on the subject from a broad spectrum. Second, the companies should have an international origin, crossborder management or international activities. Third, the interviewee should be on the position as CRE manager for the period of investigation. To speed up the interviewing process, the author collaborated with a real estate management company. This company was willing to share its network to find the right companies and right persons quicker.

When selecting the companies, the last criterion appeared to be leading. It is hard to find companies, especially big multinationals with the same person on the CRE management job. This criterion has been used as leading, since the quality and verifiability of the data is highly influenced by a person that experienced it by himself. The first selection was based on this criterion, after which the focus was brought to international focus of the companies. As has been stressed in the methodology chapter, companies with international activities are more subject to (global) economic and political trends. Since this is in the essence of the research question, the selection was highly dependent on this international presence and activities of the companies. The criterion that companies should all be in a different industry became the least important criterion, since this would have the least impact on the research question. In the methodology chapter a plan B1 and B2 were set-up to cover the possibility of the unavailability of differing sectors. But from the companies that were contacted (around 12), 5 companies were willing to cooperate in the research, and all of them were in a different sector. So eventually, all company selection criteria that were proposed in the methodology chapter were met in the acquisition of data.

4.3 Company 1

4.3.1 Background

Company 1 is in the construction sector and was established in the Netherlands in the 19th century. The company performs consultancy services, engineering services and project management in infrastructure, (water) engineering and real estate. They are active in over 70 countries worldwide, with over 25.000 employees. Still, the headquarters are located in the Netherlands.

4.3.2 Description of interview

The interview took place at the corporate headquarters in the Netherlands and the interviewee is a member of the European corporate real estate team and is working at the company for around 10 years. As was announced in the preparation email, the interview was about the two timeslots. The interviewee indicated, however, that for the timeslot *before 2007* no documentation of actual processes was available for him, since some acquisitions were just finished before 2007 and that was just before he started to work at the company. However, the formerly used criteria were clear to him because he saw how the company changed, causing a shift in accommodation criteria since then. The unavailability of (documented) alternatives in the timeslot *before 2007* disables the opportunity to verify the data for this period. Nevertheless, the value of the criteria can still be assumed. This will be done in the verification subchapter. The period *before 2007* includes the acquisition of the current headquarters.

For the timeslot *around 2017*, the interviewee was in the possession of documentation, and the interviewee worked on the projects himself. By this, the interviewee as able to give a detailed description of recent accommodation processes of the company, and the according criteria and weighing. The accommodation process that was discussed in the interview happened in 2014, and was about the search for accommodation for a secondary department of the company. Since the current location (0-option) was not fit for use anymore, the CRE team set up a long-list as a very broad overview of the building options that were available. This list consisted of nearly 20 buildings. The selection of these 20 buildings was based on a *veto-criterion*, or filter, that the area of search should be limited to a certain part of Amsterdam. This was basically a first filter for the search for accommodation. After the set-up of this long-list, a short-list was created. The short-list was based on the distance to the railway station, which was the most important criterion in this process (see also next subchapter). The short-list of feasible buildings was assessed on several criteria. These are the criteria that were leading in the decision-making process, and these criteria and weighing are subject to the data acquisition. The alternatives on the short-list, the criteria and weighing are shown below in the data and verification chapters.

During the interview, the following decision-making criteria were discovered for the period around 2007 and the year 2014. These criteria will be explained briefly, to explain the choice for using them.

Criteria	Weighing
Reciprocity	25%
Parking spaces	25%
Price/quality ratio	25%
Location near project/cient	25%

Table 6: Criteria and weighing company 1 (2005)

The criterion *reciprocity* refers to a typical situation for the company around 2007. The interviewee stated that the company always tried to relate the accommodation choice to building projects of clients. This reciprocity was therefore a gesture to clients, which was perceived well in those relationships, and could generate future work. The criterion *location near project/client* was included to ascertain work and accessibility for employees, as well as the criterion *parking spaces*, which was related to the accessibility of the company for clients and personnel. The *price/quality ratio* relates to willingness to pay more for a bigger or better looking space. Since these criteria influence each other directly, these criteria are combined in a ratio.

Criteria	Weighing
Location near public transport	40%
Price/quality ratio	20%
Parking spaces	5%
Energy label (B+)	10%
Installations	10%
Image	10%
Shared amenities	5%

Table 7: Criteria and weighing company 1 (2014)

The criterion *location near public transport* is clearly of great value. As discussed earlier, this criterion was used to filter from the long-list to the short-list, but even in the assessment of the short-list the criterion in leading. Some similar criteria can be indicated in both timeslots: parking spaces and price/quality ratio. But new ones are the specific energy label. This had to be at least label B since this applied to the sustainable focus of company 1. Also the state of the installations was important, since this relates to the energy label as well, but also to the costs (of moving). Shared amenities are new as well, and these are related to the activities that are of interest to the personnel of the company. The criterion *reciprocity* is not present anymore. This had to do with the changing nature of this criterion. A decade ago, this was perceived as positive towards clients. The feeling nowadays, however, is that reciprocity can indicate a conflict of interests. Still, representation of some kind towards clients is present in this list of criteria, under the criterion *image*.

4.3.4   Verification of decision-making process

To verify the criteria and their relative weighing, the decision-making process of 2014 was reconstructed in Tetra. As stated before, the criteria from 2007 are not fit for reconstruction since the alternatives and scorings were not available for that timeslot. Still, based on the conversation with the interviewee and the verification of the data in in 2014, an estimation about the verifiability of the data from 2007 is made below.

2014	Weighing	Building 1	Building 2	Building 3	Building 4	Building 5 (0-option)
Location near public transport	40%	100	75	100	75	0
Price/quality ratio	20%	100	65	70	65	0
Parking spaces	5%	100	40	100	70	0
Energy label (B+)	10%	100	50	80	50	0
Installations	10%	100	80	50	50	0
Image	10%	100	70	90	40	0
Shared amenities	5%	100	80	70	80	0
Score		*100*	*71*	*86*	*65*	*0*

Table 8: Verification company 1 (2014)

Above, the verification of the data from 2014 can be seen. The criteria, weighing and scoring that were provided by the interviewee were reconstructed in Tetra. The outcome of the reconstruction shows that the building that was actually chosen (building 1), aligns with the best outcome in the Tetra modelling. This means that the relative weighing and scoring of the criteria on the different alternatives in 2014, gives a good reflection of the decision-making process in reality. The values that were provided by the interviewee are therefore relevant.

If the criteria and weighing from 2007 are compared, there are only 4 criteria, all with equal weighing. The interviewee equally divided the weighing over these criteria based on his memory, but also refers to the immaturity of the decision-making process during those years. He states in the interview: *"it wasn't more sophisticated than that, then"*. These criteria were taken into account, but apparently no explicit, emphasized, importance was assigned. Although it is maybe hard to believe that the decision-making process was that simple and without any emphasis, this might relate to the office market from *before 2007*. For company 1, a project was only selected if it fitted in all these 4 criteria. Based on the office market before the financial crisis, which was way more favourable, with more variety of choice and financing options, this way of decision-making can be perceived as typical and therefore also relevant. Based on this, the weighing of these criteria is assessed as relevant as well for this research.

4.4 Company 2

4.4.1 Background
Company 2 is in the real estate investment industry. The company origins in Germany; where it was established as an investment manager for real estate, shipping, infrastructure and logistics. Clients are from Germany, the Netherlands, the UK, the United States and across Asia. In the Netherlands only, company 2 manages over 800.000 m2 of real estate, with a total worth just under 1 billion euros. The managed objects are located mainly in the Netherlands, but some original objects in Germany are under their management as well.

4.4.2 Description of interview
The interview took place in the main office in Amsterdam. The interviewee was the financial administrator (or a so called CFO), who works in close collaboration with the board. The two timeslots that were discussed were 2006, when the company moved to the current office building, and 2016 when the lease for the current building was extended. During this last process, some other options were taken into account. Eventually the 0-option (stay) was assessed as the best option. The interviewee also indicated that the company experienced a big growth during the last decade that started around the year 2006. This was the main reason to move to a new building that year. This is a *veto criterion* since it was the first filter to select some buildings out of which a list of options was generated: only buildings with the right size were taken into account. This is similar to the

filter that company 1 used to set up the first list of accommodation options by only looking at one single area in Amsterdam.

During the interview, two lists for two timeslots with criteria and the according weighing were constructed. These lists are shown below, and illustrated briefly. During the interview, also the alternative accommodation options were discussed and the criteria were scored on the different criteria. These aspects are used in the verification of the data in the next subchapter.

Criteria	Weighing
Costs	20%
Distance personel	15%
Distance business partners	40%
Distance tenants	5%
Representation (w/o sustainability)	10%
Flexibility in space	10%

Table 9: Criteria and weighing company 2 (2006)

For company 2, in 2006, the criterion *distance to business partners* was very important. The interviewee indicated that they really prefer to be in the vicinity of their business partners, since they need to visit these partners frequently. The difference between a 5 minute walk and a 30 minute drive through the city centre is of significant value to the company since they do those visits multiple times a day.

Criteria	Weighing
Costs	15%
Distance personel	20%
Distance business partners	40%
Distance tenants	5%
Representation (incl. Sustainability)	10%
Flexibility in lease	5%
Moving costs	5%

Table 10: Criteria and weighing company 2 (2016)

In the table for 2016, some criteria remained the same, but some new criteria are added as well. Sustainability as part of the representation was named by the interviewee when setting up this list. This relates to the increasing importance and emphasis on this aspect in regulatory way, but also in awareness. Another aspect that changed is the form of flexibility that the company was pursuing. In 2006, flexibility in sense of space was sought. This was caused by the big growth they were experiencing, and some possibility to grow further in the new accommodation was taken into account. In 2016, flexibility in sense of lease contract was included. This relates to the fear of being stuck to a lease contract in times of (economic) growth or decline. The possibility of adding break options was therefore part of the decision-making process. By this measure, some extra money was paid to ascertain the possibility to leave the contract earlier than planned if the company experienced an unplanned change in business or economy.

4.4.4 Verification of decision-making process

The data that was acquired from company 2 was reconstructed in Tetra to determine whether the stated data aligned with the actual decision-making outcome. Below, the input and output of the modelling are shown. Both for 2006 and 2016 the outcome of the modelling aligns with the actual choice for accommodation. This indicates that the values that were assigned to the criteria by the interviewee are a reflection of reality. Therefore the data of both timeslots are verified and assessed as relevant.

2006	Weighing	Building 1	Building 2	Building 3	Building 4	Stay (0-option)
Costs	20%	20	20	40	100	0
Distance personel	15%	0	20	10	100	0
Distance business partners	40%	70	100	70	0	70
Distance tenants	5%	0	30	10	100	0
Representation (w/o sustainability)	10%	50	100	10	0	50
Flexibility in space	10%	30	60	60	100	0
Score		*39*	*68*	*45*	*50*	*30*

Table 11: Verification company 2 (2006)

2016	Weighing	Building 3 (0-option)	Building 1	Building 2
Costs	15%	0	50	100
Distance personel	20%	100	40	0
Distance business partners	40%	100	40	0
Distance tenants	5%	100	0	60
Representation (incl. Sustainability)	10%	100	40	0
Flexibility in lease	5%	40	100	0
Moving costs	5%	100	0	50
Score		*88*	*40*	*15*

Table 12: Verification company 2 (2016)

4.5 Company 3

4.5.1 Background

Company 3 is in the computer technology (IT) industry and is among the 5 leading IT firms globally. The company makes software, hardware and provides services complementing them. Numerous offices are located all over the world, with corporate headquarters in the United States.

4.5.2 Description of interview

The interview took place via Skype since the interviewee is staffed in the United States. The interviewee is the global vice president of real estate and facilities. As head of real estate and facilities, over 100 acquisitions have been done by the interviewee. In total, over 20 million square feet of building portfolio are subject to his management. During the interview, the decision-making procedure of the company was discussed. In preparation of the interview, an email with additional information about the questions was sent. By providing this information earlier, the interviewee was able to search for additional information before the interview started. The documents that were found were discussed during the interview and were shared for this research. This documents consisted of the excel files that were used by the company to select the best accommodation option in 2007 and 2016. Also some excel files were shared from 2010 and 2015 that showed the more gradual development of the decision-making forms. As can be seen in the next chapters, a huge change has been going on in the decision-making procedure of company 3; the decision-making procedure became more sophisticated and detailed. The information that was shared for this interview is translated to tables that are fit for comparison, as can be seen in the next subchapters. The original documents are not included in this research for privacy reasons.

Based on the interview and the documents that were shared, the following tables for 2005 and 2006 can be generated. Both tables will be discussed briefly.

Criteria	Weighing
Construction costs	20%
Furniture costs	20%
Security costs	20%
Service costs	20%
Contingency costs	20%
Gross construction budget	100%

Table 13: Criteria and weighing company 3 (2005)

The table above shows the very early decision-making process around 2005. In this process, only financial matters were taken into account. In the original documents, only the *gross construction budget* was given a weighing (100%). The other criteria contributed with an equal share in this 100%. The fact that only costs were taken into account is probably related to the typical origin of company 3. Site selection in the United States in different from common practices in a lot of places in Europe and especially The Netherlands which is very dense populated. When looking for a new accommodation (building site) in the United States, it is more common than in Europe to construct a new building instead of transforming an existing one because there is more space to build in the United States and the accessibility is similar. Building something new in general is also related to the American culture, where replacement of old products with new ones is generally accepted. This is probably the cause of this minimalistic criteria list: site selection criteria for example are not needed, since sites are more or less the same.

Criteria	General weighing
Location (human factors)	12%
Location (amenities)	10%
Ownership status/reputation	6%
Parking	9%
Utility sources	9%
Security concerns	7%
Branding visibility	8%
Sr. Executive sponsorship	9%
User input	9%
FH&S concerns	3%
Accessibility/disability compliance	4%
Sustainability	2%
Floor location preference	5%
Efficiency of space	7%

Table 14: Criteria and general weighing company 3 (2015)

For setting up the criteria and weighing table for 2015, the actual assessment document of company 3 were used. In these documents, a general criteria list is made, including the weighing per criteria. Basically the decision-making procedure of company 3 is the same as the procedure used in Tetra. The table above shows the general weighing of these criteria. This is how the company divided the relative importance of the criteria. However, the company has also the opportunity to change the weighing for specific projects. For each project, the project team can adjust the weighing values to match the project best. In the project that was discussed during the interview, a slightly adjusted version of this criteria list was used. For that specific project, some of

the weighing was adjusted, which is shown in the table below. This adjusted weighing is called specific weighing, since it is only relevant for that specific project. As can be seen in the table, some criteria are set to weighing 0%. This means that these criteria are not used in this process. Still, these criteria are used in other projects and are relevant for this research, since it tells a lot about the company's decision-making process *in general.* For this research, the specific weighing will be used to *verify* the data, but the general weighing will be used as *relevant* for this research. So in short, the specific weighing will be used to verify the decision-making process, and when this process is validated, the relevance of the general weighing is also assumed and used in the rest of the research.

Criteria	Specific weighing
Location (human factors)	20%
Location (amenities)	10%
Ownership status/reputation	6%
Parking	9%
Utility sources	9%
Security concerns	9%
Branding visibility	8%
Sr. Executive sponsorship	0%
User input	9%
FH&S concerns	0%
Accessibility/disability compliance	0%
Sustainability	0%
Floor location preference	9%
Efficiency of space	11%

Table 15: Criteria and specific weighing company 3 (2015)

4.5.4 Verification of decision-making process

Company 3 used models to determine the best accommodation option both in 2005 and 2015. In 2005, this model was solely based on financial aspects. In 2015, a shift to a very sophisticated model was made. In this model, aspects from very different natures were included. A similarity with both time periods is that the choice for accommodation was based on the outcome of the model. Company 3 looks at what the best outcome is, and chooses for this outcome. Therefore, the data that was provided is *exactly* the decision-making process they dealt with. This means that modelling the data cannot make the decision-making process more of a reflection of reality than it is in their own model. The data provided by company 3 is therefore assessed to be relevant.

4.6 Company 4

4.6.1 Background

Company 4 is active in the human resources (HR) industry, and has businesses in 8 European countries. The company origins in the Netherlands and its headquarters are located there today as well. Company 4 was established in the 70's of the last century, and has been growing since. The last corporate take-over took place at the start of this last decade, resulting in the company that is currently active. The offices of company 4 differ from corporate offices (back offices) to service offices (front offices). The front offices are the offices where customers can enter who are, for example, looking for a job. The back offices are more general offices in service for the front offices. The interviewee is responsible for both office acquisition types, but the processes that were discussed are both front office processes. This was done since these processes were the most alike, which made them very suitable for comparison.

The interview was conducted at one of the corporate offices in The Netherlands. The interviewee is a Dutch corporate real estate (project) manager, and is working at the company for over a decade now. The interviewee immediately emphasized that the rise of internet was a great influencer on their business: the competition of online HR solutions is high. This led to a decline in amount of sub-brands of the company as well: from 17 brands to 5 "star"-brands. The company chose for a more centralized company, with less, but stronger brands. The amount of front offices also declined, which was also related to the current strategy to centralize offices. The process around 2007 that was discussed in the interview is not related to a specific accommodation project since there was no documentation available of that period. The interviewee, however, had prepared the interview very well and managed to come up with a list of criteria; both from memory and from other related colleagues. Moreover, he was well aware of a shift that had been going on during the last decade in the way accommodation was chosen. This shift is visible in the tables for both timeslots below.

The recent process that was discussed during the interview is about the centralization of 7 front offices to a single, bigger, office. This was, as stated before, part of their new strategy. For this timeslot, there was information available about the alternative options.

For the processes around 2007, the interviewee set up the following criteria list, with according weighing. The criteria are explained briefly below.

