**Master Thesis**

# Appraising non-market assets in the care

*Estimating the market value of intramural, real estate assets in the care industry, within a standardised valuation framework*

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Utrecht 2014

UNIVERSITY OF TWENTE.

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# Colophon

**Document properties**

| | |
|---|---|
| *Author* | *L.J.W. Willems* |
| *Document type* | *Master thesis* |
| *Institution* | *University of Twente* |
| *Faculty* | *School of Management and Governance* |
| *Program* | *Business Administration* |
| *Specialization* | *Financial Management* |
| *Company* | *Finance Ideas B.V.*<br>*Financial constant on social investment decisions* |

**Graduation Committee**

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*"The things which have the greatest value in use have frequently little or no value in exchange; on the contrary, those which have the greatest value in exchange have frequently little or no value in use"*

Adam Smith 1776, *The diamond and water paradox*

# Management summary

This research focuses on estimating the market value of non-market assets in the healthcare sector. In particular the real estate assets used to deliver intramural care in the subsector nursing and care (VVT). The healthcare sector in the Netherlands is currently going through some major reforms as the costs of healthcare have increased rapidly over the years and are predicted to rise even further and at a faster pace. There are two components of this reform which are particular important for this research; the separation of the living and care component of the lighter forms of care, and the change in compensation structure. The compensation structure changed from full and ex post to production-based and negotiable. The result of these changes is that risk is now introduced into a previously riskless investment in healthcare property, as the government would pay the costs related to the property entirely.

Up until the implemented reforms, there has been no incentive to find the market value of such properties, as they were hardly ever sold and there was no risk in financing them. Care institutions now have to bear the (financial) consequence over their decisions. Likewise, investors will have an incentive to find the market value of the assets they invested in, in case of a default.

Due to the novelty of this information many aspects about care properties are not known; therefore, the valuation has to be build from the ground up. This research therefore starts with identifying the different valuation approaches and techniques. First we analysed the various strengths of the three possible valuation approaches, the income-, comparison- and the cost approach, and their applications. Second we analysed the care assets and their characteristics. We found that healthcare properties used for intramural care deviate too much from regular apartments to find alternative uses. This is mainly caused by small rooms, often without kitchen and bathroom, a different gross/net ratio between total space and lettable space, and installations inside and intertwined with the property. Additionally, the utility function of these properties decreased rapidly. Consequently the life cycle is relatively short compared to other properties.

Many authors came up with different value drivers of real-estate property, although there is no uniform method or consensus on the impact of each of these value drivers. There is, however, little known about the value drivers of care properties. Via a survey among care professionals we found many variables which were deemed important to realize a high occupancy rate. We argue that being able to realize a high occupancy rate is an important determinant of the real estate. By combining the characteristics of care property with the strengths and weaknesses of the various valuation approaches and techniques, we found that the income approach, has the best fit, in particular the discounted cash flow method.

There are different income streams in the care, these are compensations for either care related activities or lodging expenses, of which appraisers use the latter as a fictive rent component and use this to determine the value of care property. Due to the specificity of the property we argue that these care activities can only be performed in specific properties, and thus part of the care contribution should be allocated to the property. This school of thought comes from the hotel and lodging industry. In this method the Free Cash Flow can be divided in three different parts, the company value, the value of personal property and the value of the real estate.

By subtracting the value of personal property in the form of return of and on inventory and the value of the company in the form of a management fee from the free cash flow, one is left with the cash flows generated by the real estate. Discounting this value will be an estimate of the value of the property. However, the discount rate currently used by appraisers is intransparent and many elements are entirely to the discretion of the appraiser.

To determine a discount rate, we used the weighted average cost of capital model. Finding the cost of debt was relatively straightforward, whereas estimating the cost of equity was much more challenging, as there is hardly any information available regarding this subject for the healthcare industry. By quantifying the various value drivers of property, scoring them relatively via interviews, and using the market risk premium of equity from a more liquid and transparent market, we could determine the return on equity. Although using the MRP from another more liquid market is not free of consequences, it also provides benefits. Since it is from a more transparent and efficient market, it is easier to observe the cost of equity, and represents only the systematic risk associated with equity, as it is from a market portfolio, in which all the unsystematic risk has been diversified.

Determining the most appropriate model and its elements is the first objective of this research, the second objective is to standardise the framework, in which the model is used. This will provide an easier and more accurate way to perform valuations, as individual effects of companies are left out of the valuation. Above or below average performance would be excluded from the cash flows used, in terms of occupation rate and purchase-discount. A standardised model to determine the costs has also been developed, in which the only variation comes from the size of the property and the construction year. Additionally, the earning potential is determined based on the need for certain care in the direct environment rather than the current offer.



By creating a model which could break down information into postal code areas, we were able to construct dynamic geographical areas around each property which are used to estimate the demand for care and most of the value drivers and variables for the WACC. This simplifies the use of the model, as with little input it is able to make a value estimate. The value estimate of the model represents the market value of the property when in use.

To test the model on its validity and accuracy, we compared the models estimates with other value estimates and asked experts on validation and the care industry to comment on the model, its value estimate, and the assumptions made and limitations during an interview. Since there are no transaction prices available, we were not able to test the validity via more commonly used statistical methods. Therefore, we cannot indicate any validity or accuracy of the model with any certainty, and leave the validation process for future research. The academic relevance of this research can be found in an initial design of a valuation model, within a standardised framework, for care property. The model uses various market parameters to produce the value estimate, which are unambiguously and transparent. This research is an attempt to structure the valuation process from a scientific perspective and introducing more transparency in this process.

# Preface

After finishing my bachelors degree at the University of Applied Sciences, I decided that I wanted to do a financial master. During the master, subjects related to corporate finance were among my most favourite, valuations in particular. It was at that point that I realized the graduation assignment would have to deal with valuations, this much I knew for certain.

After searching for a while for a graduation assignment my path crossed with Finance Ideas and this graduation assignment. The real estate sector as well as the healthcare sector were completely new to me, and offered plenty of challenges during this research. Many of the insights created during this research, have been the result of direct or indirect involvement of some people. Therefore, I will use this opportunity to thank them for whatever form of support they offered.

First of all I would like to thank all my colleagues at Finance Ideas for the support they offered. Especially, Pim Diepstraten, who is also a supervisor of this research, for the support and the occasional push in the right direction. Additionally, I would like to thank Daan van Everdingen for the support and the sincere interest in my thesis. It has been a real pleasure doing this research at Finance Ideas, and I am looking forward to start there as a Junior Consultant on the 1st of November.

I would also like to thank Ir. H. Kroon, my first supervisor from the University of Twente, for all the support, advice and most of all the reassurance and motivation to keep doing what I was doing. I also would like to thank Dr. B. Roorda, for being the second reader of this thesis. I always received positive and helpful feedback during the meetings which really helped me in the process of writing this thesis.



Furthermore, would I like to thank everybody else who contributed to this research, for their time, valuable insights and information.

Lastly, I would like to thank my parents who have always supported me during the studies, thank you for the never ending support!

Luuk Willems
Rotterdam 29th October 2014

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# 1. Introduction

The healthcare industry in the Netherlands is currently going through some major reforms. Where the market used to be completely supply oriented and regulated, it now finds itself in a transitional phase towards a more open and competitive market. The motivation behind this reform is to slow down rapid growth in healthcare costs. Over the past sixty years (in the Netherlands) the health care expenditure has grown rapidly compared to the growth in GDP (Horst van der, Erp van, & Jong de, 2011; VWS, 2012). This trend is also observed in other developed countries. It is expected that these costs will continue to increase for the years to come. Currently in the Netherlands, we spend roughly 13 per cent of the GDP on health care, where it used to be 8 per cent in 1972. It is expected that the average expenditure on health care in 2040 will consume as much as 25 percent or more of the GDP (Horst van der et al., 2011). This rapid inflating of the costs of healthcare find their roots in various factors, such as aging population, higher prosperity, new and more expensive technology, Baumol[1] effect and various other reasons (VWS, 2012).

## 1.1. The healthcare industry in the Netherlands

The healthcare industry can be divided in three categories in its basis, these are:

- Preventive care (Primary-, secondary-, and tertiary prevention)
- Cure (Hospitals, general practitioner, etc.)
- Care (Nurseries, etc.)

The preventive care is concerned with preventing illness or derogation of health on a population or area-wide level (Meijer & Hamberg-van Reenen, 2011). Curative care is concerned with curing illness, and for the majority, is relatively short term. Care is mostly concerned with the long term nursing, such as elderly homes, facilities for disabled people, and palliative care. In contrast with the curative sector, the care sector is concerned with keeping quality of life on a level that is acceptable to the patient accounting for their abilities and disabilities, rather than curing an "illness" (Westert et al., 2010). The preventive care will be left out of the discussion as the costs for preventive care are for a large part sent outside the healthcare sector (Meijer & Hamberg-van Reenen, 2011).



### 1.1.1. Financing of healthcare

The total amount of costs in the healthcare industry in the Netherlands was 92,7 billion Euro in 2012, which was 15,4% of the GDP that year (Voorrips, Hilten van, Bruggink, Aaldijk, & Zonneveld, 2013). These costs are financed through the following financing sources shown in Table 1. As can be seen, the government, ZVW and AWBZ are the biggest contributors in covering the costs for healthcare (cure and care). The ZVW is the Health Insurance Act (Zorgverzekeringswet in Dutch), and consists of the mandatory payments made to the health insurance act and the mandatory contributions of every inhabitant of the Netherlands.

[1] The Baumol effect, or the Baumol's cost disease, is the phenomena of rising salaries in a sector which has not experienced an increase in labour productivity, as a response to rising salaries in sectors which did experience a rise in labour productivity.

| Year | 2009 | | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|---|---|
| ***In Million €*** | € | % | € | % | € | % | € | % |
| **Government** | 12.390 | 15% | 12.712 | 15% | 12.907 | 14% | 12.811 | 14% |
| **ZVW** | 34.143 | 41% | 35.553 | 41% | 35.870 | 40% | 36.194 | 39% |
| **AWBZ** | 23.201 | 28% | 24.469 | 28% | 25.366 | 28% | 27.963 | 30% |
| **Personal Healthcare insurance** | 3.384 | 4% | 3.407 | 4% | 3.736 | 4% | 3.854 | 4% |
| **Personal Contribution** | 7.870 | 9% | 8.191 | 9% | 8.561 | 10% | 8.626 | 9% |
| **Other financing sources** | 2.896 | 3% | 3.010 | 3% | 2.902 | 3% | 2.874 | 3% |
| **Total Cost** | 83.884 | 100% | 87.342 | 100% | 89.342 | 100 | 92.322 | 100 |

***Table 1, Costs of healthcare per financing source. Source (CBS, 2014), edited by author***

The ZVW covers the bills for general practitioners, hospitals etc.; in general these costs are associated with curing and are relatively short term (less than three months in general). The AWBZ is the Exceptional Medical Expenses Act (Algemene Wet Bijzondere Ziektekosten in Dutch). The AWBZ is a statutory social insurance that has the purpose of ensuring every inhabitant against the costs of exceptional medical expenses that are not, and cannot, be included in the ZVW. The bills that the AWBZ covers are from having received care in nursery homes, rehabilitation, etc.; in general care which is long term (longer than three months).

### 1.1.2. Structure and control in the healthcare sector

Until 2008, healthcare institutions had to receive formal approval from the building regime[2] for building plans in order to receive compensation for all the costs of property. These capital compensations were tailored to the individual requests and situation. Since 2009 the building regime has no formal activities anymore and therefore no longer exists. With the denouncing of the building regime, also the official requirement of approval for building a healthcare institution expired (CIBG, 2008). Compensations are no longer tailored to an individual request but are standardised and uniform in the form of NHC's (Normative Housing Component). Healthcare institutions still require approval from the WTZi in order to receive the NHC. Next to the transition to uniform compensations, there is also a separation of care and residency in the AWBZ. This is the result of a political discussion that started in 1994. Arguments that supported this idea come from the discussion that this would make it cheaper for insurers of healthcare, as this would relieve risk of the high fixed cost of capital. Another argument in favour of this change is that it would lead to more freedom of choice as well as a differentiation in the offer of healthcare providers. The healthcare institutions can now offer their services intramural as well as extramural (van der Schaar, 2002), which is with residency or without respectively. This separation of the residency from the care does not apply for the entire AWBZ, only for the lighter care requirements, which are ZZP 1 up and until ZZP 3 (NZa, 2012). A ZZP is an indication of the intensity of the care required, where ZZP 1 indicates lightest care and so forth. This leads to the AWBZ being only for those persons for whom it is impossible to live at home. The persons who currently rely on light care (ZZP 1 – ZZP 3), are still able to reside in an institution if they choose so, however, they will pay rent for residing there (Rijksoverheid, 2012). The light care is extramuralized, and therefore no longer part of the AWBZ but will be delivered by the municipalities via the for example the Social support Act, WMO (Wet Maatschappelijke Ondersteuning in Dutch). Only the higher ZZP's, ZZP 4 and above, will remain in the AWBZ.



[2] Bouw regime in Dutch, this is part of the care institutions act (Wet toelating Zorginstellingen in Dutch)

### 1.1.3. Intra- and extramural healthcare

A distinction between healthcare services can be made based on the place that the service or treatment is offered. There are two treatment places that can be distinguished from one another, intramural and extramural healthcare. With intramural healthcare, people are treated within an institution in which they remain at least 24 hours without interruption (Gijsen, Post, & Verheij, 2013). When translated to the letter intramural means “in-between walls”. Extramural healthcare thus refers to healthcare without a residency component in the compensation. Extramural care is usually offered within the direct environment of the person, the general practitioner is an example off extramural healthcare that is offered (usually) in the vicinity of where one lives. There is also a combination of the two, where the healthcare provided proceeds extramural care, however does not have a residency component, this is called “semi mural” healthcare. There are no clear boundaries on where extramural healthcare stops and intramural healthcare starts (Gijsen et al., 2013). This research will only be concerned with intramural healthcare, as the objective is to estimate the market value of properties where intramural care is offered.

### 1.1.4. Full capital compensations

As briefly mentioned the government contributes in the payment of the capital costs associated with the investments in healthcare property. These total capital costs consist of interest, depreciation and maintenance costs. These costs used to be paid to the institution based on a full costing system. It can be compared with a declaration, as it is cost effective and ex post (van der Schaar, 2002). This system has been implemented so that these capital costs would not be included in the price of the healthcare services, and as a result would be more affordable and higher quality healthcare services. With the government guarantee for the capital costs (interest, depreciation and maintenance) and a highly regulated system by the Dutch Healthcare Authority (Nederlandse Zorg Autoriteit, in Dutch) which dictated the height and length of the depreciation (straight line over 50 years) there was hardly any risk involved in the financing and use of healthcare property (NZa, 2009b). The long depreciation period of 50 years was not at all realistic, and often healthcare properties were demolished long before that period, as the economic life had expired (NBA, 2011). However, this “full costing” system was designed in such a way that even after the property had been taken down, healthcare providers would receive the compensation. For the full costing system the interest and depreciation compensation would be determined at the beginning of the life cycle for the full 50 years. So whenever a building was demolished or (partially) rebuild, they would still receive the capital compensation over the full 50 years (NZa, 2009a). This depreciation period has therefore been reduced in most instances to 30 years or less. Traditionally, banks have been the largest credit providers for healthcare property, and for a good reason, as there was hardly any risk involved in financing this property. Due to the perceived absence of risk, the valuation of the healthcare property never received high priority in finding the market value. Banks did not have credit risk on the capital payments received from the healthcare institution, as these payments were made by the government. This did not create any incentive to find the market value, i.e. the value that they would receive for the property in case the institution would default on their payments.



### 1.1.5. Integral and uniform compensation

Inter alia with the advice of the commission "Etty" in 2000 and a letter of the ministry of public health, wealth fare and sport (VWS) to the lower house of Parliament in 2007, stating that the demand for care from the public should be a directive in the investment decision of healthcare institutions, did the authorities initiate the first steps towards an integral and uniform costing system

of the healthcare sector (van der Schaar, 2002). The "old" system did not stimulate healthcare institutions to anticipate to the needs of the market, they rather would optimize the investments to maximize the capital compensation they would receive (NZa, 2009a). In order to give an intrinsic, economic stimulus, to these institutions to better meet the demand for healthcare they would have to be (financially) responsible for their investment choices. By allowing more freedom to institutions with respect to their investment choices to meet demand, and more responsibility with respect to the obligations that are inherent to these investments decisions, the goal is to increase the quality of healthcare with lower costs.
This new system would lead to three major changes (NZa, 2009a):

- The integral compensations are uniform on a national level
- The integral compensations are based on production and output, no longer on capacity
- The integral compensation will be based on the running current average of the interest rate over a longer period, no longer on the spot rate

This shift from capacity based towards production based compensation, introduced risk for the financers, investors and the institutions themselves. The NHC is calculated so that with an occupancy rate of 97 per cent, it should be enough to cover the capital costs (NZa, 2011). When an institution has a lower occupancy rate, they could default on their payments. As banks are mandatory under Basel III to make risk assessments and maintain a capital ratio to cover credit risk and asset depreciation they now have an incentive to know the market value of health care property. Similarly, institutions have an incentive to find the market value as it is likely that, institutions with low occupancy rates, will engage more actively in their asset management. Additional stakeholders are insurers, municipalities, financers and supervisory authorities, who all could benefit from more comprehensive information and valuation data, which give better insight in the market value, and potentially make the market more transparent.



## 1.2. Problem definition

Being able to estimate the market value is, as indicated in previous sections, important for various stakeholders. With all the upcoming changes, there will be a shift from a largely supply oriented market to a more demand oriented market. A purely demand oriented market would be a free market if the supply and the prices would be solely based on the preferences and demand of the customers. However, since these changes concern the healthcare sector, free market elements will be used to improve the current supply oriented market into a regulated “free” market, or mixed economy. Within this market, some elements are still controlled and regulated in order guarantee certain quality and standards for the consumer. By partially “opening up” the market there is room for competition, which in turn can increase the quality of the services and increase the efficiency, but also put pressure on revenue streams of institutions. Also, as mentioned afore, there will be production based uniform compensations rather than the full costing system. These changes introduce risk into the equation. Cash flows are less predictable and the government no longer guarantees full compensation for the capital costs. Banks used to be the primary source for the funding of healthcare property, but nowadays they seem more reluctant to extend credit. Institutions are thus looking for other methods and ways to obtain their financing, that is, other investors and financers. These investors and financers, require knowledge on the market value if they are to make an investment. As mentioned afore, this is currently a struggle, as this need for information is novel in the healthcare sector and the current valuations and appraisals do not

(partially) account for market factors in their estimation. Thus in order to attract (new) investors, more research has to be undertaken on the market value of healthcare property. Being able to estimate the market value of healthcare property is important to attract investors, but also for the institutions themselves, monitoring institutions and authorities.

### 1.2.1. Research goal

The purpose of this research is twofold. The first objective is to find a method that can be used to estimate the market value of intramural care properties. The second objective of this research is to standardise the framework in which the valuation method can be used. If the framework is standardised it will become easier to estimate the market value and the value estimate will be more transparent. Answering these questions is relevant as currently in the Netherlands the healthcare market is subject to large changes, which could make current valuation techniques for healthcare capital to be inane and insufficient. This new request for information, the market value of non-market assets, is a result of the separation of living and care and the compensation on production rather than capacity. This has led to the following research question:

*How can the market value of non-market assets, in particular healthcare property in the care, be estimated, within a standardised and uniform framework*?

In order to answer the main research question the following sub-questions have to be answered:

1. What are the differences between market asset valuation and non-market asset valuation in the property market, with respect to estimating the market value?
2. What are the value drivers of a non-market asset with respect to the market value?
3. On what level should the valuation take place?
4. What is the most applicable valuation method for estimating the market value of non-market assets in the care?
5. How can the framework, in which the valuation method for non-market assets in the care is used, be standardised and made uniform?
6. How does the valuation technique within a standardised framework compare against the values that result from current appraisals and transactions of non-market assets in the care?



### 1.2.2. Research strategy

In order to answer the main research question, first the sub-questions will have to be answered in the same chronological order as depicted above. Sub-question 1 up and until 3 will be answered via literature research. By researching the various valuation methods that currently exist and the pros and cons of them, the factors that influence the value of non-market assets, and the level on which the valuation should take place, a clear image of the valuation methods will be given.

Sub-question 4, will portrait the most applicable valuation method for estimating the market value of non-market assets in the care. This will be done by analyzing the findings from the first three chapters. The first step in this process is to derive a list with important criteria that the valuation methods have to fulfil, with respect to estimating market value and valuing non-market assets. These factors will be derived from the literature used to answer the first three sub-questions. The second step will be to compare the valuation methods based on the criteria and select the one that satisfies the most criteria or the combination of methods that satisfies the most criteria.

Sub-question 5 will be answered by using academic literature and interviews. After choosing the valuation method(s) in the previous sub-question, the first step will be to determine the factors that make up the framework of the valuation method; this will be done by searching the literature. After these factors, which make up the framework have been identified, they will have to be standardised and unified for non-market assets in the care. This second step will be initiated by conducting interviews.

These interviews will be conducted with current and potentially new financers of healthcare property, healthcare institutions themselves, appraisers of healthcare property and other experts on valuations. The aim of these interviews is to use the insight of the interviewees to make substantiated assumptions that help standardizing the framework in which the valuation takes place.
After the valuation method has been chosen and the corresponding framework is standardised and unified the method can be tested on a business case. This business case will allow for the method to be used and compared against the appraised values of the non-market assets in the case and if available a transaction price. Based on the comparison of these values, and the available data, comments will be made on the functionality of the model and the accuracy of the prediction. After the model has been tested on the business case of Finance Ideas, a validation step will be undertaken. To validate the model we have discussed it with experts. The last part of this research will consist of conclusions, recommendations and limitations with respect to the valuation model and its outcomes.

### 1.2.3. Demarcation



In the healthcare sector a distinction is made between care and cure. They have different functions as well as different financing structures. There is large heterogeneity between the various buildings in the care and cure sector, and this is an important factor for the demarcation choices. The care sector is subject to some changes that have already been introduced in the cure sector (the integral compensation) and some changes that are novel such as the extramuralisation. Due to these differences between the cure and the care, and the fact that the care is at the brink of some major changes, this research will focus on the care sector only. There are three categories of care, Nursing and Caring (VVT), disabled care (GHZ) and mental health care (GGZ). This research will focus the VVT and exempts the properties that offer care which is bound to be extramuralized, or already being delivered outside the institutional walls. The majority of the care falls under the AWBZ, however there are some elements such as somatic rehabilitation (SRZ), which are transferred to the ZVW and thus have a diagnosis treatment combination (Diagnose Behandel Combinatie in Dutch) as their integral and normative compensation (NZa, 2010b). These are the integral compensations from the cure sector. For this reason the demarcation will be on properties, which are used to deliver intramural care, which thus can lay claim to the integral compensations.

## 1.3. Methodology

The objective of this study is to design, and apply a uniform and standardised framework, in which the most probable valuation method to determine the market value of care properties, can be used.

To answer the main research question, the research can be divided in three steps:

1. Find the most applicable valuation method for estimating the market value of non-market assets in the care
2. Standardise and unify the framework in which the valuation method is used, which is the input variables, and value drivers to the method
3. Apply the model to a case and compare the results with current appraisal values.

This approach is a combination between a design study and a case study. A case study focuses attention on a single instance or some social phenomena, such as a village, a family, or a juvenile gang (Babbie, 2010), or a country, company or other form of organization (Ryan, Scapens, & Theobald, 2002). There is little consensus on what can be a "case", and the term is used quite broadly. The case that is being studied might be a period of time rather than a, for example, group of people. The limitation of attention to a particular instance of something is the essential characteristic of a case study (Babbie, 2010). In this research, the attention will be on the valuation techniques for estimating the market value of care properties. Next to this, there will be design elements in this study. We start by dissecting the various valuation techniques available and the characteristics of the care properties, and from there construct a valuation method. This process is iterative and reciprocal of nature. In order to design the model for estimating the market value, the model will have to be designed, tested, validated and redesigned if necessary. This process can be classified as a design focused business problem solving model (BPS). BPS models deal with improvement problems, not with pure knowledge problems (Aken van, Berends, & Bij van der, 2010).

## 1.4. Structure of the thesis



This thesis consists of 8 chapters, a bibliography and appendices. In order to give insight in the sector and the problem, this thesis starts with an introduction to the problem and why this knowledge is relevant, chapter 1.

Chapter 2 and 3 will be concerned with providing insight in the various valuation techniques available and the characteristics of care property. The valuation methods will be dissected and the relative strengths and weaknesses will be covered.

Chapter 4 is concerned with matching the strengths of the various techniques available with the characteristics of care property to determine the most applicable valuation approach. With the most applicable technique the valuation model is designed and the relevant input criteria are added to the model.

Chapter 5 is concerned with standardizing the input of the model. The property value should not be influenced by effects of the current user. Income and costs are therefore standardised, and effects of management are removed from the valuation input.

Chapter 6 is concerned with the valuation framework. The variables and value drivers are quantified and matched with the impact on the value. From this the WACC, which is used as a discount rate, is constructed. Additionally we do attempt to standardise all these input variables.

Chapter 7 is concerned with testing the model on a business case and validating the model. By testing the model on a business case an attempt is made to compare the results to other value estimates. And based on this comparison, and additional interviews with experts, the validity of the model is discussed.

Chapter 8 covers the conclusion, recommendations, limitations, future research and a short reflection upon the research.

# 2. Valuation approaches, techniques and definitions

The afore mentioned changes in the healthcare sector are leading to a significant book value problem for healthcare institutions (van der Schaar, 2002). The book value problem of healthcare property entails that the value of the property, as is used in their balance sheets, does not represent the market value, or fair value. This problem is caused, inter alia by the long[3] depreciation period used under the full costing system, and the absence of market factors used in the valuation (NZa, 2010a). Properties which needs to be renovated or replaced as their economic life and/or technical life has expired, are not fully depreciated yet, thus institutions will have to make new capital investments while the old ones are not fully capitalized. Care institutions are subject to the directives of the WTZi which fall under the influence of the ministry of public health, wealth fare and sport (Jaarverslaggeving), 2012). According to these directives, fixed assets (property) cannot be carried at the balance sheet for more than their recoverable amount. This entails that a carrying value has to be used which can be earned back, by definition, the market value is a recoverable amount, as it is the price that one can receive in the market. This is very similar to the definition of IFRS 36, impairment of assets (Deloitte, 2013). Under the full costing system, there was no book value problem, as the book value problem usually does not, or hardly, occur with valuation techniques which do not have to estimate or correct for market parameters and influences (Uittenbogaard et al., 1996). However, now the reimbursement of the capital costs is linked to the production, it will cause problems for buildings, which can no longer be productive or are less productive than anticipated. The current book value will have to be impaired when there are signs that the book value does not represent the value of going concern, which is the value under current exploitation.