Criteria	Weighing
Costs	45%
Accessibility public transport	20%
Accessibility car	10%
Prominent location	6%
Location in shopping street	6%
Ground floor space	10%
Moving costs	2%
Installation and construction	1%

Table 16: Criteria and weighing company 4 (2007)

As can be seen in the table, the criterion *costs* was by far the most important one. This was emphasized by the interviewee multiple times, since their focus was always on the minimizing of costs and the optimizing of return. This may seem obvious, but with this company, it was translated directly to the list of accommodation criteria, since the offices in their portfolio account for a great deal in their operating costs. Therefore, minimizing accommodation costs were of great interest, already in the acquisition of new offices.

Also accessibility was an important criterion, but the accessibility by public transport was the most important one. This had to do with their customers, who came mostly by public transport. Another criterion that relates to the connection with customers is the need for a location on the ground level. Being able to see the office was of great value for the company because the customers would walk in more easily. Some other criteria were also taken into account, but these were barely critical, for example the *moving costs,* and specific location in *shopping street*.

Criteria	Weighing
Costs	30%
Central district	5%
Accessibility public transport	10%
Accessibility car	2%
Ground floor space	2%
Centralization	2%
Internal experience (for employees)	35%
Internal experience (for clients)	5%
Flexibility	2%
Sustainability	2%
Prominent location	5%

Table 17: Criteria and weighing company 4 (2017)

In the criteria table from 2017, some differences are visible. First of all, the most important criterion is not *costs* anymore, but the *internal experience for employees*. The interviewee explained how the new offices were internally designed to create a great, healthy and inspiring working place for the employees. This internal experience was also focused on clients and customers, but not nearly that much. Another striking difference is the share of *costs* that became less. The interviewee explained that costs are still one of the leading aspects in the accommodation processes, but that quality in sense of experience now overrules the costs. Another aspect that changed is the share of accessibility, both in public transport and by car. Accessibility by public transport is now more important since the centralization strategy focuses on central locations in city centres, where most people come by public transport. The accessibility by car is nowadays barely decisive.

4.6.4   Verification of decision-making process

As said before, the process for 2007 is not suitable of reconstructing since there was no data available about the alternative locations then. Moreover, the data from 2017 only consists of two alternatives, which isn't fit for reconstructing as well. Based on only two alternatives, no comparison can be made. To assess whether or not the data is a logical reflection of reality, two aspects are reviewed: the way of acquiring data and the explanation of choices.

The most important aspect is that all the data was acquired in tables that were filled in by the interviewee himself: no biasing or prompting took place. Additionally, the biggest changes in percentages were explained by the interviewee, and were mostly related to a change in business strategy to counter the only competition. Therefore, the story that was told by the interviewee, and numbers accordingly, align and makes the numbers relevant. So the acquiring of data happened in a scientific way and the number that were acquired were logical and make sense. Therefore the data for company 4 are assessed as relevant as well.

4.7 Company 5

4.7.1   Background

This company is in the food industry, and is among the top fast-food chains worldwide. Company 5 is active in more than 100 countries but originates in the US, where its headquarters are still located today. The company owns numerous restaurants around the world, since it is in the food industry, but the interview was focused on the corporate offices instead of the restaurants. This is done because the choice for restaurant locations is part of different criteria, which are related to retail-like considerations (strategic location of the sales), instead of office-like considerations (strategic location of the business). The interviewee is a real estate manager at the Dutch real estate department. He is in charge of both the restaurant locations and building and the office locations and buildings.

During the interview, two timeslot were discussed. The first timeslot (around 2000) was the timeslot that the current headquarter of company 5 was built. For this process, the company looked at a number of criteria, but in that time, the criteria list was not that impressive. This had to do with the mind-set of the global corporation. They wanted the offices to be a *service* to the restaurants. Therefore, the offices were not subject to extensive criteria lists. This mind-set changed during the years, as can be seen in the criteria list from this year (2017). This process relates to a current relocation of the Dutch headquarters. This process is currently going on, and a lot of thought has gone into the new program of requirements, which is in this case a criteria list. Since this process in currently happening, there are (yet) no alternative buildings selected. At the moment, only the choice about the area in the Netherlands is being made. Therefore these alternative locations are (if possible) used to check the data. As can be seen in the data verification, not all criteria can be rated on the alternatives areas, but the ones that can, are included. The outcome of the modelling in this research is actually used by the company as support in choosing the right location.

As a result of the interview, the following tables can be set up. These tables will be explained briefly below.

Criteria	Weighing
Amsterdam as location	30%
Accessibility car	20%
Distance to national airport	10%
Possibility to expand	20%
Costs	20%

Table 18: Criteria and weighing company 5 (2000)

Some important criteria in 2000 are related to the location. As *service* office, the accessibility and the distance to the airport were the leading in location choice. Since no special demands were available for the office, since it was just a *service*, really practical aspects like *costs* complete the list. Since the company didn't expected much from the office, the criteria set is not that sophisticated and mostly consisting of practical issues.

Criteria	Weighing
Distance to national airport	10%
Accessibility public transport	20%
Accessibility car	10%
Parking spaces	10%
Discrete location	2%
Representation	2%
Open feel internal	10%
Open feel external	20%
Costs	10%
Fitness	6%

Table 19: Criteria and weighing company 5 (2017)

It is clear that the list with criteria became bigger during the last decade. This has to do with the changing idea behind the offices. This idea changed from *service* office to *example* office. The interviewee took me to one of their example-restaurants to do the interview because he wanted me to show how hospitality was present in the restaurants of these days. By this, he wanted to make clear what the atmosphere of the new office should be. Hospitality is a keyword in the demand for the new office, and this is translated to criteria like *open feel internal* (for employees)*, open feel external* (for visitors/clients)*, fitness* and *representation*. Additionally, the *accessibility by car* became a new and important criterion. This has to do with the sustainable approach of the

company. This is namely an aspect that is pursued by the corporation worldwide, and that should be included in every detail of the company. The accessibility by car became by this less important.

To verify the data that was acquired, the data from 2017 was reconstructed in Tetra. the data from 2000 consists of only two alternatives, which makes it not suitable for comparison: at least three alternatives are needed. The data from 2017 is reconstructed, but in this process, no alternative is chosen yet. There was only an expected best outcome among the alternatives. This expected outcome aligns with the best outcome in Tetra. The aspects, such as fitness, and the open feel are not taken into account in the reconstructing, since these aspects will be involved after the actual locations (and not the areas) are determined. Important note: the preference of the interviewee was not necessarily on the expected best outcome. The interviewee thought himself that the option Utrecht Central was very interesting. Therefore it is expected that the numbers are not, for a fair amount, influenced by preference of the decision-maker, right because it doesn't align with his preference. Moreover, the interviewee is currently working on this program of requirements, and is therefore really close to the items in this list. Also the relative weighing is *currently* subject to his concern. The fact that this process is currently going on indicates that the criteria and the relative weighing is correct and relevant; they are fresh in memory and subject to day-to-day attention. Additionally, the datasets for both time periods were acquired in a similar, scientific, way. Since the data for 2017 is assessed as relevant, assumed in that this also accounts for the data of 2000, since the interviewee was very close to this process as well.

2017	Weighing	A'dam South-East	A'dam North	Utrecht South-West	Utrecht central station
Distance to national airport	10%	100	90	90	0
Accessibility public transport	20%	80	0	70	100
Accessibility car	10%	100	90	90	0
Parking spaces	10%	100	90	70	0
Discrete location	2%	0	80	80	100
Representation	2%	0	80	80	100
Open feel internal	10%	0	0	0	0
Open feel external	20%	0	0	0	0
Costs	10%	100	70	80	0
Fitness	6%	0	0	0	0
Score		*58*	*33*	*50*	*17*

Table 20: Verification company 5 (2017)

DATA INTERPRETATION

5. Data interpretation

5.1 Introduction

Now the data is acquired and verified, the data can be interpreted. The goal of this chapter is to indicate whether or not a change, or a structural change, can be found in the evolution of accommodation criteria. To do so, the data from the 2007 period and the 2017 period are compared. First all data from the interviews will be combined in tables. Conclusions on the evolution of these criteria can be drawn based on that. For example: some criteria disappeared and other criteria were added. This change in criteria can say something about the way decisions are made in both time periods. Possibly, a structural change can be indicated. Note that this change only regards the interviewed companies, and is not a generalization of these kinds of companies in general.

Additionally, the weighing of the criteria, which indicates relatively *how important* criteria are, will be added in the tables as well. The evolution of criteria can indicate a change, but the evolution of criteria weighing (assigning importance) can also indicate another change. Moreover, the criteria and weighing for both time periods will be organised along the eight means of real estate by Gibler & Lindholm (2012). Addressing this order can make a change in decision-factor focus clearer.

Eventually, these changes will be assessed in sense of *structural change*. In the next Discussion chapter, the role of uncertainty in this structural change will be discussed as well, leading to the conclusions and recommendations in the subsequent chapter.

5.2 Combining criteria

5.2.1 Full tables of unstructured decision criteria

5.2.1.1 Unstructured criteria count

The table on the next page shows all criteria that were mentioned and how often they were mentioned among the companies. When looking at this table, it is clear that there are very little criteria that are mentioned in *exactly* in the same sense with more than one company. Since the amount of interviewed companies is limited, this is not a coincidence. The full table of criteria that was found in literature (see appendix 1) consisted of a very broad amount of different criteria. This means that there are many criteria that can be important to companies. Having many overlap in used criteria from the 5 interviewed companies is therefore unlikely. There are, however, some criteria that appear at more than one company. The criterion *costs* and *parking spaces* for example, are mentioned often. This is a bit obvious, since these criteria are really practical and are relevant for a wide arrange of offices and companies. Criteria like *discrete location* or *reciprocity* for example, are more detailed and relevant for only a single company, out of the 5 that are interviewed. It is important to note that some criteria are almost alike, but slightly different.

The criterion *representation* for example, is mentioned multiple times, but always in a slightly different sense. One company explicitly stated that representation didn't consist of sustainability in 2007, but did consist of sustainability in 2017. Another company mentioned representation as well, but didn't add anything like sustainability as part of this criterion. To avoid biases during the interview, no too specific follow-up questions were asked in this case. Since the individual criteria are too varied, to draw conclusions on the full list of criteria, the level of detail should be one step lower. This is done by organising them in chapter 5.2.2, but first the evolution of the individual criteria is shown.

All mentioned criteria	2007					2017				
	Comp. 1	Comp. 2	Comp. 3	Comp. 4	Comp. 5	Comp. 1	Comp. 2	Comp. 3	Comp. 4	Comp. 5
Accessibility car				X					X	X
Accessibility public transport					X					
Accessibility/disability compliance								X		
Amsterdam as location					X					
Branding visibility								X		
Central district									X	
Centralization										X
Construction costs			X							
Contingency costs			X							
Costs		X		X	X		X		X	X
Discrete location										
Distance business partners		X					X			
Distance personel		X					X			
Distance tenants		X					X			
Distance to national airport					X					X
Efficiency of space								X		
Energy label (B+)						X				
FH&S concerns								X		
Fitness										X
Flexibility									X	
Flexibility in lease							X			
Flexibility in space		X								
Floor location preference								X		
Furniture costs			X							
Gross construction budget			X							
Ground floor space				X					X	
Image	X									
Installation and construction				X						
Installations						X				
Internal experience (for clients)									X	
Internal experience (for employees)									X	
Location (amenities)								X		
Location (human factors)								X		
Location in shopping street				X						
Location near project	X									
Moving costs		X					X			
Open feel external										X
Open feel internal										X
Ownership status/reputation								X		
Parking spaces	X					X				X
Possibility to expand					X					
Price/quality ratio	X					X				
Prominent location				X					X	

Criteria	2007	2017
Reciprocity		
Representation		
Representation (incl. Sustainability)		
Representation (w/o sustainability)		
Security concerns		
Security costs		
Service costs		
Shared amenities		
Sr. Executive sponsorship		
Sustainability		
User input		
Utility sources		

Table 21: All mentioned criteria for both timeslots

5.2.1.2 Unstructured criteria evolution

The individual, unstructured criteria can give an indication of the evolution of criteria over time. With evolution, the increase or decrease of variety and amount is meant. In order to compare both timeslots, the lists of criteria are made unique; which means that overlapping criteria are left out.

The table on the next page shows al the unique criteria that were mentioned for both timeslots by the interviewed companies. When looking at both time periods, it is clear that the amount of criteria that were taken into account increased a lot. From 26 different criteria that were mentioned for the 2007 period, to 41 different criteria that were mentioned in the 2017 period (+58%). Apparently, the *interviewed* companies take into account a wider variety of criteria in the 2017 period, than in the 2007 period.

An important note here is, is that it is possible that the companies have less information or memory available for the period 2007, since it is a long time ago. It is thinkable that this is the cause of the shorter list of criteria for this timeslot. On the other hand, company 3 had specific documentation available about the decision-making process in the 2007 period and this lists consisted of only 5 criteria. This can indicate that not a memory loss is the cause of the small variety in criteria, but that the decision-making procedure was immature those days, compared with today. This is also a remark that was given by the interviewee from company 3 and company 2. They both referred to the immaturity of the decision-making process when compared to today. Again, the reference to Roulac in 2001 illustrates this statement: *"more dramatic and rapid economic evolution suggests increasing need to adapt workspaces and places – as well as management thinking"* (Roulac, 2001, p. 138). Based on these statements, expected can be that the criteria *have* become more extensive or varied, and that the increase in variety of criteria is indeed a significant development and change.

+/- 2007	+/- 2017
Accessibility car	Accessibility car
Accessibility public transport	Accessibility public transport
Amsterdam as location	Accessibility/disability compliance
Construction costs	Branding visibility
Contingency costs	Central district
Costs	Centralization
Distance business partners	Costs
Distance personel	Discrete location
Distance tenants	Distance business partners
Distance to national airport	Distance personel
Flexibility in space	Distance tenants
Furniture costs	Distance to national airport
Gross construction budget	Efficiency of space
Ground floor space	Energy label (B+)
Installation and construction	FH&S concerns
Location in shopping street	Fitness
Location near project	Flexibility
Moving costs	Flexibility in lease
Parking spaces	Floor location preference
Possibility to expand	Ground floor space
Price/quality ratio	Image
Prominent location	Installations
Reciprocity	Internal experience (for clients)
Representation (w/o sustainability)	Internal experience (for employees)
Security costs	Location (amenities)
Service costs	Location (human factors)
	Moving costs
	Open feel external
	Open feel internal
	Ownership status/reputation
	Parking spaces
	Price/quality ratio
	Prominent location
	Representation
	Representation (incl. Sustainability)
	Security concerns
	Shared amenities
	Sr. Executive sponsorship
	Sustainability
	User input
	Utility sources
Total: 26	**Total: 41**

Table 22: Full table of unique criteria for around 2007 and around 2017

To illustrate how the variety of criteria changed during the last decade, *at the 5 interviewed companies*, the table below shows the criteria that remained the same over both time periods, the criteria that disappeared and the criteria that were added. Again: this is only relevant for the 5 interviewed companies, and is not at all a generalization of change.

Remained since 2007	Added since 2007	Disappeared since 2007
Accessibility car	Accessibility/disability compliance	Amsterdam as location
Accessibility public transport	Branding visibility	Construction costs
Costs	Central district	Contingency costs
Distance business partners	Centralization	Furniture costs
Distance personel	Discrete location	Gross construction budget
Distance tenants	Efficiency of space	Location in shopping street
Distance to national airport	Energy label (B+)	Possibility to expand
Flexibility in space	FH&S concerns	Reciprocity
Ground floor space	Fitness	Representation (w/o sustainaibility)
Installation and construction	Flexibility in lease	Service costs
Location near project	Floor location preference	
Moving costs	Image	
Parking spaces	Internal experience (for clients)	
Price/quality ratio	Internal experience (for employees)	
Prominent location	Location (amenities)	
Representation	Location (human factors)	
Security costs	Open feel external	
	Open feel internal	
	Ownership status/reputation	
	Representation (incl. Sustainability)	
	Shared amenities	
	Sr. Executive sponsorship	
	Sustainability	
	User input	
	Utility sources	

Table 23: Criteria evolution since period 2007

The table above shows to the evolution of criteria since 2007, for the 5 interviewed companies. This list shows that more criteria were added than disappeared. This is of course in line with the statement from the previous subchapter; the variety of criteria became bigger between the two timeslots.

5.2.2   Full tables of structured decision criteria
The criteria that are showed above, can be divided among the 8 topics that were introduces in the theoretical framework chapter. Organising the criteria over these topics can say more about the specific focus of the 5 companies, and how this focus has changed since 2007. By looking at the criteria from a lower level of detail, the structure can tell more about criteria focus instead of individual criteria. This implies that the criteria that were discovered during the interviews are organised over the 8 topics, and that the amount of criteria per topic indicates a change or similarity in focus. The table in appendix 4 shows all the unique criteria (overlapping ones are left out) in the topic in which they belong. The table below shows the counting of these criteria per topic.

Topics	Counted around 2007	%	Counted around 2017	%
Reducing real estate related costs	9	35%	7	17%
Increasing employee/organisation's efficiency and productivity	9	35%	9	21%
Promoting market, sales and organisational brand	5	19%	10	24%
Enabling flexibility	2	8%	3	7%
Increasing value of organisation's real estate assets	1	4%	1	2%
Enhancing employee wellbeing and satisfaction	0	0%	9	21%
Encouraging and support employee innovation and creativity	0	0%	0	0%
Supporting environmental sustainability	0	0%	3	7%

Table 24: Counted criteria per topic

This table indicates some interesting changes between 2007 and 2017. When looking at 2007, it is clear that costs-related criteria account for a great deal of the total mentioned criteria by the interviewed companies. 35% of the total variety of criteria is about costs. Compared to 2017, this amount dropped to only 17% of the total variety of criteria. For the interviewed companies, this is a significant difference; a difference in focus.

Additionally, the share of *promoting market, sales and organisational brand,* remained slightly the same in the total amount of criteria. Interesting, however, is that this topic is mentioned the most from all in the 2017 period. This topic overruled both *costs*-related criteria and *employee/organisation's efficiency and productivity* related criteria, which were mentioned more in the 2007 period.

The biggest increase between the two timeslots is the increase of criteria in *employee wellbeing and satisfaction*. Among the interviewed companies, this topic was not mentioned at all in the 2007 period, but accounts for 21% of total variety in the 2017 period.

Another element that is clear is that *sustainability*-related criteria became a new topic for the interviewed companies. Although it is not mentioned a lot, it wasn't mentioned at all around 2007. This might be related to increasing media and regulatory attention on this topic and the relation with *promoting*-related criteria. Sustainability is often used in sense of promotion and not just as social responsibility.

So to conclude, the focus of criteria became broader between 2007 and 2017. Important changes are the drop of *costs*-related criteria and the sudden increase in attention for *employee wellbeing and satisfaction*. Additionally the focus on *promoting*-related criteria remained the nearly the same, but is a leading topic in the 2017 period.

5.3 Combining criteria and weighing

As shown in the beginning of the previous chapter, looking at the criteria and their occurrence at each individual company shows too little information to draw conclusions on. This relates to the wide variety of criteria that are used and the limited amount of companies that are interviewed. In appendix 5, a table is included that shows all criteria that were mentioned, including the weighing that was assigned to them by the interviewed companies. For the individual criteria, the weighing is added up of the criteria are mentioned more than once, but as discussed in the previous chapter, the individual criteria are too varied to draw any conclusions upon.

Therefore the criteria are divided again among the eight topics from Gibler and Lindholm (2012, p. 36). By doing this, the weighing per topic can be determined. The table below shows the total percentage of weighing, out of 500% (5 companies, with all 100%) and it shows the according percentages out of a 100% total.

Topics	% of weighing in 2007	% of weighing in 2017
Promoting market, sales and organisational brand	11%	14%
Increasing employee/organisation's efficiency and productivity	40%	36%
Reducing real estate related costs	38%	20%
Enabling flexibility	6%	3%
Increasing value of organisation's real estate assets	5%	4%
Enhancing employee wellbeing and satisfaction	0%	18%
Supporting environmental sustainability	0%	5%
Encouraging and support employee innovation and creativity	0%	0%

Table 25: Share of weighing per topic

The essence of the table above, is that it shows the weight, or importance, of the different corporate real estate means, or in other words: the division of "attention". The interviewed companies used around 2007 40% of their total "attention" for the *organisation's and employee's efficiency and productivity*. This criterion focus, was the most important one among the interviewed companies. The second is the focus on *reducing real estate related costs*. This topic accounts for 38% of the total weighing or importance around 2007. Together, these two focus points, include almost 80% of the total weighing by the interviewed companies. This means that around 2007, costs-related criteria, and business efficiency-related criteria overrule all other points of interest. Apparently, practical considerations significantly dominated accommodation decision-making around 2007.

Moreover, not all topics were covered around 2007 by the interviewed companies. Only five out of eight topics were present in the answers that were given by the companies. *Employee wellbeing, sustainability* and *supporting innovation and creativity* are topics that were not mentioned. When looking at the 2007 list, someone could think that the interviewees were maybe not aware of these possibilities and that they didn't mention them for that reason. But looking at the list of 2017, almost all topics are covered. Therefore the interviewed CRE managers *are* aware of topics such as *sustainability* and *wellbeing*, but they simply didn't knew or used them around 2007. Only the topic *innovation and creativity* isn't mentioned at all in both timeslots. This can be a coincidence, since only a limited number of companies are interviewed, but it can also indicate a very low interest in such subjects.

The most striking change in the table is the sudden increase of *employee wellbeing and satisfaction*. This topic had no weighing, or importance, around 2007; out of the 5 companies, no single company mentioned any criterion that matches this topic. However, it accounts for nearly 1/5th of the total attention around 2017. This difference with 2017 is the most radical one.

The time period 2017 is in general more diverse than 2007. The 100% weighing is divided over more topics than in 2007. This awareness of a broader variety of criteria is also something that was visible in the table of criteria count.

5.4 Summary of changes

The period around 2007 and the period around 2017 show some interesting changes regarding real estate accommodation criteria. These changes are related to the variety of criteria that are used and the emphasis on criteria. The points below show the summary of these changes. Note that these changes are related to the interviewed companies.

Changes from practice
1. The variety of accommodation criteria in general became bigger after 2007
2. Costs-criteria showed a drop in mentioning after 2007
3. Employee satisfaction and wellbeing were not mentioned around 2007, but became one of the most mentioned criteria around 2017
4. Branding shows and increase in count
5. The variety of assigned weighing became wider after 2007; importance is divided wider
6. Practical criteria outweigh other criteria before 2007, but decline around 2017
7. Employee wellbeing and satisfaction go from 0% around 2007 to 18% around 2017, which is the biggest change among the companies
8. Branding shows an increase in weighing and thus importance

Table 26: Changes from practice

To illustrate the changes mentioned above, the most significant changes that were indicated in literature are listed again as well:

Changes from literature
1. A big emphasis can be seen on the wellbeing and satisfaction of employees in both time periods. After 2007, however, the share of employee satisfaction became even bigger
2. Reducing real estate costs shows a big emphasis as well, although it decreased after 2007

Table 27: Changes from literature

If these tables are compared, it is clear that they are mutually affirmative. Note: since weighing was not extracted from literature, only the *count* of criteria in literature was taken into account. Still, the amount of mentioning in literature aligns with the outcomes of the research from practice, and are therefore more consolidated appointed changes.

By combining these tables, a final table with indicated changes from literature and practice can be made. This table will be assessed in the next subchapter: *Structural change*.

DISCUSSION

6. Discussion

6.1 Structural change

To determine whether or not the changes are structural, the occurrence of the changes will be measured with each company. This implies that for each change will be investigated at which companies it occurred. If a change is recognisable in all companies, a structural change can be indicated. If a change is only recognisable in one company, there is no *structural* change. For this matter, the definition of *structural* is as follows: "*a particular coherent structure*" (Woordenboeken.nu, 2017) and "*the way in which parts of a system are arranged*" (Dictionary.cambridge.org, 2017). Combining these definitions with *change;* leads to the following definition for structural change, which will be used in this research: "*a change in the way how parts of a coherent system are arranged*". So, before a structural change can be indicated, something should have a structure.

With structure, this research refers to the structure that is used to organise the criteria (parts) under the eight means of corporate real estate management (system) by Gibler & Lindholm (2012, p. 36). This structure is not just made up by the authors, but subject to extensive research on the *essence of corporate real estate management*. This subdivision of goals is accepted among researchers, and used in following-up researches as well. Therefore, this structure and a *change* within this structure's elements will be subject to the assessment of *structural change*.

The changes that were discovered in the previous subchapter are now compared along the interviewed companies. If the changes in organisation structure appear to be existing at a significant number of companies, we speak of a confirmed structural change, for the interviewed companies. The table below shows the changes and the presence or absence of these changes at the companies.

Change	Comp.1	Comp. 2	Comp. 3	Comp. 4	Comp. 5
Increasing criteria variety after 2007	■		■	■	■
~~Costs-criteria showed a drop in mentioning after 2007~~			■	■	
Employee satisfaction and wellbeing show sudden emerge	■		■	■	■
Branding shows an increase in importance	■	■	■	■	■
Division of weighing becomes wider after 2007	■		■	■	■
Practical criteria show drop in importance	■	■	■	■	■
Employee satisfaction and wellbeing show sudden big importance	■	■	■	■	■

Table 28: Coverage of changes at companies

If changes are covered by multiple companies, it means that these changes are significant. One thing that is clear, is that there is one company that doesn't cover all the found changes. This company used criteria in the most conservative way. Almost no changes were seen after 2007, and additionally, the focus was mainly on practical criteria like *costs* and *distance to the office*. However, a comment on the visibility at the current location and the feeling to show of some sustainable focus, were related to the branding topic, which is by this covered by all the companies.

However, 6 out of 7 changes are covered by all the other companies. This implies that these changes are indeed significant, and can therefore be indicated as *structural changes*.

The change *costs criteria show a drop in importance* is not recognised among all the companies. This is related to the criteria of company 3. This company focused solely on costs around 2007, which brought the ratio of costs a bit out of proportion. Therefore, there is no drop visible at the other companies. An important remark here is that this doesn't mean that costs were not important. When looking at the division of weighing, costs still account for a great deal of importance division. This means that costs didn't show a drop in importance. It can be assumed that costs are still high on the agenda of companies, but that companies are now willing to pay more for quality, both in quality of the building as in quality for the employees and branding.

6.2 Changes: explained

If we look at the changes that are confirmed as *structural changes*, the following list can be set up. The structural changes will be explained briefly.

6.2.1   Increasing criteria variety after 2007

After 2007, among the interviewed companies, a significant increase in amount of criteria is detected. Where around 2007 a more immature set of criteria or CREM was used, around 2017 this expertise sophisticated a lot. Apparently, the companies thought it was useful of desirable to focus on more aspects. This can be caused by the need to cover more uncertain elements, but this can also be related to the natural development of the expertise CREM. In general, it is clear that the area of attention got bigger, and more diversified.

6.2.2   Division of weighing becomes wider

This change is related to the increasing variety of criteria, and has probably the same cause. When the variety of criteria is getting bigger, the division of weighing has to be broader as well. The awareness or the convincement of a broader criteria focus includes a broader focus.

6.2.3   Employee satisfaction and wellbeing show sudden emerge

This change probably relates to the recovering after the financial crisis. Business are flourishing again, and companies feel the need to be competitive advantageous in comparison to other companies. A greater focus on the employee is therefore a result. This relation, however, should be investigated further since it shows a very ample change compared to the others. For further elaboration on this, see chapter 6.5.

6.2.4   Employee satisfaction and wellbeing show sudden big importance

The emerge which is discussed above, is directly related to the big importance this wellbeing and satisfaction topic got. Apparently not only the "awareness" of these criteria arose, but also were the interviewed companies determined to give this immediately a big emphasis.

6.2.5   Practical criteria show drop in importance

The drop of conventional costs and efficiency criteria is probably related to the increasing focus on the more quality-focused criteria, like wellbeing, satisfaction, promotion and sustainability. It is logical that if those quality-criteria get more attention, the attention for costs drop. But the drop in importance of efficiency criteria is probably related to the different view on getting efficiency. Nowadays businesses might be convinced that the wellbeing of the employee contributes a lot to the efficiency and productivity of the company. It is nowadays basically a different, and more sophisticated approach. This new approach is related to external challenges, in the sense that companies need to adjust and adapt when the conventional way of doing is challenged by (financial) crises and the according uncertainty. More on this topic is explained in chapter 6.5.

6.2.6   Branding shows an increase in importance

The aspect branding, marketing and image show an increase in importance. The reasons for such an increase can be related to the increasing competitive environment, in which push factors (push branding) are needed to acquire the needed clients and projects. Also, other aspects of branding are described, mostly related to the show-off of sustainability or the emphasis that is drawn upon the receiving of clients and visitors.

Now the structural changes are indicated, the relation with external uncertainty can be drawn. As stated in the introduction and theoretical framework chapters, external uncertainty, or volatility, is a theme that characterised the last decade. External uncertainty was and currently is present in a few different forms. A list of trends and events that characterised the last decade can be seen in Appendix 2. As has been stressed out in the theoretical framework, the trends and events that caused external uncertainty can be subdivided in 5 categories: political uncertainty, economic uncertainty, demographic uncertainty, technological uncertainty and environmental uncertainty. Based on literature, the expectation in the hypothesis was that political uncertainty and macro-economic uncertainty were a cause of changing accommodation decision-making. The research question focuses on external uncertainty in general and to answer this research question, all different types of external uncertainty will be related to the changes that were indicated in the previous subchapters. By assessing all the forms of external uncertainty, the *extent* to what it caused a change can be indicated, this will also reveal whether or not macro-economic and political uncertainty were indeed the biggest drivers, as was expected in the hypothesis.

6.3.1   Relation to uncertainty according to interviewees

The last question in the interview protocol was used as a check-up question for this research. The data was acquired with a standard protocol, so no biases would occur. The check-up question, on the other hand, was asked at the end of the interview, and asked for the relationship between the change in criteria and weighing, and causes of external uncertainty, according to the interviewee. This question "reveals" in some way the actual reason of the research, but all the data was at that moment already written down.

The answers of the interviewees were all somewhat alike. In general, the question was asked in an open way, meaning that the relation to external uncertainty *in general* was subject to research. The interviewees answered the question all related to their own company. Overall, no direct relationship was found by the interviewees. However, the answers the provided are indeed related to some uncertain factors or uncertain *legacy*, but they were simply not aware of it. Some of the answers will be illustrated below.

The interviewee from company 1 answered regarding to their focus on accessibility with public transport:

"That has absolutely nothing to do with it, it is a movement from within. If we are high on the sustainability ladder, we are ahead of competition. Commercially, this is very important. In addition, we want to include aspects such as sustainability in our entire thinking, whether it's housing or driving to the office.
Also, the quality of our buildings has to do with our HR department, which is very much concerned with how well we work, how you move, how you handle your diet. How do we keep our employees as healthy as possible and how do we deliver them a work environment as healthy as possible, and how can we do it in a sustainable a way. So there is a commercial side, but also: how do we remain an attractive employer" (Interviewee Company 1, personal communication, March 8, 2017).

Although the interviewee states that external uncertainty has nothing to do with it, some aspects in his reasoning *are* related to some external drivers. The aspect of HR and the wellbeing of employees is related to a more societal change, which will be introduced in chapter 6.5. The commercial aspect, on the other hand, is related to the economic environment of today. The statement that the company is ahead of competition when focusing more on sustainability is a typical strategic reaction in a competitive environment. But also the aspect *"remain an attractive employer"* is typical for the business environment after the crisis. The current tendency is that employee do not feel bound to a particular company anymore, like this was 25 years ago.

Erik Beekman, head of tenant representation at *Savills*, and responsible for the housing of companies like Dell, CBS Network, Snapchat and Harman Kardon, illustrated this tendency in a personal communication (April 25, 2017). According to Beekman, the economic upturn, which is currently the case after the ending of the financial

crisis, led to a severe competition between companies both for attracting business and to retain employees. Businesses have to make sure that they are more attractive to employees than similar companies, to keep their employees from switching jobs. The current market is in favour of employees, so giving them the best work environment is a strategic choice to respond to this economic (upcoming) climate after the financial crisis (E. Beekman, personal communication, April 25, 2017).

The interviewee from company 2 answered as follows to the question whether or not external uncertainty was an influencer for their decision-making of the last decade:

"That's not very likely in my opinion [...] external threats would not be a reason for me to change [accommodation decision-making]. [...] No, what we did, is stop having long-term contracts for 5 years. The last decade, we only had contracts for 5 years with a break option after 2 of 3 years. [...] We got a little more careful with this" (Interviewee Company 2, personal communication, March 9, 2017).

Although the interviewee says that uncertainty was probably not the cause of a changing accommodation focus, he does describe a typical reaction to external uncertainty: having flexible lease contracts and avoid long-term commitment in times that are strategically unfavourable in economic uncertain times.

The interviewee of company 3, one of the world-leading IT firms, doesn't think that there were no external uncertainties of influence on the change in decision-making. He recognises this aspect and describes the reaction to these elements of uncertainty as follows:

"I think that the external factors that came into play, are mostly related to the landlord due diligence. There was a lot of talk, after the financial crisis, about landlords who were not able to meet their commitments and particularly to their allowances.
The other influencers that came into play are really more on the compliance side: there is much more compliance awareness on our side, where we now really need to investigate a building owner, [...] to for example research if there is no funny money" (Interviewee company 3, personal communication, March 9, 2017).

The aspect that was recognised by the interviewee was clearly the financial crisis and its aftermath. Carefulness, doing research, and check compliance are now standard procedures. Also with this company, the uncertain climate out of the financial crisis (*can my landlord meet his requirements*) changed the way they make decisions.

The interviewee of company 4, in the HR industry, answer the question related to their current focus on centralization:

"Yes, yes, those links are definitely there. First, there is the crisis, and now the staffing industry of around 2007 is not the same anymore. The focal points are changed in such a way, that it is better to be on a centralized location to lower the costs. [...] As a result of the crisis, the margins and profits declined very much. The market from before 2007 is not coming back. People switch often between organisations now, and you have to distinguish yourself [...] in comparison to other organisations, by expression for example" (Interviewee company 4, personal communication, March 21, 2017).

The interviewee explained how the crisis resulted in a decline of profits, and the effect it had on the real estate portfolio. An important remark of the interviewee is that again the expression towards clients is important to distinguish yourself from other companies. Marketing seems, based on his answer, more important than it was around 2007, since he claims that this is a new, common practice.

The interviewee of company 5, in the food industry, responded to the question:

"Sustainability is a very important external aspect that plays a role in our decision-making. It is embedded in our company's DNA. Because how we operate our restaurants, we want our offices to express the same. Recycle, re-use, that kind of stuf, green energy, we have a windturine on the parking lot, sustainability is going to play a big role" (Interviewee company 5, personal communication, March 20, 2017).

The answer of the interviewee was not about an external *uncertainty* aspect, but about a general external aspect, namely: sustainability, and the force to include this aspect in the company's operations. The interviewee clearly states that sustainability is something they want to *express*. This refers to the *image* or *representation* of the company. Also in this case, environemtal concerns are not related to environmental uncertainty, but they are deployed as branding for the company.