Property markets are inefficient, which makes it difficult to determine whether the observed price is a reflection of all the information needed to determine that price. Part of this inefficiency is caused due to the fact that there are relatively few transactions, property is not a homogeneous product, transactions are costly, immobility of the property, slow reaction of supply and there is no single (or few) market(s) where transactions are conducted (Lusht, 2001). This inefficiency can cause for large differences in transaction price and the market value. The efficient market hypothesis states that the security prices reflect all available information and prices adjust immediately and to the full extent to new information (Fama & Malkiel, 1970). The weakest form of efficiency according to this theory is the weak form of efficiency, where the securities perform a "random walk", and thus predictions are not probable. The second form, a semi-strong form of the market reflects all the publicly available information (Fama & Malkiel, 1970; Hillier, Westerfield, Jaffe, & Jordan, 2013). In property markets there is usually a difference between the time of appraisal and the transaction. This means that the property market, according to Fama's theory cannot even be semi-efficient. The time difference between appraisal and transaction only re-enforces the inefficiency of the market. As during this period there is usually more and newer information available, which is not incorporated in the appraisal but should be in the transaction price, as this information can have its effects on the transaction price.

[3] 50 years, straight line, with zero residual value. Whist a more market conform period would be 30 years, and henceforth a depreciation period longer than 30 has to be explained to the NZa.

There are however transactions in the property market and thus a transaction price. There are many different techniques which can be used to estimate the market value of property. Some of these techniques are internally done and are usually referred to as "valuations", where others are referred to as "appraisal" and are usually done by a third, independent fraction (Gool van, Brounen, Jager, & Weisz, 2007). Both valuations as well as appraisals can be legitimate estimators of market value of property, that is, the techniques do not necessarily differ from one another, just the fraction that performs the valuation. In general, internally performed valuations are perceived less reliable than valuations performed by independent appraisers (Cotter & Richardson, 2002). For the readability of this report these terms will be used interchangeably and refer to the technique which is used rather that the fraction that performs the technique. Market value can be a broad and nonspecific term, therefore in this research we will use the definition as defined by International Valuation Standards Committee (IVSC):

"*Market value is the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller at an arm's-length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently, and without compulsion*" (Berkhout & Hordijk, 2008).

One critical note to the definition of value is that the term value itself is objective, and depends for a large part on preferences and expectations, therefore the value will remain subjective until the transaction has taken place and the value becomes observable in the form of the transaction price, and therefore objective (Uittenbogaard et al., 1996). For real estate the current users and leasehold can influence the market value a great deal. The techniques, which are used to value property, can be divided into multiple categories, based on their value drivers. Different authors have developed different categories and different divisions of these categories, and some valuation techniques can fit multiple categories. For this research, we will use the appraisal categories as mentioned by Lusht (2001). These categories are based on their value drivers can be divided into three approaches: (ten Have, 2007a; Lusht, 2001; Uittenbogaard et al., 1996):



- Sales Comparison
- Cost
- Income

Under these three categories all, or at least the most general practices of valuation, can be classified. The most general techniques used for estimating the market value of property are listed below (ten Have, 2007a; Lusht, 2001):

- Sales Comparison
    - Transaction price comparison
    - Rental value method
    - Capitalisation method
    - Multi regression analysis

- Cost
    - Cube method[4]
    - Building component costs[4]
    - Retro perspective method[4]
    - Replacement method
- Income approach
    - Gross Initial Yield method (BAR)
    - Net Initial Yield method (NAR)
    - Discounted Cash Flow method (DCF)
    - Capacity rent method

The value estimate produced by the sales comparison, cost and income approaches, do not usually produce the same value estimate. This is caused by three factors (Lusht, 2001):

- The economical “one-price-rule”, assumed in the sales comparison approach, does not work very well in imperfect or less efficient markets. And as mentioned afore, the property market is not usually classified as efficient.
- The cost of an object is often difficult to relate to the market value of the object. The relation between the techniques under the cost approach, in general, have a weaker relation with the market value than do the other two approaches.
- The income approach uses estimates and forecasts, which are imperfect and imprecise by definition.



In many property markets, there is a separation of ownership and use, however the transaction price remains the same, whether the purchaser has investment or occupation in mind (Pagourtzi, Assimakopoulos, Hatzichristos, & French, 2003), but the view of the two groups is different. The following chapters will discuss each of the afore mentioned approaches which are used to estimate the market value of property, as for any valuation to have validity it must produce an accurate estimate of the market value (Pagourtzi et al., 2003). That is, the value estimate that the model produces must reflect the market culture and conditions at the time of the valuation. Therefore, some of the 'cost-approach'-techniques, will be omitted. They produce a value which hardly relates to the market value of an object. We will however describe them briefly.

Properties are mostly very homogeneous products and therefore there are no standard techniques for calculating its value. The appropriate technique has to be determined for each class or case separately. This results in a lack of literature with respect to standard approaches, and therefore the next sections will discuss the possible approaches and later match this to the characteristics of care properties. This thesis contributes to existing academic literature by providing a standardised and transparent method to estimate the market value of non-market assets in the healthcare industry.

[4] This method does not give insight in market value and therefore only mentioned as a valuation method but largely omitted otherwise.

## 2.1. Sales comparison approach

There are different sales comparison techniques, however, in their basis they all use comparable properties which had recent transactions, and use, for example, the transaction price or rent charges as a base for the valuation. This approach rests on two fundamental assumptions: 1, the selling prices are a reliable indicator of market prices and 2, equal properties should sell for equal prices (Lusht, 2001). These transaction prices are adjusted for various factors (value drivers) which are different from the recent reference sale(s) (ten Have, 2007a; Lusht, 2001; Uittenbogaard et al., 1996). The two steps which have to be taken are; 1, finding transactions which involve comparable properties, including the matching of their highest and best use. In the second place, the transaction price needs to be adjusted for the differences between the two objects (Lusht, 2001). Although these two steps sound straightforward there are various factors which complicate this sales comparison approach. Factors such as heterogeneous products, few comparable transactions, and if there are comparable transactions, which one is "the best" for comparison, and what is the proper adjustment for the market value, complicate this seemingly simple valuation technique (Lusht, 2001).

Even though this approach is not as straight forward as one might think, it is one of the most commonly used approaches on all the financial markets, not just the property market (ten Have, 2007a; Uittenbogaard et al., 1996). As this method uses sales prices of recent and comparable transactions, the market has to be reasonably efficient. If the market were not efficient, this information would be more difficult to obtain, and be more likely to deviate from the actual value. What classifies as a comparable transaction is mostly to the discretion of the appraiser. There are very little standards on what counts as a comparable transaction and what is recent. The appraiser estimates the value based on, by his judgement, the relevant differences between the objects which are compared, which raises the question “how much subjectivity is in these appraisals?” (Uittenbogaard et al., 1996). In practice, all the appraisals done, with the exception of non-market assets (unique or highly specialized assets), use references to determine the relation between the transaction price and the value drivers (ten Have, 2007b).



### 2.1.1. Transaction price comparison

Recent transaction prices of comparable objects are used in this method to determine the value. Based on different units, such as $m^2$ or $m^3$, the differences and similarities between the objects are analysed and valued. Since this method depends on comparable objects and “recent” transaction prices, it requires a reasonably efficient market (Uittenbogaard et al., 1996). As mentioned afore, there are no strict guidelines that determine what can be classified as a comparable object or recent transaction, therefore much is left to de discretion of the appraiser (ten Have, 2007a; Lusht, 2001). There little known on how many comparable objects are needed for the valuation. It seems straightforward that when objects are less comparable more references are needed to make an “accurate” prediction, however there is little research done on the subject of the optimal number of references under different valuation conditions (Uittenbogaard et al., 1996). Some research has shown that when more references are added the prediction becomes more accurate, however the decline in the standard error was at a lesser rate than the number of references added. Appraisers can derive the reference objects for this valuation from various sources such as own records, databases or cadastre[5] (ten Have, 2007a). Each source has its own strengths and weaknesses. When

[5] These are common sources of references in the Netherlands

focussing on own records the information can lose its connection with the market, cadastre information is approximately three months behind on the market data. The NVM database is updated on a daily basis, and gives plenty of recent data, which can be used as references, and has no apparent cons.

When the property is less marketable, it will become harder to find references for this object, and information from, for example, a wider area will be used as a reference, a different valuation method will be used, or a combination thereof (ten Have, 2007a). Regardless of the marketability of the property, the appraiser will estimate the value under alternative use. When this value is higher than the value of continued use, this will represent the market value (ten Have, 2007a). The alternative use of property will be discussed under chapter 3 in greater detail. The transaction price comparison method best applications are reasonably well marketable properties, and in particular residential properties (ten Have, 2007a). When used for income properties, the appraiser is faced with more heterogeneous properties, compared to residential properties, and income properties are less frequently sold (Lusht, 2001). To offset for this, references from a wider area are often used, and ratios will be used in the comparison such as BAR and NAR. This relatively simple method has to be applied with scrutiny and prudently as it makes predictions based on factual data from the past, one should bear this in mind while performing the valuation. For example, a reasonable assumption about previous transaction prices can be that properties which have been sold after a relative short time on the market might be underpriced, and the reverse can be argued as well (Lusht, 2001). Thus, one should be careful what references to use, even if the objects themselves might be comparable in other aspects.



### 2.1.2. Rental value method

With this method, a rental value is calculated via a similar procedure as the transaction price comparison. Where, under the transaction price comparison method, objects are considered as a single object and then compared, whit the rental value method objects are divided in smaller units, such as square meters (ten Have, 2007a). This method is predominately used for commercial property, such as retail and offices. It is also relatively easy to apply and allows for size, location and build quality of the building to be well expressed in the value estimation. A large part of the Dutch commercial property market comprises of rental buildings, this results in few references in the owner-occupied commercial property market, and as a result this method is also used in the capitalisation, BAR and NAR method (ten Have, 2007a), which will be covered in the following chapters. Similar to the transaction price comparison, the value estimation is a result of objectifying subjective criteria. The square meter price of a property will be dependent on both quantitative as well as qualitative factors, which entails that the appraiser has to calculate the rentable area and qualify it. There are various methods, which can be used to calculate the rentable area, but each method might yield different square meter prices at a similar rent. Therefore, for valuation purposes the rentable area has to be calculated as defined by NEN[6] 2580 (ten Have, 2007a). To qualify the calculated square meters there are various methods and factors which are important to consider, such as the law of diminishing marginal utility[7] and the fact that some areas are worth more to a

[6] Dutch Normalisation and Standards Institute

[7] The value does not increase linear with the increase in square meters, when the room cannot be separated in smaller areas, as there is more demand in smaller rooms than there is for bigger rooms.

certain user than others (ten Have, 2007a). This method estimates the price of property free of use and rent and assumes that the property can be rented out on a relatively short term against the optimal rent.

### 2.1.3. Capitalisation method

This method builds on the rental value method, since the rent of a property gives insight in the application possibilities of the property, and the cash flows it could generate with that use. It is used to transform the value free of use and rent into a market value, by treating the rent as the basis for hypothetical cash flow and divide this with the appropriate yield percentage (ten Have, 2007a). The capitalisation method can only be applied when the property is free of tenants, as this condition is (probably) required to charge the optimal rent. When there are tenants in the property an income method is used.

#### 2.1.3.1 Yield percentage

The appropriate yield percentage depends on various factors and cannot be determined so easily. The calculation itself is not complicated, as it is the rent per year divided by one percent of the original investment. However, there are various elements, which have to be taken into account, such as; the investment costs will have to be raised with the costs of the transaction. The rental value (often) assumes only commercial and functional components of the building, where there can be additional components that create value. There are differences in the condition the property is in, and the costs, which have to be made to improve the condition, etc. The yield percentage assumes these factors equal and will have to be corrected for this (ten Have, 2007a).

### 2.1.4. Multi regression analysis



The multi regression analysis (MRA) may be a good analysis when there is a relatively large data set available. One of the advantages from a regression method, compared to the other sales comparison approaches, is that beside the value point estimate, it also gives a value range and the probability that the market value will exist in this range (Lusht, 2001). Two other strengths of a regression model are that it can be used to estimate the value of a large number of properties quickly and economically, and next to providing an estimate value it can be used to explain this value. Two major weaknesses of this approach are that it requires much more data than normal transaction price comparison and that it does not perform very well when properties are unique or unusual (Lusht, 2001). Within regression a known variable(s) is used to predict an unknown variable, that is, the independent variable(s) is used to predict the dependent variable (ten Have, 2007b).

## 2.2. Cost approach valuation

The cost approach has its foundation in the production costs, incremented with the value of the ground and corrected for the depreciation, or the costs of reproducing a similar property (ten Have, 2007a; Lusht, 2001). The relation this approach has with the market value, and its valuation methods, is weaker than with the sales comparison approach, as there is hardly any reaction of the demand and the supply based on the market (ten Have, 2007a; Uittenbogaard et al., 1996). There is an indirect relation over time when one assumes that the production cost have a market relation (If demand decreases and supply stays the same, the price will decrease).

The cost approach is the alternative when the comparison and income approach cannot be used, as there is always information about the costs. And similar to the comparison method, this method is

based on the principle that two similar properties have the same value (Lusht, 2001). In general, the objects that are appraised via the cost methods can be classified as special use property or non-market assets (ten Have, 2007a; Uittenbogaard et al., 1996). This is because there is no market information available and thus the only available information is the costs which were made. Even if there are transactions prices available, they are usually very few, and difficult if not impossible to compare. The definition of special use property according to the IVSC is:

"*Properties that are rarely if ever sold on the (open) market, except by way of a sale of the business or entity of which they are all part (called business in occupation), due to their uniqueness, arising from the specialized nature and design of the building, their configuration, size location or otherwise*" (Berkhout & Hordijk, 2008)

Another name for special use properties is a non-market asset, and for the readability of this report we will use these definitions interchangeably throughout the report. There are various appraisal techniques which can be classified under cost approach, they are however of limited use to estimate the market value. This method will give the market value when the market is in equilibrium, as only then will the costs equal the value (Lusht, 2001). The technique, which has the highest relation with the market value, within the cost approach, are the corrected replacement costs, and the replacement costs method. The limited capability of this technique for estimating market value depends on the interpretation of the technique, and the factors it depends on. Factors such as economical life (depreciation factor), changes in construction methods, obstruction in potential use of the property and high exploitation costs due to aging, all contribute in the limitation of this technique when estimating market value (Uittenbogaard et al., 1996). For example, inefficiently produced buildings would have a higher value than a similar building build more efficiently. It is real unfortunate that this technique is of limited value when estimating the market value, as usually the only (reliable) information available for non-market assets are the costs of building the asset.



The cost method can be used to value a structure as a whole or in individual components. When adjusting sales prices, it is the individual cost components of the structure that are important (Lusht, 2001). The problem, however, is that to produce each part of an improvement separately usually exceeds the cost to produce the component as part of the building in its entirety. There are some conceptual issues and mechanical limitations with the use of the cost approach for estimating the market value (Lusht, 2001). Some of these limitations are the estimation of depreciation, building and/or replacement costs. Estimating the loss of value from depreciation is one of the more difficult tasks in this method. What really is being measured with depreciation is the loss in value form a loss in utility (Lusht, 2001). Market perceptions of utility are subject to change over time, and also utility is an elusive concept, which tends to resist measurement. Therefore, age is usually taken as an indication of this loss in value; however, there is not necessarily a relationship between age and loss in utility, and even if there were it is not likely to be linear. Therefore, this approach works best for new properties, which are not yet subject to (much) depreciation. The cost approach often relies on either reproduction or replacement costs. There is a key conceptual difference between these two definitions. Reproduction costs are the estimated costs to construct, at current prices, at the date of the valuation, an exact duplicate of the building, while using the same building layout, the same materials, construction standards and so forth. The replacement costs are the estimated costs of reconstructing a building with the same utility. Newer building methods, materials and standards

etc., which are available in the present time can be used when they are cheaper than the old ones (Lusht, 2001). This is an important difference between these two definitions, which could have a large impact on the value estimate.

### 2.2.1. Cube method

The cube method is a cost approach valuation method, which is used to estimate the reconstruction costs of the tenancy. This method is most of the times based on cubic meters rather than squared meters; however, squared meters can also be used. This method uses various factors such as quality, type and volume of a property to estimate a price of the building. This method does not provide any insight in the market value of an object.

### 2.2.2. Building component cost

The building component cost method is often used as a component in other valuation methods. This method can be seen as a sophisticated budgeting technique. It estimates the value based on elements such as, materials used, hours, profit and risk (ten Have, 2007a).This method does not provide any insight in the market value of an object.

### 2.2.3. Retro perspective method

Retro perspective method is harking back to the original establishment costs. This historic cost is then converted to current prices via price index values of the Dutch national statistics office. This method cannot be used for buildings that are older than eight years, as it is assumed that the functional design of the building and the building methods have changed to such an extent, that it is no longer useful to use this method (ten Have, 2007a). This is also true for properties which have been subject to multiple enlargements or renovations. For the calculation, the value of the land has to be deducted first, as land has its own value course, and then an estimation has to be made about the costs which were included in the establishment costs, which is also converted via price indexes. This method does not provide any insight in the market value of an object.



### 2.2.4. Replacement value

This method should not be confused with the corrected replacement costs, which are calculated for the WOZ; these two techniques have many similarities but differ on some crucial elements. The value estimates of this method are usually used in annual reports, for determining the value of non-market assets and to double-check the value estimates of other valuation methods (ten Have, 2007a). This method estimates the costs to build a property on a piece of land with similar properties and a property that is similar in economical terms. It does not take the situation and the possibilities of the current user into consideration in terms of investment possibilities or alternative use of property. This method uses three major steps to estimate a value, estimate the replacement costs of the land, estimate the replacement costs of the building, and correct the value due to functional and technical obsoleteness. The land will be appraised based on the location, square meters and the urban planning. Technical and functional obsoleteness play no part in the valuation of the land value, the condition of the land does however. Aspects such as pollution will diminish the value of the land. The estimated replacement costs of the building are calculated via the building component cost method or the retrospective method. Finally, the appraiser has to incorporate the technical and functional obsoleteness in the value without referring to historic cost price and already incurred depreciation. There are numerous factors which account for obsoleteness, both from the building itself, such as damage or wear and tear, and external factors such as quality of the buildings in the direct environment or nuisance etc. (ten Have, 2007a). The replacement value is often used as an

alternative to the "market value" if the income method and the comparison method cannot be used due to lack of data (Andrew & Pitt, 2000). It does however present an estimation of the maximum value of the object, as it represents the costs of building a new, similar property.

## 2.3. Income approach valuation

The income approach uses the cash flows (or income sometimes) which can be generated with the property to estimate the value. The underlying assumption to this approach is that the value of an income producing property is a function of the flow of income, or cash flow, it is anticipated to produce (Lusht, 2001). There are various income methods, which can be used; we discuss the five most popular and frequently mentioned techniques in the consulted literature and books. The methods mentioned below have some very different input information and assumptions. Therefore and as mentioned afore, especially in this section, are valuation techniques, for whom it is also possible to classify them under another or different valuation approaches, depending on the author consults. However, the valuation methods themselves do not differ from one another, when described by different authors, therefore, some references have been made to material from authors who have classified the technique differently in their own work.

### 2.3.1. BAR

The Gross Initial Yield (BAR) method has many similarities with the capitalisation method. Where the capitalisation method estimates the market value free of rent and use, the BAR method gives the market value in rented condition (ten Have, 2007a). The BAR method can be expressed in multiple ways, in its simplest form; it divides the rental value by the yield and deducts the transaction costs to compute the market value. This method is shown to have some drawbacks, resulting from the fact that the "bandwidth" of some properties might be so wide that value estimates are too broad and gross (ten Have, 2007a). To correct for this the method was refined so that it would deal with the problems that caused this, such as the possibility to correct for the rental value. The new calculation would look like this:



$$Market\ value = \left(\frac{RA}{Y_{bar}} - PV_{RD}\right) - TT \qquad \textit{Equation (1),BAR}$$

Where

$$Y_{bar} = \frac{RA}{PP + PV_{RD} + TT} \qquad \textit{Equation (2), Yield bar}$$

Where

$$PV_{RD} = \sum_{t=1}^{n} \frac{RM - RA}{(1+r)^t} \qquad \textit{Equation (3), PV rent}$$

Legend:

| | |
|---|---|
| $RA$ | Rent Adjusted |
| $Y_{bar}$ | Yield rate |
| $PV_{RD}$ | Present value of the difference between the Rent adjusted and present market rent |
| $TT$ | Real estate transfer tax (Kosten Koper in Dutch) |
| $PP$ | Purchase price exclusive of $TT$ |
| $RM - RA$ | Net difference between the adjusted and present rent |
| $r$ | Discount rate |
| $n$ | Number of periods (years) |
| $t$ | 1.....$n$ |

The rationale behind this ratio is that each segment in the property market (residential, retail, office, etc.) has its own characteristic BAR bandwidth and relationships (Uittenbogaard et al., 1996). This characteristic makes this ratio a convenient measure for the estimation of the market value. The BAR method is simple to use and makes use of two observable prices in a reasonably efficient property market, the rent and the transaction price (Uittenbogaard et al., 1996). The rent which is used is not the actual rent, which is paid by the tenant, but the market rent, and is obtained by using references (ten Have, 2007a). This is also true for the yield, as one of the elements in the yield formula is the purchase price, it has to be from a reference object, as this is what one is trying to estimate. Since this method uses quite some references as well, some authors, therefore, classify it as a comparison approach. One of the major advantages of this technique is that, besides its ease of use, many professional real estate companies use this approach, and thus references are usually not that difficult to find. One of the disadvantages of the technique is that the references are based on a one year income, which has led to some criticism (Uittenbogaard et al., 1996).

### 2.3.2. NAR

The Nett Yield (NAR) method is in concept very similar to the BAR method, only does the NAR method correct the rent income with the exploitation costs, and capital adjustments. Rational for this method is the same as with the BAR method, there is a specific bandwidth for each property and therefore, the NAR can be used to compare and estimate value. The NAR method also estimates the market value in rented condition, and thus the value estimate should be similar to the value estimate of the BAR method. Although it might seem that the NAR method is more accurate than the BAR method, due to the refinement of the input, this is not necessarily the case. Exploitation costs and capital adjustments are not usually observable and therefore rely on estimates, which are by definition inaccurate. Where the BAR can be determined by dividing the rent by the transaction price, to calculate the NAR additional calculations and estimations are required. This leaves a margin for more inaccuracy, however, due to the fact that for example the ROZ/IPD index uses the NAR, the information on the exploitation costs and capital adjustments of a property object are increasing. The formula to estimate the value via the NAR method is:



$$Market\ value = \left(\frac{RA - EC}{Y_{nar}} \pm PV_{RD} \times CA\right) - TT \qquad \textit{Equation (4), NAR}$$

Where[8]:

| | |
|---|---|
| $EC$ | Exploitation costs |
| $CA$ | Capital Adjustments |

There are two new components introduced in this method which have not been mentioned under the BAR method. These are exploitation costs and capital adjustments, and they require some more explanation. Since exploitation costs and capital adjustments are also relevant for some other techniques they will each be explained in the subsequent subchapters. Similar criticism as with the BAR approach hold true for this method, as this technique also relies on the income of one year.

[8] Only the new components have been mentioned in the legend, the rest of the components are similar to those mentioned under equation 1, 2 and 3.

#### 2.3.2.1 Exploitation costs

The exploitation costs can be defined as: "*The periodic costs that are related to the real estate and that are charged to the owner*" (ten Have, 2007a). Even with this definition there is still some discussion on what should be included in exploitation costs and what should not be; therefore, the definition still leaves room for discussion. For example, the period is not defined, so in general appraisers use a period that lasts at least 10 years (ten Have, 2007a). The definition does also mention that it is regarding the costs that have to be paid by the owner, when in practice a part of these costs is also paid by the user. Different valuation methods deal in different manners with the exploitation costs, for example, the NAR method is only concerned with the part that is paid by the owner and the DCF method, (depending on the approach), is concerned with the part that is paid by the user only. The exploitation costs can be classified in five categories, which in turn can be classified in the specific costs that incur (ten Have, 2007a):

- Fixed costs
- Variable costs
- Rental costs and re-renting
- Other costs
- Loss of rent costs

Most of the fixed costs consist of some form of tax or levy. The variable costs are matters such as maintenance, and the remaining three categories consist of costs such as missed rent.

#### 2.3.2.2 Capital adjustments

To the contrary of exploitation costs, capital adjustments do not have a periodic character, rather random and temporarily. The costs are also directly related to the real estate, as is the case with exploitation costs, and characterizes itself by having only limited influence, in terms of time, on the future cash flows. An example of a capital adjustment would be overdue maintenance costs. This will only incur once, and will affect the cash flow for only a short period of time, after the maintenance is performed the costs are not likely to incur any time soon, especially not if there is an amount for this incorporated in the exploitation costs. In general, a distinction can be made between six different capital corrections, such as; overdue maintenance, initial vacancy of the property, rent differences, VAT-corrections, leasehold and future capital investments.



### 2.3.3. DCF

Discounted cash flow (DCF) methods discount future cash flows, to the value it currently represents. The value of property is estimated via the "anticipated" income, or cash flows. This approach relies on forecasts of income or cash flows, which, by nature relies on assumptions. Also, an estimation has to be made of the risk factors that belong to the cash flows, which again relies on assumptions (Lusht, 2001; Uittenbogaard et al., 1996). Although this approach relies heavily on assumptions, it is technically demonstrable superior (Uittenbogaard et al., 1996). This is because it uses all the foreseeable future cash flows that the property can produce; it takes into account the time value of money and the risk profile of investors. DCF methods are frequently used, and perhaps most applicable, when properties are infrequently traded and are more heterogeneous (Lusht, 2001). This is a function of the fact that there are few transactions and the properties traded are more heterogeneous than properties used in the sales comparison method. This makes information used to compare the property with, scarce and difficult to adjust for the differences. Similarly does the

uniqueness of the property, produce difficulties for the cost approach, as it is difficult to estimate the replacement costs when a building is this unique. Also does the cost approach use depreciation for its estimate, and for an income property the deterioration of property does not necessarily effect the income producing capacity, and even if it does, is this relationship probably not linear (Lusht, 2001). The basic DCF model can be expressed as:

$$PV = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} + \frac{TV}{(1+r)^n} \qquad \textit{Equation (5), DCF}$$

Where:

| | |
|---|---|
| PV | Present value |
| $CF_t$ | Cash flow at time t |
| $r$ | Discount rate |
| $TV$ | Terminal value |
| $n$ | Time Horizon |

The main input variables for the DCF method are the cash flows, discount rate, time horizon and the terminal value. Although the technique itself, as mentioned afore, is superior, all these main input variables do rely on assumptions, it is therefore important that scrutiny is applied when using this technique and that informed assumptions and estimates are made.

### 2.3.4. Capacity rent method

This is a method that estimates the market value indirectly for properties such as retail, catering and recreation. In contrast to other methods, the principle of this technique is based on the use of the object rather than the object itself. To be able to do this, detailed information about the revenue and income of the current operator have to be known, as well as benchmark information from the sector they operate in. The benchmark information refers to a percentage of the revenue or gross income, which is what they can maximally spend on rent, in order to employ a healthy exploitation. Two major disadvantages of this technique are that; 1, the rent depends on the sector one operates in rather than the building and 2, the quality of the business influences the maximum rent.