6.3.2   Relation to political uncertainty

Out of the answers that were given by the interviewees and the criteria and changes that were discovered, no single relation with the political uncertain environment was recognised. The aspect of local of national politics was not mentioned and did not make the decision-making procedure different according to the interviewed companies.

The probable cause of this, is related to the moment at which *political-influenced* choices are made. A *political-influenced* choice is the expansion for the business to a new country or location with another political climate. For businesses, the choice to expand is made as a strategic (expansion) choice. This choice is never solely triggered by a CRE department since the real estate of businesses follows the business choice and therefore the choice for expansion to a new location with a new political climate is already made when the CRE queries arise. In other words: political issues are already dealt with when the choice for accommodation is made.

To find political influences in strategic decision-making, a research on business expansion drivers should be conducted, in which location and country related elements are taken into account. This will reveal the hesitations or considerations that businesses make when entering a new market or area and the according political climate. Such a research takes place one step before the subject of this research.

6.3.3   Relation to economic uncertainty

It is clear that the economic context of the last decade has had a great influence on the decision-making procedures of the companies. Some links with the (aftermath of) the crisis were recognised in the answers of the companies (see chapter 6.3). This driver can therefore be assessed as driver of change in accommodation decision-making. This doesn't imply, however, that this is the only reason: economic context is not exhausting. Still, the economic causes of uncertainty were mentioned the most among the interviewees, which makes it an important lead for this research. To be more specific about this aspect, a more in-depth dissertation about the economic context and its implications for real estate decision-making is given in chapter 6.4.

6.3.4   Relation to demographic uncertainty

Among the criteria and changes that were discovered, and among the explanations that were given by the companies, no link was revealed with demographic uncertainty. As was expected in the design of this research, this was not a driver of change in real estate decision-making, since the influence of political and economic uncertainty was expected to be leading. The argument that demographic uncertainty is not a driver of change, therefore stands, based on the interviewed companies.

6.3.5   Relation to technological uncertainty

For technological uncertainty, the same applies as for demographic uncertainty. Although it is a cause of external uncertainty, it was not expected to have influenced the accommodation decision-making for

multinationals in this research. Among the interviewed companies no link was discovered with this type of uncertainty, and therefore this idea stands as long as it isn't countered.

6.3.6 Relation to environmental uncertainty

Environmental uncertainty was also assessed as a general influencer of uncertainty during the last decade, although its influence wasn't expected to reach the accommodation decision-making in this research. Environmental criteria *were* mentioned among the interviewed companies, but this was never related directly to environmental uncertainty. The companies that focused more on environmental responsibility mainly did this to be more competitive compared to other companies, or to get the right image (also in comparison to other companies). Therefore this type of uncertainty is not a direct driver of change in real estate decision-making. It only changed the *expectations* that people have from companies (social responsibility), which is used by companies to increase their competitive advantage. Again, this is related to the interviewed companies, and is no generalisation of all companies. For this research, the aspect *environmental uncertainty* is therefore not assessed as driver for change in accommodation decision-making for multinationals.

6.4 Economic uncertain environment

The previous subchapters showed that the (macro-)economic context, and the according uncertainty from the last decade, can be linked to the changes in real estate decision-making. This in contrary to the other sources of uncertainty that were distinguished. Although political uncertainty was expected to be the cause of changes in real estate accommodation decision-making, this was not the case at the interviewed companies. This was due to the aspect that political factors mostly play a role in earlier and more business-related decision-making. In other words: the choice for a location to expand the business to, can be influenced by the political climate in such areas. The choice for accommodation comes after, and is therefore not influenced by the political climate anymore, since this consideration was done earlier in the business cycle.

The main influence of economic uncertainty, caused by the (aftermath of) the financial crisis and the following debt crisis, is therefore the only external uncertainty that can be assigned as influencer of change, based on the results of this particular research. This conclusion, however, triggers some different line of thought than was expected at the beginning of this research.

6.4.1 Strategic climate: revised

It was expected, based on literature, newspapers and journals from practice, that political uncertainty and economic uncertainty were together the biggest influencer on change. Additionally, it was expected, as has been stressed out in the theoretical framework, that these causes of uncertainty led to a *very* uncertain strategic climate. At the beginning of this research, the assumption was that this uncertainty was in the middle of its severity.

However, after the conclusion that political uncertainty doesn't play such a big role, only (macro-)economic uncertainty remains as major influencer of change in decision-making among the researched companies. Based on this idea, the level of strategic uncertainty should be reviewed again.

Since the interviewees mainly referred to the *financial crisis* as event that changed their decision-making, the other (macro-)economic events appear to be less important or impacting than the crisis itself. Since the financial crisis and according debt crisis hit the world around 2007, and was assessed to be "over" around 2014, it can be reasoned that the amount of uncertainty that the companies experience is now less than around 2007, when the disrupting financial crisis hit. The world is in an economic acceleration right now (2017), and the external economic climate is somewhat better as well. This implies that the earlier assumption that the current external climate is at its severest doesn't stand. Actually, the external climate is in a recovering state, although it still is not fully *certain*.

By this means, the current strategic uncertainty level is not "low", but more in the direction of "moderate". If we now look back to the scheme by Singer (2005), based on O'Mara (1999), it can be seen that the typical real estate reaction to this level of uncertainty is different than was assumed.

Expected was, that the high level of uncertainty would cause the real estate reaction to be *incremental*. But since this level (economic) appears now to be *moderate* at the moment, the real estate reaction to this level of uncertainty should be *value-based* according to the scheme of Singer (2005). This reaction will now be described in relation to the indicated changes at the 5 companies.
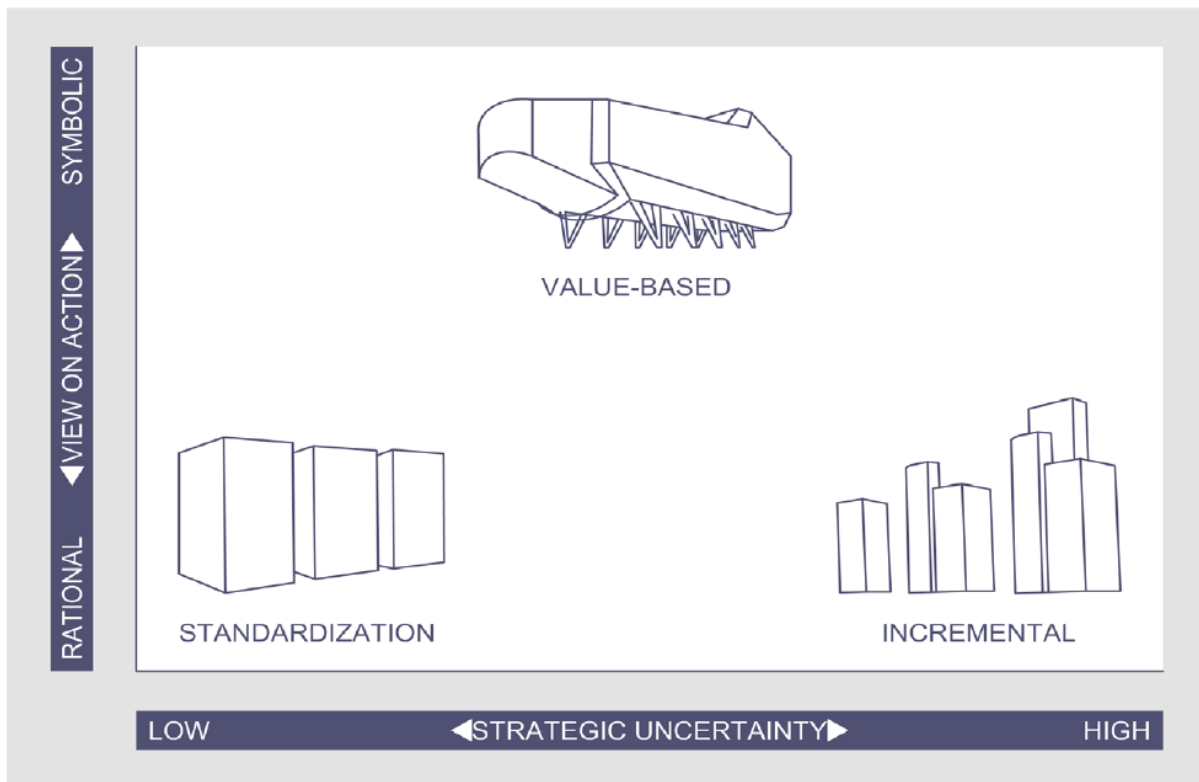
Figure 9: Generic corporate real estate strategies (Singer, 2005; based on O'Mara, 1999)

6.4.2   Value-based strategy

The characteristics of a *value-based* strategy according to O'Mara (1999) and described later by Singer (2005) are:

- *"Expresses the values and strategic direction of the company*
- *Recognizes that people construct social meaning out of their physical environment*
- *Is proactive about using the inherent power of the physical setting to symbolize values and influence behaviour*
- *Embraces and utilizes the setting's communicative powers to the organization's advantage*
- *Considers the company's relationship with its customers, employees and the community"*

The statements described above can be linked to the eight strategies by Gibler and Lindholm (2012). It is clear that all of the statements above are related to both *promoting organisational brand* and *embracing employee satisfaction and wellbeing.* These are the topics that were mentioned most among the interviewed companies and among the articles that were reviewed. Given this, it can be confirmed that the current strategy is indeed based on a *value-based* approach and that the current strategic uncertainty context is indeed "moderate". In the next subchapter, the influencing forces for a *value-based* strategy will be described.

6.4.3   Driving forces

Singer (2005) describes in his thesis three stages in real estate decision-making to come to a generic strategy. These stages are: analysing the portfolio, analysing the context and influencing forces and finally the determination of a generic strategy.

In this research, the generic strategy for the interviewed companies is determined: *value based*. In order to indicate the underlying influencing forces, the stages by Singer will be following backwards: from strategy to driving forces. By this, the actual influencing forces of the generic strategy can be indicated.
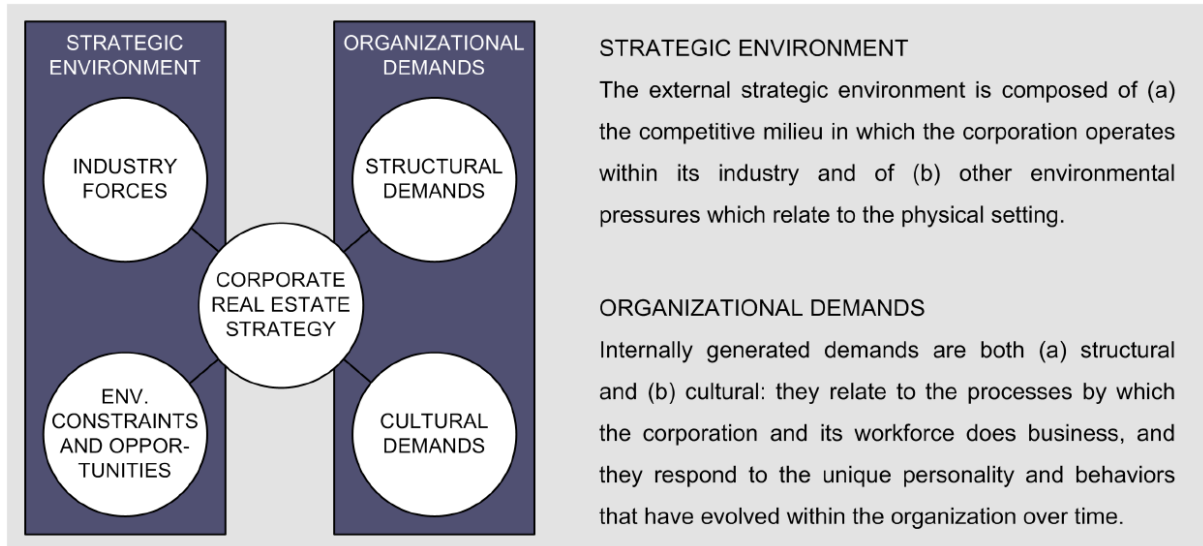
Figure 10: Analytical framework for real estate decision-making (Singer, 2005)

The driving forces that are shown in the figure above will now be illustrated in relation to the changes that were discovered among the interviewed companies. In general, the focus of this research is on the external drivers for change (external uncertainty), which will probably be related to the forces in the *strategic environment* part of the framework. Still, all the parts of the framework will be explained, to indicate to which elements of the framework the changes are related.

6.4.3.1   Industry forces

Industry forces refers according to Singer (2005) to the competitive environment in which the company operates. This environment consists of other companies with similar (or competitive) objectives, customers, targets, products and operational focus. The corporate real estate strategy is by this used to deliver competitive advantage, like was described by Gilber and Lindholm (2012), over other companies.

The way in which this was visible among the interviewed companies, and with the indicated changes, is that there is a high focus on *image and branding*. This aspect is included by the companies to gain promotional advantage over other companies. This is of course a way to deal with a competitive environment, and to "win" clients over other companies. Within *image and branding*, aspects such as a high focus on sustainable exposure (company 1), prominent location (company 4) and representation (company 5) were mentioned. The industry force that is underlying is that the current economy is increasing again and that there are more business opportunities than a few years ago. Gaining this advantage will lead to the acquisition of all these new opportunities, if done in the right way. In some sense, this industry force is not exactly a *force*, but more business focus that is adapted to the industry.

6.4.3.2   Environmental constraints and opportunities

The previous subchapter already covered some opportunities from the market, but these are slightly different from environmental constraints and opportunities. According to Singer (2005), the environmental constraints and opportunities relate to "environmental pressures related to the *physical setting*". This physical setting, interpreted as physical environment, refers to tangible aspects such as buildings. Among the interviewed

companies, the changes that belong to this aspect are for example the focus on short (flexible) lease contracts (company 2). This consideration reacts on the (economic) uncertain environment which can have a direct impact on the physical space a company needs. In economic uncertain times, the demand for space can differ a lot, and being tied to a long-term contract may be very disadvantageous. Another reaction that can be thought of, but wasn't mentioned, is the reaction to the oversupply of office space. This characterised the last decade as well (at least in The Netherlands). This could be seen as a physical, environmental opportunity (or threat) but the interviewed companies did not mention this aspect.

6.4.3.3 Structural demands

Although the focus of this research was not necessarily on the internal drivers of change, but on the external drivers, the companies explained their used criteria for decision-making, which were sometimes related to internal structural demands. With structural demands, the workforce and the way the company does business are meant. In other words: typical business supporting demands. Among the responses from the interviewees, some criteria were related to a changing work-related focus. For example the focus on centralization (company 4) was a change that related to the restructuring of the workforce of the company. Of course, this is eventually related to the external environment in which the company operates, by remaining flexible or compact for example, but this criterion was a direct influencer on the structural, workforce demand, which had a great impact on the corporate real estate strategy: centralization (from seven offices to one). Although the exact external driving force for this criterion is probably multi-dimensional, the internal, structural driving force is making the workforce compact, centralized and by this flexible. Another structural demand that came into light among the interviewed companies, is the focus on the driving distance for employees (company 2) and for example the distance to the national airport (company 5). The force that causes these structural demands (to change) is in no clear way related to political, environmental (sustainable), technological or demographic elements. Only the economic environment in which the companies work eventually influence these cultural demands. Economic uncertainty, as driver of these demands, can be seen recognised in the desire to be flexible as an organisation, to be able to switch or adapt quickly and to lower the amount of offices to be immune of resistant to bound to unneeded office space.

6.4.3.4 Cultural demands

When looking at the unique personalities and the behaviours of the companies, the following aspects where mentioned. An important cultural aspect that was pursued by company 1 around 10 years ago, was the focus on reciprocity. This was part of their business culture: to show their commitment and trust to their business relations. Also in this sense, this aspect was related to gain competitive advantage over other companies, but this aspect was directly related to an internal cultural demand and eventually in the demand for office space: corporate real estate strategy. Although this aspect changed during the last decade, it does illustrate how cultural demands can shift and how the culture of company 1 is now focused more on sustainable promotion to gain competitive advantage. So the goal is the same, but the force (internal to external) changed during the years. Mentioned at company 4 and 5, is the cultural demand for the client care. Both companies have a strong view on how the experience for visitors should be and how this eventually is related to the building: corporate real estate. This aspect has not directly something to do with the structural demands of the company, but is clearly organisational driven. Also in this case, eventually the ultimate goal is to gain competitive advantage over other companies, by showing of to clients. But since this in the first place refers to the culture a company wants to express, it is assessed as part of the organisational demands.

6.5 Relation to other external developments

The driving forces that were discussed in the previous subchapter, are mostly related to the financial (economic) changes and the focus on image and branding. One important change that was indicated, however, the focus on *employee wellbeing and satisfaction*, is not necessarily recognisable in the framework. It is not an environmental constraint, nor an industry force, nor an internal structural demand and not a cultural demand

(in the way Singer describes it in figure 10: related to internal processes and evolved personality). For this reason, the origin of a focus on *employee wellbeing and satisfaction* is investigated.

Apparently, some sort of understanding of a new office space, or a different workplace focus is present among corporate real estate managers. The development of offices spaces during the years is described years ago by Van Meel (2000), but in these "old" typologies of office space, a space similar to the mentioned criteria cannot be found.

Wouter Spijkerman, urban area developer, real estate investor and lecturer, describes a new type of space that shows great similarities with the type of space that was mentioned by the interviewees in their search for a building with high focus on *employee wellbeing and satisfaction.* This space is called *third space* (Spijkerman, 2016). Naturally, there is also a *first space* (home) and *second space* (the office), and the *third space* is the working space in between. Spijkerman describes it as follows:

"Certain commercial places, such as restaurants, bookstores, and bars, took on a special meaning for their customers, representing places to which they could retreat to unwind, relax and talk with friends and even strangers. This was a place that was neither home nor work, a place where customers just felt comfortable… a Third Place" (Spijkerman, 2016).

Elements from this quote, that were also mentioned by the interviewees are "relax", "talk" and "comfortable", but always in light of work. Apparently, the awareness of the existence of such spaces, and the convincement that they are needed in a modern office, was present among some of the interviewed corporate real estate managers. The only difference is that the corporate real estate managers wanted to include this *third space* in the office, which basically means that the third space and second space become a new version together.

Beekman acknowledges this trend, he experiences the same demand among other corporate real estate managers he worked with. He adds: *"People don't want to work in a coffee bar 5 days a week, but they they also don't want the same workplace every day of the year. They want places to meet with other colleagues but also places to work alone in silence. The people want open spaces, but also closed spaces, meeting rooms, but also private rooms. Basically, the new office space consists of all the different spaces an employee needs for all of his activities".* He attributes this trend to a societal awareness of the applicability of such spaces. It is basically a *societal development.* (E. Beekman, personal communication, April 25, 2017).

6.5.1   Analytical frame: revised

As a result of the external, societal, developments as influencer of corporate real estate strategies, the framework by Singer (2005) can be expanded with *societal environment*. The described societal awareness and understanding of the changing working space, results in a different societal context which should be taken into account by companies and CRE managers. This *third space* focus, consisting of flexible working spaces, a home-like environment and social interactive places, is currently a societal change in comparison with 10 years ago. Since this societal *awareness* is not directly related to a competitive environment, or any other aspects in the framework by Singer (2005), it can be added to complement the framework: the societal environment is the context in which the society interacts and does business; see the next page.

STRATEGIC ENVIRONMENT

INDUSTRY FORCES

ENV. CON-STRAINTS AND OPPORTUNITIES

CORPORATE REAL ESTATE STRATEGY

ORGANIZATIONAL DEMANDS

STRUCTURAL DEMANDS

CULTURAL DEMANDS

SOCIETAL ENVIRONMENT

(NEW) SOCIETAL STATE-OF-ART
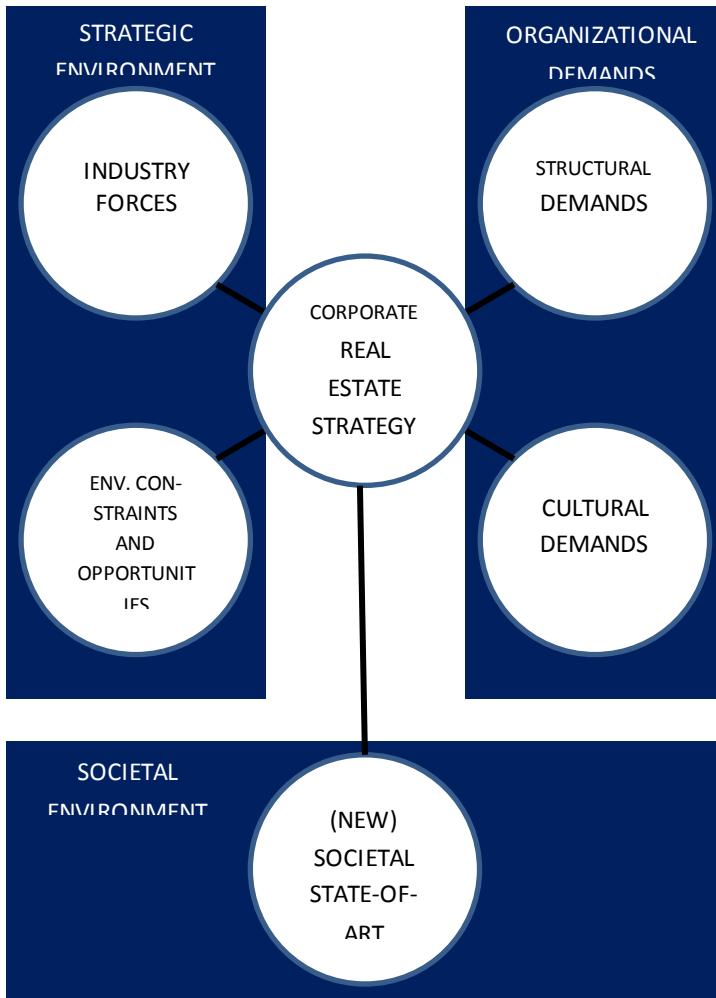
Figure 11: Analytical framework for real estate decision-making (own figure, based on Singer, 2005)

6.6 Relation to the human factor

Now the data has been discussed and related to several outside and inside forces and demands, a critical look upon the collection of data and the acquired data should be taken. This is needed to know what *could* have gone wrong and what the essence of the data actually is or can be. Researchers, who might be reproducing this research, should be aware and familiar with this.

As has been described in the theoretical framework, the human factor plays a role in decision-making. This has probably been the case in the decision-making procedures that were discussed with the interviewees. By verifying the data, however, the correctness of the data and their values was demonstrated.

There is, however, still the possibility that the interviewees did not *knew* he provided false data or there is the possibility that the interviewee deliberately distorted the data to, for example:

- To sound more "correct", in sense of his personal *credibility and expertise*, and to fit expectations that a researcher might have.
- To sound more "socially responsible", in sense of the *company's social responsibility*, and the fact that the information he provided was about to be published (albeit anonymously).
- To sound more "certain", about facts that he might even had forgotten.

Despite the anonymity of the interview, and the fixed structure of the interview, the interviewee might have given more socially approved answers than was established in reality. Although the verifying of the data did reconstruct a decision-making procedure that reflected reality, there is the possibility that more or other criteria with a different weighing were used in reality. This could have happened in the following cases:

- The interviewee had a favourite alternative, and distorted the weighing *deliberately afterwards* to make it fit the right, favourable, building.
- The interviewee was convinced of criteria *after* their presence was demonstrated among the alternatives, so the criteria set was not established prior to the decision-making procedure, but the awareness of criteria came later. This is the *accidental* version of the previously mentioned item.
- The interviewee deliberately made up criteria and their scoring on the alternatives, for example to fit to the aforementioned reasons to sound more "correct", "socially responsible" or "certain".

In general, expected is that the interviewee did not *deliberately* provided wrong information, since the goal of this research is to gain insight in practical implications. No logical reason would explain why a practitioner, would undermine this understanding, but the chance that it happened exists. A more probable chance, however, is that the interviewee was not aware of all the (right) information anymore, and distorted the fact a little to fit the interview for the sake of his and his company's credibility and reputation. The fact that this could be the case, should be taken into account when interpreting the conclusions as a reader, and this should definitely be taken into account in case this research will be reproduced.

In addition to the research that was undertaken in this report, the main question of this research was submitted to three experts in corporate real estate management, and in particular in tenant representation that deals with accommodation processes for large companies. The view and comments of the first expert, Erik Beekman from Savills were already mentioned in the discussion. In the conversation with him, the main research question was asked and explained, to which Beekman responded with his practical view. Own findings and conclusions were not mentioned so the view would not be biased.

The same set-up was used in the later conversations with two other experts. The first, P. van der Peet from Cushman & Wakefield, was responsible for housing companies like Ernst & Young and Boston Consultancy Group and worked for and with several agency corporations in the Netherlands and in London. The second expert, E. Hoet was responsible for housing major companies. He works at Jones Lang LaSalle (JLL) for over 9 years now and is head of corporate solutions and tenant representation at this company, after setting up this particular team. Both conversations are summarized and discussed below. The purpose of these interviews it to get a double check on the conclusions of this particular research, and to possibly add practical opinions to the recommendations for any follow-up research. Basically, the comments of experts give an indication of the applicability and relevance of the research, and are a validations for the conclusions. Both experts' explanations are shown below.

6.7.2   Interview with expert 1

In the past, around 10 years ago and before, accommodation was simple seen as a way to house your employees. In accommodation, companies focused on the operational costs and mostly didn't focus on the image or expression of a building. Companies with a high margin were able to afford expensive locations, and companies with a low margin were located at the bad sub-locations.

Nowadays, the companies focus on what the employees need. First, everything in an office was standardized, but now companies focus on activity-based working. In this, the companies optimise the working environment of the employees and make sure that all activities are supported by the surroundings of an employee. This includes meeting rooms, places to socialise and for example rooms where you can focus on something hard. At this moment, real estate is not solely seen as an expense anymore.

Moreover, companies want to attract the most talented employees that are available. By this, you see that several companies choose a location that is in the vicinity of a university campus or some other knowledge hub. But also with real estate they want to stand out in comparison to others. For example Deloitte [in The Edge] is located near the VU (university), to be close to students. Additionally, companies in general now want to create knowledge clusters by centralising their own activities. By putting different departments together, knowledge and experience can be transferred, which results in a very innovative company climate.
More about Deloitte; the building they lease is known for its high sustainable and technological standard. This is used by the company to attract employees. If a company normally spends €20,000.- on attracting a very talented employee, and they manage to accomplish the same with a well-functioning building; they are more likely to spend the €10.- per square meters more to do this. In the end this approach is cheaper, and additionally, the employees are happy and proud about their working environment as well.

Also some new real estate labels are introduced. Around ten years ago, companies used BREEAM and LEAN labels. This became common and not distinctive anymore. Such labels were focused on sustainability, where new labels are focused on the employee and its wellbeing. The label WELL is now widely used, on not solely because everyone does so.

This is a trend of the last few years. Companies care much about the expression of the building; its location and the comfort for the employees. Especially in times of economic prosperity, every company wants to be the best employer around. Many accommodation processes are attended by the human resources department. An example of such an employer is Google, who pays for the employee's lunch for example.

All in all, the microclimate within a company became very important. Not only as working environment, but also to make people proud, to attract the best employees and in the end to become the best employer around, especially in these economic upcoming times.

(P. van der Peet, personal communication, June 8, 2017)

6.7.3   Interview with expert 2

Political aspects only play a role in cross border cases. If companies are looking for new accommodation, using a shortlist for example, no macro political aspects are taken into account since this simply isn't relevant. If you look at micro level, on the other hand, internal political aspects do play a role. For example with a merge between two companies; the different cultures are merged as well, often resulting in the search for a new building to express this fresh and new combination of companies. This is in some way a political decision, at internal micro level of companies.

10 years ago, companies focused on quality, price and expression of quality. Now, companies see this differently. Real estate is nowadays part of the human resources department at some companies. The biggest cost for a company is people. Acquiring these people is therefore an important activity, which is also very pricy. Using a trendy and modern office, especially in these times of economic prosperity, helps attracting the best people that are available. Real estate is only 5% of the costs of a company. Paying a bit more per square meter for a very nice office is therefore a small act that results in a big decline in HR costs. Moreover, retaining people is simultaneously achieved by this. Also towards clients, you want to show that you are successful.

All in all, during these post-crisis times, the war for talent is a serious business, which has a big result on the use and function of real estate. At our own new office, for example, we implement a pool table, tribunes for presentations, a bar, a fire place and screens that are integrated in every room. By this, people are pleased and made comfortable. This is a change in how offices are seen and used compared to some years ago.

(E. Hoet, personal communication, June 13, 2017)

CONCLUSIONS &

RECOMMENDATIONS

7. Conclusions and recommendations

7.1 Introduction

Now all literature research is done, data is acquired, interpreted and discussed, an answer to the main research question can be given. This answer will be formulated, based on the answering of the sub-questions that were set-up to gradually underpin the main research question.

First a brief summary of the research expectations and the research questions will be given, to understand the viewpoint at the start of the research and the actual outcome of the research.

Based on literature, newspapers and other journals, expected was that the external climate for multinationals, caused by some characterising and new trends and events, had been very uncertain during the last decade and that it was still at a very uncertain level at this exact moment. Since the past showed corporate real estate management to change as the result of external fluctuations and uncertainty, the expectation was that this would have happened again during the last decade. The extent to which external uncertainty, caused by numerous trends and events, was the cause of such a change in corporate real estate management, was therefore the subject of this research, to be more precise: the extent to which accommodation decision-factors had changed as a result of external uncertainty at multinationals during the last decade.

In addition to the expectation that the external climate was *very* uncertain at this moment, another expectation was that the biggest influencers, or the most important influencers of such a change, were political uncertainty and (macro-)economic uncertainty, since this relation was described most in literature and other sources. Other forms of external uncertainty that were covered in the news and journals, like demographic uncertainty, technological uncertainty and environmental uncertainty, were expected to be less important for the accommodation decision-making process. Still, the research question was open to all forms of uncertainty, but the hypothesis included the expected drives of change.

Note once again, that the conclusions are based on the information that was acquired at a limited number of multinational companies and literature. Though they cannot be generalized based on their number, the conclusions and indicated and established correlations between the investigated aspects, will be regarded as the first and leading knowledge thus far and therefore inductively true for as long as no counter argument or deepening study exists to prove otherwise. The procedure used, stressed out in the previous chapters and being the first of its kind in this subject, is available for reproducing and supplementing the outcomes to refine or redefine these explorative conclusions in the future.

7.2 Answering sub questions and main research question

In order to confirm or reject the hypothesis that triggered this research, the sub-questions will be answered to come to the conclusion on the main research question, and the according hypothesis. The hypothesis was:

Real estate accommodation decision-making has changed due to external uncertainty, caused by (macro-) economic and political volatility, during the last decade.

This hypothesis is the translation of the main research question, including the aforementioned expectations. The main research question was:

To what extent does external uncertainty change the decision factors for accommodation of multinational corporations?

The sub-questions were set up to underpin the different pillars of this question. By this, the answer will be constructed based on these questions. The sub-questions will now be answered in succession.

What criteria are leading in accommodation decision-making?

Research in literature and in practice showed some criteria for corporate accommodation decision-making to be mentioned and used with excess over others. For the period 2007 and for the period around 2017, a count and weighed average has been made. Since individual criteria are mostly unique and defined slightly different among companies and literature, a structure is needed to reveal meaningful focus points. Using the subdivision out of the model of Gibler and Lindholm (2012), the dominant subjects around 2007 are *reducing real estate costs* and *increasing employee/organisation's efficiency and productivity*, which can be regarded as really practical and direct criteria that support the core business in the most efficient way. With over 80% of the total attention, these criteria generally overrule others.

The dominant subjects around 2017 are different and are focused on *enhancing employee wellbeing and satisfaction* and *promoting market, sales and organisational brand.* Also *reducing real estate related costs* criteria are still of big importance, but not in the same excess as around 2007. 2017 shows that these issues still account for a substantial share in decision-making, but that the focus is more diversified over a varied set of criteria topics.

Have accommodation criteria changed between 2007 and 2017?

The differing criteria focus that is illustrated shows a change, between 2007 and 2017, in how companies approach their accommodation projects. From a very practical approach, to a more value-adding approach. Besides those indicate changes in criteria focus, another change is the increasing variety of criteria. The total set of criteria became bigger in comparison to 2007. So, the focus of companies is not just different, but also wider. This supports the statement that not only practical and direct criteria are used anymore at this moment, but that the focus shifted towards a more supporting set with broad coverage of topics. This extensive approach is generally more mature or sophisticated. The CREM expertise experienced a development or improvement that enlarged the *vocabulary* of corporate real estate managers.

Can this change be regarded as structural?

A structural change regards to the change in which the elements of a coherent structure are organised. In this research, *structure* relates to the coherent structure of CREM that was set out by Gibler and Lindholm (2012). The changes that are laid down show the transformation that occurred among some pillars of this structure. Around 2007 over 80% of the focus was on practical criteria, which diversified during the last decade. The size and internal division of these eight topics, or pillars, changed. This indicates that the structure of CREM *did* change during the last decade. This change is confirmed among the assessed companies by determining the coverage of the changes. The changes that are indicated above show a significant coverage at the interviewed companies. This change in structure is therefore substantially reflected and can therefore be assessed as relevant. The changes are therefore structural changes.

What is the role of uncertainty in this structural change?

The main question of this research was to determine to what extent uncertainty was the cause of these changes. By explaining the *role* of external uncertainty, the extent to which it was (or wasn't) a driver is determined. The causes of external uncertainty during the last decade are divided among five different topics: (macro-)economic uncertainty, political uncertainty, demographic uncertainty, technological uncertainty and environmental uncertainty. Expected was that the influences of political and (macro-)economic uncertainty were possibly the drivers of a change during the last decade.

The outcome of the interview tables, interview explanations, supporting comments by the interviewees, an external expert and the author's advanced experience resulted in the conclusion that political influences (uncertainty) were not linked directly to criteria use in corporate accommodation decision-making. The relation with the political environment is not applicable anymore when the choice for building or location is being made. Location choice might experience influences from political tensions, but the consideration for the expansion to a new environment, context, area or even country is not up for corporate real estate managers but is part of a business strategy, going on earlier in the business process.

Technological uncertainty, demographic uncertainty and environmental uncertainty are not related to the decision-making factors of multinationals, in sense that they changed the decision-making factors to *respond* to these forms of uncertainty. Only, environmental change, or uncertainty, is in some way a driver of change in accommodation decision-making, but in light of marketing and branding options. Companies react on this type of uncertainty, by focusing on sustainable business solutions that are deployed as competitive attractiveness over other, lagging, companies.