## 2.4. Chapter summary

This chapter has covered the three valuation approaches, which can be used when valuing or appraising an asset or real estate. Each approach consists of various techniques, each with their strengths and weaknesses and sometimes even specific applicability. In general, the cost approach has the weakest link with the market value from the three approaches. Both the comparison and income approach are viable to estimate the market value, where the comparison approach is best applicable when the asset is homogeneous and recent transactions of similar assets have been established. The income approach is mostly used when the objects are difficult to compare and/or no recent transactions are at hand. In chapter 4 we provide a table in which we compare these approaches to one another based on the characteristics of properties in the care.

# 3. Non-market assets

A distinction can be made between properties on the property markets. The property market can be divided into three categories: properties, infrastructure and ground (Gool van et al., 2007). The property market, in which, among others, healthcare capital finds itself, can be divided into two categories: market assets and non-market assets (Gool van et al., 2007; Uittenbogaard et al., 1996). Market assets are properties that are frequently traded, and therefore have reference prices, objects and ratios. Although even the market properties are heterogeneous, they can be compared when the reference objects are adjusted for specific value drivers. A non-market asset does not have these reference objects, since there are hardly any sales. Even if a transaction price is available, it is unlikely that it can be used as a reference object, simply because the differences are too large between the two objects.

## 3.1. Key differences between market and non-market assets

Before the value drives of non-market assets can be described, we will elaborate on the key differences between market assets and non-market assets. There are three key differences between market and non-market properties which are relevant for the valuation: (van der Geer, 2006):

- A non-market assets has specific (unique) characteristics
- There is no market for a non-market property, due to limited supply and demand
- There are very little transactions that can be used as reference for non-market assets, and mostly transactions for non-market assets are part of a larger transaction, such as the acquisition of an entire enterprise.



### 3.1.1. Specific characteristics

Market objects, in general, have characteristics that are experienced as favourable by most of buyers and sellers on the property market. For non-market properties the reverse is true, they possess one or multiple characteristics, which are only appreciated by a small proportion of the market, and the majority does not appreciate these characteristics. The Dutch research organization TNO distinguishes three types of buildings in the care sector, and the specific characteristics it has based on the modifications with respect to regular residential buildings[9] (van der Aalst, Wissekerke van, & Verhoeff, 2010):

- Nonspecific property
- Specific property
- Specialized property

Nonspecific property concerns residential property which has only minor adjustments compared to normal residential property, based on; appearance, design, provisioning of facilities, finishing level and investment costs (van der Aalst et al., 2010). Specific property concerns residential property with radical changes compared to normal residential property, based on afore mentioned aspects. Specialized property concerns residential property that is in no way comparable with normal residential property. Specialized property concerns highly specialized facilities where security and

[9] The comparison to regular residential buildings is made due to the fact that the care usually concerns long term periods as well, in which the patients are staying in the facility for multiple consecutive years, or even for a lifetime.

protection are central concerns. In a study from 2006 that arranged different buildings based on the degree of un-marketability health care capital scored rather high. A hierarchy was created where 1 indicated the most unmarketable object and 20 indicated relatively well marketable object. Hospitals and elderly homes scored 5 and 9 on this list respectively (van der Geer, 2006). Elderly homes were more unmarketable than marketable according to this study; however, elderly homes would be classified under nonspecific property, by the TNO. The nonspecific properties as classified by TNO are for the majority properties from which the services are gradually extramuralized, as is the case with elderly homes. Therefore, we find that specific and specialized property are both non-market assets, and possess specific characteristics. These are, as mentioned afore, based on appearance, design, provisioning of facilities, finishing level and investment costs. These specific characteristics do cause limited alternative use for such a property, however, these properties can be very valuable for the select group of users that does appreciate these characteristics. For example, the fact that a hotel has a bathroom in every room, is valuable only when the building is used as a hotel. When the owner wishes to use the building as offices, the fact that each room has a bathroom does not create any value, it could well be that this would lead to a value reduction instead, as it would involve costs to remove all these bathrooms for the building to serve as an office. From this perspective one could assume that the highest and best use of a non-market asset, is the use and purpose it was built for. So there is no (or very limited) alternative use for it.

### 3.1.2. Absence of a market

When this reasoning is continued, it is fairly easy to see why there is hardly any market for such property. First of all, the property can only be used for the function it currently fulfils (without rebuilding or reconstructing part of the building), and perhaps slight deviations from its current function. This deviation is caused by the fact that often care buildings house a mix of multiple services, ZZP's. The composition of this mix changes over time, as many institutions have been build in such a manner that they can anticipate to demand, which in this case entails that with minor investments they are able to provide a range of ZZP's in their target group (van der Aalst et al., 2010). Although the buildings can be somewhat flexible in their utilization, provide ZZP4 – ZZP10 within the target group with minimal additional investment, the use beyond that is very limited. Therefore, there is only a very limited amount of potential buyers and sellers exist, thus limited demand and supply.



### 3.1.3. Absence of reference transactions

The absence of references is mainly caused by two factors, the absence of a market and the heterogeneity of the buildings. The absence of a market directly causes the absence of references, as there are no any (none) transactions which only concern the assets. The second factor, the heterogeneity of buildings, is to blame that even when there is a reference, it is not probable that it can be used for comparison as the differences are too large between the buildings. Thirdly it can be argued that the market is currently not transparent enough. This only enforces the effect of the previous two points, even when there would be a reference transaction, it is next to impossible to exactly identify the value drivers. Therefore, this makes adjustments to these value drivers, for the purpose of comparison, next to impossible as well. This comes forth from the fact that very little effort has been given to standardise and unify the work of appraisers, compared to for example the stock market. However, there are organizations such as the ROZ/IPD and NVM which actively engage in standardizing methods and defining concepts.

## 3.2. Value drivers of property

There are several characteristics and aspects that influence the value of a property, either in a positive or negative manner. There are three categories in which these value drivers can be classified (ten Have, 2007a):

1. Macro economical and general value drivers
2. Property specific value drivers
3. Valuation technique specific value drivers[10]

### 3.2.1. Macro economical and general value drivers

This chapter concerns the value drivers that are not (easily) influenced by the owner or the user of the property. Not all the factors mentioned below affect every valuation approach in a similar fashion, some of the value drivers have no or hardly any impact at all with a certain method, or are the main source of value creation. The value drivers in this category are (ten Have, 2007a):

1. National income development
2. Rental cost development
3. Construction cost development
4. Maintenance cost development
5. Mortgage interest cost development
6. Governmental influence (via rent-, grant- and tax-policies)
7. Discontinuity in price expectations
8. Location and region



Many of these factors are closely related to one another, and thus will influence each other upon changes. For example, when the national income will rise it is probable that construction costs will rise as well. It is important that this relation is considered when appraising a property, and that one is aware of the multicollinearity of these variables. It may seem strange that inflation is not mentioned in the enumeration above; however, property prices are not in the first place a result of inflation. They do tend to follow a similar direction as inflation, but they are far more sensitive to market conditions, such as demand and supply (ten Have, 2007a). Location and region is one of the, if not the, most important value determinant of property in the macro economical and general value driver category, in the classical property valuation literature. The location and region itself can be divided into five distinguishable factors, which have impact on the value:

1. Trends in population and inhabitants characteristics
2. Economical and growth factors
3. Transport and spatial design
4. Characteristics of the location
5. Characteristics of the vicinity

The analysis on the above five mentioned aspects will give more insight in the economical development of the location, and provide some more insights in the uses of the property and the

[10] These value drivers will not be covered in this chapter; however, a large part of these value drivers is already discussed under chapter 2, where the valuation models have been discussed. When the final choice for a valuation technique has been made in chapter 4, the specific value drivers for that technique will be discussed.

demand for that particular location. Each type of real estate, and purpose of the valuation, will be influenced differently from the location analysis, and there are no standards with respect to this analysis. In general, the economic value of real estate is higher when it is closer to the centre of a city, as, the economical utility of a building increases when it is closer to the centre of an urban environment (ten Have, 2007a). This principle has been true for many years, and among the first to write about this phenomena was Hurd (1903).

"*When land is suitable for a single purpose only, its value is proportionate to the degree to which it serves that purpose and the amount which such utility can afford to pay for it. When land is suitable for a number of purposes, one utility competes against another and the land goes to the higher utilization".*

Next to the proximity to the city centre is the accessibility of the property an important factor for its value, this is probably even more important for properties who are dependent on the income they produce.

### 3.2.2. Property specific value drivers

The property specific value drivers influence the value of property directly, this in contrast to the macro economical and general value drivers from the previous chapter, whose influences on the value are indirect. Similar to the macro economical and general value drivers, the impact of the value drivers depend on the technique used to estimate the value. The property specific value drivers can be classified into the following categories (ten Have, 2007a):



1. The property object
2. Land
3. Environment
4. Cadastre
5. Title (Easements)
6. Technical
7. Spatial administration and planning
8. Rent contract

These property specific value drivers have a different impact based on the type of the property and the valuation technique used and there are no general rules here either. For example, the property which is located at the corner of the building usually represents a higher value, due to favourable conditions. However, these favourable conditions differ per property object. Age is used as a value impairing factor; however, age itself is mostly, and by itself not the factor that affects the value, rather the fact that age is associated with loss of utility, it is this loss of utility that is associated with the loss in value. Measuring loss in utility is extremely difficult, thus age is used to estimate something that itself resists measurement (Lusht, 2001). Although age is used as an indicator for loss of utility, there is not necessarily a relation between these two variables. Even if there would be a relation, it is not likely to be linear or easily defined (Lusht, 2001). Also, as was mentioned under the different valuation techniques, the size has not necessarily a linear relation with the value due to marginal utility.

The value of the land greatly depends on the potential use of the land and factors such as pollution of the ground and harmful building materials, such as asbestos, that might have been used. This is due to the fact that costs have to be made to clean or dispose this pollution. The technical aspects of a building, such as construction technique, materials used, upkeep and maintenance and the purpose for which it is built will influence the value of the property. The above-mentioned factors are just a fraction of all the factors that can/have to be taken into consideration when estimating the value. For all the techniques mentioned, we will describe the relevant factors and their impact on the value in chapter 4.

#### 3.2.2.1 Sector specific value drivers

The value drivers and variables mentioned under the previous sections are classical real estate value drivers. It is only reasonable to assume that there are also property specific value drivers in the care sector, as this is also true for other sectors such as offices, retail and hospitality. There is, however, remarkably little known about these value drivers in academic literature. To find these value drivers a survey[11] has been conducted with the financial managers of care institutions (GGZ, GHZ and VVT). We targeted all the different forms of care, to check for common and different value drivers, and factors which could contribute to our research. We specifically targeted financial and property managers of care institutions, as they will probably have the best insight into what are important determinants (contributors) to a high occupancy rate of intramural care buildings.

As previously mentioned, care properties can be classified as an income generating property, we will argue that factors which contribute to this occupancy will add value to the business. The questions asked in this survey are outlined in appendix B. The survey was sent to approximately 900 financial managers via the "Financiële Zorgthermometer"[12] (FZT), and 13,2 per cent replied, and could be used. Via the survey we have identified some care property specific determinants, which contribute to a high occupancy, and are thus value drivers (for the user). The response rate and the sector they are active are shown in Table 2.



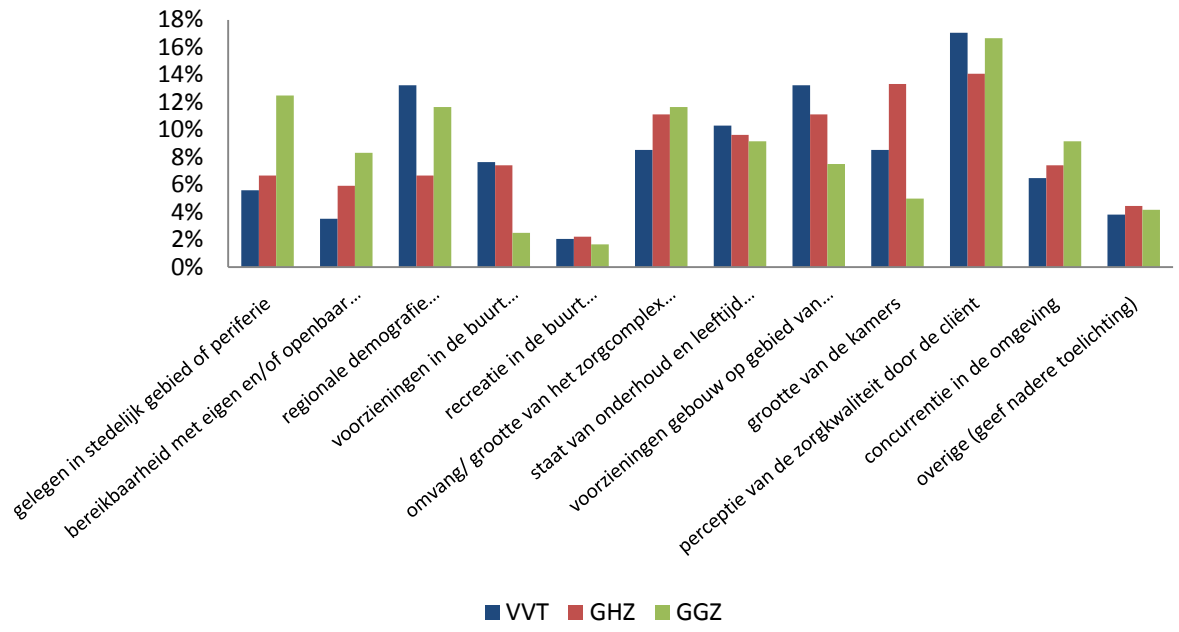
| VVT | | GHZ | | GGZ | | Total | |
|---|---|---|---|---|---|---|---|
| # | % | # | % | # | % | # | % |
| 68 | 58% | 27 | 22% | 24 | 20% | 119 | 100% |

***Table 2, Respondent of the FZT per subsector in absolute numbers and percentages of the total number of respondents***

The survey focussed on location, vicinity, property aspects and the quality of the care. Via this survey we were able to find and give insight in the sector specific value drivers. In addition, it provided insight in the importance of the value driver in comparison to some classical real estate value drivers. The FZT allows for distinguishing between the three subsectors, and thus differences between these sub-sectors value drivers can be identified. Graph 1 shows the percentage of respondents per sub-sector and value driver.

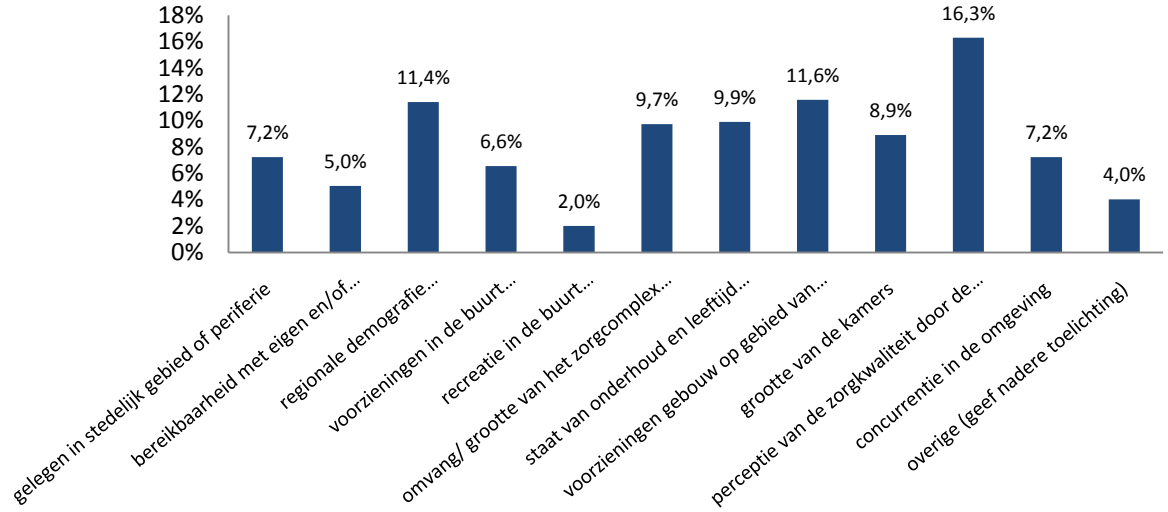
[11] Detailed information about the number of participants and detailed information per question can be found in the appendices C.

[12] This is an initiative of Finance Ideas and HEAD. A survey is sent out every quarter to measure financial trends and developments in the healthcare sector. Results are published on their website: http://www.headonline.nl/kennis/financiele-zorgthermometer.




*Graph 1, Relative importance of value drivers per sub-sector*

Graph 1 shows that there are some (small) differences between the sectors. Graph 2 shows the importance of each value driver, from the point of the user, corrected for the three subsectors and the overrepresentation of respondents in the VVT.




*Graph 2, Weighted average importance of the sector specific value drivers.*

This is an indication of the value drivers from the perspective of the user and their importance; this does not yet indicate the impact of each value driver. To be able to classify the value drivers we have chosen only those which can be measured and quantified (or accurately estimated), such as square meters and accessibility (either via public transport or car), and can thus be compared. This allows us to make a classification of the quality for each value driver. The value drivers from Graph 2 will help in making this classification, as the highest rated value drivers will be used.

### 3.2.3. Alternative and optimum use

When estimating the market value of property, the principles of alternative and optimum use are inherently tied to the valuation process, and therefore have to be taken into account (ten Have, 2007a). This is due to the fact that in an efficient market the side, which is able to utilize the land with the highest efficacy, will be prepared to pay more for the land or property. The expected use of property must meet four criteria (Dotzour, Grissom, & Liu, 1990; Lusht, 2001):

1. Legally permissible
2. Physically possible
3. Financially feasible
4. Maximally productive

These criteria need to be considered in the same chronological order as depicted above, as it would not make any sense to investigate in the financial feasibility when it is not legally allowed. Most of the care properties have social zoning on their location in the Netherlands, and thus are legally bound to performing social activities on that land parcel. This limits the uses to take place in a social context. Among scientists and practitioners engaged in valuing real estate there is a general consensus on the first three points; however, the fourth still leaves room for discussion and interpretation.

#### 3.2.3.1 Maximally productive property

There are three trains of thought which can be adopted when considering the maximally productive criteria (DeLisle, 1985; Lusht, 2001):



1. The highest and best use
2. The expected use
3. The most probable use

The highest and best use reasoning is deterministic and argues that the expected use is the single, specific use that maximises the value of the land. This school of thought has been the most dominant thought among practitioners and literature since 1931 (Lusht, 2001). The expected use reasoning is more a weighted average of the set of feasible uses. The most probable use, like the highest and best use, uses a single specific use to estimate the value of land; the difference is that it uses the most probable use, which is not necessarily the most value-maximizing use. There is, however, no consensus in the literature when to use which criteria, and they do not answer the question of how to evaluate real estate use (DeLisle, 1985). Although the “highest and best use” method has received much attention in the literature and it is currently the dominant theory among practitioners, a growing number of practitioners and scholars argue that this method is not compatible with how real estate prices are formed in today’s market (Lusht, 2001). Some of the arguments against the highest and best use method are the following:

- Real estate markets are not auctions in which all bids are known and simultaneous, rather, a sequential bid process in which the seller does not have a clear perception of all the (potential) bids. As a result, at some point the decision is made to sell, even though there is the possibility of a higher bid. The sale will be made since the perception is that it is unlikely to receive any higher bids than the current one. This indicates that the highest possible bid will only be received a small percentage of the time, a conclusion which conflicts with the

highest and best price use assumption, that the highest price will actually be received (Green & Vandell, 1995).

- Another way to arrive at the conclusion that market prices do not reflect average highest and best use, is the observation that, if prices did reflect highest and best use, the land would be put to that use and all net present values would be zero. Only markets in competitive equilibrium behave that way, and certainly real estate markets cannot be described that way (Lusht, 2001).

It is due to arguments as mentioned above that the expected and most probable use are gaining in popularity. Following the IVCS; "*Market value is a representation [...] to estimate market value, a valuer must first determine highest and best use, or most probable use.*" (Berkhout & Hordijk, 2008), they distinguish between two uses. The definition of highest and best use (HABU) is: "*The most probable use of property, which is physically possible, appropriately justified, legally permissible, financially feasible, and which results in the highest value of the property being valued"* (Berkhout & Hordijk, 2008).

Considering the arguments above and the definition by the IVS, we will go along with the most probable use for this research, considering the maximally productive criteria for our valuation. The advantage of this approach is that there is no need for speculation of what the highest and best use might be. One remark to this decision, as mentioned afore, is that most of the care properties are built in such a manner that they can support multiple ZZP's with small investments. So the alternative use of property does exist in this manner, as it can be alternatively arranged to support different ZZP's than are currently being offered. We however do account for this variation in our model as we will discuss in a later stage.



Alternative uses are mostly derived from comparable objects, and this might be problematic with non-market assets, this approach, the most probable use, allows working from a set of feasible uses, rather than uses based on speculation. Due to the nature of the real estate under consideration in this report, we argue that the most probable use of the real estate is the activities performed under the current exploitation. By doing so, we avoid having to make unsubstantiated estimations of alternative uses of the real estate and of the costs that incur when preparing the property for its new use. This does not exclude the range of ZZP's they are able to offer, which will yield potential different income. How to deal with this potential income volatility will be discussed in greater detail when standardizing the valuation framework.

#### 3.2.3.2 Feasibility of most probable use

When the alternative use of land is limited, the price of the property greatly depends on the uses which are feasible (ten Have, 2007a). As a consequence, these uses have to be tested on their feasibility, that is, will the use make sense in terms of utilization in that area. The demand for healthcare and the associated costs have been rising for years in the Dutch healthcare sector, as briefly noted in the introduction; the percentage of the GDP we spend on healthcare has been rising for 60 years. This is partly because of the rising costs and the Baumol effect within the care industry. The demand for care is also rising in all the three sub-sectors. Due to the fact that the population is aging there are more people who are in need of care services, as the need for care intensifies with age. However, due to the extramuralising of some of the services, there are fewer people who are allowed into a care institution. In the Netherlands the "Centrum Indicatiestelling Zorg" (CIZ) assesses

who qualifies for care from the AWBZ and give them an indication of the care they are entitled to. Due to the extramuralisation the lower ZZP's have not been issued anymore by the CIZ, and a significant drop can be noticed there. This does not, however, affect our research as we focus on the property which will continue to deliver intramural care. Additionally, there are huge differences in the demand for care in the various sub-sectors. There are many different care indications and rules, which influence the demand for care. As shown in graph 1, there are also (small) differences in the factors, which are perceived important to realise a high occupancy rate. Therefore the rest of this research will only focus on the intramural care properties in the VVT sector. This will allow us to make more accurate estimates as there is no need for corrections due to the differences in the sub-sectors.

The year on year growth in the VVT sector from 2009 until 2030 has been predicted at a rate of 2,2 per cent (Eggink, Oudijk, & Sadiraj, 2012). More detailed information about the growth in the sector will be covered at a later stage, when we determine the discount rate. For now we rely on this information to determine that the most probable use is a feasible use.

## 3.3. Chapter summary

So far, we have argued that healthcare property can be classified as non-market assets or specialized property and that this complicates estimating a market value as there are few (if any) reference objects. We also mentioned that the properties have been built to support a range of ZZP's with small modifications. Due to the specificity of buildings, it is possible to deliver these care services in them, as this would not be possible in regular residential property (van der Aalst et al., 2010). The specificity of the buildings also results in no (or limited) alternative uses, therefore we argue that the current use is the highest and best use of the property. Examples of factors, which deviate from regular residential property, are extra wide hallways, small rooms which cannot be let as regular apartments, often no own sanitation facilities and installations intertwined with the property. Most of these are necessary to deliver the care services. As the extra wide hallways are a requisite to transport the beds and such through them, otherwise turns, or passing each other would be impossible. It is factors as these which are valuable for care institutions as they are a requisite to deliver care, however hold no value for most other uses. We therefore assume that the current use is the highest and best use of the properties, and alternative uses are not feasible, or would yield less income.

# 4. Valuation approach

Having discussed the various valuation approaches and the characteristics of non-market healthcare assets, in this section we will focus on choosing the valuation approach and technique which is most appropriate and will be able to incorporate all the relevant value drivers for this technique. Firstly, the valuation method will be chosen based on various criteria which have been covered in the previous sections. Secondly, the design of the valuation model will be discussed.

## 4.1. Current valuation practises

From various interviews and appraisal reports, we learned that currently appraisers mostly use a DCF method to estimate the market value. Appraisers discount the NHC which they correct for capital costs, and use the occupancy and purchase discount of that particular institution. The capital costs they use are mostly between 12 and 15 per cent of the NHC compensation, and are in line with the amount the NZa used to calculate the height of the NHC. Using these fixed rates does not allow them to account for scale advantages and we will discuss this in further detail under chapter 5. Using the occupation rate and the purchase discount rate of the institution allows for managerial effects to influence the value of the property. The discount rate used is made up out of several components, a fixed real estate increment, and a sector and property specific increment. These increments have a fixed upper and lower threshold and we were not able to deconstruct these discount rates into smaller value drivers or factors.

Using different occupancy and purchase discount rates for each property makes valuations rather incomparable and intransparent, as individual company effects influence the value. Additionally, is it difficult to determine the risk associated with a property based on the discount rate used. Although appraisers use various increments to determine the discount rate, is it to the discretion of the appraiser to determine these elements. This makes the valuation estimates rather intransparent.



## 4.2. The most appropriate valuation technique and scoring

Before we can choose the most appropriate technique, we need to compare the various techniques discussed under chapter 2 against some criteria that are inherently tied to the definition of market value as well as some criteria that are inherently tied to non-market assets.
The definition of market value, which we use from the IVS, is subject to some criteria that have been used for the demarcation of the definition. This results in having to test the valuation methods against those criteria.

"*The market value is estimated through application of valuation methods and procedures that reflect the nature of property and the circumstances under which the property would most likely trade in the market*" (Berkhout & Hordijk, 2008).

From this definition we can determine the first criteria, which the valuation technique will have to take into consideration; the nature of the property, which in our case is a specialized and non-market asset.

From another part of the market definition,"*...wherein the parties had each acted knowledgeably and prudently...*" (Berkhout & Hordijk, 2008), we derive that the method used has to be transparent and unambiguously in its use; this will facilitate the users and auditors in acting both knowledgeably

and prudently. This leads to the second and third criteria, the valuation technique will have to be commonly used in practise to be clear and unambiguous, and transparent about the incorporated value determinants and assumptions.

In economic literature, value is the result of the future earning potential, free cash flows (FCF) or abnormal earnings (AE) of the object in question (Palepu, Healy, & Peek, 2010); this determines the fourth criteria of the valuation technique It has to be able to provide insight in the future earning potential of the property, and take this into account for the value estimate.

We have argued that one of the factors, which complicate an estimation of the market value, is the fact that there is little information available that can be used for comparison. This might seem trivial and obvious, however, the fifth criteria is that there is sufficient and reliable[13] information available to perform the valuation.

The sixth criteria, against which the techniques will be compared, is to see if the method is able to incorporate different scenarios into the value estimate. This is necessary so that if there are events that are not constant, they can be incorporated in the valuation technique.

The seventh criteria compares how well the technique is able to incorporate most (all) the different value drivers identified in the previous chapters for property, and is able to quantify them.