Economic uncertainty, on the other hand, was a driver of structural change during the last decade. Although expected was that the economic environment was very uncertain at the moment, companies responded that currently an upturn in economy is going on. The measurement of data around 2017 is therefore applicable to an environment that is recovering. Still the statement that economic uncertainty was a driver of change does apply. The strategic environment in which businesses and corporate real estate managers operate changed as a result of (macro-)economic trends and events, but the upcoming economy does not alter the effects of the remaining uncertainty. Although the market is recovering, expectations about for example the direction of the Eurozone, the effects of the Brexit, and the disappointing interest rates remain. Again illustrated by the statement of PwC (2016b): *"although it may seem like the eurozone crisis has ended, businesses must be ready to deal with future eurozone shocks. And very loose monetary policy in the US and UK could blow up asset bubbles and destabilise the recovery".*

External uncertainty caused by the financial crisis, the biggest influencer during the last decade, resulted in some lessons learned that companies implemented in their decision-making process. A more cautious approach, with for example double checks on partners' compliances and the focus on flexible (terminable) contracts are now part of companies' decision-making criteria.

Moreover, during current times of economic recovery, companies react opportunistically to acquire a competitive advantageous position in the upcoming market. Upcoming markets, however, are still characterised by uncertainty. An ongoing change is happening, and the moment of stabilising is unsure as well. The combination with ongoing external, economic, challenges makes the external environment a bit less uncertain, but not at all stable. Claiming a position in the market is thus the strategy to stay ahead of competition, and to guard the company for future downturns or fluctuations. The reaction of companies to this relative uncertain continuation, is by distinguishing themselves from others. In literature this is described as a value-based strategy (Singer, 2005). The criteria and changes that showed this behaviour, are the focus on marketing and branding. Criteria in this category are the focus on sustainable competitiveness, internal experience for visitors and the prominent locations. Beside this external approach, also internally criteria can be recognised that focus on the distinctive and opportunistic excellence of companies. Attracting and retaining the best employees, in times that are favourable for employees, is among the top criteria, in comparison with 10 years ago. The focus is on employee wellbeing and satisfaction, where a big amount of amenities like a fitness, is pursued, the input of employees is taken into account and the workplaces consist of all thinkable forms to fit all uses. This last aspect is also driven by societal changes that shifted from solely single workplaces or open floors, to the implementation of flexible working places, silent working spaces, meeting places, informal and formal spaces and so on. Also coffee-bar like environments are attracted into the office now. By this, the employee should feel relaxed, comfortable and in the end: productive. Companies have to take into account these societal changes, in order to become the best employer around, and in order to attract and retain the best employees. *Value-based* is therefore the strategy that is used by these companies: to express

their symbolic value and to show off their capabilities and success. In this upcoming market, companies use their real estate in the *war-for-talent*, to acquire the best employees and to claim their position in the new promising market.

Aside from the just described developments, corporate real estate management as an expertise has been developing continuously since 2007 as well. Like Roulac (2001) already described: corporate real estate management changes when its "normal" environment is challenged. CREM is becoming a professional expertise, and the differences with 2007 are visible in the more extensive use of criteria today. Since businesses tend to change when normal practices are challenged or outcomes are different than expected, in such times of crisis, businesses start looking for ways to improve their skills and adapt their expertise to remain competitive advantageous. Fall back onto new research, new trends, new knowledge and successful examples in the market, is a normal response. In this economic light, the maturing of CREM as an expertise has therefore been triggered by the last financial crisis, its economic consequences and the eventual recovering for businesses.

Hypothesis

So the hypothesis *"real estate accommodation decision-making has changed due to external uncertainty, caused by (macro-)economic and political volatility, during the last decade"* can be confirmed partly. As is appears, no influences of political uncertainty were recognised, probably due to the characteristic that they play a meaningful role earlier in the process and already at the business side. Economic uncertainty, mostly fed by the financial crisis and the events that is caused, can be recognised as driver of change, on the other hand. This change can be explained in twofold: first, multinational corporations learned from economic challenging times and are now more cautious in acquiring corporate real estate, hereby for example focussing on flexible contracts and the compliance of landlords. Second, the eventual aftermath of the financial crisis, or in other words *recovering*, introduced an economic landscape in which competition, culture and societal changes force corporations to *follow* in order to stay ahead of others and so competitive advantageous. Making use of marketing, branding, employee attraction and retaining by the creation of satisfaction in real estate and its amenities is now a used measure. Adding value to the company is the key-term to describe these current real estate focusses.

7.3 Recommendations for further research

After conducting this research, some recommendation for improvement, addition, refinement, deepening and sustaining can be made. These are all measures to make conclusions future proof and constantly better. If this research is reproduced, what is encouraged, the following aspects should be taken into account.

The conclusions, as stressed out earlier, are based on a limited amount of companies. Still, the explorative insights that were acquired and the method to measure and verify the data are new and at hand, and the conclusions are therefore assessed as take-off in this specific topic. Supporting research to redefine the outcomes and the generalise the effects, should be conducted in the future. Below, some recommendations for conducting this additional, follow-up research are given. These recommendations should solidify a generalisation, broaden the research field, consolidate future conclusions and put it to use.

1. Conducting the research at a higher number of companies will eventually lead to a more general view on the topic. Also conclusions can be consolidated. Since the current research is set out on a differing set of sectors, the same should be applied in future research as well to follow the line that was set out in this research. The same sectors should be investigated, using the same method. If possible, a random sample will provide a generalisation better.

2. The conclusions of this research are related to the IT sector, the FS sector, the HR sector, the engineering sector and the food sector. This is a very broad approach, and additional research should be done to consolidate the conclusions in the future. Beside the execution of additional research, another way to confirm the data (to some extent) is at hand. If this research is reproduced on a totally different sector; one that is not included in this research, and the results align with the conclusions of this research (validation), the correlation of the data is confirmed even more.

3. If a conclusion is needed on a single sector, the research can be reproduced within a single industry. The same steps can be followed, and probably the interview protocol can be adjusted slightly to fit the industry best. An important note is that this additional research into one sector will remove the balance that is sought in this research. Therefore conclusions should be interpreted separately from this these conclusions.

4. The data of this research is acquired over the period between 2007 and 2017. It might be, however, interesting to take a point right in the middle as well. A research on the criteria around 2011 might show more direct responses to the financial crisis, which reveals the more *uncertain* reaction that companies had as response to this specific but important event. The incremental strategy, explained by Singer (2005), can probably be recognised in such investigations. The data in this research is acquired in an (economic) period that appeared to be "better" than expected. Therefore, the practical data from around 2011 can be interesting if an investigation solely about the financial crisis is pursued.

5. If eventually the conclusions are stressed out over a bigger amount of companies, results can be used to predict responses to uncertainty better. A model can be developed to advice companies that experience uncertainty and to teach them from the past. Such a model can go deeper into the unique characteristics of the company and the likelihood of a striking uncertain climate. Adjusting to such situations will be supported and guided by such a model.

6. Further research should also go into the location choice for businesses in general. Since political uncertainty is not related, according to this research, to the criteria for accommodation, the influence on the higher business level should be investigated. Apparently, the choice for location, which is more under influence of political climate, is already made in an earlier stage and on a higher level than the accommodation choice. If the relation of political uncertainty should be highlighted regarding to accommodation, the research should focus on a lower level of detail (less detail).

7. Another limitation of the research is the possibility that the interviewees did deliberately distort the answers and thus the data. Future research should take this into account again and can try to eliminate this aspect by:

- Double check data with another involved decision-maker, separately (validation).
- Reveal the true purpose of the research during the interview, to inform the interviewees that the distortion of data doesn't make sense. This will, however, bias the answers given (transparency).
- Conduct the same research in a non-anonymous way, and indicate to what extent the answers differ.
- Ask solely for acquiring authentic models, documents, reports, etc. to gather the information without asking the interviewee.

8. In this research, a correlation was indicated between external uncertainty and changes in CRE decision-making factors. Now the link between these two recent factors is revealed, and to a limited amount supported, the previously mentioned recommendations can be implemented to sustain and improve the conclusions. The *correlation* that is shown, however, can also be measured and valued on its strength. In order to do so, the measured aspects should be measured or translated into numbers.

Several tests can be used to determine the factual correlation factor that indicates how *strong* the aspects are correlated; for example a chi-squared test. By determing the correlation factor, the conclusions and predictions for further research can be made more precise. Moreover, eventually it might even be possible to determine or proof whether or not a causal relationship exists between the factors. In order to do so, different research methods are needed to investigate such a relationship. In order to prove a causal relationship, which can probably exist, a research environment that excludes other influences should be created. A recommendation in setting up such an environment is to downsize the research into very small particles, so the possibility of other influences is excluded as much as possible. Only focussing in-depth on one sector, with one criterion and one company can probably ultimately reveal such relationships.

9. The economic upturn that is recognised in the research, reveals another source of uncertainty. The companies are not sure to what the upturn will lead and how long it will last, but at the same time they have to get a hold on their market share, and try to improve their position and competitive advantage. This insight wasn't expected at the start of the research, and future research can focus (from the beginning) on the aspect *uncertainty during economic upturns*. The way companies response opportunistically, can probably reveal some naïve and reckless, or cautious and re-active actions. In the future, these researched together can eventually lead to some form of *guidance* through uncertain times.

8. Literature

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9. List of tables and figures

10. Appendices

10.1   Appendix 1 – Full list of criteria for real estate decision-making

Criteria	Category	Source	First year of publishing
Expansion potential	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Flexibility	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Vertical zoning	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Space with deviating weight capabilities	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Unit size	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Size per floor	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Ability to grow within building	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Zoning difficulties	Enabling flexibility	REN 2003 in Vermeer, 2007	2003
Building form	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Construction type	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Expanding possibilities	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Building depth	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Building Height	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Building volume	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Number of floors	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Floor layout	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Spatial characteristics and flexible elements	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Room/workplace layout	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Installations capacity	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Connection possibilities of installations	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Standardisation of installation	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Connection of installation elements	Enabling flexibility	Appel-Meulenbroek and Feijts, 2007	2007
Room for expansion	Enabling flexibility	Zaghdoud, 2013	2013
Vertical accessibility in the building	Enabling flexibility	NEN 8021:2014	2014
Flexibility in case of change of layout	Enabling flexibility	NEN 8021:2014	2014
Flexibility in change of size of floor space	Enabling flexibility	NEN 8021:2014	2014
Building depth	Enabling flexibility	NEN 8021:2014	2014
Layout flexibility	Enabling flexibility	Remoy & Van der Voordt, 2014	2014
Space efficiency	Enabling flexibility	Remoy & Van der Voordt, 2014	2014
CRE actively involved in firm-wide initiatives such as special asset use	Encouraging and support employee innovation and creativity	Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	2003
Amount of teamwork space	Encouraging and support employee innovation and creativity	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Amount of distance work settings in use	Encouraging and support employee innovation and creativity	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Spaces enabling face-to-face idea sharing	Encouraging and support employee innovation and creativity	Niemi & Lindholm, 2010	2010
Virtual communication spaces	Encouraging and support employee innovation and creativity	Niemi & Lindholm, 2010	2010
Employee satisfaction with professional skills	Encouraging and support employee innovation and creativity	Riratanaphong, 2014	2014
Employee satisfaction with information sharing	Encouraging and support employee innovation and creativity	Riratanaphong, 2014	2014
Amount of advice given to other business units	Encouraging and support employee innovation and creativity	Riratanaphong, 2014	2014
Variety in workplaces and activities	Encouraging and support employee innovation and creativity	NEN 8021:2014	2014
Alternative Worklace Arrangements	Encouraging and support employee innovation and creativity	GSA, 2006 in Riratanaphong, 2014	2014
Distance employees commute	Enhancing employee wellbeing and satisfaction	Duckworth, 1993 in Riratanaphong, 2014	1993
Employee satisfaction with work environment	Enhancing employee wellbeing and satisfaction	Arthur Andersen, 1993; Nourse, 1994; Bdeir, 2003 in Riratanaphong, 2014)	1993
Proximity to required transportation modes	Enhancing employee wellbeing and satisfaction	Duckworth, 1993; Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	1993
Access to employees	Enhancing employee wellbeing and satisfaction	Duckworth, 1993; Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	1993
Amount of local amenities	Enhancing employee wellbeing and satisfaction	Duckworth, 1993; Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	1993
Employee satisfaction with CRE services	Enhancing employee wellbeing and satisfaction	Duckworth, 1993; Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	1993

Number of helpdesk calls per square foot	Enhancing employee wellbeing and satisfaction	Bon et al, 1993 in Riratanaphong, 2014	1993
Proximity to required transportation modes	Enhancing employee wellbeing and satisfaction	Duckworth, 1993; Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	1993
Rating based on building attributes	Enhancing employee wellbeing and satisfaction	Duckworth, 1993 in Riratanaphong, 2014	1993
Quality of indoor environment	Enhancing employee wellbeing and satisfaction	Kincaid, 1994 in Riratanaphong, 2014	1994
Noise level	Enhancing employee wellbeing and satisfaction	Kincaid, 1994 in Riratanaphong, 2014	1994
Absentee rates by buildings	Enhancing employee wellbeing and satisfaction	Massheder and Finch, 1998 in Riratanaphong, 2014	1998
Customer satisfaction with responsiveness	Enhancing employee wellbeing and satisfaction	Amaratunga and Baldry, 2000 in Riratanaphong, 2014	2000
Location with preferred amenities (shopping, recreation, entertainment)	Enhancing employee wellbeing and satisfaction	Roulac, 2001	2001
Loyalty	Enhancing employee wellbeing and satisfaction	Bradley, 2002 in Riratanaphong, 2014	2002
Community sentiment	Enhancing employee wellbeing and satisfaction	Bradley, 2002 in Riratanaphong, 2014	2002
Contribution to public policy and societal priorities	Enhancing employee wellbeing and satisfaction	Hagarty and Wilson, 2002; RPS 2003 in Riratanaphong, 2014	2002
Working environment	Enhancing employee wellbeing and satisfaction	Kaczmarczyk and Morris, 2002 in Riratanaphong, 2014	2002
Ratio of office space to common areas	Enhancing employee wellbeing and satisfaction	Lubnieniecki and Desrocher, 2003 in Riratanaphong, 2014	2003
Amount of local amenities	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Congestion sensitivity	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Accessibility public transport	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Proximity to airport	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Routing, accessibility	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Public parking for visitors	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Parking on own terrain	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Parking norm	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Parking for bicycles	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Ability to open windows	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Thermal comfort summer	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Therma comfort winter	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Allowable internal heat load	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Reduction of sun	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Air quality	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Controllability climate installations	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Controllability lighting	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Security of entrances	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Presence of restaurants	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Provision of amenities	Enhancing employee wellbeing and satisfaction	Bdeir, 2003 in Riratanaphong, 2014	2003
Customer satisfaction	Enhancing employee wellbeing and satisfaction	Bdeir, 2003 in Riratanaphong, 2014	2003
Customer choice rating	Enhancing employee wellbeing and satisfaction	BCBC, 2003 in Riratanaphong, 2014	2003
Percentage of customers with service level agreements in place	Enhancing employee wellbeing and satisfaction	BCBC, 2003; Lindholm and Gibler, 2005 in Riratanaphong, 2014	2003
Data and IT amenities	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Proximity to highway	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
IT	Enhancing employee wellbeing and satisfaction	REN 2003 in Vermeer, 2007	2003
Accessibiility	Enhancing employee wellbeing	REN 2003 in Vermeer, 2007	2003

	and satisfaction		
Quality of facilities	Enhancing employee wellbeing and satisfaction	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Building Orientation	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Amount of glass in façade	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Detailing of elements and connections	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Exposition, orientation and climate	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Materials forms and colours of floor	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Control of environmental characteristics	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Controlling possibilities of installations in specific locations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Production of noise of installations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Characteristics of ventilation installations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Characteristics of lighting installations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Characteristics of cooling installations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Characteristics of heating installations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Characteristics of air moisturising installations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Characteristics of IT installations	Enhancing employee wellbeing and satisfaction	Appel-Meulenbroek and Feijts, 2007	2007
Accessibility by a wide range of transport nodes	Enhancing employee wellbeing and satisfaction	Morgan & Anthony, 2008	2008
Air quality	Enhancing employee wellbeing and satisfaction	Niemi & Lindholm, 2010	2010
Temperature	Enhancing employee wellbeing and satisfaction	Niemi & Lindholm, 2010	2010
Sound	Enhancing employee wellbeing and satisfaction	Niemi & Lindholm, 2010	2010
Lighting	Enhancing employee wellbeing and satisfaction	Niemi & Lindholm, 2010	2010
Physical body conditions	Enhancing employee wellbeing and satisfaction	Niemi & Lindholm, 2010	2010
Accessibility for cars	Enhancing employee wellbeing and satisfaction	Zaghdoud, 2013	2013
Orientation within the building	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Experience of light in the building	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Amount of natural light in building	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Internal air quality	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
External air quality	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Ability to cool building	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Ability to heat building	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
External noise	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Internal noise	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Accessibility for disabled	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Accessibility for cars	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Accessibility for pedestrians	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Accessibility public transport	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Accessibility parking spaces	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Size parking spaces	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Amount of workplace reforms and space modifications	Enhancing employee wellbeing and satisfaction	Riratanaphong, 2014	2014
Distance to employees' homes	Enhancing employee wellbeing and satisfaction	Riratanaphong, 2014	2014

Customer satisfaction with facilities	Enhancing employee wellbeing and satisfaction	Riratanaphong, 2014	2014
Audits for service providers in use	Enhancing employee wellbeing and satisfaction	Riratanaphong, 2014	2014
Accessibility of main entrance for people	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Controllability climate installations	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
View from workplace	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Social security	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Safety measures	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Facilities for consumption	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Sport facilities	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Extra facilities (in neighbourhood)	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Sanitary facilities	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Storage facilities	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
IT facilities	Enhancing employee wellbeing and satisfaction	NEN 8021:2014	2014
Comfort	Enhancing employee wellbeing and satisfaction	Remoy & Van der Voordt, 2014	2014
Interior appearance	Enhancing employee wellbeing and satisfaction	Remoy & Van der Voordt, 2014	2014
Routing	Enhancing employee wellbeing and satisfaction	Remoy & Van der Voordt, 2014	2014
Bike parking	Enhancing employee wellbeing and satisfaction	Remoy & Van der Voordt, 2014	2014
Accessibility by car	Enhancing employee wellbeing and satisfaction	Remoy & Van der Voordt, 2014	2014
Accessibility by public transport	Enhancing employee wellbeing and satisfaction	Remoy & Van der Voordt, 2014	2014
Productivity (%)	Increasing employee efficiency and productivity	Carder, 1995; van der Voordt, 2004 in Riratanaphong, 2014	1995
Equipment provided meets business needs	Increasing employee efficiency and productivity	Hinks and McNay, 1999 in Riratanaphong, 2014	1999
Access to costumers	Increasing employee/organisation's efficiency and productivity	Duckworth, 1993; Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	1993
Distance to other sites and businesses	Increasing employee/organisation's efficiency and productivity	Duckworth, 1993; Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	1993
Possibility to attract talent	Increasing employee/organisation's efficiency and productivity	Roulac, 2001	2001
Location that is convenient for suppliers	Increasing employee/organisation's efficiency and productivity	Roulac, 2001	2001
CRE inegrated with HR strategies	Increasing employee/organisation's efficiency and productivity	Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	2003
Overall tenant satisfaction with property management services	Increasing employee/organisation's efficiency and productivity	RPS, 2003 in Riratanaphong, 2014	2003
CRE unit quality	Increasing employee/organisation's efficiency and productivity	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Employees' opinion on how well the workplace supports their productivity	Increasing employee/organisation's efficiency and productivity	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Proximity of labour market	Increasing employee/organisation's efficiency and productivity	Appel-Meulenbroek and Feijts, 2007	2007
Proximity of selling market	Increasing employee/organisation's efficiency and productivity	Appel-Meulenbroek and Feijts, 2007	2007
Proximity of suppliers/sources	Increasing employee/organisation's efficiency and productivity	Appel-Meulenbroek and Feijts, 2007	2007
Proximity to related organisational departments	Increasing employee/organisation's efficiency and productivity	Appel-Meulenbroek and Feijts, 2007	2007
Proximity of collaboration parties	Increasing	Appel-Meulenbroek and Feijts, 2007	2007

	employee/organisation's efficiency and productivity		
Presence of supporting facilities	Increasing employee/organisation's efficiency and productivity	Appel-Meulenbroek and Feijts, 2007	2007
Accessibility of facilities on site	Increasing employee/organisation's efficiency and productivity	Appel-Meulenbroek and Feijts, 2007	2007
Location target consumers	Increasing employee/organisation's efficiency and productivity	Zaghdoud, 2013	2013
Accessibility of resources	Increasing employee/organisation's efficiency and productivity	NEN 8021:2014	2014
Business cluster	Increasing employee/organisation's efficiency and productivity	Remoy & Van der Voordt, 2014	2014
Value for money	Increasing value of organisation's real estate assets	Hinks and McNay, 1999 in Riratanaphong, 2014	1999
Economic/market value added	Increasing value of organisation's real estate assets	Bradley, 2002 in Riratanaphong, 2014	2002
Return on Investment	Increasing value of organisation's real estate assets	Hagarty and Wilson, 2002; BCBC, 2003; RPS, 2003 in Riratanaphong, 2014	2002
Return on invested capital	Increasing value of organisation's real estate assets	Kaczmarczyk and Morris, 2002 in Riratanaphong, 2014	2002
Net Income	Increasing value of organisation's real estate assets	BCBC, 2003; NPB, 2003 in Riratanaphong, 2014	2003
Return on equity	Increasing value of organisation's real estate assets	NPB, 2003 in Riratanaphong, 2014	2003
Value of property, plant and equipment	Increasing value of organisation's real estate assets	Lubieniecki and Desrocher, 2003 in Riratanaphong, 2014	2003
Total proceeds on properties sold	Increasing value of organisation's real estate assets	BCBC, 2003 in Riratanaphong, 2014	2003
Return on investmentment for Owned Market-Comparable office buildings	Increasing value of organisation's real estate assets	BCBC, 2003 in Riratanaphong, 2014	2003
Bulding age	Increasing value of organisation's real estate assets	Appel-Meulenbroek and Feijts, 2007	2007
Price of building	Increasing value of organisation's real estate assets	Zaghdoud, 2013	2013
Book value building	Increasing value of organisation's real estate assets	Verhoeff, 2014	2014
Juridical structure building	Increasing value of organisation's real estate assets	Verhoeff, 2014	2014
LFA per user profile	Increasing value of organisation's real estate assets	Verhoeff, 2014	2014
Marketability	Increasing value of organisation's real estate assets	Verhoeff, 2014	2014
Building condition	Increasing value of organisation's real estate assets	Verhoeff, 2014	2014
Costomer-friendly place	Promoting market, sales and organisational brand	Roulac, 2001	2001
Form of institutional advertising	Promoting market, sales and organisational brand	Roulac, 2001	2001
Positive market profile	Promoting market, sales and organisational brand	Kaczmarczyk and Morris, 2002 in Riratanaphong, 2014	2002
Political results	Promoting market, sales and organisational brand	Kaczmarczyk and Morris, 2002 in Riratanaphong, 2014	2002
Type of location	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Attractive power location	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Environmental quality	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Social enivronment location	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Publicity	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Appearance	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Identity of building	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Common space	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Main entrance	Promoting market, sales and organisational brand	REN 2003 in Vermeer, 2007	2003
Percentage of positive and neutral press coverage	Promoting market, sales and organisational brand	Statsbyg, 2003 in Riratanaphong, 2014	2003
Registration of all properties according to plan for protection of historical/cultural values	Promoting market, sales and organisational brand	Statsbyg, 2003 in Riratanaphong, 2014	2003

Media monitoring	Promoting market, sales and organisational brand	NPB, 2003 in Riratanaphong, 2014	2003
Charisma/image location and environment	Promoting market, sales and organisational brand	Appel-Meulenbroek and Feijts, 2007	2007
Materials, forms and colours	Promoting market, sales and organisational brand	Appel-Meulenbroek and Feijts, 2007	2007
Strong positive relationship with the surroundings	Promoting market, sales and organisational brand	Morgan & Anthony, 2008	2008
Representativeness	Promoting market, sales and organisational brand	Zaghdoud, 2013	2013
Coherence between architectural form, function and construction	Promoting market, sales and organisational brand	NEN 8021:2014	2014
Monumental status	Promoting market, sales and organisational brand	NEN 8021:2014	2014
Recognisability of building	Promoting market, sales and organisational brand	NEN 8021:2014	2014
Exterior appearance	Promoting market, sales and organisational brand	Remoy & Van der Voordt, 2014	2014
Square feet per employee	Reducing real estate costs	Arthur Andersen, 1993; Nourse, 1994; Bdeir, 2003; Lindholm and Gibler, 2005 in Riratanaphong, 2014)	1993
Occupancy cost per square foot	Reducing real estate costs	Arthur Andersen, 1993; Nourse, 1994; Bon et al. 1994; Bdeir, 2003 in Riratanaphong, 2014)	1993
Occupancy costs per employee	Reducing real estate costs	Arthur Andersen, 1993; Massheder and Finch, 1998; Bdeir, 2003 in Riratanaphon, 2014	1993
Occupancy cost as a % of operating revenue by building or business unit	Reducing real estate costs	Arthur Andersen, 1993; Bdeir, 2003 in Riratanaphong, 2014)	1993
Percentage of space ccupied	Reducing real estate costs	Nourse, 1994; Bdeir, 2003 in Riratanaphong, 2014	1994
Occupancy cost per seat	Reducing real estate costs	Nourse, 1994; in Riratanaphon, 2014	1994
Actual extra occupancy cost versus predicted cost	Reducing real estate costs	Massheder and Finch, 1998 in Riratanaphong, 2014	1998
Gross floor area per usable floor area	Reducing real estate costs	Massheder and Finch, 1998 in Riratanaphong, 2014	1998
Absentee rates by buildings	Reducing real estate costs	Massheder and Finch, 1998 in Riratanaphong, 2014	1998
Occupancy cost per dollar or per unit of revenue	Reducing real estate costs	Massheder and Finch, 1998 in Riratanaphong, 2014	1998
Cost of acquisitions versus returns	Reducing real estate costs	Massheder and Finch, 1998 in Riratanaphong, 2014	1998
Holding costs per year	Reducing real estate costs	Massheder and Finch, 1998 in Riratanaphong, 2014	1998
Effective utilisation of space	Reducing real estate costs	Hinks and McNay, 1999 in Riratanaphong, 2014	1999
Accommodation usage	Reducing real estate costs	Hagarty and Wilson, 2002; Kaczmarky and Morris, 2002; RPS, 2003 in Riratanaphong, 2014	2002
Vacancy rates	Reducing real estate costs	Hagarty and Wilson, 2002; GSA, 2006; BCBC, 2003; RPS, 2--3; Lindholm and Gibler, 2005 in Riratanaphong, 2014	2002
Cost of leased vs. owned inventory	Reducing real estate costs	Hagarty and Wilson, 2002 in Riratanaphong, 2014	2002
Contaminated sites management	Reducing real estate costs	BCBC, 2003 in Riratanaphong, 2014	2003
Budget management	Reducing real estate costs	RPS, 2003 in Riratanaphong, 2014	2003
Return on property management	Reducing real estate costs	Statsbygg, 2003 in Riratanaphong, 2014	2003
Result before finance costs as percentage of invested capital per year	Reducing real estate costs	Statsbygg, 2003 in Riratanaphong, 2014	2003
Total income from consulting and planning	Reducing real estate costs	Statsbygg, 2003 in Riratanaphong, 2014	2003
Area leased as percentage of total area	Reducing real estate costs	Statsbygg, 2003; Lindholm and Gibler, 2005 in Riratanaphong, 2014	2003
Space supply and demand ratios	Reducing real estate costs	RPS, 2003 in Riratanaphong, 2014	2003
Area managed/employee	Reducing real estate costs	BCBC, 2003 in Riratanaphong, 2014	2003
Occupancy cost per customer	Reducing real estate costs	Bdeir, 2003 in Riratanaphong, 2014	2003
Total annual building occupancy charge	Reducing real estate costs	BCBC, 2003 in Riratanaphong, 2014	2003
Costs per CRE employee	Reducing real estate costs	Bdeir, 2003 in Riratanaphong, 2014	2003
Operation cost/square metre	Reducing real estate costs	Statsbygg, 2003 in Riratanaphong, 2014	2003
Maintenance cost/square metre	Reducing real estate costs	Statsbygg, 2003 in Riratanaphong, 2014	2003
Different costs per square metre such as energy consumption	Reducing real estate costs	NPB, 2003 in Riratanaphong, 2014	2003
Total poject cost in relation to budget	Reducing real estate costs	Statsbyg, 2003 in Riratanaphong, 2014	2003
Length of lease terms	Reducing real estate costs	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Physical condition of facilities	Reducing real estate costs	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Percentage of surplus assets sold	Reducing real estate costs	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Number of workstations per employee	Reducing real estate costs	Lindholm and Gibler, 2005 in Riratanaphong, 2014	2005
Employees housed	Reducing real estate costs	GSA, 2006 in Riratanaphong, 2014	2006
Total square feet employees housed	Reducing real estate costs	GSA, 2006 in Riratanaphong, 2014	2006
Costs per square foot (owned/leased)	Reducing real estate costs	GSA, 2006 in Riratanaphong, 2014	2006
Technical condition of installations	Reducing real estate costs	Appel-Meulenbroek and Feijts, 2007	2007
Cost of services and resources	Reducing real estate costs	NEN 2748 in Riratanaphong, 2014	2007
External facilities costs	Reducing real estate costs	NEN 2748 in Riratanaphong, 2014	2007
Total amount of square metres	Reducing real estate costs	Appel-Meulenbroek and Feijts, 2007	2007
Standardisation of elements	Reducing real estate costs	Appel-Meulenbroek and Feijts, 2007	2007
Controlling possibilities of installations in general	Reducing real estate costs	Appel-Meulenbroek and Feijts, 2007	2007
Logistic infrastructure	Reducing real estate costs	Appel-Meulenbroek and Feijts, 2007	2007
Threat of expropriation	Reducing real estate costs	Zaghdoud, 2013	2013
Technical condition of space	Reducing real estate costs	Zaghdoud, 2013	2013
Price of land	Reducing real estate costs	Zaghdoud, 2013	2013

Time used in project versus time budgeted for the project	Reducing real estate costs	Riratanaphong, 2014	2014
Lease term	Reducing real estate costs	Verhoeff, 2014	2014
Time wasted with interruptions (due to open space layour	Reducing real estate costs	Riratanaphong, 2014	2014
Occupancy cost per sales or turnover	Reducing real estate costs	Riratanaphong, 2014	2014
Occupancy cost per business unit	Reducing real estate costs	Riratanaphong, 2014	2014
Building Occupancy Charge savings to customers	Reducing real estate costs	Riratanaphong, 2014	2014
Lease costs per square metre	Reducing real estate costs	Riratanaphong, 2014	2014
Number of moves per year	Reducing real estate costs	Riratanaphong, 2014	2014
Cost of under utilized space	Reducing real estate costs	Riratanaphong, 2014	2014
Worplace standards in use	Reducing real estate costs	Riratanaphong, 2014	2014
Layout of lettable floor area	Reducing real estate costs	NEN 8021:2014	2014
LFA per FTE	Reducing real estate costs	Verhoeff, 2014	2014
Service level agreements in use with service providers	Reducing real estate costs	Riratanaphong, 2014	2014
Energy performance	Reducing real estate costs	Remoy & Van der Voordt, 2014	2014
Waste disposal	Supporting environmental sustainability	REN 2003 in Vermeer, 2007	2003
Energy use/square meters	Supporting environmental sustainability	Statsbygg, 2003 in Riratanaphong, 2014	2003
Energy	Supporting environmental sustainability	Appel-Meulenbroek and Feijts, 2007	2007
Production of heat in installations	Supporting environmental sustainability	Appel-Meulenbroek and Feijts, 2007	2007
Energy	Supporting environmental sustainability	REN 2003 in Vermeer, 2007	2007
Number of energy audits	Supporting environmental sustainability	Riratanaphong, 2014	2014
Amount of garbage	Supporting environmental sustainability	Riratanaphong, 2014	2014
Energy label	Supporting environmental sustainability	NEN 8021:2014	2014
Use of renewable sources	Supporting environmental sustainability	NEN 8021:2014	2014
Energy consumption	Supporting environmental sustainability	Riratanaphong, 2014	2014

Trend/event	Description	Uncertainty	Source
Credit crunch (2007)	The collapse of certain banks in the US and Europe and the according extreme global economic downturn indicated the biggest economic crisis since the Great Depression in the 30's of last century.	The great economic downturn was the cause of challenges about bankruptcy, unavailability of money, hesitating banks, collapsed real estate market etc. were the result. Numerous corporations had to adapt, sometimes in chaos, in order to remain running.	(Dalderup, 2014)
European debt crisis (2008)	As a result of the global economic crisis, some European countries were about to go bankrupt. This led to emergency plans to save these countries from filling bankruptcy and cause even greater economic problems in Europe.	The financial situation of some European countries as Greece, Spain and Ireland, among others, is still not trustworthy. A risky investment climate and volatile political response and European support is the result, although the prospects are getting better.	(The Guardian, 2011)
Emerging populism (2010)	The last years a rise of populism can be seen in Europe and the US. Some recent results of this rise is the Brexit, the election of Trump in the US and the rise of extremely right-wing parties in Germany, France and The Netherlands for example.	Uncertainty emerges about a declining growth rate and the rise of populist parties. Rise of populism indicates dissatisfaction among people in Europe and the US. Public readiness to accept necessary structural reforms may get worse and policy cannot be implemented as easily as before.	(De Waard, 2016)
Arabic Spring (2012)	Democratic revolution in Arab countries where the regime was forced to leave and make place for democratic government. In many cases, crises emerged due to the lack of a leader when non-governmental parties took over power.	Political instability and changing power in some Arab countries suppressed economic growth and a stable investment climate. Uncertainty about future economy, future (international) policies, future demographic developments and political system and legislation in general are the result.	(BBC, 2013)
Ongoing attacts Islamic State (2014)	Since the formation of IS (or ISIL, ISIS) in 2014, declaring a caliph and Islamic state, ongoing attacks and violence has taken place. Not only in the middle-east, but also in western Europe and Asia. The emerge of IS widely seen as extremely threatening and was reason for military interventions in the middle-east.	Safety and political stability in IS occupied countries cannot be guaranteed. Besides, numerous attacks in western Europe, the US and Asia caused fear and chaos among the population. Ongoing threat of attacks is worsening people's trust and safety feeling.	(Wikipedia, n.d.-a)
European reguee crisis (2014)	As a result of the crises in the middle east and other Arab countries, an ongoing stream of refugees is entering Europe, to look for safety and shelter. Sceptics are afraid of violence and lose of wealth due to these refugees, while another part of society supports and helps them. This dichotomy is causing tension between the western population and politics.	Uncertainty about amount of refugees that is about to enter Europe is a result. Consequently political tension and discord is the result, as well as the same reaction among citizens. Additionally, political polarisation takes place, causing an uncertain political climate in many European countries.	(Wikipedia, n.d.-b)
Chinese stock market turbulence (2015)	The popping of the stock market bubble in 2015 caused the stock market to fall over 30%. This event caused concern about a second global financial crisis.	Uncertainty arises about the stability of the Chinese stock market and subsequently the fear for a possible next financial crisis; possibly global again.	Wikipedia, n.d. -c)
Globalisation	An ongoing global interweaving of cultural and economic aspects changes the economic and political structure of individual countries. It is hard to predict where this will lead to, but the presence of the trend is visible all over the world	Uncertainty exists about the result of this trends. It is known that this process takes place and that it will continue, but there is always fear that too large international interdependencies will lead to even more crises and downturns when an economy stagnates; with a domino effect.	(Planbureau voor de Leefomgeving, 2013)
Aging population western countries	The average age of the population in western countries is rising. This is due to the decrease in children that are born, but more over due to the "baby boom" generation that emerged after the second world war. This trend leads to tension about pensions and elderly care, but also has its effects on the employee potential that is available.	The rise in average age influences the workforce potential for companies. Less younger people will become available compared to elderly. Besides, providing the amount of pensions that is needed will have a possible negative effect on the purchasing power of the population.	(Wikipedia, n.d. -d) (PwC, 2014)
Urbanisation	Since 1950 a shift towards cities has begun, from 30% to 50% right now. Additionally, by 2050, the world's urban population will have increased by some 72%.	There will be concentrations of people in city centres. This makes it harder to transfer to work, like in London and this has an influence on possible workforce and the place for companies within a city	(PwC, 2014) (EY, 2015)
Oversupply office market	At this moment, 15% of the offices in the Netherlands is vacant, and this is about to increase. This has a negative effect on the liveability in the cities since empty building have a negative effect on this. Besides, the offices are often outdated and not interesting for companies to invest in. This is also due to the relative low costs of developing new office buildings, compared to refurbishing existing ones. This aspect reduced the liquidity of real estate portfolios since the older office buildings are harder to sell. On the other hand, the prices of vacant offices are very low and can be interesting to buy as a bargain, when someone sees a potential.	Uncertain is the liquidity of offices since the competition of buildings is high and the transformation costs are high as well. Besides, it is predicted that this situation will become worse, showing a negative prospect for the coming years. This can lead to hesitation and reluctance on the market, and in financing of banks.	(Rijksoverheid, 2017)