The eighth and final criteria is for validation purposes. The valuation technique has to be substantially supported in the literature. If the technique has been thoroughly discussed and tested in the scientific literature, it will contribute in the acceptance of the valuation technique, as it has strong foundations. Also this will help in determining and reporting on the limitations of the model.



We have scored these eight criteria, and the valuation techniques, in a matrix format. It is difficult if not impossible to quantify all the criteria, therefore three possible scores have been chosen. The criterion strongly applies, applies to some extent and does not apply to the valuation model. This simplifies the selection, as it does not require comprehensive and circuitous quantification, but does allow scoring the criteria based on their characteristics. Our scoring of the valuation techniques with respect to care property are in the Table 3.

From Table 3 we can see that the DCF method scores the highest on the eight criteria. Therefore, we will use the DCF method to estimate the market value. The DCF approach is also most commonly used when assets are unique and have a cash-flow generating capacity (Damodaran, 2002). The income approach, in particular the DCF method, has the best fit and will therefore be used to estimate the market value of care properties in the VVT sector.

[13] Estimations will have to be sufficiently substantiated to classify as reliable

| *Valuation methods* / *Criteria* | **Transaction price comparison** | **Rental value method** | **Capitalisation method** | **Multi regression analysis** | **Replacement cost method** | **BAR** | **NAR** | **DCF** | **Capacity Rent** |
|---|---|---|---|---|---|---|---|---|---|
| ***Accounts for nature of object*** | *+/+* | *0/0* | *0/0* | *0/0* | *-/-* | *+/+* | *+/+* | *+/+* | *0/0* |
| ***Commonly used in practise*** | *+/+* | *+/+* | *+/+* | *0/0* | *+/+* | *+/+* | *+/+* | *+/+* | *+/+* |
| ***Clear and transparent*** | *0/0* | *+/+* | *+/+* | *+/+* | *0/0* | *+/+* | *+/+* | *0/0* | *0/0* |
| ***Incorporates future potential*** | *0/0* | *0/0* | *0/0* | *0/0* | *-/-* | *-/-* | *0/0* | *+/+* | *0/0* |
| ***Data required is available*** | *-/-* | *0/0* | *0/0* | *-/-* | *+/+* | *-/-* | *-/-* | *0/0* | *0/0* |
| ***Incorporate change/scenarios*** | *-/-* | *-/-* | *-/-* | *-/-* | *-/-* | *0/0* | *0/0* | *+/+* | *-/-* |
| ***Incorporates all real estate value drivers*** | *0/0* | *0/0* | *0/0* | *+/+* | *-/-* | *0/0* | *0/0* | *+/+* | *0/0* |
| ***Foundation in the literature*** | *+/+* | *+/+* | *+/+* | *+/+* | *0/0* | *+/+* | *+/+* | *+/+* | *0/0* |

*+/+ the criteria strongly applies to the valuation method*
*0/0 the criteria applies to some extent to the valuation method*
*-/- the criteria does not apply to the valuation method*

***Table 3, Valuation approach and technique matrix to find the best fit between the available valuation techniques and the nature and characteristics of care property***



## 4.3. The DCF model value drivers

In the preceding chapters we have discussed what the value drivers for the DCF valuation technique and what the value drivers of properties are. This sub-chapter and subsequent chapters will elaborate more on how to incorporate the value drivers in the valuation model and at what level the valuation should take place. Within the basic DCF model, as described under chapter 2, there are four main input variables:

- The cash flow ($CF$)
- The Discount rate ($r$)
- The time horizon ($t$)
- Terminal Value ($TV$)

These input variables are the value drivers or determinants of value in a DCF model. As mentioned afore, all these input variables rely on assumptions and estimations. To make the valuation estimate as accurate as possible the process of estimating will have to be done very carefully. There are two types of risk for property, commercial and static risk (ten Have, 2007b). Static risks cannot (or hardly) be influenced and always have a negative influence, the contrary is true for the commercial risks; they can be influenced and can have a positive or negative effect. It is important that one is aware of static risks; they are however not easily captured in economic turns, and therefore will this type of risk be omitted in further analyses. The commercial risks can be divided into income risk and investment risk, and are thus measured in the cash flow and discount rate respectively.

### 4.3.1. Cash flow

We have learned from various interviews and appraisal reports that appraisers currently use the rent component, or fictive rent (NHC), to estimate the market value. Although at first sight it makes sense to use the rent as income component, we do not agree with this logic for care capital. The cash flows, which we intend to use in our valuation model, are all the free cash flows. The reasoning behind using all the FCF rather than for example the rent per square meter is twofold:

1. We have argued earlier that the care property can be seen as an income producing property. And that due to its specificity part of the income is a function of the "bricks", and should thus be allocated to the property rather than the enterprise which delivers the care services in the property.
2. The second reason for using FCF is that there is no "real" market rent for care properties. Due to the full costing system most intramural properties are owned rather than rented, however, this compensation is composed of several elements and not just a compensation for rent or instalments on the mortgage. Additionally, the properties are built in such a manner that they are flexible in the ZZP's they can deliver, and the NHC compensation which they would receive for each ZZP is different. When using a static proportion of delivered care, for example the current ZZP's delivered, future needs are not incorporated.

Our intent is thus to use the free cash flows rather than a fixed rent component in the valuation model. The FCF will consist of ZZP's, NHC's and NIC's, and all the relevant cash outflows. One important note is that care institutions in the AWBZ are exempt of VAT and income tax[14] (Weekers, 2013). This has some important implications, such as the revenue does not have to be adjusted for VAT paid or received. The organization also does not benefit from a tax shield, as there is none, this is important when calculating the Weighted Average Cost of Capital (WACC). We will discuss this in more detail in the next chapter. Although the number of cash flows depend on the time horizon which will be used, the minimum number of cash flows that have to be used, are the FCF's of ten years (ROZ/IPD, 2007).



### 4.3.2. Discount rate

The ideal discount rate is based on other, comparable, real estate which is used as a reference (ROZ/IPD, 2007). When these references are not available, an estimation has to be made. In practice, this often happens by using the risk free rate (RFR) and incrementing this rate with risk premiums, which in turn depend on the type of real estate and object specific aspects (ROZ/IPD, 2007). Many appraisers use three broad categories, a general real estate increment, a sector increment and an object increment. There are, however, no uniform risk premiums which can be used to increment the RFR, it is to the discretion of the appraiser or valuer to determine these, although they have to be substantially underpinned and transparent (ROZ/IPD, 2007). The discount rate should represent the risks associated with the investments, where the risks which are associated with the income are in the cash-flow (ten Have, 2007b).

In financial literature, the discount rate is referred to as "the expected return on a financial asset of comparable risk" (Hillier et al., 2013). The Capital Asset Pricing Model (CAPM) can be used to find this return when something is all equity financed. Care institutions are however financed via equity and

[14] This refers to their core activities. These are the activities that surround the care.

debt, and thus the Weighted Average Cost of Capital model (WACC) can be used. The market for care assets is not liquid, and therefore the relation between the market and the assets itself (beta) is not defined. This is problematic when estimating the return on equity. In practice, care institutions are often using rates in between 3 to 5 per cent, these rates are, however, not underpinned.

There are some countries that have a (more) free healthcare market, hence in these markets information on the equity beta and the required equity return is available. Examples include the Real Estate Investment Trusts (REIT's) in America. It is, however, problematic to use this as an indication. This is due to the fact that the Dutch healthcare sector is financed quite differently and operates within a totally different legal framework. Factors, such as governmental influences, can have an (large) impact on the risk associated with an investment, and thus the required return of an investment. Especially, in an environment where governmental influences are perceived as highly influential, such as the healthcare industry. To overcome the problem of a non-comparable market and a non-existing market, we estimated the WACC via the Dutch Market Risk Premium (MRP) of equity.

This is the average premium required by the market on equity compared to government bonds (Leach & Melicher, 2012). Since the MRP represents the average return required on equity from a market portfolio, it represents the systematic risk only. We assume that the systematic risk of a care property is equal to the MRP, and adjust this risk for property specific factors. This MRP is calculated to be 6 per cent on 31 March 2014 (Weimer, Koning, & Sabkov, 2014).There are some downsides to this assumption, which are not free of consequence. This MRP premium is calculated by analyzing various developed and reasonably efficient markets; this cannot be said about the real estate market. Secondly, the market risk premium is for the entire market and thus represents the MRP for a market portfolio, where the Beta is one. In theory, this could be the result of perfect diversification and thus eliminating all systematic risk. Even with many different investments this is no easy task, let alone with an investment in a single property. Thirdly, the MRP does represent the average risk premium for stocks and alike, where we are using it to estimate the required equity return on property equity, which might have a different equity return. Being aware of the potential risk of assuming the MRP of an average performing property to be 6 per cent, the subsequent formulas will be used to calculate the discount rate:



$$R_{WACC} = \left(R_0 \times \frac{E}{V}\right) + \left(R_D \times \frac{D}{V}\right)$$

*Equation (6), WACC*

Where:

$$R_0 = R_F + \beta(R_M - R_F)$$

*Equation (7), Cost of equity*

Where:

$$(R_M - R_F) = MRP$$

*Equation (8), Market Risk Premium Netherlands*

Where:

$$R_0 = R_F + \sum_{t=1}^{n} (MRP \times Impact\ value\ drivers)$$

*Equation (9), Equity cost adjusted with value drivers*

Legend:

| | |
|---|---|
| $R_{WACC}$ | Weighted average cost of capital (used as discount rate) |
| $R_0$ | Required return on equity capital |
| $\frac{E}{V}$ | Proportion of equity in the company |
| $R_D$ | Cost of debt |
| $\frac{D}{V}$ | Proportion of debt in the company |
| $R_F$ | Risk free rate[15] |
| $(R_M - R_F)$ | Market risk premium ($MRP$)[16] |

As we mentioned afore, there is no data on the required return on equity in the Netherlands and therefore we will use the MRP as an indication for the equity return required of average risk care capital. However, the discount rate will have to reflect the risk, which is associated with the investment.

To be able to make variations to this fixed MRP we will take the following two steps:

Firstly, we will use the value drivers found in the literature and via the FZT, and define and quantify them. We argued that these value drivers influence the value of the property, and thus the risk associated with the income that can be produced. Most of the value drivers and variables can be measured quite accurately, however, some resist measurement and will be dummy variables. When all the value drivers are quantified, scoring average on all of them will represent a property of average risk, and thus the MRP.



Secondly, will we have to determine the impact of each value driver and variable, as some will undoubtedly have more impact than others. To measure the impact of each variable, the Analytical Hierarchy Process (AHP) model from Saaty (1987) will be used. This is one of the most widely used models for multi criteria decision making and has a large advantage over other multi criteria decision making models, as it also measures the consistency of the input, which will allow us to omit "random" input. During the interviews, the interviewees have rated the various value drivers and variables relatively to one another. The reasoning behind this method comes forth from the fact that there is little transparency in how the current discount rate is build up. When asking directly for the impact of each value driver we would probably receive the discount rates currently used without further specification, and thus not be able to relate our quantification to the actual discount rate. Therefore we have chosen to have the interviewees score the value drivers relatively, so that we can relate it to our quantification data.

Using this model will most likely provide us with a range for each variable, which we can then use to apply the quantifications to. When a property has scores at the lower end of the quantifications (i.e. below average) it is assigned to the higher end of the range (larger increment on the discount rate).

[15] The Euro area Yield curve on triple A, zero coupon, government Bonds with a maturity of 15 years. We have chosen to use the yield curve rather the yield on national bonds since there is an increasing trend in companies using the yield curve (Elter & Castedello, 2012). The time horizon of 15 years has been used as they have the same time horizon as we will use in our valuation model. We used the average of the last ten years.

[16] Beta is left out of the equation, as we use MRP of six per cent, where beta is one.

The effect in this case will be that the property is associated with more risk and thus requires a higher return on equity.

To test this idea we designed a test in which an artificial range of criteria was rated in the AHP model, and generated 10.000 random iterations. We used this many iterations to check if the MRP in the model would stabilize around the average of 6 per cent, which it did. When we incremented this with the risk free rate from 2012 (which was approximately 2 per cent), we received an average return on equity of 8 per cent. This return was compared against the average cost of equity for the Life Science and Healthcare industry in the Netherlands and the real estate sector, as calculated by Elter and Castedello (2012). Both these sectors have an average return on equity of around 7,5 percent and we can see that our return on equity is about 50 basis points higher. The total range of equity returns given by our calculations is between 6,11 and 9,89 per cent. This range is fairly similar to the range given by Elter and Castedello (2012) for the two different industries, 7,5 and 11,1 percent and led us to believe that this method would give a fairly good indication on the required return on equity in the healthcare market[17]. Empirical research from Fama and French (2002) showed that equity premiums seem to be mean reverting and that the average equity premium of the Standards and Poor's, over the period 1872 – 2000, was 5,55 per cent. This leads us to believe that using the six percent MRP as the mean is in line with market expectations.

Additionally, we have compared this return to the required equity return on a health care REIT from America based on the dividend growth model. We estimated the required return to be 5,52 per cent based on a five year period. Our estimates seem somewhat high compared to these equity returns, especially taking into consideration that the cash flows are subject to more risk in the American health care industry. However, these healthcare REITs are subject to very high annual depreciation charges which in turn have a high effect on the net profit. This causes the dividend payout to be higher than the earnings per share in several years, and complicates the calculation. We will have a more detailed discussion of the result from the AHP model and our quantifications under chapter 6.



### 4.3.3. Time horizon

The time horizon refers to the time the property will be able to generate cash flows, that is, the number of consecutive years from which the FCF's are used to calculate the present value. At the one extreme of considering the time horizon one may consider the asset a cash flow generating entity that may last into perpetuity, while at the other extreme, as is common with liquidation valuation, one may consider that the asset or entity ceases generating cash-flows today (Damodaran, 2002). Previously the NZa set the depreciation period to 50 years, which is the period in which the property could be used without interim renovations, and thus generate cash-flows. As mentioned afore, this period was unrealistically high and the period has been reduced to 30 years in most instances. This thirty year depreciation period is also the period used for calculation the NHC compensation (Wissekerke van, Verhoeff, & Sijsling, 2011). From interviewing various appraisers and independent experts, we learned that currently the most frequently used time period is 15 years, and an exit yield is used to determine the terminal value, or the value of the asset at year 15. There is, however, no

[17] Although this study focuses predominantly on the Germany, Austria and Switzerland, there are some Dutch companies included (Eurostoxx-50). We use this study merely as an indication, as the equity return for care institutions in the Netherlands is not known.

solid theory or argument which explains why 15 years is the "right" time period. The (model) uncertainty increases over time and the prediction accuracy will probably decrease over time. Choosing the appropriate time horizon will have to take this into consideration. Upon asking how much speculation would be in the estimates of cash flows 15 years from now, the answer was that an exit yield was just as speculative. However, one argument in favour of using an exit yield after a certain time horizon is that it is more difficult to estimate market factors over such a long period, while it is "relatively" easy to estimate aging factors for the property, which are translated to an exit yield.

Appraisers asked mostly use a period of 15 years with an exit yield, unless the expected lifetime of the property is shorter. When this occurs the time horizon is corrected for the life expectancy of the asset. The ROZ/IPD ordained that the minimal time horizon to be considered is 10 years, when estimating property value, where for business valuations the time horizon is mostly no longer than 3 to 5 years. There is no uniform number of years or method to determine the time horizon for all valuations. However, the value of the asset should not be manipulated by lengthening the time horizon (Ganchev, 2000). The time horizon greatly depends on the time period for which estimates can be made with any certainty. Therefore, we argue that time period currently used by most appraisers is fair. As the healthcare market is quite stable, there is no "real" competition and prices are stable. The NZa increases the compensations with roughly the inflation rate every year. The demand will not increase or decrease suddenly either, nor are there seasonal effects or are there large cyclical effects. This is simply due to the nature of the sector. These factors are all in favour of a relative stable environment with relatively well predictable medium to long-term influences. Due to these factors we will adopt the time period that is currently used by appraisers, that is, we will use a time horizon of 15 years to predict the cash-flows. Naturally, when the property has a shorter life we will use fewer years.



### 4.3.4. Terminal Value

The terminal value can be determined via various methods, and represents the value of the building (asset) after the period of cash-flows which have been forecasted (Damodaran, 2002; Palepu et al., 2010). There are in general three methods, which are most frequently used to find the terminal value.

- The book value as liquidation value
- Stable growth model
- Earning multiple to determine the liquidation value

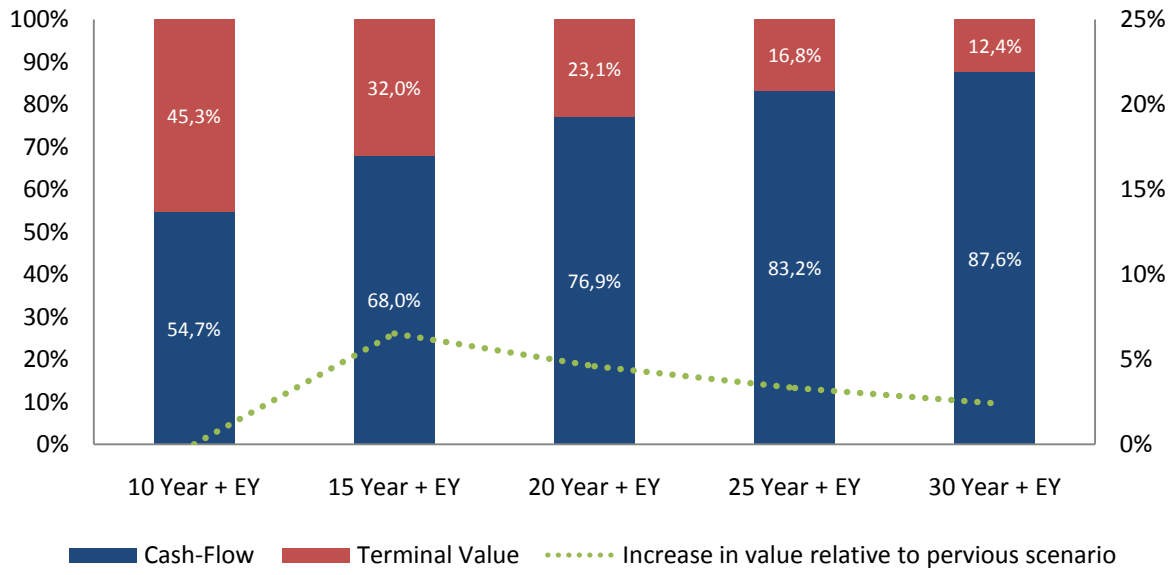
We will not use the book value as liquidation value, as we argued that currently the book value of the property has little relation with the fair value of the property, as it is based on historic cost price and diminished gradually over time with a (too) long depreciation period.

Currently, appraisers use a variation to the stable growth method as exit yield. The measure for growth in appraising is the rent income that can be charged to the user of the asset. The method to do this is described earlier and known as the BAR method. The BAR is then corrected for aging factors and the differences in rent between the beginning period and the end. From various appraising reports and interviews we have learned that the rent which appraisers use for care assets is derived from the NHC, as this is the income component which is directly related to the real estate. From our

perspective however, there is a problem in using this cash-flow. This is the result form reasoning that health care assets are income producing properties and have been built in a very specific manner, as was described by TNO in their research. Due to this, these health care activities/ service cannot be performed in regular buildings. Continuing this reasoning, one can see that the value of the property cannot be determined by the "rent" or NHC alone. The property itself also facilitates and supports the healthcare, which is performed inside. Therefore, we state that by using only the NHC, some of the income components, which are to be allocated to the property, are left out. This is also evident in our valuation model, where we use all the free cash-flows, and extract the property value from this.

This, however, poses another problem however, as almost all appraisers use the BAR and increment this with aging factors. Ten Have (2007a) argues that the BAR is so frequently used as it is similarly constructed as the exit yield. As it represents the income that can be earned after the forecasting period. To overcome the problem of not being able to use the BAR incremented with age effects, we will use a variation to the liquidation value. One of the predominant reasons to choose for a variation of the liquidation method comes from a shortcoming of the exit yield in this context. For regular real estate, like residences, the income is forecasted for a certain time period, and then an exit yield is used to estimate the value at the terminal year. This makes sense as (most) properties will still have many remaining years after the terminal year, with no "certain" amount of years. For care property this is different, as the previous decades have shown us that the properties did not last for much longer than thirty years, and would then have to be completely renovated or rebuild. Based on our reasoning that there is no alternative use for these properties, the value of the building should be nil after thirty years. The rather abrupt ending of the cash generating capacity of the building is difficult to translate in an exit yield. The occurring problem is perhaps best explained via Graph 3.






*Graph 3, Discounted terminal value and Cash-flows as proportions of the total value under different scenarios*[18]

[18] For this graphical representation a cash flow which remained constant over the time period has been used. The discount rate used was approximately 8 per cent, which is in line with what appraisers are currently using. The exit yield was set equal to the discount rate and adjusted for aging effects. For robustness various different discount rates have been tested, however the effect is limited as the exit yield is a function if the discount rate.

As can be seen, there is a change in value depending on the number of years for which the cash flows are forecasted, which should not be the case. This can be seen best in the scenario where 30 years of cash flows and an exit yield has been used. After year thirty the value of the property should be nil, assuming the cost of demolition and the value of the land are roughly equal, however the terminal value still represents roughly 12 per cent of the total value. To overcome this problem the exit yield would have to be extremely high in the final years, and then be related to the losing utility function. We have run various tests with this, however, there are too many factors, which would have to be included. Since the exit yield would have to vary with the time horizon, the expected phase of the company in the life cycle and the discount rate itself, while keeping the value estimate roughly stable, which was clearly not the case.

Since we assume the functional lifetime is fixed, we can use a different method for determining the exit yield, the liquidation value based on the remaining productive years. The formula to calculate the terminal value can be represented as:

$$Terminal\ Value = FCF_{TY+1} \times \frac{\left[1 - \frac{1}{(1+r)^t}\right]}{r}$$

*Equation (10), Terminal Value*

Legend:

| | |
|---|---|
| $FCF_{TY+1}$ | The free cash flow the year after the terminal year |
| $r$ | The discount rate |
| $t$ | The remaining productive years |



Using this method to determine the terminal value, the total value will not fluctuate based on the scenarios used, and will be a function of estimated productive years. We use the cash flow from the year after the terminal years because we have learned from the interviews that there is some scepticism about the compensation received in the future. Currently, the sector's average compensation is 95 per cent of the NZa maximum, however, predictions are that this rate will decline to as much as 90 per cent. To include this scepticism we will use only 90 per cent of the NZa maximum compensations for the years after the terminal year. The reasoning behind this comes from the fact that it is believed that older property will be subject to higher purchase discounts on the compensations received. This is based on the rapid change in standards within the healthcare industry, and thus older property will probably not meet all the standards and thus receive a discount because of this.

## 4.4. The "Rushmore approach"

Although we have determined the most appropriate valuation technique and approach to estimate the value of care capital, there are still some complications due to the stances we took. We have argued that we disagree with the current method of appraisers, to discount the fictive rent, the NHC, to estimate the value. We mentioned that we would use the FCF rather than the NHC in our valuation model. However, when we discount the FCF, the value we receive contains more than just the value of the real estate. To dissect this value into multiple entities we have turned to hotel valuation literature. This comes from the fact that hotels and care properties share some commonalities, such as; the property is a vital element of the ability to generate cash-flows, the cash-flows which are earned can be allocated to various entities and the property is so specific that the

alternative uses are limited to the current use. There are two techniques mentioned in the hotel literature by which one is able to dissect different values from the FCF:

- The Rushmore approach
- The business enterprise approach

Of which the Rushmore approach, although quite old, is still the most dominant approach used. One of the major advantages of this technique is that it only parts the values, which are likely to change when the building would be operated by another user, and therefore, represent the "true" value of the real estate. Rushmore and Rubin (1984) argue that when the FCF is discounted one receives the "enterprise" value, and that this value consists of three elements:

1. The value of the real estate
2. The value of the business
3. The value of personal property

So in order to find the value of the real estate the other two values have to be dissected from the "enterprise " value. The IVSC (2012) also indicated that the value of income producing property is made up out of the enumeration above and adds land to the equation. As we are trying to determine the value of the property, we have to dissect the value of the business and the personal property from the enterprise value.

### 4.4.1. The business value

The rationale behind the business value as a component of the "enterprise" value is that lodging activities are a labour intensive, retail type of activity that depend on customer acceptance and highly specialized management skills (Rushmore & Rubin, 1984). A similar argument can be made for care properties. Customer acceptance, or perception, was rated the number one most important factor in the survey conducted in the FZT (Graph 1 and 2). Also in regular appraisal literature the connotation has been made that an emerging issue with allocating a transaction price is the extent to which the price includes business as well as real estate value (Lusht, 2001). Profits that are in excess of market expectations, and can be attributed to the manager should not be included in the value estimate (IVSC, 2012). While yet others argue that this "business-value" captured in the real estate is simply a function of highest and best use and therefore properly reflected in land values (Lusht, 2001).



The fact that the business-value should not be part of the real estate can be explained in the following manner; more intensive management (better management) can increase the earning potential (Gool van et al., 2007). This can be caused by, for example, a higher occupancy rate or more efficient use of the available assets. It might seem somewhat farfetched to apply this principle to the care industry. However, when considering it in somewhat more detail, this reasoning has its merit. The healthcare market is changing, and market functions are henceforth a reality in this sector (at least, this is the intention). To make the sector cheaper for the government, as well as rewarding good management of institutions by relating the compensation on production or occupation (Klink & Bussemaker, 2007; NZa, 2009a). Continuing this reasoning, we can state that part of the income can be allocated to the business (management) and should thus not be included in the price of the property, as we cannot assume that any manager would be able to generate similar earnings.

Therefore, it can be argued that the business value should not be included in the property price and should be deducted from the enterprise value.

In the hotel valuation literature, the business value is deducted from the enterprise value in the form of a "management fee". This comes from the reasoning that when a manager is employed to take over the day-to-day business, the owner only has a passive interest, and thus the income attaint to the business has been taken by the management in the form of a management fee (Rushmore & Rubin, 1984). There is a range of management fees that are used in various literatures, all expressed as a percentage of the total revenue, but no solid method to determine this percentage. To determine the business value in form of a management fee for the care buildings, we argue that it should only be made up of the earnings that they can affect, which are the direct earnings from the care services. To determine the management fee, we will use the net profit percentage they report in their annual report, and take this over the revenue generated from care services. To overcome the problem that there is no business value when a loss is made, or a huge business value when there is a onetime benefit we will take the weighted average profit margin. We have calculated the average by analysing the profit margin of roughly 400 institutions, and the results can be found in Table 4:

| **Year** | **Profit margin** | **Number of institutions** | ***Profit margin per year categorized by size of the institution*** | | |
|---|---|---|---|---|---|
| | | | Revenue < 25 million | 25 million < Revenue < 50 million | Revenue > 75 million |
| ***2013*** | 2,21% | 236 | 3,20% | 1,79% | 1,35% |
| ***2012*** | 3,15% | 436 | 3,45% | 4,55% | 2,18% |
| ***2011*** | 2,45% | 434 | 2,70% | 0,89% | 1,68% |
| ***2010*** | 2,48% | 426 | 2,80% | 0,71% | 1,36% |
| ***2009*** | 3,26% | 417 | 4,11% | 0,89% | 1,05% |
| ***Average*** | ***2,71%*** | ***390*** | ***3,25%*** | ***1,77%*** | ***1,52%*** |

***Table 4, Profit margin in the VVT from 2009 -2013 categorized by size of the institution and the weighted average profit margin. (source CIBG, edited by author)***



As can be seen, there are quite some differences between the institutions depending on their revenue size. Although this difference seemed to gradually decrease over the years and roughly equal in 2012, in 2013 the differences increased again. There is, however, a reason which (partially) explains this difference; many institutions, predominantly the bigger ones, have incurred the losses on the impairment of their assets (Actiz, 2013). Due to this fact, we will make use of the weighted average over the period 2009-2012, and thus use a management fee of 2,83% over the care related revenue (ZZP) to determine the business value.

### 4.4.2. The personal property value

The personal property of a hotel is known as furniture, fixtures and equipment (FF&E), and its value must be separated from the real property components (Rushmore & Rubin, 1984). Two calculations are needed to separate the personal property value from the income flow: a return of personal property and a return on personal property (Rushmore, 2004b). The return of personal property is necessary because FF&E has a relative short life, and must periodically be replaced. And the return on personal property is based on the premise that personal property is entitled to a return equal to the cost of capital comprising that component (Rushmore & Rubin, 1984). A similar train of thought

can be used for the personal property for care assets, which is the inventory. The inventory of care property also has a relatively short life, according to the NZa it should be depreciated within 10 years, which is similar to hotel FF&E. Since the inventory in care institutions is functionally dependent, but not fashion or trend dependent, 10 years seems like a reasonable depreciation period. Nor is most of the inventory of specific nature, most of the inventory is made up out of items which are common in most residences, only few items are very specific. This also enforces the depreciation period of ten years, as most of the inventory could be sold to third parties. Similarly to a hotel, the business activities within care property do not stop every ten year to replace the entire inventory at once; rather, this is a gradual process. Which at a sector level can be regarded as constant, where every year the total investments roughly equal the depreciation. For this reason we will assume the total inventory constant and argue that the investments are equally spread throughout the lifetime period.

When we assume linear depreciation, the depreciation will be constant every year, ceteris paribus. Although the replacement of inventory is a capital expenditure, it does affect cash-flows when new inventory has to be purchased to replace the old inventory. By finding the average value/cost of inventory per room or square meter, a fixed rate depending on the size of the property can be deducted from the cash-flow. To get an indication of the average inventory value per room, we will work back from the compensations, which are given by the NZa. There are different NIC compensations based on the ZZP delivered. The Nza expresses the NIC compensation per client per day, table 5 below shows all the compensations per ZZP, and converts them to per client per year, and the costs per client per year, which is based on the 10 per cent depreciation.



| NIC | NIC compensation per day | NIC compensation per year | Inventory investment per room | Return of inventory (depreciation) |
|---|---|---|---|---|
| **4VV** | € 2,42 | € 883,30 | € 8.833,00 | € 883,30 |
| **5VV** | € 3,67 | € 1.339,55 | € 13.395,50 | € 1.339,55 |
| **6VV** | € 3,67 | € 1.339,55 | € 13.395,50 | € 1.339,55 |
| **7VV** | € 3,67 | € 1.339,55 | € 13.395,50 | € 1.339,55 |
| **8VV** | € 4,74 | € 1.730,10 | € 17.301,00 | € 1.730,10 |
| **9bVV** | € 5,02 | € 1.832,30 | € 18.323,00 | € 1.832,30 |
| **10VV** | € 3,67 | € 1.339,55 | € 13.395,50 | € 1.339,55 |
| ***Average*** | ***€ 3,84*** | ***€ 1.400,56*** | ***€ 14.005,57*** | ***€ 1.400,56*** |

***Table 5, Inventory investment and compensation rate and the return of inventory per ZZP in 2015 (Source: NZa CA-BR-1512 Edited by author)***

The return of inventory will be indexed on a yearly basis as the NZa also does this for the NIC compensation. The index rate will be 2,5 per cent until 2018 and after that it will be an inflation rate of 2 per cent[19].

Similarly to the return of inventory, it can be argued that inventory will be entitled to a return on it, from an economical point of view this makes sense. When investing in an asset a return on top of the initial investment is required, this represents a compensation for the risk, which was taken by investing. Although the concept of a return on investment is not new, it is rather novel in this

[19] The goal of the ECB is to maintain an inflation rate below, but close to, 2 per cent over the medium term

context. Therefore, there are no guidelines that stipulate the rate of return required on inventory. Due to the fact that inventory is subject to intensive wear and tear, which is the everyday use, and therefore the relative fast depreciation rate, we argue that the required return on it should at all times be higher than the required return on the property, as there is less risk associated with property. Therefore banks and/or other investors will demand a higher compensation for the credit extended to finance inventory. In our model the highest possible required return on equity is close to 11 per cent. Since we have no data on required returns on inventory, and it is justifiable that inventory investments will be all equity financed, due to the relatively small investments in it every year, we will assume this rate to be 11 per cent. This is the highest possible required return on equity in our model, and will therefore represent more expensive financing due to increased risk perception. We have tested this assumption for robustness, by changing the required rate of return, and observing the impact on the value prediction form the model. We could conclude that the effects of using 11 per cent return rather than a higher or lower return (+5 or -5 per cent) is very limited due to the relatively small investment amount it is concerned with. Therefore we will use 11 per cent as the required return on inventory investments. The NZa already accounts for financing cost of 4 per cent in the NIC compensation, and therefore we will set the return on inventory to 7 per cent in the model.

## 4.5. The valuation model

We now have the most appropriate valuation approach and technique and combined this with a method that is able to distinguish between the three elements in the FCF. We can represent our model as follows:

$$Market\ value\ Real\ Estate = \sum_{t=1}^{n=15} \frac{FCF_t - (C_{inv} + Y_{inv}) - V_b}{(1+R)^t} + \frac{TV}{(1+R)^T}$$

*Equation (11), Valuation Model*



Legend:

| | |
|---|---|
| $FCF_t$ | Free cash flow to equity at time $t$ |
| $C_{inv}$ | Cost of Inventory in year $t$ |
| $Y_{inv}$ | Required return on inventory in year $t$ |
| $V_b$ | Business value. Percentage taken from the revenue of the care related activities. |
| $R$ | Discount rate (WACC) |
| $n$ | Time horizon of predicted cash flows |
| $FCF_{n+1}$ | Free Cash Flow at year $n$ corrected for aging factors |
| $TV$ | Terminal value |
| $T$ | Number of productive years left after terminal year |

One of the major advantages of dissecting the value of the business and inventory before discounting is that we do not have to identify different discount rates for them. Different risk might be associated with these cash-flows, and therefore, a different discount rate would be applicable. Deducting the value of the business and the inventory from the value before discounting simplifies this process.

## 4.6. Chapter summary

The argument for estimating the value of the property in such an "elaborate" manner comes forth form difficulties to find the value via other, perhaps more commonly used, techniques. As we have seen earlier, there are three approaches to valuation, of which the income approach seemed to be the only appropriate technique for care assets. This is due to the fact that the care buildings are quite unique, and therefore even more heterogeneous than most other forms of real estate, which allow for comparisons to be made. Additionally, there is a very limited market for care assets which are built for delivering intramural care. These buildings have many alterations compared to for example normal residential property. These alterations make it possible to deliver the expected or required services in that particular building. Care properties have many alterations which deviate from regular residency and factors like these cause alternative uses to yield less income than the intended function of the building, and according to the highest and best use theorem, the value of the building should reflect its highest and best use.

Allocating the cash flows to the property is not as straightforward as it might seem. There are basically three streams of income to the healthcare institution, the NHC, ZZP and NIC. Currently, appraisers use the NHC and use this as rental income, which is a fair assumption, since the NHC represents all the real estate related costs. There is, however, a problem with this method, when accepting that the building (partially) contributes in being able to generate income from healthcare services as well. When this is true, this income should be allocated to the value of the building. It is, however, not easy to separate the various income streams, and allocate them to either business, inventory or real estate value. We turned to hotel and lodging literature and used a method to dissect this value. The merit of this method comes from dissecting the cash flows, which would change upon a change in user of the property, and thus only the real estate value would be left.

# 5. Level of the valuation

As mentioned earlier, the real estate value has to be separated from the value of the business and the inventory value. We argued earlier, the value of the real estate should not be affected by the management or the inventory inside. This is the intention of this valuation model. In order to truly separate all these values form the real estate we will use norm exploitation values, and average occupation rate and compensation rate. By doing so, we will omit all the affects from managerial activities. For hotels, this is done by estimating a stabilized net income, which therefore excludes any abnormal relation of supply and demand (Rushmore & Rubin, 1984). To calculating stabilized income for the care assets, or norm income, will be somewhat different due to the nature of the sector. There is no competition on price and care institutions can all lay claim to the same compensations prices from the NZa. This chapter will discuss how we estimate the stabilized income and costs.

## 5.1. Stabilized income

There are basically three income streams which can be stabilized, the ZZP, NHC and NIC. Currently, they represent three different streams of income, however, intentions are to merge them into a single and uniform compensation rate after 2018[20]. The height of these compensation rates is set by the NZa and represents the maximum compensation. It is, however, not the compensation they will receive. The health agencies (Zorgkantoren in Dutch) in the Netherlands negotiate the prices the care institutions will receive, currently this only applies to the ZZP. There are 32 health agency regions in the Netherlands, and each has its own and unique set of criteria on which they base the compensation the institution receives. Via the FZT we have found that the sector average compensation was roughly 95 per cent for the VVT. This indicates that they would only receive 95 per cent of the maximum compensation. These compensation rates suggest that they can be influenced by the management of a care institution, as they are the result of negotiation. In order to omit the effects of the above mentioned average, or poor management, we will use the average compensations received. Also the occupation rate can be standardised based on the sector wide average, which is 94,5 per cent. There are more streams of income in the care, such as the clients contributions and subsidy, they are, however, omitted as income for the institution for various reasons. The own contribution is no income for the care institutions themselves. The height of this contribution is set and collected by the "Centraal Administratiekantoor" (CAK). There are various subsidies, which institutions could claim, they are however no standard income streams. As management would have to actively engage agencies in order to lay claim to a subsidy, we argue that these subsidies are attributed to the business value rather than the real estate, and therefore can be omitted completely in our model.



### 5.1.1. ZZP compensation

The ZZP compensations are fixed by the NZa, and represent the maximum compensation that an institution can receive for the care delivered. These compensations are indexed every year with the inflation rate, 2 per cent. In appendix D there is an overview of the ZZP compensations and the indexation of them from 2014 – 2030. As mentioned afore, these compensations represent the maximum compensation. Therefore, we will reduce the compensation with the sector average purchase discount on the compensations, which represents 95 per cent of the maximum

[20] In our model we will treat them as three separate streams of income. We keep indexing the compensations after 2018, as there is too little information on this single uniform rate.

compensation. It is relatively easy to estimate the compensation received per ZZP, it is however not as straightforward to estimate the composition of ZZP's which is offered in a building. As we try to omit all managerial influences, we cannot assume that the current ZZP mix is free of managerial influence. To overcome this, we have first analysed how many different ZZP there were in the VVT and the various compositions in which they occur.

There are 7 different ZZP's which are associated with intramural care in the VVT. Due to the nature of the care, which is required per indication, there is not necessarily a random mix of ZZP's per building, or at least a mix which is tailored to the needs of in the direct environment. From the interviews, we have learned that there are basically two possible combinations of ZZP's:

- ZZP 5 and 7. This combination is mostly present in "small-scale living" properties, where client groups of 5-6 are situated together.
- ZZP 4, 6 and 8 - 10. This is the alternative option, the frequency of each ZZP occurring depends on the need of the direct environment of the care property[21].

To estimate a stabilized income, we have to take into account these two possible formations and the needs of the clients in the environment of the care property. To be able to make this estimate, we have taken three steps.

Firstly we analysed the number of ZZP indications that are present per region. This information is available via "Centrum Indicatiestelling Zorg" (CIZ), on a national level, but also per COROP region[22]. From this analysis we were able to determine the absolute and relative need for care from the VVT per COROP region. The problem with these static regions is that they have pre-defined borders and therefore a fixed cut-off point. When analyzing the need for care in a region at the border of the COROP region, information from adjacent regions is relevant as well, however, simply combining these regions would not be a very accurate method.



To increase the accuracy we have used zip codes to break the information down. COROP regions are amalgamations of various municipalities, which can be divided into zip code areas. With the zip code we are able to construct a dynamic area, which is always around the institution. Before we could construct dynamic areas, which are always in a circle around the care institution, we had to deconstruct the COROP areas into zip code areas. This method does rest on the assumption that the need for care is distributed roughly equally in a COROP region.

The third step was to cluster post-code areas in such a manner, that it would be possible to determine the demand in the area around any institution based on the zip code. We have done this by grouping zip codes based on the first two digits, and the adjacent areas and calculating weighted averages based on the number of inhabitants of that area and the number of ZZP indications delivered. We formed 89 dynamic clusters (from the first two digits 10 to 99). By doing so, we

[21] This composition predominantly exists of ZZP 4 and 6. ZZP 8-10 are so small in occurrences that in practice they are found in both ZZP combinations. We however placed them with ZZP 4 and 6 due to the specific nature of the care under ZZP 5 and 7.

[22] COROP regions are made for analytical purposes in the Netherlands. There are 40 COROP regions available and they have been divided based on criteria which would help future analysis and availability of data.

received the absolute and relative demand for care in the environment, and were able to translate this in proportions between the two ZZP combinations. This made is possible to split the capacity of a care building and calculate the stabilized income based on the different needs in the environment.
The advantage of this method is that it allows for dynamic areas, which always use the care institution as the centre and use the information from the area around it calculate the demand. This way, it will probably give a better estimate of what is feasible in that region as it uses the actual need for care in that particular region. It does rest on the assumption that the current requirement of care is a good indication of the future care requirement.

### 5.1.2. NHC compensation

The stabilized NHC income can be calculated relatively easy since we now know the division of ZZP's per region, as the NHC is a fixed amount depending on the ZZP. As we know the proportion of the ZZP's, we can apply this proportion to the NHC compensation, since each ZZP has its own NHC compensation. The problem with the NHC is that it is currently in a transition phase; the shift from full costing towards the NHC is currently taking place. This is a gradual process rather than an abrupt transition, and appendix F shows this transition. Currently institutions thus receive part of the NHC and the other part is still done based on the full costing. However, the full costing is different and unique to each institution. There is, however, no information on the full costing compensation per institution and thus will we use the NHC as if it was implemented to the full extend today. The net effect of this should be marginal, as the NHC is to replace the full costing system, and the cumulative compensation should be roughly equal. The NHC compensations per ZZP and the indexation are shown in appendix D. One important note here is that the indexation rate until 2018 is 2,5 per cent, and after this period it returns to the same level as the ZZP, which is 2 per cent.



### 5.1.3. NIC income

Calculating the NIC compensations is similar to the NHC, in terms that it is also a fixed amount per ZZP, and that the indexation until 2018 is 2,5 per cent, and after this period it returns to the inflation rate. The full costing to NIC process is, however, implemented at a different rate, as can be seen in appendix F. Similarly to the NHC, the NIC is not fully implemented yet; we are, however, indifferent towards full costing and NIC, and will therefore also use the NIC as if it were fully implemented. The compensations we used in our model can be seen in appendix D.

## 5.2. Cost Norms

The ZZP, NHC and NIC compensations are based on research from Wilders and Voetelink (2004), PWC (2010), NZa (2007), and Brouwers, Heinen, Heumen, and Traversari (2014), which have provided insight in the cost structure, and the height of the compensations has been set via these researches. This allows us to express the costs as a percentage of the compensation. This is also practical due to the fact that when the compensation is indexed, the costs are automatically indexed as well. Each income stream has some unique costs and the next sections will elaborate on what these costs are and their height.

### 5.2.1. ZZP costs

As mentioned afore, the ZZP relates to the care component and therefore the costs associated with the healthcare services provided. The cost structure of the different ZZP's can be seen in Table 6.

| | *ZZP VV4* | *ZZP VV5* | *ZZP VV6* | *ZZP VV7* | *ZZP VV8* | *ZZP VV9* | *ZZP VV10* |
|---|---|---|---|---|---|---|---|
| **Personnel costs** | 72,43 | 75,95 | 75,98 | 77,76 | 78,92 | 77,73 | 79,54 |
| **Food and lodging costs** | 11,65 | 8,73 | 8,71 | 7,22 | 6,26 | 7,26 | 5,75 |
| **General costs** | 4,61 | 4,71 | 4,71 | 4,77 | 4,80 | 4,77 | 4,82 |
| **Client- and resident tied costs** | 3,51 | 2,70 | 2,69 | 2,28 | 2,01 | 2,28 | 1,86 |
| **Maintenance and utilities** | 4,97 | 5,08 | 5,07 | 5,14 | 5,18 | 5,13 | 5,19 |
| **Profit margin** | 2.83 | 2.83 | 2.83 | 2.83 | 2.83 | 2.83 | 2.83 |

***Table 6, Costs related to the ZZP revenue expressed as a percentage of the maximum compensation by the Nza. (Source: Wilders and Voetelink (2004), PWC (2010), NZa (2007) and Brouwers et al. (2014))***

As can be seen in Table 6, the higher ZZP's are more labour intensive, and the personnel costs represent the vast majority of the overall costs. These costs have been calculated as a percentage of the ZZP compensation by Wilders and Voetelink (2004) and PWC (2010), and might therefore be somewhat dated. However, they remain the only available insight in the costs of the care on a ZZP level. We have run several tests to check if these proportions are still true, by dissecting various annual reports and the DigiMV database and comparing the costs. We found that these proportions still remain approximately true to what we report in Table 6.

We have made two modifications to the cost structure. First, we have included a profit margin, because our analysis of the annual reports showed that institutions had more revenue than costs related to the care services. The second adjustment we made comes from the fact that these proportions are based on the maximum compensation. However, some of these costs can be influenced or maybe even somewhat navigated based on the occupation rate and the revenue, which is influenced by the purchase discount rate. To determine how much of the costs could be influenced, we conducted another analysis on institutions of which we had the information of several consecutive years. By comparing growth or decline in revenue to the associated costs, we have developed insights in how these costs could be influenced. Due to information constraints, we were not able to conduct correlation analysis, which would allow for more accurate estimates of how much the costs would depend on the occupation and managerial influences. We did, however, gain some insights into the extent to which these costs would be influenced based on the nature of the costs and have implemented this in the valuation model. This has taken form by linking part of the costs to the full compensation and part to the revenue realized. By doing so, we have created artificial managerial influences, by adjusting business activities and costs to the revenue, there is, however, no other information available on this level of detail to avoid this.



### 5.2.2. NHC costs

As mentioned afore, the NHC is a compensation for the capital costs related to the property and the maintenance costs associated with the property, and some other variables such as construction time and temporary residency during the construction (NZa, 2014a). The NZa uses 0,8 per cent of the construction value as maintenance costs in the NHC compensation (NZa, 2014a). When expressing these maintenance costs as a percentage of the compensation, it represents roughly 12,3 per cent; see appendix E for a specification of this number. These costs are standardised and based on a

calculation of Bode, Brouwers, and Heumen (2010). From these standardised costs, we can no longer differentiate between costs differences per construction year and size of the property. We argue that there will be differences between the maintenance costs and the construction year of a property. Based on research by Brouwers et al. (2014) and Koëtler (2014), we differentiate between six different time periods with respect to changing rules and construction techniques in these periods. Therefore we argue that there will be a difference between the maintenance costs between these periods. There is, however, no information available about each of these periods for care capital. A similar problem arises with respect to the size of the property; common sense dictates that when the number of units in a building increases, the maintenance costs per unit go down due to scale advantages[23]. To still be able to differentiate between the maintenance costs of a property based on its size and construction year, we have combined maintenance cost information from Koëtler (2014); van de Waeter and van Lienden (2014) with information on square meters from van der Aalst et al. (2010). This allowed us to create four different types of property, for which we could calculate the maintenance costs per ZZP, see Table 7.

| Type of property | ZZP VV4 | ZZP VV5 | ZZP VV6 | ZZP VV7 | ZZP VV8 | ZZP VV9 | ZZP VV10 |
|---|---|---|---|---|---|---|---|
| **Small-scale, simple, max. 24 units** | 10,32% | 8,90% | 8,91% | 8,90% | 8,92% | 8,93% | 8,93% |
| **Medium-scale, simple, max. 50 units** | 9,00% | 7,76% | 7,76% | 7,76% | 7,77% | 7,79% | 7,78% |
| **Large, simple, min. 90 units** | 7,05% | 6,09% | 6,09% | 6,09% | 6,10% | 6,11% | 6,10% |
| **Medium-scale, modern, max. 50 units** | 8,72% | 7,53% | 7,53% | 7,53% | 7,54% | 7,55% | 7,55% |

***Table 7, Maintenance costs per property type expressed as a percentage of the NHC compensations***



As can be seen, it is possible to differentiate between properties based on size and year of construction. The differences in the maintenance costs expressed as percentages of the NHC compensation come from the fact that the NHC compensations are different per ZZP and the gross floor space is different per ZZP. The only differentiation we could make for age was for the medium sized property, there is, however, no fixed cut-off year mentioned, only modern. Therefore, we will regard properties constructed after 2000 as modern, after this period there has been no change in construction methods (Brouwers et al., 2014; Koëtler, 2014). It is noteworthy that even for the small scale properties the maintenance costs are not higher than the mentioned NZa norm of 0,8 per cent of the construction value. By creating an annuity of the known parameters (rent, construction costs and depreciation period (NZa, 2014a), we tried to determine how much maintenance could be afforded based on the NHC compensation, and had to conclude the NZa norm was rather high. The annuity we constructed showed a negative income the first couple of years and a marginal result the years after. The net present value of the deficit and surpluses was little more than zero. As care institutions do not have a very strong equity position, we argue that the maintenance costs calculated in table 7 based on Brouwers et al. (2014); Koëtler (2014) are more realistic and affordable. This information is also more recent, and therefore will represent the maintenance costs in our model. A graphical representation of the annuity constructed can be seen in appendix G. During the case testing, we will test the sensitivity of the model by also testing with the Nza norm and measuring the effect.

[23] The ideal company size is unknown and thus we assume that with an increase in size the per-unit-cost will decrease and that there is no diseconomies of scale effect from a certain size on.

### 5.2.3. NIC costs

The NIC compensation has been used to calculate the standardised inventory investment per ZZP. This was necessary due to the unavailability of information on standard investments in inventory per room or ZZP. The NIC compensation set by the NZa should be sufficient to cover all the costs during the lifetime of the investment (NZa, 2014a). Thus the effect of using the compensation to determine the investment value is that the return of inventory is equal to the compensation. Therefore, the return on and the return of inventory will together be slightly higher than the NIC compensation by default. The impact of this "standard loss" is, however, very limited as the NIC only represents a small part of the total cash flows. When calculating the return on inventory, we assumed that the inventory is all equity financed. As we have mentioned afore, on a sector level, the inventory can be regarded as a constant, since the replacement is a gradual process rather than abrupt all at once replacements. When translating this to individual institutions, it indicates that throughout the year multiple small investments in inventory are made. As the replacement of inventory is a gradual process, with multiple relatively small investments, we assume inventory is all equity financed. For our WACC model the highest possible return on equity is roughly 11 per cent. Since there is no alternative information available on the required return on inventory, we will use the 11 per cent return. The reason we use the highest possible return from our model comes from the fact that there is more risk associated with financing inventory. The inventory of care institutions is not fashion dependent, and most of the inventory is non-specific. The inventory is, however, subject to every day wear and tear and therefore the depreciation period is ten years. This relatively short depreciation period represents rapid value reductions and a risk that when the institution is in financial distress, the sale of inventory will not recoup the invested value. The NZa used a 4 per cent interest rate in their calculation for the NIC as they assume it will be (partially) financed with a loan (NZa, 2014a). Therefore, some of the return on inventory is already included in the return of inventory. To calculate the return on inventory we thus subtract the 4 per cent from our 11 per cent, and thus use a return of 7 per cent in our model.



## 5.3. Auxiliary property

Some healthcare properties are located in a cluster of multiple healthcare properties. Most of these buildings are concerned with delivering care, however some solely offer auxiliary activities, such as administration or catering activities. These properties do not generate a (direct) income, however, they are necessary to perform the activities in the care buildings and generate revenue from care activities. These properties cannot be valued by the same method as the care properties. These buildings do probably have more resemblance with an office building than a care building, in terms of layout and facilities in the building. However, it is unlikely that another party, other than the current user, will use this "office space". Main criteria for such an "office building" to be beyond comparison are factors such as the location, the layout and facilities which it offers. There are currently many vacant office properties in the Dutch office market, and some of the main grounds for this vacancy are that the offices are not on favourable locations, are not suited for multitenant use and do not offer the range of facilities which are demanded (Dynamis, 2014). The valuation of these auxiliary buildings will be challenging, as it is unlikely they have no value at all, however this is outside the scope of this research. It is also unlikely that individual buildings within a cluster will be sold, rather the cluster as a whole represent a certain value. The costs of these auxiliary services are included in the ZZP, as they are relevant costs, and required to perform the care activities.

## 5.4. Land allocation and excess land

Sometimes clusters of care property or individual care properties have more land than is functional or ancillary to the building or property, which is on the land. We are specifically referring to land being productive or not. In other words, does all the land contribute in the cash flows being generated or the activities performed inside the care building on it? It is problematic to determine how much of the land contributes, to the value creating process. Another real estate type that frequently has to deal with this problem is warehouses, they reserve land for future expansion or for the storage of goods outside (ten Have, 2007a). There are two factors, which are important when considering excess land; how to determine what is excess land and what is not? Second, if there is excess land, what is its value? To determine if and how much excess land a property has, the land-to-building footprint ratio can be used (Sonneman, 2001). This ratio can be calculated as follows:

$$Land\ to\ building\ footprint\ = \frac{Square\ footage\ of\ land}{Square\ footage\ of\ building\ footprint}$$

*Equation (12), Land-to-building footprint*

In most markets, the typical land to building ratio is roughly between 2,5 and 3,5, however, some properties can vary quite dramatically from this range (Sonneman, 2001). A typical ratio used according to ten Have (2007a) is around 2, however this cannot be assumed as the standard due to deviations in the properties. There is no standard ratio which can be used as a land to building footprint, therefore we will use the average of the range mentioned by Sonneman (2001), which is 3. The second problem of excess land is to determine the value of this land. The value will depend on whether the land can be sold separately from the rest of the "functional" land. The value of the excess land will vary greatly depending on whether it can be sold or not, and the potential development (the HABU of the land). Excess land is land which is part of the property object but must not be allocated to the building (ten Have, 2007a). Due to the fact that the value of excess land does not belong to the property, it is outside the scope of this research, and will therefore be excluded of this research. The mentioned footprint can be used to determine how much of the land is productive and belongs to the property, but is largely outside the scope of this research.