Emerging euroscepticism	As a result of the financial crisis and other European problems, some countries are questioning their EU membership since it is said to be too costly and not profitable. This caused, for example, the Brexit in the UK. Reforms are needed, but the support for them is lacking due to this Euroscepticism. Overall the EU is becoming less popular.	When countries are questioning their role and presence in the EU, it is harder to conduct reforms since there is no support for them. Since this trends is spread all over Europe, the future role and presence of the EU is uncertain. Economic collaboration, trade advantages and other agreements that were implemented during the last decades are not certain to exist in the future when the European collaboration is point of discussion. This creates an economic and political environment that is not advantageous for businesses.	(Rabobank, 2015)
Rise of geopolitical tensions in EU-Russian relationship	As a result of the Ukraine-Russian conflict about the annexation of the Krim, mutual mistrust between Europe and Russia is the result. No military interventions have taken place, but some military build-up on Russian borders is going on. This leads to a tense situation that resembles some of the tensions during the Cold War.	Political tension between Europe and the superpower Russia is negative for trade and economic advantages between both territories. Some economic measures have been taken on Russia, and as a result Russia did the same to Europe. This situation and a worsening prospect of this, makes the investment and business climate uncertain; in particular the environment in Russia.	(Rabobank, 2015)
TTIP (2013)	TTIP is a recent economic trade agreement between Europe and the US. China sees this agreement as a geopolitical move against China. If TTIP succeeds, it can lead to a structural increase in economic growth and economic outlook for the EU and the US.	Although the success of TTIP is uncertain, the outlook for the economic situation for Europe is good. It is, however, hard to trust this agreement, since its definite implementation is not ready yet. This is a cause of uncertainty, since there are a lot of opponents. Besides, the trading agreements between China and the EU may become worse, since China feels somewhat threatened by this recent agreement between the EU and the US. This can affect business badly, although its specific effects remain uncertain at this moment.	(Rabobank, 2015)
Brexit (2016)	As a result of the Euroscepticism, mentioned before, the Brexit was applied. This leads to more negative trade agreements since the UK is not in the EU anymore. Besides, the exit of the UK, has implemented this idea among other countries as well, possibly leading to more exiting countries.	Worsening trade and economic agreements with the UK has a negative effect on business with this region. This is a cause of uncertainty. On the other hand, businesses may move to other places in the EU, like The Netherlands. This can be an interesting chance for cities, but the eventual result and effects are still uncertain.	(Hunt & Wheeler, 2016)
New European Commission	The new European Commission under the lead of Juncker is significantly more political than the last one. A strong German influence, however, is another result. The effectiveness and influence of the new commission is not known, and has to be discovered.	New political leader on EU level can influence the European economy and political direction very much. What the result of this will be, is not known, but it can lead to a political gridlock when some Eurosceptic countries are not willing to collaborate. In general the economic and political climate is probable to change for companies, but to what extent is not known and therefore uncertain.	(Rabobank, 2015)
Shift in economic power	The focus and location of global growth is shifting. This can lead to other superpowers than those of today.	If power and economic focus is shifting companies may have to reshape their competitive environment. Also, other legislation and regulations in new focus areas may need to be implemented in business. This change leads to uncertainty about business in the future.	(PwC, 2014)
Climate change and resource scarcity	The impact of climate change is of growing economic concern. Also the scarcity of resources may become more important.	Increased conflict and political tensions about regulation and the protection of own resources may lead to uncertainty, to which the businesses have to adapt.	(PwC, 2014)
Technological breakthroughs	Breakthroughs in nanotechnology and other fields of research and development are increasing productivity of people and machinery and are opening up new investment opportunities.	New technological opportunities can be interesting to adapt the business to or to implement in the business itself. On the other hand, employees may become redundant since their work can be done by machines. This can affect the business negatively, due to bad advertising, but can also positively influence the profitability and quality of the business. The ongoing development and need to adapt to remain competitive advantageous makes this trend a cause of uncertainty, since there is always a new development to adapt to.	(PwC, 2014) (EY, 2015)

The protocol below will be used in the interviews of the corporations. A Dutch version is available as well, and can be acquired upon request. For interviews with Dutch corporations the Dutch version is used, but the content is exactly the same.

Important: as can be read in the protocol, no links to *uncertainty* are made. This is to avoid the interviewee being biased by this aspect. Therefore the explanation of the research is limited to "accommodation decision-making for corporates and the difference between now, and before 2007". The aspect uncertainty will only be used in the following investigation, where the interview answers will be assessed with relation to *uncertainty* as possible driver.

Interview protocol
Introduction
Thank you again for giving me the opportunity to interview you and your company about decision-making for accommodation projects.

I'm currently conducting a research for the TU Delft, and on behalf of Cairn Real Estate on how decision-making for corporate accommodation has changed during the last decade.

Let me first guarantee you again about the anonymity of this research. Your name, the name of your company and any other sensitive information will be anonymized in the report. This will only be available for me; my two mentors and our contact at Cairn Real Estate.

The aim for this research is to get an insight in corporate decision-making procedures now, in 2017, and around 10 years ago, before 2007. I want to map the differences in the criteria that are used to select the best alternative, and the relative importance of these criteria. I'm also interested in the CRE team, and the people who, together, make this decision. Eventually I want to compare both time periods, and note any changes.

The questions for this research are linked to specific accommodation projects. One recent project and one former project, around 10 years go. This was announced in our preceding email contact. The questions during this interview are based on the two timeslots. We will start with the recent project, and subsequently discuss the former project.

In short, the questions are about (1) the different alternatives that were available in both timeslots. (2) Then the criteria that were used to select the best alternative will be discussed. (3) Subsequently, we will appoint an importance to the criteria. (4) And afterwards the criteria will be rated as well. (5) Also the CRE team and the decision-making procedure will be discussed. This will be done for both timeslots.

This interview will be recorded since this is required by the TU Delft, but again, any sensitive information will be anonymized. If you have any questions or comments during the interview, please do not hesitate to interrupt me. If you have no further questions right now, we will start with the interview.

Question	Follow-up question	Aim to find out
We will start with the recent project in (…). First we discuss the alternative accommodation options.		
1. What alternative buildings and/or locations were available in this project?	- How many buildings were there to choose from? - Who set up this list? - Was staying/remaining in the same building an option?	- Which alternatives were available - Where did these alternatives come from (outsourcing?) - Was the current building an option to stay? Why, why not?
Now the alternative options are pointed out, we continue with the criteria on which the alternatives were assessed.		

2. Which criteria were used to rate the alternatives and select the best alternative?	- Which criteria were used that relate to the workplace level? - Which criteria were used that relate to the building level? - Were there any criteria on portfolio level used? - Were there any criteria used from the business?	- The full spectrum of criteria (no biasing, but posing line of thought) - Also criteria from the business, and not just the CRE department
For these criteria, I would like you to assign a weighing. For this question we will use this diagram (show pie chart on table)		
3. If you can divide 100% of importance over these given criteria. How many percent would you assign them relatively?		
Now the criteria and the alternatives are laid down, I would like you to rate the criteria for each alternative.		
4. Could you indicate a 0 (bottom) and a 100 (top) alternative for all the criteria, and place the other alternatives somewhere in between, according to their relative rating?	*For each criterion:* - Which alternative scored the best? - Which alternative scored the worst? - Where would you place alternative x, y, - Can you clarify briefly why you give these ratings?	- Relative rating of criteria for given alternatives - The reason behind the given ratings
Before we go to the next project, I would like to ask you a few questions about the CRE team and the decision-making process.		
5. How are decisions made at your corporation?	- Are there any models used for the selection of alternatives? - How many people are there in the CRE team? - How many decision-makers are there? - Who makes the last call?	- Indication of decision-making procedure - Understanding of the inter-relation of the decision-makers
These were the first questions about the recent project (…). We continue now with the project in (2007?) you indicated. For this project I would like you to answer the same questions.		
Continue with question 1 to 5.		
6. Do you think that rising external uncertainty caused any of these changes?		Check-up question about the influence of rising uncertainty in decision-making

Closing

This was the last questions of this interview.

Thank you very much for your time and information, this has been very helpful for my research. If I need any additional information in the future, I may need to ask you a few following-up questions. Are you OK with that? These questions can be answered by telephone.

(Then, before we finish, I would like to ask again if you can send me the information/models/calculations/papers etc. we discussed before)

Thank you again for you time and hope to see you again.

End

+/- 2007		+/- 2017	
1	**Enabling flexibility**	1	**Enabling flexibility**
	Flexibility in space		Efficiency of space
	Possibility to expand		Flexibility
2	**Promoting market, sales and organisational brand**		Flexibility in lease
	Ground floor space	2	**Promoting market, sales and organisational brand**
	Location in shopping street		Branding visibility
	Prominent location		Central district
	Reciprocity		Floor location preference
	Representation (w/o sustainability)		Ground floor space
3	**Reducing real estate related costs**		Image
	Construction costs		Internal experience (for clients)
	Contingency costs		Open feel external
	Costs		Prominent location
	Furniture costs		Representation
	Moving costs		Representation (incl. Sustainability)
	Security costs	3	**Reducing real estate related costs**
	Service costs		Costs
	Gross construction budget		Installations
	Installation and construction		Moving costs
4	**Increasing employee/organisation's efficiency and productivity**		Ownership status/reputation
	Accessibility car		Security concerns
	Accessibility public transport		Sr. Executive sponsorship
	Amsterdam as location		Utility sources
	Distance business partners	4	**Increasing employee/organisation's efficiency and productivity**
	Distance personel		Accessibility car
	Distance tenants		Accessibility public transport
	Distance to national airport		Centralization
	Location near project		Discrete location
	Parking spaces		Distance business partners
5	**Increasing value of organisation's real estate assets**		Distance personel
	Price/quality ratio		Distance tenants
6	**Enhancing employee wellbeing and satisfaction**		Distance to national airport
7	**Supporting environmental sustainability**		Parking spaces
8	**Encouraging and support employee innovation and creativity**	5	**Enhancing employee wellbeing and satisfaction**
			Accessibility/disability compliance
			FH&S concerns
			Fitness
			Internal experience (for employees)
			Location (amenities)

		Location (human factors)
		Open feel internal
		Shared amenities
		User input
	6	**Increasing value of organisation's real estate assets**
		Price/quality ratio
	7	**Supporting environmental sustainability**
		Energy label (B+)
		Representation (incl. Sustainability)
		Sustainability
	8	**Encouraging and support employee innovation and creativity**

Table 29: Structuring of criteria

+/- 2007	Weighing	%	+/- 2017	Weighing	%
Costs	85%	17%	Costs	55%	11%
Distance business partners	40%	8%	Location near public transport	40%	8%
Accessibility car	30%	6%	Distance business partners	40%	8%
Amsterdam as location	30%	6%	Internal experience (for employees)	35%	7%
Reciprocity	25%	5%	Accessibility public transport	30%	6%
Parking spaces	25%	5%	Parking spaces	24%	5%
Price/quality ratio	25%	5%	Price/quality ratio	20%	4%
Location near project/cient	25%	5%	Distance personel	20%	4%
Construction costs	20%	4%	Open feel external	20%	4%
Furniture costs	20%	4%	Location (human factors)	12%	2%
Security costs	20%	4%	Accessibility car	12%	2%
Service costs	20%	4%	Energy label (B+)	10%	2%
Contingency costs	20%	4%	Installations	10%	2%
Accessibility public transport	20%	4%	Image	10%	2%
Possibility to expand	20%	4%	Representation (incl. Sustainability)	10%	2%
Distance personel	15%	3%	Location (amenities)	10%	2%
Representation (w/o sustainability)	10%	2%	Distance to national airport	10%	2%
Flexibility in space	10%	2%	Open feel internal	10%	2%
Ground floor space	10%	2%	Utility sources	9%	2%
Distance to national airport	10%	2%	Sr. Executive sponsorship	9%	2%
Prominent location	6%	1%	User input	9%	2%
Location in shopping street	6%	1%	Branding visibility	8%	2%
Distance tenants	5%	1%	Security concerns	7%	1%
Moving costs	2%	0%	Efficiency of space	7%	1%
Installation and construction	1%	0%	Ownership status/reputation	6%	1%
	500%		Fitness	6%	1%
			Shared amenities	5%	1%
			Distance tenants	5%	1%
			Flexibility in lease	5%	1%
			Moving costs	5%	1%
			Floor location preference	5%	1%
			Central district	5%	1%
			Internal experience (for clients)	5%	1%
			Prominent location	5%	1%
			Accessibility/disability compliance	4%	1%
			Sustainability	4%	1%
			FH&S concerns	3%	1%
			Ground floor space	2%	0%
			Centralization	2%	0%
			Flexibility	2%	0%
			Discrete location	2%	0%
			Representation	2%	0%
				500%	

Table 30: Individual criteria with total added weighing

Around 2007	Weighing	%	Around 2017	Weighing	%
Promoting market, sales and organisational brand			**Enabling flexibility**		
Reciprocity	25%		Flexibility	2%	
Representation (w/o sustainability)	10%		Flexibility in lease	5%	
Ground floor space	10%		Efficiency of space	7%	
Prominent location	6%		**Total topic**	**14%**	3%
Location in shopping street	6%				
Total topic	**57%**	11%	**Promoting market, sales and organisational brand**		
			Open feel external	20%	
Increasing employee/organisation's efficiency and productivity			Image	10%	
Distance business partners	40%		Representation (incl. Sustainability)	10%	
Accessibility car	30%		Branding visibility	8%	
Amsterdam as location	30%		Floor location preference	5%	
Parking spaces	25%		Central district	5%	
Location near project/cient	25%		Internal experience (for clients)	5%	
Accessibility public transport	20%		Prominent location	5%	
Distance personel	15%		Ground floor space	2%	
Distance to national airport	10%		Representation	2%	
Distance tenants	5%		**Total topic**	**72%**	14%
Total topic	**200%**	40%			
			Reducing real estate related costs		
Reducing real estate related costs			Costs	55%	
Costs	85%		Installations	10%	
Construction costs	20%		Utility sources	9%	
Furniture costs	20%		Security concerns	7%	
Security costs	20%		Moving costs	5%	
Service costs	20%		Ownership status/reputation	6%	
Contingency costs	20%		Sr. Executive sponsorship	9%	
Moving costs	2%		**Total topic**	**101%**	20%
Installation and construction	1%				
Total topic	**188%**	38%	**Increasing employee/organisation's efficiency and productivity**		
			Distance business partners	40%	
Enabling flexibility			Accessibility public transport	70%	
Possibility to expand	20%		Parking spaces	24%	
Flexibility in space	10%		Distance personel	20%	
Total topic	**30%**	6%	Accessibility car	12%	
			Discrete location	2%	
Increasing value of			Centralization	2%	

organisation's real estate assets					
Price/quality ratio	25%		Distance to national airport	10%	
Total topic	**25%**	5%	Distance tenants	5%	
			Total topic	**185%**	36%
Enhancing employee wellbeing and satisfaction	0%	0%			
Supporting environmental sustainability	0%	0%	**Enhancing employee wellbeing and satisfaction**		
Encouraging and support employee innovation and creativity	0%	0%	Internal experience (for employees)	35%	
			Location (human factors)	12%	
			Location (amenities)	10%	
			Open feel internal	10%	
			User input	9%	
			Fitness	6%	
			Shared amenities	5%	
			Accessibility/disability compliance	4%	
			FH&S concerns	3%	
			Total topic	**94%**	18%
			Increasing value of organisation's real estate assets		
			Price/quality ratio	20%	
			Total topic	**20%**	4%
			Supporting environmental sustainability		
			Energy label (B+)	10%	
			Sustainability	4%	
			Representation (incl. Sustainability)	10%	
			Total topic	**24%**	5%
			Encouraging and support employee innovation and creativity	0%	0%

Table 31: Weighing per topic with individual criteria

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