## 5.5. Chapter summary

This chapter covered the normalised income and costs of a care property. Since the second objective of this research is to standardise the framework in which the valuation takes place, we have made an attempt to standardise the input parameters. We have standardised the purchase discount received and occupation rate based on a survey among institutions in the VVT sector. This has been done to eliminate the effects of below or above average management performance. Similarly, we have standardised the costs associated with the production, which are outside the influence of the property, as variations in these costs should not affect the value. We mentioned the auxiliary properties and functional land, which are important aspects to take into account when properties have more land than is functional and are clustered. They are, however, mostly outside the scope of this research.

# 6. Valuation framework

Now that we have analysed all the income and cost components for the care properties, we have to determine the discount rate and terminal value. These are the final variables that have to be analysed before the model can be tested and validated.

## 6.1. Estimating the discount rate

In order to identify the appropriate discount rate, we have made quite an extensive analysis. As mentioned afore, the ideal discount rate comes from a reference transaction, however these are not available. Nor was there any background information on the current discount rate used by appraisers. From the interviews we have learned that appraisers use an IRR as discount rate, which they derive from the BAR. We indicated that it is problematic to use a BAR as there is no market rent. In various taxation reports, we have noticed that the BAR is deduced from the BAR of office buildings, which are an entire different asset class. We therefore argue that this discount rate cannot be used to determine the market value. We use the WACC model to determine the discount rate as indicated earlier in this research; where we use the MRP to determine the required return on equity. The assumption here is that the average risk premium of care assets is similar to the average equity risk premium of the stock market as used in the research from Weimer et al. (2014). We are aware of the possible consequences this assumption has and have mentioned several of them under chapter 4.

### 6.1.1. The important value drivers

The first step to translate the MRP into a discount rate was to identify the value drivers of care capital. These value drivers come from two sources, the general real estate literature and the FZT. The value drivers from both these sources have been mentioned under chapter 3. Table 8 shows the most important value drivers, which are allocated to the discount rate.



The rationale behind these value drivers is twofold; first these are the value drivers that proved to be most important by analyzing various literature, appraisal reports and the results from the FZT. Secondly, since these are factors scored in the interviews, it was necessary to group them to decrease the complexity of scoring them in the AHP model for the interviewees.

As we indicated earlier in this research, there are many variables that influence each other or partially measure the same effect. We have tested the variables for which we had sufficient data on correlation and table 9 shows the results. As can be seen, there are some variables with a fairly strong correlation, which is in line with what we expected. Even though this correlation exists between some of the variables, we argue that there are some important differences as well. None the less is multicollinearity a problem. Some common methods to eliminate the multicollinearity are to omit one of the variables or via the partial leas square regression (PLS). Both of these methods cannot be performed in our research, as the impact of each variable would have to be calculated again, and for this new interviews would have to be conducted. We are aware that multicollinearity is a problem, we are, however, unable to correct for this.

| *Level* | *Value Drivers* | *Fundamentals* |
|---|---|---|
| **1** | **Location an region** | Accessibility, regional demographics, urban area or periphery, Competition in the environment, facilities in the direct environment (General practitioner, convenience store, Parks) |
| **2** | **The property object** | Quality perception of the care service, features of the property, building year and, size of the building and size of the rooms |
| **3** | **Market risk and non-market characteristics** | Governmental influences via rules and regulations , development of building costs, development of demand and supply, discontinuity of expected income |
| **1.1** | **Regional demographics** | Growth or shrinkage area, Relative use of intramural care in the environment, Average age in the area |
| **1.2** | **Urban area or periphery** | Urban area or periphery, (G4, G32 or adjacent municipalities or periphery |
| **1.3** | **Competition in the environment** | Competition in terms of number of ZZP's delivered in the area relative to the number of institutions |
| **2.1** | **Quality perception of the care service** | Additional services, Night care (Safety),Lodging possibilities for family members |
| **2.2** | **Features of the property** | On the area of living, well being and lifestyle. Thins such as additional room for communal activities and landscaping areas |
| **2.3** | **Building year** | Building year or year of last (full) renovation |
| **2.4** | **Size of the building and size of the rooms** | Size of the building in terms of number of rooms and size of the rooms. |

*Table 8, Value drivers determining the discount rate and underlying factors*



| | **Competition** | **Average age** | **Growth or contraction area** | **Usage of AWBZ related care** |
|---|---|---|---|---|
| **Competition** | 1 | - | - | - |
| **Average age** | -0,07 | 1 | - | - |
| **Growth or contraction area** | 0,00 | -0,76 | 1 | - |
| **Usage of AWBZ related care** | 0,21 | 0,45 | -0,44 | 1 |

*Table 9, Correlation of variables and value drivers used to determine the discount rate*

### 6.1.2. Quantification of the value drivers

After we analysed which the most important value drivers are, we quantified them so that they could be estimated for care property. This quantifying process was a rather time consuming process, as most of the information was not readily available or comparable at first. The information was provided in various forms such as per COROP region or WMO regions. The only common denominator between all these different regions is the zip-code areas. By reducing all the information to zip-codes and then constructing dynamic areas in a similar fashion as was explained under chapter 5, we were able to construct information which we could compare and measure based on averages and deviations from these averages. This also rests on the assumption that the information is equally spread throughout each region. One advantage of this method, next to the fact

that it enables comparison of the information, is that the information is always from the area around the real estate. The next sections will shortly elaborate how we have chosen to quantify or measure all the variables and why we have chosen to do so.

#### 6.1.2.1 Location and region

This value driver consists of five factors, which we have measured and defined:

1. Accessibility
2. Regional demographics
    a. Growth or contraction area
    b. Usage of AWBZ related care
    c. Average age
3. Urban area or periphery
4. Competition in the environment
5. Facilities in the direct environment (General practitioner, stores, Parks)

The accessibility of the area is a general real estate parameter but was not deemed important by the respondents of the FZT. In general, when an institution is well accessible, it has a positive effect, as the residents are more mobile and their relatives can visit more easily. This variable has to be estimated, due to the constraint on information availability, and we have done this by defining three possibilities: well-, average- and ill-accessible, based on how close the institution is to a freeway, and if public transport is available.

The regional demographics are determinants of potential clients in the direct environment and consist of three variables. All these variables could be measured and thus dynamic areas have been constructed in a similar fashion as explained earlier. There are growth and contraction areas[24] and this indicates whether an area experiences a(n) (expected) growth or decline in population. When there is a decline in population this indicates fewer personnel available for the institution and less potential residents. The usage of AWBZ related care in the environment[25] is another measure, which indicates the attractiveness of the area in terms of potential residents. When an area has a high rate of AWBZ users, it is potentially very attractive. This variable has a rather strong correlation with age, as was expected. We included both since we argue that there is an important difference between them, since AWBZ users also have to pay an own contribution, wealth can be a important determinant for them to either use or AWBZ care or not. Wealth is not measured in the age variable, but it is included in the AWBZ use in the area. We did not include the wealth variable itself as it is difficult to measure. The last variable under regional demographics is age[26], and this variable also indicates the attractiveness of the area, as the use of intramural care increases with age (Argumentenfabriek, 2012). Based on averages and deviations from this average, we were able to define seven points that are associated with the risk for all the three variables.



[24] This information is available on a COROP area level
[25] This information is available on a WMO area level via Vektis
[26] This information is available via CBS on a zip code level

Urban area or periphery is a general real estate variable and is an indication of various elements such as the value of the land, the alternative uses of the land and attractiveness of the area. There are three possible classifications, G4 cities and suburbs, G32 Cities and suburbs and periphery. Within cities, it is most likely easier to realize a high occupation, as there are more potential residents in the environment and, in general, it is well accessible. .

Competition in the environment is an indication of how easy it is to maintain high occupation rates. This variable was not deemed important by the respondents of the FZT. We, however, feel that we do need to include this variable as we base our model on an income method and occupation is an important determinant of the value. A possible explanation of why competition was not seen as an important factor by the respondents of the survey is that up until the recently implemented changes, it did not play a role. Institutions would receive full compensation regardless their occupation rate and performance otherwise. We therefore feel that this variable is currently underestimated but will be an important determinant on occupation rate. We have measured the competition in a certain area by relating the number of institutions and the number of ZZP's delivered by institutions in that area[27]. Based on the number of ZZP's per institution, we created groups of 20 per cent percentiles, which indicate a relative competition score.

The final variable under this value driver relates to the facilities in the direct environment of the real estate. Research of Castelijns, van Kollenburg, and Meerman (2013) has shown that residents have some preferences regarding facilities in the direct environment, of which stores, general practitioners and parks proved to be the most important. Therefore, we argue that if these facilities are present in the direct environment, it will be a determinant of how well an institution is able to have high occupation rates. This variable also has to be estimated, and we therefore, define “in the area” as reachable within ten minutes, and used three possible scores. All in the area, one or two in the area or none in the area.



#### 6.1.2.2 The property object

This value driver consists of four factors, which we have measured and defined:

1. Quality perception
    a. Quality of the care service
    b. Night-care
    c. Lodging possibility
2. Features of the property
    a. Communal rooms
    b. Landscaping around the property
3. Construction year or year of full and complete renovation
4. Size
    a. Number of rooms
    b. Size of the rooms

[27] This information was retrieved from a Digi MV public dataset: https://www.jaarverslagenzorg.nl/zorginstellingen/jaarverantwoordingzorgwieenwaarom/gebruikgegevens/openbaredatasetsdigimv.asp

The quality perception was rated the most important criteria in the FZT and relates to how comfortable residents perceive the care services (factors such as personal sanitation facilities, meals on wheels, safety (night-care), lodging possibility, etc.). Although these factors (partially) depend on the institution, it is also an indication on how effectively the real estate can be deployed to realize high occupation rates, and how well it is able to deliver care, which meets norms and standards in the near future. To measure the quality of the care service, we checked for a quality mark. There are various quality marks which check for compliance to imposed and planned norms and standards. Having such a quality mark will therefore reduce the risk of not being able to comply with future norms and standards. Both night-care and lodging facilities are needs from residents and enforce a feeling of safety. Since they are preferences, they will help maintaining a higher occupancy rate. It is, however, also an indication on whether the property allows for such services, and is thus prepared for current/future needs. The quality of the service and the possibility of night care have both been rated as important by the respondents of the FZT. Research form Castelijns et al. (2013)also showed that residents have a preference for lodging facilities for visitors/relatives.

Features of the property is also a variable from the research of Castelijns et al. (2013), and is an indication of how well the property can be used to anticipate to the needs of the residents and is therefore an indication of how well it is able to maintain a high occupancy rate. Communal rooms refers to rooms which can be used for activities. Residents have a preference for properties with communal rooms, and it is therefore an indication of how well a high occupancy rate can be realized.

The construction year of the property is an important indication on the remaining functional life. As discussed earlier, the previous depreciation period of 50 years was not realistic due to the rapid aging of the property and the functional obsoleteness. This is, inter alia, caused by fast changing norms and standards. Examples of changing norms are mandatory installations such as peak cooling and ceiling hoist. Installations as such are integrated in structure and are difficult to remove or replace once new norms are introduced. Additionally, the current capital compensation is based on a functional lifetime of 30 years, which is the best estimation of the lifetime we currently have. Under the previous depreciation period it was not uncommon for a building to be demolished before it was fully depreciated. From this we can see that the first period of 50 years was unrealistic, and that properties had no residual value (no alternative uses), thus they were demolished. Therefore, we believe that the 30 year period currently used is more realistic and that this represents the functional lifetime. Additionally, age has been rated as an important criteria for realizing a high occupancy rate. The logic behind this might be that "newer" properties are better equipped to deal with current needs of the residents.



For the size of the building we identified two variables, which influence the value of the property. The first variable, the number of rooms, refers to the minimum number of rooms necessary to allow for an efficient use of the property. In recent years, there had been as shift in the care approach[28], small-scale living has been introduced as a form of care. This indicates that small groups of six to eight people live together rather than whole sections or divisions. This has been a huge success from the perspective of the client (Krijger & Brouwer, 2011), as they feel very comfortable in a small-scale

[28] This is mostly true for people whom require ZZP 5 or 7 care. The other ZZP's do not (hardly) have small scale living projects.

living environment. The problem with these projects is that it is difficult to be efficient in terms of costs, as there are no scale advantages, therefore the costs are high. To allow for more scale advantages, usually several of these groups are combined in one building, i.e. multiple large apartments in a building. The minimum number of total inhabitants, which is regarded as feasible, is 24 (Krijger & Brouwer, 2011), which is made up by three or four groups of 8 or 6 persons. If there are fewer residents in a care property, it cannot be used cost effectively. Although there is no hard data available on this number, we use it as a lower bound to determine if the property itself can be used cost effectively. This variable will therefore be a dummy variable.

The size of the rooms is a variable which was indicated as (marginally) important from the research of Castelijns et al. (2013) and the respondents of the FZT. It contributes in realizing higher occupancy rates as residents have a preference for larger rooms compared to smaller rooms. Due to unavailability of data on size of all the rooms in the in the intramural care within the VVT, we had to make a crude estimations based on the information that was available. Based on Vroon and Schreeder (2005), we have been able to establish an average sized room in the intramural VVT and standard deviations from this average. Although we use this data in our model, we have to conclude that this information is fairly dated as the research was performed in 2005, and therefore does not necessarily represent the current situation. However, due to the unavailability of more recent data on this subject, we will use it none the less. The second problem with this data is that during the research it was more common than now to have multiple-person rooms. From our interviews we learned that currently appraisers are sceptical about multi person rooms and the ability to use them as such in the future. This scepticism is enforced by the fact that for several years now, a trend towards more privacy and single person rooms has been noticeable in the care. The goal of the government was to have only single person rooms left in the care in 2010. Although they did not succeed in pursuing this goal, the message is clear: there is no future for multi person rooms in the care. Since there are still some institutions that have multiple-person rooms, we implement a penalty for this in our model. We will treat multiple-person rooms, as single person rooms, thus the number of rooms will be used in our model rather than number of possible residents.



#### 6.1.2.3 Market risk and non-market characteristics

This third main value driver has been constructed differently than the other two. There are variables such as governmental influences and discontinuity of expected income for which it is difficult to measure the impact. This is also true for development of demand and supply and the development of building costs. Although these variables can be measured, governmental choices can have large impact on them. For example with the current extramuralisation of the lower ZZP's. This has no (or limited) effect on the demand, as the people still have a need for care; it has however a large impact on the supply side. Since we cannot measure these variables well, we have grouped them under one value driver. And have the interviewees assess the impact of it as a whole, rather than individual components.

### 6.1.3. Impact of the value drivers

After the value drivers of care property have been identified, the impact of each of them had to be estimated. This is done via interviews, and scoring the value drivers relative via the AHP model. This has two large advantages; first, by using the AHP model we can omit the values which score too high on the consistency index, which indicates that input is next to random. Second, because all the comparisons are relative to each other, the interviewees can express what they regard as important

and unimportant without committing to a fixed increment to the discount rate. The interviewees are mentioned in appendix A. Our interviewees are from as many different disciplines as possible (although most were related with assessing risk and or value), in order to gain insight in the risks associated with care capital from every possible angle. The fact that many different disciplines where interviewed, and thus filled out the AHP model, also contributed to a wide range for every value driver, as most disciplines have a different opinion on the value drivers. Table 10 shows the impact range of the value drivers based on the AHP model. Scores with a too high consistency index score were omitted in an attempt to increase accuracy.

| Value drives | Lowest impact score | Highest impact score | Average impact score | Increment on discount rate when scoring average |
|---|---|---|---|---|
| 1 | 7,38% | 72,35% | 39,86% | 2,02% |
| 2 | 8,82% | 73,11% | 40,96% | 2,08% |
| 3 | 8,33% | 66,87% | 37,60% | 1,91% |
| | | | | |
| 1.1 | 66,87% | 72,35% | 69,61% | 0,85% |
| 1.2 | 8,33% | 19,32% | 13,82% | 0,17% |
| 1.3 | 8,33% | 24,31% | 16,32% | 0,20% |
| | | | | |
| 2.1. | 11,97% | 57,06% | 34,52% | 0,66% |
| 2.2 | 13,60% | 63,43% | 38,51% | 0,74% |
| 2.3 | 4,98% | 7,65% | 6,31% | 0,12% |
| 2.4 | 13,92% | 43,40% | 28,66% | 0,55% |

***Table 10, The relative impact scores of the various value drivers based on the various scores assigned during the interviews and the increment of each value driver on the discount rate.***



In order to keep the AHP model as simple as possible the value drivers have been classified in various levels, whereby the various levels could be incremented. Most of the interviewees, however, still perceived the AHP model as rather difficult. The interviewees filled out three tables each. From the total of 30 tables 11 proved to be too random and the results from these have been omitted. Based on the 19 remaining tables the impact of each value driver could be calculated, as shown in Table 10. As the assumption is made that an average care property should have a return on equity similar to the MRP of six per cent incremented with the RFR, which also seemed to be in line with average return of equity in the research of Castedello and Schöniger (2013), we calculated the impact per value driver based on deviations from the average. This method allowed us to estimate the return on equity required based on the perceived risk of the property.

## 6.2. WACC

The estimates explained in the previous chapters enabled us to construct the return on equity in our WACC model. The two remaining components to determine the WACC are the (rent) costs of long-term loans and the proportion of debt in the company. To calculate the average cost of long-term debt the Interest Swap Rate (IRS) with a maturity of 30 years was used, and incremented with a percentage based on secured or non-secured loans. The current IRS for thirty years is 2,45 percent[29]. One critical note here is that this IRS rate is currently very low due to the low interest rates and is likely to increase over the coming years. In the Netherlands, we have a fund (Waarborgfonds voor

[29] Retrieved from http://www.finance-ideas.nl/marktinformatie/Treasury_Update.pdf at 21-9-2014.

Zorginstellingen in Dutch (WFZ)), which guarantees long-term loans, leading to low cost of debt. Information on how many secured loans care institutions have in relation to unsecured loans is not (publicly) available and therefore this is assumed to be equally divided. When a loan is secured via the WFZ, the IRS is incremented with 0,75 per cent interest (NZa, 2014b). When a loan is unsecured the base loan is incremented with an average of 3 per cent. This leads to an average interest rate of care institutions of 4,33 per cent. When comparing our rate to a research from Riksen (2013), we can see that our computed percentage scores slightly above the average of care institutions in 2012. The proportion of debt in various care institutions has been calculated based on the available dataset on DigiMV. By calculating the weighted average solvability of the care institutions over several years, the average proportion of debt in the company could be determined, see Table 11 for the results.

| Year | Solvability | Corresponding proportion of debt |
|---|---|---|
| **2009** | 28,22% | 71,78% |
| **2010** | 28,80% | 71,20% |
| **2011** | 29,74% | 70,26% |
| **2012** | 30,98% | 69,02% |
| **2013** | **32,48%** | **67,52%** |

***Table 11, Time series solvability of care institutions***

It seems from the table that there is a trend towards gradual improvement of the solvability. In the WACC model the proportions of debt and equity as they were in 2013 are used. We choose to use the solvability of 2013 as institutions are actively trying to improve their gearing ratio. This is also required by lenders. Appendix H gives an example of a WACC computation for a fictive institution. Table 12 shows the range in which the WACC will be located regardless of the input.



| | Lowest | Highest |
|---|---|---|
| **Market Risk Premium** | 4,78% | 9,01% |
| **Required Return on Equity** | 7,19% | 11,42% |
| **Cost of debt** | 4,33% | 4,33% |
| **WACC** | 5,26% | 6,63% |

***Table 12, Range in which the WACC will be located***

When the figures from the table are compared with the test we ran earlier in this research, we can see that the required return on equity is slightly higher than in our test. This can be (partially) explained by the fact that the impact range of the value drivers is wider than used in the test. This also explains why the range in WACC is slightly higher than in the test we ran. It clearly shows that due to the leverage of care institutions, the spread between the highest and lowest WACC is very limited. This leads us to believe that this model will have difficulties estimating the discount rate for high risk or low risk assets, as the upper- and lower boundaries are fixed. When we compare the estimates of the required return on equity with the estimates of Elter and Castedello (2012), which are 7,5 and 11,1 per cent, we see that they are fairly similar. Castedello and Schöniger (2013) report an average cost of equity of 8,8 and 9 per cent for the Healthcare and real estate sector respectively. The average return on equity in the model is 9,3 per cent and thus slightly higher, however, it results in a lower WACC due to low cost of debt and the high leverage in the Netherlands. When the return on equity estimates are compared with the return equity investors in real estate in the Netherlands

realized in 2013, we can see that they realized returns between 5,3 and 12,3 per cent (Mosselman, 2013). We, therefore, believe that our equity estimate is in line with market expectations. The above made comparisons are merely to obtain an indication of the range in which it should be, as mentioned earlier, and we have by no means the intention to mirror these rates.

## 6.3. Market parameters and transparency

Using the afore mentioned variables and value drivers in our model contribute to the transparency of the model. First of all, we omit individual institution effects by standardising the occupancy and purchase discount rate. Standardizing these rates allows us to omit managerial influences on these rates and thus makes the value estimates comparable. Secondly, the various variables used to determine the discount rate, have been derived from public sources and are thus available to everyone. By doing so anyone can use the same input for valuation estimates and information is relatively easy to keep up to date. Using market and publicly available information contributes to the transparency of the model. As the intransparency is one of our objections to the current valuation practices, we aimed to improve this by using market factors and parameters. By structuring the valuation process and approaching it from a scientific perspective we have aimed to standardise the valuation framework.

## 6.4. Chapter summary

This chapter covered the last part of the valuation framework, the discount rate, for which the Weighted Average Cost of Capital is used. The WACC is used for computing the discount rate since we argue that the property cannot be alternatively used and thus only care institutions will use the property. The cost of debt is relatively easy to compute as there is quite some data available on how to compute it and some reports with historic data to compare it with. By using industry averages on the cost of debt the influences of an individual company on this cost of debt are excluded. This is also true for the proportion of debt in the company relative to the equity in the company, the gearing ratio. Since industry averages are used, the effects of a single, above or below average leveraged institution, are excluded. The required return on equity is calculated by using the average MRP of a more liquid and transparent market, and correct this for above or below average scores on the various value drivers. An average risk profile for a care institution is estimated, by quantifying various value drivers from the literature and the FZT. By interviewing various actors in the care industry, this subject has been exposed from multiple angles, and via the AHP model the impact of each variable was calculated. Although we are aware that it is very probable that multicollinearity exists between our variables, we are unable to correct for this effect due to the unavailability of data. This is also true for endogeneity. To analyse the value drivers, we have looked at the problem from multiple angles, this however does not exclude the possibility that there are missing variables. Since we are unable to make a regression, due to insufficient data, we are not able to make any inferences regarding this problem.

# 7. Case testing and validation

This chapter focuses on testing the model on business cases to compare the value estimates. This involves two steps: first, gather the necessary data for the model and compare the results to other recent performed valuations of the same object. Second, present the model and its value estimates to experts during an interview and discuss the potential of the model. It is not possible to test the validity of the model against transaction prices as they are not available.

## 7.1. The cases

To gather the required data for the model, several institutions have been contacted with a request for information, which we could use as input to the model. Two institutions replied and were willing to cooperate, and provided the information necessary for the valuation. As these institutions wished to remain anonymous we will henceforth refer to them as A and B. Table 13 gives some information on both cases:

| | A | B[30] |
|---|---|---|
| **ZZP Mix currently offered** | ZZP 5 and 7 | ZZP 3 - 8 |
| **Number of rooms** | 95 | 100 |
| **Remaining exploitation time[31]** | 18 | 15 |
| **Average room size ($M^2$)** | 10 | 25,8 |
| **Computed WACC** | 5,87% | 5,92% |
| | | |
| **Recent Taxation value** | € 8.500.000 | - |
| **Recent going concern value** | €9.300.000 | € 6.642.000 |
| **WOZ 2014** | - | € 6.958.000 |
| **Book value (after impairment)** | - | € 7.253.000 |

***Table 13, Model Input information on two care properties, computed WACC and the value estimate of the care property under alternative valuation methods.***

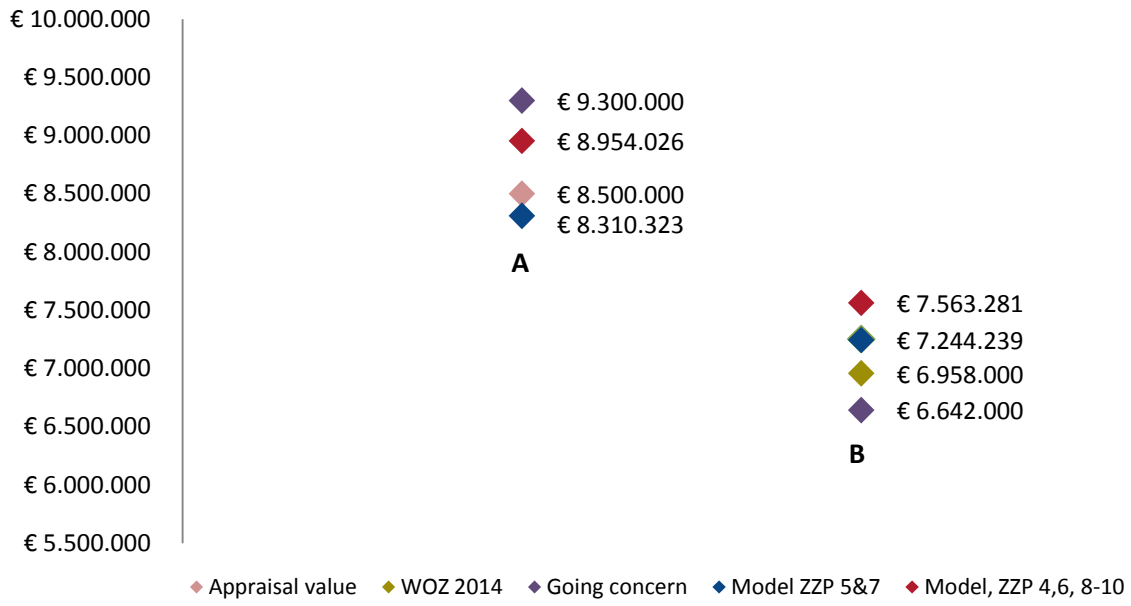


The properties from both cases have many similar features, and although the location of the properties is quite different, the effect in the discount rate is limited. The ratio between equity and debt also tempers the differences somewhat, as the difference between the required equity return is 17 basis points, which is more than three times the difference between the two WACC's. The model has been constructed in such a manner that the input information needed is minimal. Most of the input is required to calculate the WACC. Once this is done all the information required to calculate the value is the information in the table above. As mentioned under chapter 5, the model differentiates between two ZZP mixes, as these two mixes occur most frequently. This results in the model producing two different value estimates, with a small difference between the two values. The difference is roughly 5 per cent, and the logic behind these two different values comes from the fact that the higher ZZP's are more sensitive to labour costs, as can be seen in Table 6. Since part of the

[30] For this case some modifications to the model had to be made, as they are currently in the process of transforming 40 rooms. These rooms are partially rebuild to be able to rent them as "regular" apartment with extramural care services. To correct for this these 40 rooms are excluded from the model. The value of these 40 rooms is calculated based on their cash-generating potential based on the basic rent for these "apartments". The time horizon is extended with 15 years, as they are a quite different division of the property, otherwise used similar parameters in the calculation.

[31] Based on construction year, or year of complete renovation and a functional lifetime of 30 years

cost are dynamic (dependent on revenue) and part static (fixed amount based on maximum ZZP compensation), and the fact that the personnel needed to treat higher ZZP's is more expensive, higher ZZP's are more sensitive to lower occupation rates and higher discount rates on the maximum compensation. Since all the rates are normalised in the model, properties that offer ZZP 5 & 7 will by default have a slightly lower value. Graph 4 plots each value estimate for both properties. The value computed via the model represents the market value in rented state. We cannot make any informed estimates about the market value of a care property free of rent and use. A possible alternative estimate for the market value free of rent and use could be when one has more insight on the process of furnishing and gradual filling up of the property when an institution is moving in, but this is outside the scope of this research. From the two value estimates our model produces, the ZZP mix closest to the currently offered ZZP mix represents the best value estimate.




*Graph 4, property values from different valuation methods plotted*[32]

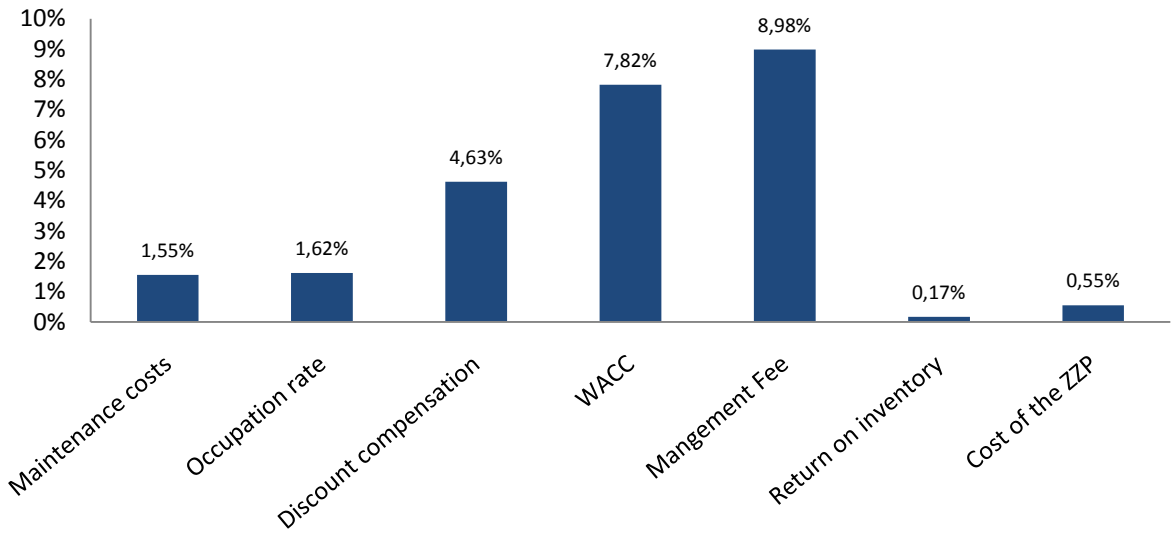
## 7.2. Sensitivity analysis

To test the sensitivity of the model on some of the parameters used and the value effect, various sensitivity tests have been conducted. Throughout this research, several aspects, on which the model's sensitivity would be tested, have been mentioned. The enumeration below lists all the aspects on which the model has been tested for sensitivity:

- Maintenance costs
- Occupation rate
- Discount on the compensations received
- WACC
- Management fee
- Return on inventory
- Costs of the ZZP (Vary between dynamic or static)

[32] For property B the book value of the asset is almost equal to the model ZZP 5 & 7 value, the book value is €10.000 higher, however to keep the graph clear the value does not show in the table.

For all of the parameters mentioned, the sensitivity has been tested in the following manner; the input in the model of the parameter has been increased by one per cent ceteris paribus, and the percentage change in output has been measured. Graph 5 shows the results from this sensitivity analysis.




*Graph 5, Sensitivity of the model on some of the different parameters in absolute percentages when the parameter is changed by one percent and the effect is measured in the value prediction of the model*

The impact of each variable varies from hardly any effect to a massive value impact. As indicated afore, using assumptions is an inherent process in a discount model, and therefore important that these assumptions are underpinned. Graph 5 clearly shows that some small variations in some of the input data can have large effects on the value estimate. Most of the effects of changing the parameters in the model by one per cent are in line with our expectations, except for the management fee. The effect of this variable on the value is far larger than we anticipated, and is the result of how this fee is calculated. This variable represents the business value, and is taken as a percentage of the care revenue. Increasing or decreasing this percentage has a large effect on the FCF and therefore the value.



## 7.3. Validity of the model

As a result of the novelty of this approach towards this subject and the lack of information on market values of intramural care, such as transaction prices or even appraisal reports, it is not possible to make statistical inferences on the value estimate of the model. In absence of this possibility the model had to be validated via alternative methods. Therefore, interviews with experts on validation and the healthcare market have been conducted, appendix I provides a table with the interviewees. During these interviews, the model and the value estimates were discussed, and also placed in perspective with the few reference values available.

Five main areas have been discussed during these interviews; assumptions and principles, normalised income and costs, WACC, comparison to the two cases and the limitations of the model. The next section will describe the comments and feedback received in the same chronological order as the subjects mentioned above.

The assumption that care property has a technical lifetime of 30 years might be true for most of the care property currently on the market. Since these properties have not been constructed in such a manner that they can be easily adapted to meet current or newer standards and they have no alternative use. This comes, inter alia, from the fact that the rooms are too small to transform them into regular apartments. However, newer care properties are built with these two aspects in mind. The rooms in these properties are larger so that alternative uses such as regular apartments become feasible. They have also been built with the intention to deliver intramural care and are better equipped for this task, as opposed to most of the care property currently out there, which was, or is, not always equipped for the task. Therefore, it might very well be possible that newer care properties have an extended functional life compared to the 30 years, which we use now. The comparison with hotel real estate is a surprising comparison, however does have it merits.

The use of all the normalised incomes and costs to calculate the market value is different from the current situation to calculate the market value. Most of the appraisers, or companies that let their real estate to care institutions, use the NHC for the market value estimate. Additionally, do most of them use the maintenance costs which the NZa indicate, which is the 0,8% of the replacement value. This charge might be more than sufficient to cover these expenses, the VEX norms might underestimate the real costs somewhat.

The computation of the discount rate via WACC is rather novel, compared to what is currently done and does deviate from the rates currently used. Although the incremental approach for the discount rate used in our model is more transparent than the discount rates currently used in most appraisals, the market value is estimated by these current discount rates. Therefore, the approach deviates from the current methods used and thus from current market value estimations in the real estate sector. Using the unsystematic risk of a portfolio as an indication for average risk of care property does seem as a viable approach, and a better estimation of the cost of equity than the number institutions currently use. This ranges from between 3 to 5 per cent.



The value estimate of the model compared to the cases is relatively close to other value estimates. However, this is only a positive sign when the current value estimates are a good representation of the market value. However, as transaction prices are not available, this is the next best alternative. When taking the mentioned limitations into consideration, and assume that current appraisals are a good estimate of the value, the interviewees are quite confident the model gives a valid estimation of the market value.

The overall opinion on the model is that it is very prudential. It interlinks the earning potential to the property, which is different from what is currently done by appraisers, but makes sense from an economical point of view. It shows that every step is well thought through and does not focus on location as heavily as is currently done by appraisers, which makes sense taking the value drivers into account.

Next to the opinion of valuation experts on the model, another attempt to validate the model has been made. Ever since values were estimated, there have been many court cases in which the discrepancies between value estimate and selling price or the discrepancies between two value estimates have been discussed with various outcomes. Between the outcomes there have been quite

some contradictions, in terms of whether value estimates are allowed to deviate and how much. *"The valuation of land and property by trained, competent and careful professional man is a task which rarely, if ever, admits to precise conclusion. Often [...] work. Valuation is an art, not a science. Pinpoint accuracy in the result is not, therefore, to be expected by he who requests the validation"(Crosby, 2000)*, indicating that it cannot be expected that a valuation is a precise price predictor. *V*aluers also produce different results, *"It is true, of course, that if several valuers valuing the same property on the same basis at the same date produce different assessments, it does not follow that only one is right, that any of them is wrong or that any of the valuers was negligent "(Crosby, 2000).* Both these quotes indicate that it is not at all remarkable when a value estimate differs from the actual transaction prices, they however do not provide the answer to how much subjectivity or deviation from another value estimate or an actual transaction price is acceptable.

Research from Crosby (2000) has shown that the differences in margin of error differs depending on the country, type of real estate or even the year the value estimate has been made. The absolute threshold seemed to be around 20 per cent, as internationally no margin of error higher has been accepted (Crosby, 2000). This is especially true for properties that are considered difficult to appraise. The average deviation between two appraisals over all the different sectors is 8,64 per cent, and roughly two out of every three valuations are within 10 per cent of each other (Crosby, 2000). This is in line with information from the ROZ/IPD, who claim that roughly 75 per cent of the value estimates done by appraisers are within a 10 per cent range from the eventual transaction price in the Netherlands. As such, we will use the 10 per cent error margin as an indication of validity of our model. The problem, however, is that it can only be compared against one reference value, which is the appraisal value of case A, as case B does not have an appraisal value and no other institution returned the information requested. As mentioned afore our model returns two values, depending on the ZZP mix the building currently offers, Case A currently offers ZZP 5 & 7.



The value estimate from our model is 2,28 per cent lower than the estimated value in the appraisal report. For comparison, the value estimate for ZZP mix 4,6, 8 -10 is 5,07 per cent higher than the estimated value in the appraisal report. Although both the estimates are fairly close to the value the appraiser estimated, and are within the value range in which it is likely to be sold, according to Crosby (2000), it is difficult to conclude a validity from this comparison. As, first of all, it is based on a single comparison, and second because the value estimate from the appraiser might have a large margin of error when compared to the actual selling price.

Therefore, we can only suggest that the small margin of error, as compared to the appraisal value, is a good omen that the value estimate is a representation of the market value. However, we cannot rule out the possibility that our value estimates will have a much larger margin of error when compared to other value estimates from appraisers or actual transaction prices of property.

# 8. Discussion

In the following sections we will discuss our research, the valuation model, and the limitations and make recommendation on which steps should be taken next and why. Lastly, we will reflect on the research and describe some of our pitfalls during this research.

The lack of applied literature on estimating market values of specific real estate led us to construct the valuation method from the ground up. By matching the strengths of each approach to the characteristics of the property, we determined that the income approach is the most applicable approach to estimate the value of healthcare property. Using this approach and the DCF technique does not deviate from what is currently done by appraisers. Most of the appraisers also use a DCF technique to estimate the value. Where our model deviates from current practises is how the DCF method is applied. We use the "Rushmore approach" to estimate the value. This technique is designed for the lodging industry to reflect the economic realities of this industry (Rushmore, 2004a). This method is used to determine the tax assessment value of the property, which represents the market value. It has been designed for lodging businesses who own their property, as otherwise the rent could be used to determine the value of the property.

The Rushmore approach argues that the free cash flows from a hotel are the result of the land, improvements, personal property and going concern value. By reducing the cash flows from the personal property and the going concern the value of the property is left. Using all the available or generated cash flows to estimate the value of the property seems straightforward and is possibly one of the strengths of the model, this, however, also leads to many estimations to be made. Since there has never been a transaction, in which only the going concern has been sold, its market value has to be estimated. Due to the many estimations that are inherent to this model, its applications is limited to highly specific property, which also generate cash flows, such as hotels and nursing homes. If properties are less specific, transaction information is available and alternative uses will distort the value estimate of our model. A similar effect is expected from the location of the property, as usually in city centres, the demand is higher than the supply and alternative uses are aplenty. It must be noted that the two arguments are most likely related, and often occur simultaneously.



The difference with this approach and current practices are cash flows and discount rate used. Current appraisers only use the fictive rent, whereas we use all the cash flows and subtract the value of the personal property and the going concern. There are quite some conceptual differences between our model and current practices, predominantly with respect to the discount rate and the cash flows used. Current methods of estimating the discount rate are rather static and intransparent, whereas we aimed to make this process more uniform and transparent. Although we believe we succeeded in making the process of estimating the discount rate more transparent, by using publicly available information to calculate the discount rate, we also limited the use of the model by doing so. As the discount rate is now determined by factors important to care assets, more specifically, VVT care assets, we limited the use of the model to these properties only. Additionally, the spread of our discount rate estimate is limited by the method we use to calculate it. This leads us to believe that our model cannot be used for properties, which have just been constructed or are almost at the end of their life cycle. This limitation is not inherent to the "Rushmore approach", rather, the result of our calculations.

By testing the model on two cases, we aimed to make some inferences about its value estimates. In the absence of transaction prices we had to compare our estimates with the estimates of appraisers. This results in a rather strange trade-off: when our value estimates would deviate from the estimates of appraisers, we are inclined to conclude that the current value estimates do not properly reflect the market value. However, in the absence of transaction prices, it would be difficult to prove which technique gives the most accurate value estimate. On the contrary, when our value estimates are in line with current value estimates, then what does our model add?

As our value estimates seem to be in line with current value estimates, we believe that the added value from our model can be found in the scientific approach towards the problem and the standardised framework in which the valuation is done. We attempted to provide the initial step towards a standardised valuation method and framework. Valuation estimates are highly subject to influences and estimates from appraisers, and market values only manifest when a transaction is realized. To overcome some of the differences, which result from different estimates, we have structured a standardised valuation framework. Individual institutional effects are omitted in this framework and widely available data is used to estimate the discount rates. This increases the transparency, as anyone could use the model and update the variables in it. Additionally, our method accounts for upcoming changes in the healthcare industry, such as combining all the compensations into a single uniform compensation. It will no longer be possible to distinguish between the individual components within this compensation. Therefore, appraisers can no longer use the fictive rent as a cash flow.

## 8.1. Conclusion



The care industry is facing some unprecedented reforms and institutions in this industry will have to drastically alter their way of business. One of the consequences of these reforms is that institutions will have to manage their real estate better. There is, however, little known about the market value of real estate in the care, as there was no need for this information until the reforms.

In this research, we have developed a model to estimate the market value of intramural care assets, in particular the VVT care assets. The model takes the characteristics of the care properties and the way the sector is financed into account. Due to the novelty of the problem in the healthcare sector and the uniqueness of the real estate type, no standardised solution or applied literature is available. This caused for an approach by which we would have to build the valuation model from the ground on up.

By analysing the characteristics of care assets and matching these to the strengths of the various valuation approaches and techniques, we found that the income approach, in particular the DCF method, has the best fit. Using the income method to estimate the market value does not deviate from current practises by appraisers. However, our application of this method has quite some conceptual differences with current practises. The basis for the model is derived from the hotel valuation literature since we found quite some common factors between hotels and care property. Two of the more fundamental aspects of using this model, rather than a more conventional model for valuing real estate, come from the fact that care property has very limited alternative uses and is built with the current use in mind, and therefore very specific.

We argue that the different cash flows (NHC, ZZP and NIC) are the result of a combined effort of the land, the improvement, the personal property and the going concern. In order to estimate the market value of the land and the improvement, in other words the property, we deducted the value of personal property and the going concern. One of the fundamental differences with current practices, is that next to general real estate value drivers, we found and used value drivers that are important to realise a high occupancy rate. Currently, appraisers use general real estate drivers, which do not or only partially, recognise the potential of a property to realise cash flows in the future. Since we classified care property as an income producing property, we argue that this cash generating potential should be taken into account when estimating the value. Additionally, we have standardised the value framework, so that managerial influences are omitted in the value estimate of the property.

The discount rate used to discount the future cash flows has been estimated by quantifying the value drivers of care property. By using information that is widely available, we argue that this model is more transparent than current practices. Quantifying the various value drivers allowed us to determine the average of each value driver and deviations from this average. By using the market risk premium of equity as the average return we were able to calculate the required return on equity for the different care properties. Using the average cost of debt and the proportion of debt in the company we were able to determine the WACC, which we used as a discount rate in our model.

Due to the absence of transaction prices, we tried to validate the models value estimates by comparing them with the value estimates of appraisers. Although we were not able to obtain many appraisal references, our value estimate does not deviate much from the ones we could compare it to. Since our value estimates seem to be in line with what appraisers have done, we are led to believe that the added value of this model can be found in the scientific approach to structure the valuation process and the valuation framework. The valuation structure we propose uses widely available data which can be verified and used by many, and therefore contributes to the transparency of the valuation process. Some of the advantages of our model are that, with minimal input, it is able to produce a value estimate, and that it accounts for upcoming changes in the financing structure of the sector.



## 8.2. Recommendations

The recommendations we have for Finance Ideas are divided in three categories: follow up, short term and long term, and in each category we have two recommendations. The first follow-up recommendation is to test the model on more cases. There is only very limited input required for it to make a value estimate. This process could be combined with regular projects for clients, as it is not a time consuming process. The value estimates of multiple cases can then be compared and this will provide a better insight in the value estimates of our model and how they compare to other value estimates. Additionally, we recommend that Finance Ideas tries to obtain insight in the process by which a new property gradually increases occupancy rate and the rate at which it will decline at the end of a life cycle. This will help in estimating the market value free of use and rent. The second follow up recommendation is to interlink the occupancy and discount rate to the dynamic areas. We now use normative percentages for every property, whereby it might be possible that we ignore regional differences in occupation and purchase discount. Insights in local differences might increase the accuracy of the model.

We have two recommendations on the short term. The first recommendation is to expand the research into the normalised costs and income in the care. As from 2018 there will only be one uniform compensation, one cannot differentiate anymore between NHC, ZZP and NIC. Further research into the costs, will not only allow for absolute costs per care indication rather than percentages of the compensation, it will also be more up to date. The second recommendation is to look into the option to implement the reference tables of the model into their own products. These reference tables are used to create the dynamic areas, which can be made smaller or larger if preferred. Some of the products of Finance Ideas, such as Zorgrating, could be complemented with information from these tables. In particular, the method, which allows breaking down all the information to area code level so that it can be compared, has the potential to complement these products. We believe further exploring this method can be very meaningful and form the basis of valuable and comparable information.

We have two recommendations for the long term. First of all, when eventual transactions take place in the care property market, the model's estimates can be compared to truly test the validity, together with the impact of the various value drivers used in the model. Secondly, the effect and impact of these value drivers can also be tested when transaction prices become available. The advantage of testing this, and using the incremental approach to determine the discount rate, is that in the long term it could contribute to the transparency of price forming in the care market.

## 8.3. Limitations

Although a discounted cash flow method is by its very nature subject to assumptions, some assumptions made in this research limit the application of the model. First and foremost, the model only works for intramural care properties, although this was the intention, it does limit the use of the model. When a property houses rooms which are not intended for intramural care, the model will have to be adjusted, as was evident in case B.

The model calculates the appropriate risk associated with care property, based on scores on each value driver, which in turn are linked to the market risk premium. As a result the upper and lower boundaries of the WACC are fixed and the spread of the discount rate is therefore limited. Therefore the WACC might not represent the appropriate rate for care properties, which are at the end or the beginning of their life cycle. This effect is enforced by the fact that we do not have proper insights in the process by which institutions gradually increase their occupancy rate after commissioning a new building. And likewise, the phasing of the occupancy rate when the property is old and bound to be demolished or renovated. Additionally, all the data collected is based on care property currently extant in the market. The consequence of this is that the model, in some aspects, does not account for characteristics of future care property, which will influence the average risk profile and the deviations from this profile. Although these aspects can be updated in the model's reference tables as soon as there are newer properties extant, future anticipation remains difficult, even though one of the value drivers tries to measure this.

Additionally, it seems that the economical lifetime of properties constructed from now on might have a longer economical life time than 30 years. Recent developments show that care properties are now constructed with more scrutiny and care for longer use. This also has the potential to influence the possible alternative uses of the properties, mostly because of larger rooms so that they can be made into regular apartments. Although it remains to be seen whether these newer properties enjoy a longer economical life cycle, it could result in having to revise some of the assumptions made on the short or medium term.



In our research, we assume that there is no residual value of the land, as the effect of the land value minus the demolishing costs of the property is zero. Although this might be a rather fair assumption for parcels with social zoning, in the absence of social zoning the residual value of land is potentially much higher. This is especially true when the land lies in city centres, where the land prices are much higher. Additionally, it is very unlikely that a 30-year-old building in a city centre will be demolished, only to be rebuild. Alternative uses, therefore, in large city centres, such as Amsterdam, will probably be in abundance. Although the model produced a value estimate that is in line with other value estimates of the same property, we are reluctant to translate this into a validity. First of all, since one cannot judge this by a single comparison. Second, since this rests on the assumption that other value estimates are proper indicators of the market value. Therefore the validity cannot be truly tested without transaction prices.

Additionally, there is a problem of multicollinearity between our variables. Although we were unable to correct for this, we do recognize that this phenomena can bias our value estimates. This is also true for endogeneity, or missing variables. Since we did not have sufficient data to perform a regression analysis and test to see if there was a correlation with the error term, we are unable to

make inferences with respect to missing variables. Both of these problems are likely invigorated due to the fact that the data gathered had to come from many different sources and was sparse.

## 8.4. Future research

This research addresses a rather novel problem and likewise offers a novel solution to the problem. There are, however, many factors which could not be tested empirically. Although many of the limitations of the model come from the lack of transaction prices, there are some future researches that can be performed without transaction prices.

First of all, and as briefly mentioned under recommendations, further research into the normalised costs will increase the accuracy of the model. As from 2018 the compensations will no longer be offered in three different forms, rather it will be one uniform compensation. Appraisers will no longer be able to use the NHC as this compensation will no longer exist, this model could however still be used. However, renewed and more insight into the costs would help to increase the models accuracy. As currently the compensations are based on the costs as they were in 2004. Research into the current bandwidth of the costs could provide new insights. Not only in terms of a different proportion between the various cost elements, but also a variation of costs depending on size of the property. When the costs can be expressed as absolute amounts based on the care indication and the size of the property the accuracy of the model will improve. Additionally will it be possible to make inferences about the size of a property and the efficiency with which it can be used.

If transaction prices will not become available, research could compare the cost of equity generated by the model with the return demanded on equity in Real Estate Investment Trusts (REIT's). Although we argued that we cannot simply use the equity demand from REIT's in our model, similarities between the various value drivers are to be expected. Assuming that the properties are very similar in terms of utility and alternative uses. This will help in confirming the value drivers used or find additional value drivers.



The last suggestion for future research addresses long-term issues. As we argued that developments are noticeable around the alternative uses of the property and their life cycle, which have the potential to increase them both. When these two developments are realized, they will most likely have large influence on the value of the property. Further research into these two subjects will expand the knowledge of these effects on the value and help to determine an accurate estimate of the market value.

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# Appendices

## Appendix A). Interviewees

The table below depicts the interviewees of our interviews. There is no questionnaire added as the interviews only had few fixed questions and were more discussions to comprehend some problems faced.

| Name | Employed by Company | Function | Sector employed | Date of interview |
|---|---|---|---|---|
| ***Users of care property*** | | | | |
| Piet Dijkstra | Ijsselheem | Controller | VVT | 6/8/2014 |
| Peter Vlaar | WZG samen | Concern Controller | VVT | 30/7/2014 |
| Frank Godefrooy | Hilverzorg | Manager planning & Control | VVT | |
| ***Appraisers and consulting*** | | | | |
| Nicolai Noordzij | ABZV | Taxateur/adviseur | Advisory | 4/8/2014 |
| ***Financers and investors*** | | | | |
| Anja van Balen | ABN AMRO | Sector Banker Zorg | Banking | 21/8/2014 |
| Leo Benneker | Habion | Directeur Financiën en bedrijfsvoering | Woon Corporatie | 25/8/2014 |
| **Insurers** | | | | |
| Frans Schaepkens | Achmea & Nyenrode business university | Senior business analyst healthcare/ Lecturer in Financial accounting en reporting | Insurance, Academic | 1/09/2014 |
| ***Experts*** | | | | |
| Piet Eichholtz | Maastricht University | Professor of real estate finance | Academic | 14/8/2014 |
| Rob Huijsmans | Zorgbalans | Manager vastgoed | VVT | 22/7/2014 |
| Rob Rotscheid | Finance Ideas | Partner bij Finance Ideas, & Raad van toezicht diverse zorggroepen | Consulting | 5/8/2014 |

# Appendix B). Questionnaire Financiële Zorgthermometer

These questions have been asked in the FZT to identify the most important value drivers. And additionally find the average occupation rate and purchase discount. The questions are in Dutch.

1. Wat zijn de belangrijkste factoren die zorgen voor een hoge gebouwbezetting van uw intramurale zorggebouwen? (Selecteer 5 opties)
    a. Gelegen in stedelijk gebied of periferie
    b. Bereikbaarheid met eigen en/of openbaar vervoer
    c. Regionale demografie (Bevolkingsgroei, Gemiddelde leeftijd, Krimpgebied, e.d.)
    d. Voorzieningen in de buurt (Winkels, Cultureel, Eetgelegenheden, e.d.)
    e. Recreatie in de buurt (Wandelroutes, Parken, Groenvoorziening, e.d.)
    f. Omvang/ grootte van het zorgcomplex (Naar het aantal bewoners)
    g. Staat van onderhoud en leeftijd zorgcomplex
    h. Voorzieningen gebouw op gebied van welzijn, wonen en leefstijl (Keuze in maaltijden, eigen tuin, eigen sanitaire voorzieningen, extra verzorging e.d.)
    i. Grootte van de kamers
    j. Perceptie van de zorgkwaliteit door de cliënt
    k. Concurrentie in de omgeving
    l. Anders, namelijk …
2. Wat is de huidige bezetting van uw intramurale zorggebouwen?
    a. 100 – 98%
    b. 98 – 96%
    c. 96 – 94%
    d. 94 – 92%
    e. 92 – 90%
    f. < 90%
3. Wat is het gemiddelde vergoedingspercentage voor uw intramurale zorg in 2015 ten opzichte van de Nza tarieven?
    a. 100 – 98%
    b. 98 – 96%
    c. 96 – 94%
    d. 94 – 92%
    e. 92 – 90%
    f. < 90%

## Appendix C). Detailed results of the survey

The following pages have detailed results from the survey.

**Total respondents, and per subsector.**

| VVT | | GHZ | | GGZ | | Total | |
|---|---|---|---|---|---|---|---|
| # | % | # | % | # | % | # | % |
| 68 | 57,14 | 27 | 22,69 | 24 | 20,17 | 119 | 100 |

**Most important factors which contribute to a high occupancy rate, total and by subsector.**

| | VVT | | GHZ | | GGZ | | Total | | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| **Question** | # | % | # | % | # | % | # | % | # |
| **1.a** | 19 | 5,6 | 9 | 6,7 | 15 | 12,5 | 43 | 7,2 | 7 |
| **1.b** | 12 | 3,5 | 8 | 5,9 | 10 | 8,3 | 30 | 5,0 | 10 |
| **1.c** | 45 | 13,2 | 9 | 6,7 | 14 | 11,7 | 68 | 11,4 | 3 |
| **1.d** | 26 | 7,6 | 10 | 7,4 | 3 | 2,5 | 39 | 6,6 | 9 |
| **1.e** | 7 | 2,1 | 3 | 2,2 | 2 | 1,7 | 12 | 2,0 | 12 |
| **1.f** | 29 | 8,5 | 15 | 11,1 | 14 | 11,7 | 58 | 9,7 | 5 |
| **1.g** | 35 | 10,3 | 13 | 9,6 | 11 | 9,2 | 59 | 9,9 | 4 |
| **1.h** | 45 | 13,2 | 15 | 11,1 | 9 | 7,5 | 69 | 11,6 | 2 |
| **1.i** | 29 | 8,5 | 18 | 13,3 | 6 | 5,0 | 53 | 8,9 | 6 |
| **1.j** | 58 | 17,1 | 19 | 14,1 | 20 | 16,7 | 97 | 16,3 | 1 |
| **1.k** | 22 | 6,5 | 10 | 7,4 | 11 | 9,2 | 43 | 7,2 | 8 |
| **1.l** | 13 | 3,8 | 6 | 4,4 | 5 | 4,2 | 24 | 4,0 | 11 |
| **Total** | **340** | **100** | **135** | **100** | **120** | **100** | **595** | | |

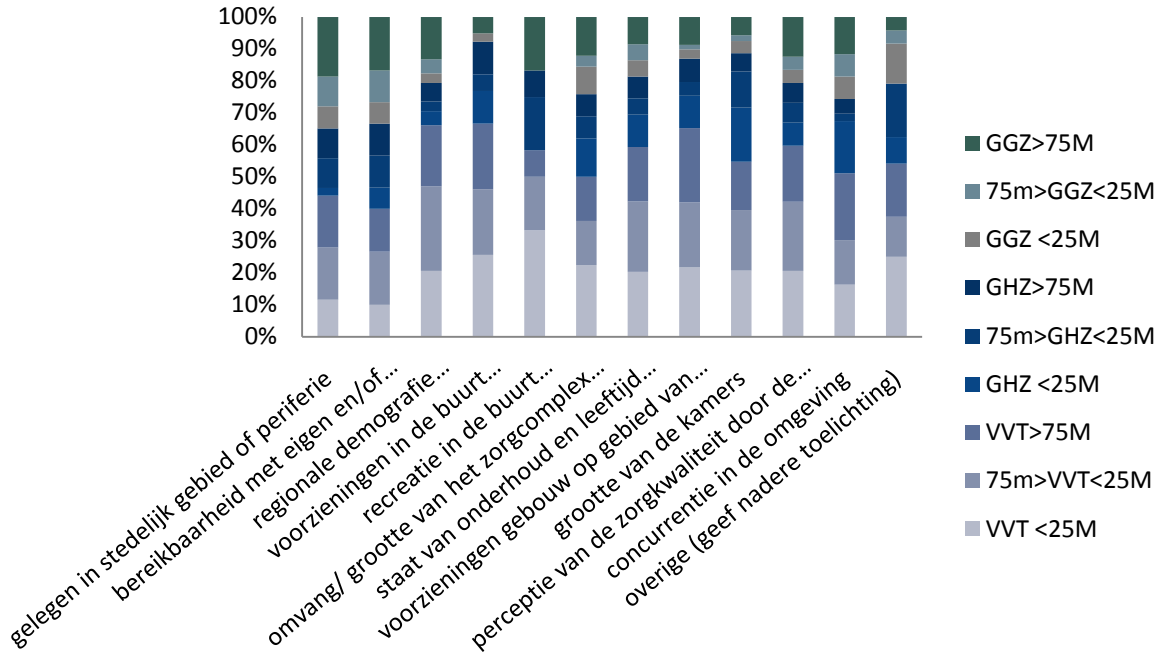
**Current average occupancy rate of the intramural care buildings, per subsector**

| | VVT | | GHZ | | GGZ | | Total | | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| **Question** | # | % | # | % | # | % | # | % | # |
| **100%–98%** | 17 | 25,0 | 13 | 48,1 | 5 | 20,8 | 35 | 29,4 | 1 |
| **98% – 96%** | 22 | 32,4 | 6 | 22,2 | 7 | 29,2 | 35 | 29,4 | 1 |
| **96% – 94%** | 15 | 22,1 | 4 | 14,8 | 6 | 25,0 | 25 | 21,0 | 2 |
| **94% – 92%** | 5 | 7,4 | 2 | 7,4 | 2 | 8,3 | 9 | 7,5 | 3 |
| **92% – 90%** | 4 | 5,9 | 0 | 0,0 | 1 | 4,2 | 5 | 4,2 | 4 |
| **< 90%** | 4 | 5,9 | 2 | 7,4 | 3 | 12,5 | 9 | 7,5 | 3 |
| **Not applicable** | 1 | 1,5 | 0 | 0,0 | 0 | 0,0 | 1 | 0,84 | 5 |
| **Weighted average** | | **94,5%** | | **96,8%** | | **95,3%** | | **95,2%** | |
| **Total** | **340** | **100** | **135** | **100** | **120** | **100** | **595** | | |

**The average compensation received, as a percentage of the maximum compensation, the ZZP, per subsector**

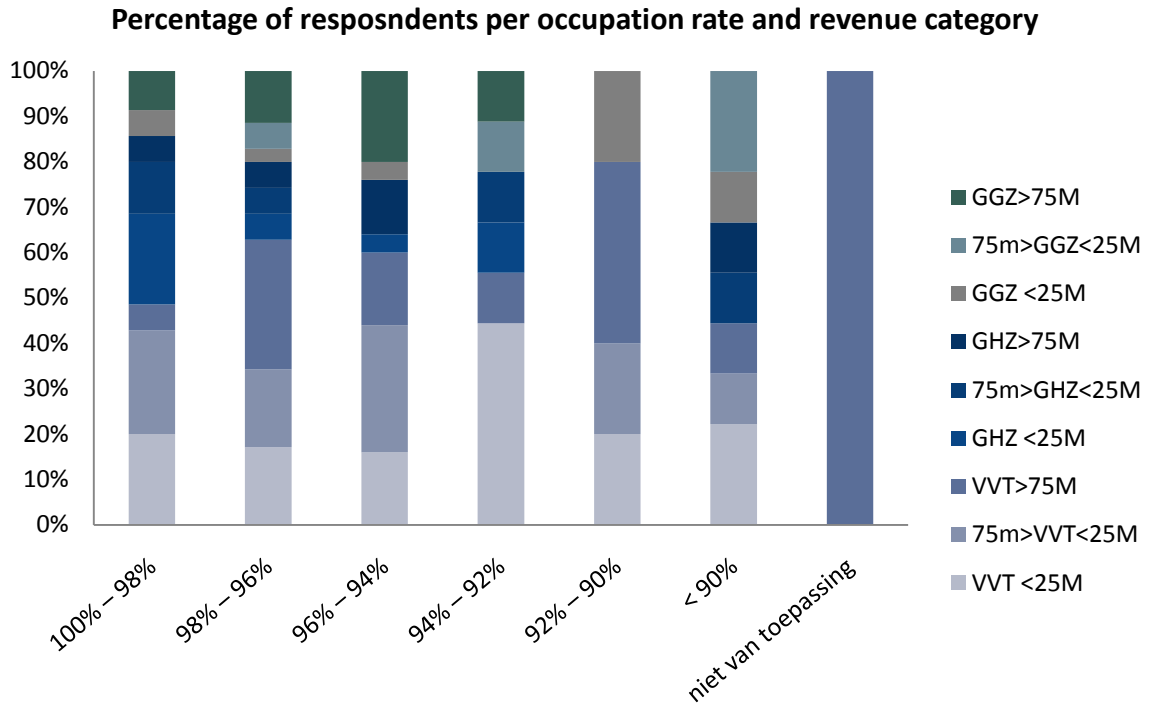
| | VVT | | GHZ | | GGZ | | Total | | Ranking |
|---|---|---|---|---|---|---|---|---|---|
| **Question** | # | % | # | % | # | % | # | % | # |
| **100%–98%** | 8 | 11,8 | 1 | 3,7 | 5 | 20,8 | 14 | 11,7 | 3 |
| **98% – 96%** | 37 | 54,4 | 9 | 33,3 | 12 | 50,0 | 58 | 48,7 | 1 |
| **96% – 94%** | 18 | 26,5 | 14 | 51,9 | 4 | 16,7 | 36 | 30,2 | 2 |
| **94% – 92%** | 3 | 4,4 | 2 | 7,4 | 1 | 4,2 | 6 | 5,0 | 4 |
| **92% – 90%** | 1 | 1,5 | 1 | 3,7 | 1 | 4,2 | 3 | 2,5 | 5 |
| **< 90%** | 0 | 0,0 | 0 | 0,0 | 1 | 4,2 | 1 | 0,8 | 6 |
| **Not applicable** | 1 | 1,5 | 0 | 0,0 | 0 | 0,0 | 1 | 0,8 | 6 |
| **Weighted average** | | **95,0** | | **95,5** | | **96,3** | | **95,4** | |
| **Total** | **68** | **100** | **27** | **100** | **24** | **100** | **119** | **100** | |

**Percentage of respondents per subsector and revenue category**

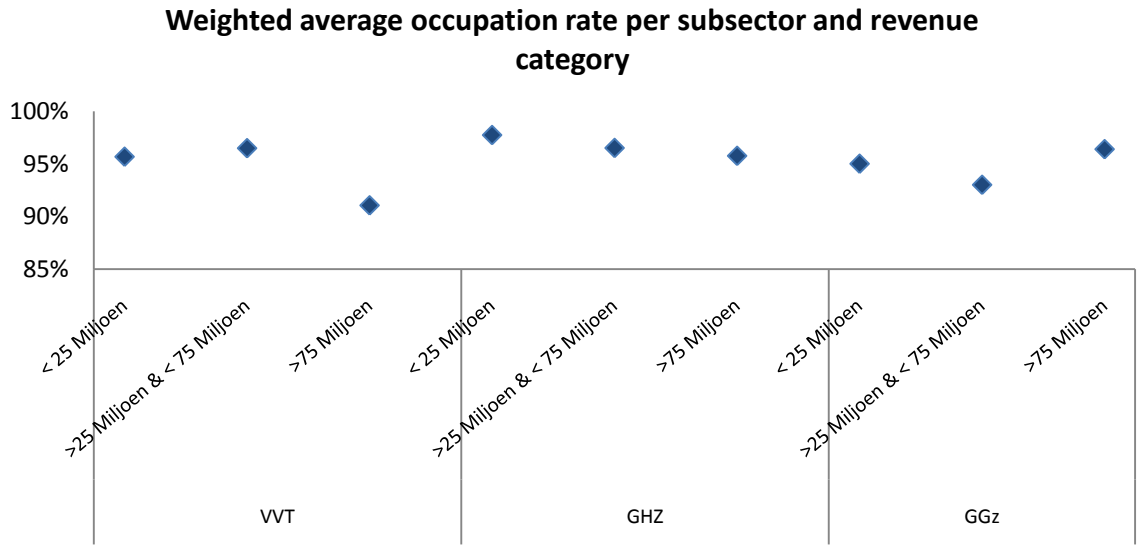


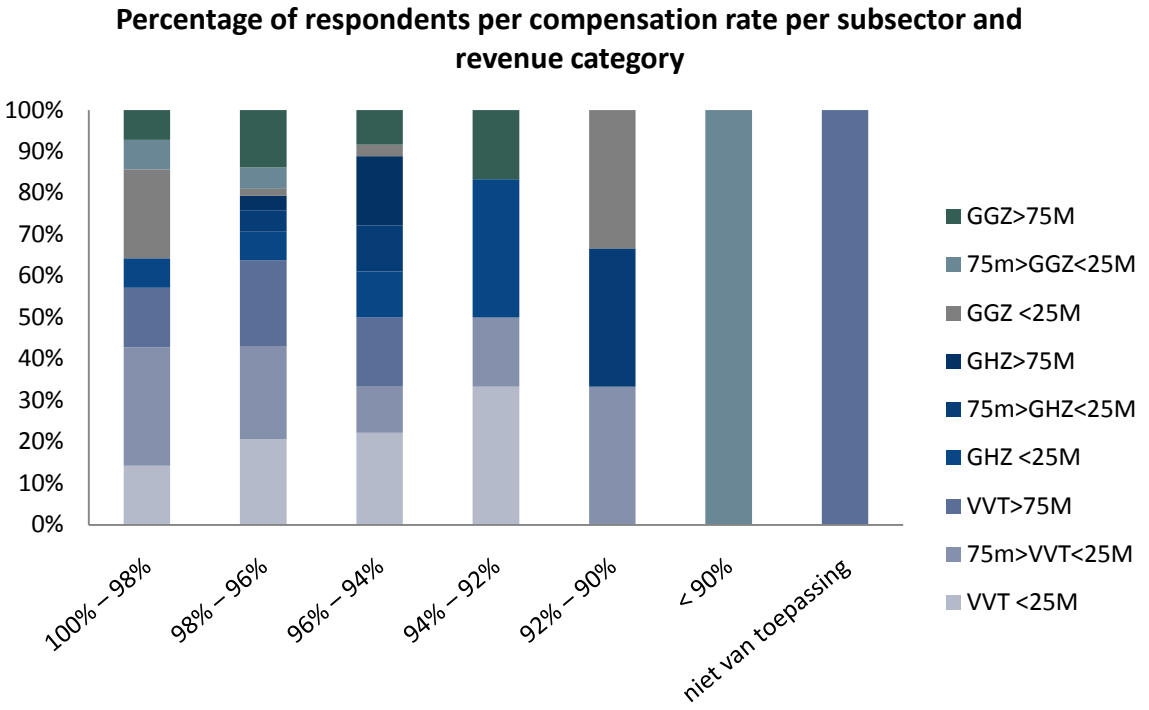

**Notes of respondents when answered other per subsector and revenue category**

| Subsector | < 25 Million | >25 & < 75 Million | >75 Million | Notes of respondents |
|---|---|---|---|---|
| **GGZ** | | | X | aantal specialistische functies |
| **GHZ** | | X | | aanwezigheid behandelfuncties in de buurt |
| **VVT** | | X | | aanwezigheid van nachtzorg (veiligheid) |
| **GGZ** | | X | | bovenrregionale voorziening |
| **VVT** | | | X | enige aanbieder op aantal plekken |
| **VVT** | X | | | Financiering door Zorgkantoor (ivm afbouw lichte ZZP's) |
| **GGZ** | X | | | geloof |
| **GHZ** | X | | | grootste regionale voorziening |
| **GHZ** | X | | | instelling richt zich doelgroep met specifieke identiteit |
| **VVT** | | X | | nvt |
| **VVT** | | | X | nvt |
| **GGZ** | X | | | nvt |
| **GGZ** | X | | | nvt alle 5 zijn niet n.v.t. |
| **VVT** | X | | | nvt wij hebben geen intramurale zorg alleen thuiszorg, dus maar wat aangevinkt anders kon ik niet verder |
| **VVT** | | X | | specialisatie |
| **GHZ** | | X | | specialist zware zorg |
| **VVT** | X | | | specifieke identiteit |
| **VVT** | X | | | Uniciteit van het gebouw |
| **VVT** | X | | | Veel activiteiten |
| **VVT** | | | X | veel cliënten met behandeling |
| **GHZ** | | X | | Veiligheid en continuïteit naar de toekomst |
| **GHZ** | | X | | Verhuur aan cliënten VPT, Begeleiding individueel |
| **VVT** | | | X | vraag overtreft nog steeds aanbod, weinig tot geen concurrentie |

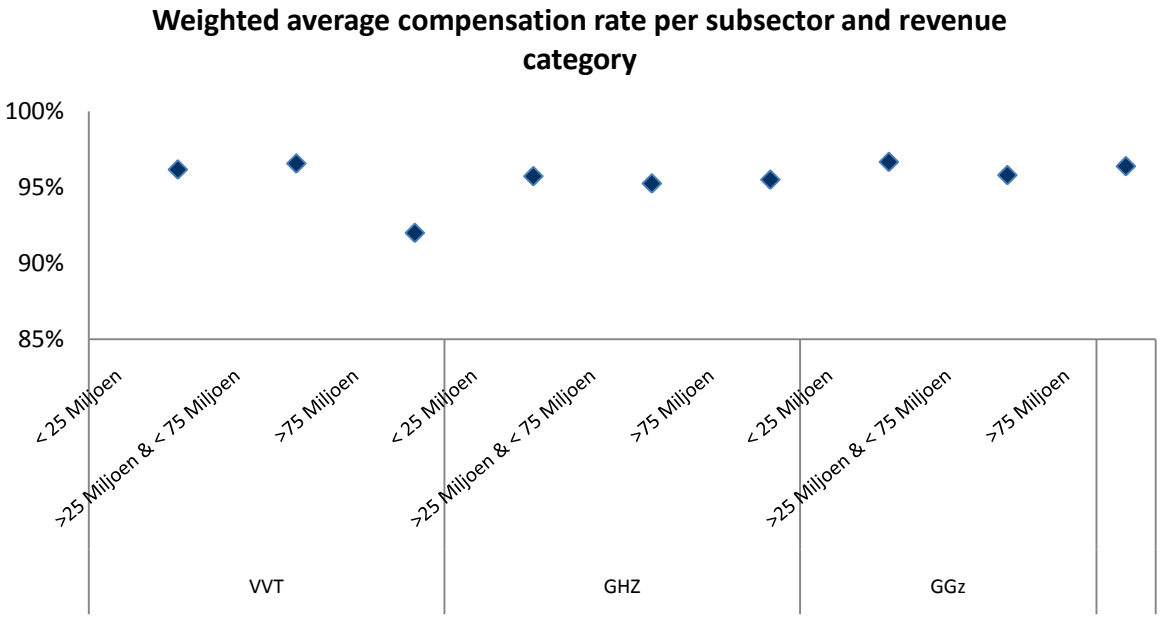

Percentage of resposndents per occupation rate and revenue category
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
100% – 98%
98% – 96%
96% – 94%
94% – 92%
92% – 90%
< 90%
niet van toepassing
GGZ>75M
75m>GGZ<25M
GGZ <25M
GHZ>75M
75m>GHZ<25M
GHZ <25M
VVT>75M
75m>VVT<25M
VVT <25M




Weighted average occupation rate per subsector and revenue category
100%
95%
90%
85%
< 25 Miljoen
> 25 Miljoen & < 75 Miljoen
> 75 Miljoen
< 25 Miljoen
> 25 Miljoen & < 75 Miljoen
> 75 Miljoen
< 25 Miljoen
> 25 Miljoen & < 75 Miljoen
> 75 Miljoen
VVT
GHZ
GGz


Percentage of respondents per compensation rate per subsector and revenue category
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
100% – 98%
98% – 96%
96% – 94%
94% – 92%
92% – 90%
< 90%
niet van toepassing
GGZ>75M
75m>GGZ<25M
GGZ <25M
GHZ>75M
75m>GHZ<25M
GHZ <25M
VVT>75M
75m>VVT<25M
VVT <25M




Weighted average compensation rate per subsector and revenue category
100%
95%
90%
85%
< 25 Miljoen
> 25 Miljoen & < 75 Miljoen
> 75 Miljoen
< 25 Miljoen
> 25 Miljoen & < 75 Miljoen
> 75 Miljoen
< 25 Miljoen
> 25 Miljoen & < 75 Miljoen
> 75 Miljoen
VVT
GHZ
GGz

## Appendix D). Stabilized income and costs

| ZZP Compensation per client per day as used in the valuation model, in Euros* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ***2015*** | ***2016*** | ***2017*** | ***2018*** | ***2019*** | ***2020*** | ***2021*** | ***2022*** | ***2023*** |
| **ZZP VV4** | 143,2 | 146,1 | 149,0 | 152,0 | 155,0 | 158,1 | 161,3 | 164,5 | 167,8 |
| **ZZP VV5** | 188,2 | 192,0 | 195,8 | 199,8 | 203,8 | 207,8 | 212,0 | 216,2 | 220,6 |
| **ZZP VV6** | 188,6 | 192,3 | 196,2 | 200,1 | 204,1 | 208,2 | 212,3 | 216,6 | 220,9 |
| **ZZP VV7** | 224,6 | 229,1 | 233,7 | 238,4 | 243,1 | 248,0 | 253,0 | 258,0 | 263,2 |
| **ZZP VV8** | 256,3 | 261,4 | 266,6 | 271,9 | 277,4 | 282,9 | 288,6 | 294,4 | 300,2 |
| **ZZP VV9** | 223,6 | 228,0 | 232,6 | 237,3 | 242,0 | 246,8 | 251,8 | 256,8 | 261,9 |
| **ZZP VV10** | 277,1 | 282,7 | 288,3 | 294,1 | 300,0 | 306,0 | 312,1 | 318,3 | 324,7 |

***** Indexed at a rate of 2 per cent per year

| NHC Compensation per client per day as used in the valuation model, in Euros | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ***2015*** ǂ | ***2016*** ǂ | ***2017*** ǂ | ***2018*** ǂ | ***2019**** | ***2020**** | ***2021**** | ***2022**** | ***2023**** |
| **NHC VV4** | 29,3 | 30,1 | 30,8 | 31,6 | 32,2 | 32,9 | 33,5 | 34,2 | 34,9 |
| **NHC VV5** | 29,3 | 30,1 | 30,8 | 31,6 | 32,2 | 32,9 | 33,5 | 34,2 | 34,9 |
| **NHC VV6** | 30,0 | 30,7 | 31,5 | 32,3 | 32,9 | 33,6 | 34,2 | 34,9 | 35,6 |
| **NHC VV7** | 30,9 | 31,7 | 32,5 | 33,3 | 33,9 | 34,6 | 35,3 | 36,0 | 36,7 |
| **NHC VV8** | 31,8 | 32,6 | 33,4 | 34,2 | 34,9 | 35,6 | 36,3 | 37,0 | 37,8 |
| **NHC VV9** | 37,6 | 38,5 | 39,5 | 40,4 | 41,3 | 42,1 | 42,9 | 43,8 | 44,7 |
| **NHC VV10** | 31,8 | 32,6 | 33,4 | 34,2 | 34,9 | 35,6 | 36,3 | 37,0 | 37,8 |

ǂ Indexed at a rate of 2,5 per cent per year
***** Indexed at a rate of 2 per cent per year



| NIC Compensation per client per day as used in the valuation model, in Euros | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ***2015*** ǂ | ***2016*** ǂ | ***2017*** ǂ | ***2018*** ǂ | ***2019**** | ***2020**** | ***2021**** | ***2022**** | ***2023**** |
| **NIC VV4** | 2,4 | 2,5 | 2,5 | 2,6 | 2,7 | 2,7 | 2,8 | 2,8 | 2,9 |
| **NIC VV5** | 3,7 | 3,8 | 3,9 | 4,0 | 4,0 | 4,1 | 4,2 | 4,3 | 4,4 |
| **NIC VV6** | 3,7 | 3,8 | 3,9 | 4,0 | 4,0 | 4,1 | 4,2 | 4,3 | 4,4 |
| **NIC VV7** | 3,7 | 3,8 | 3,9 | 4,0 | 4,0 | 4,1 | 4,2 | 4,3 | 4,4 |
| **NIC VV8** | 4,7 | 4,9 | 5,0 | 5,1 | 5,2 | 5,3 | 5,4 | 5,5 | 5,6 |
| **NIC VV9** | 5,0 | 5,1 | 5,3 | 5,4 | 5,5 | 5,6 | 5,7 | 5,9 | 6,0 |
| **NIC VV10** | 3,7 | 3,8 | 3,9 | 4,0 | 4,0 | 4,1 | 4,2 | 4,3 | 4,4 |

ǂ Indexed at a rate of 2,5 per cent per year
***** Indexed at a rate of 2 per cent per year

## Appendix E). Investment costs per ZZP

| Investments per ZZP used to calculate the maintenance costs indication of the NZa, in Euros | | | | | | |
|---|---|---|---|---|---|---|
| | **Basic Accommodation +** | ***Ancillary services*** | ***Total Basic*** | ***Daytime activities*** | ***Treatment*** | ***Total Investment*** |
| **NHC VV4** | 138.544 | 6.468 | 145.012 | 16.435 | 2.420 | **163.867** |
| **NHC VV5** | 127.665 | 9.500 | 137.165 | 21.765 | 4.936 | **163.866** |
| **NHC VV6** | 125.197 | 9.500 | 134.697 | 23.785 | 8.975 | **167.457** |
| **NHC VV7** | 130.357 | 9.500 | 139.857 | 23.785 | 8.975 | **172.617** |
| **NHC VV8** | 135.294 | 9.500 | 144.794 | 23.785 | 8.975 | **177.554** |
| **NHC VV9** | 125.197 | 9.500 | 134.697 | 19.522 | 55.648 | **209.867** |
| **NHC VV10** | 135.294 | 9.500 | 144.794 | 23.785 | 8.975 | **177.554** |

## Appendix F). Full costing process to uniform compensations

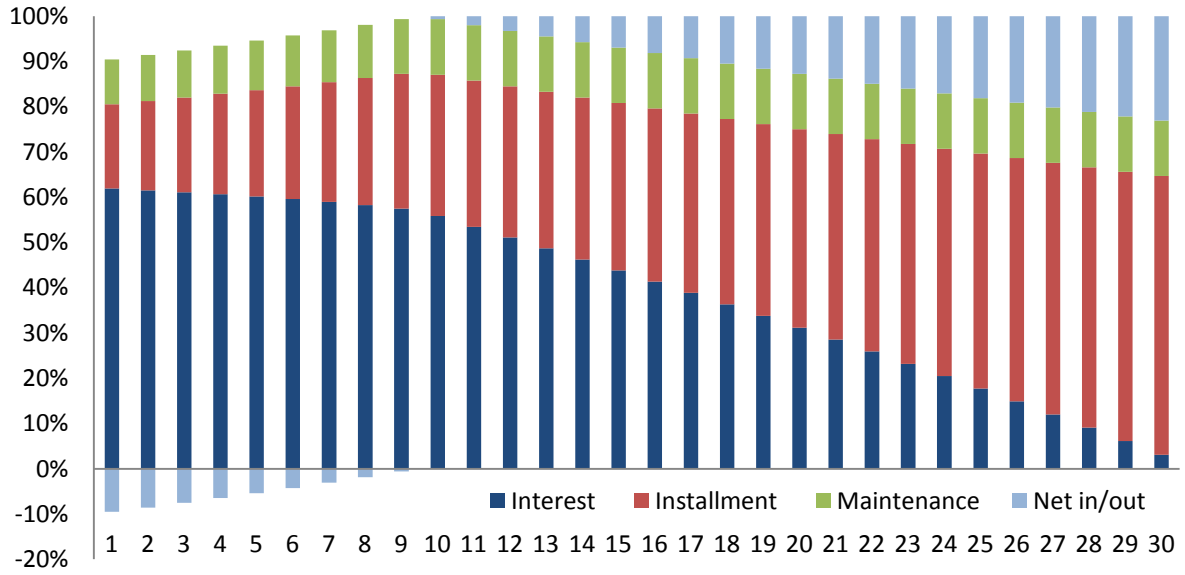
| Gradual process of full costing to NHC for care institutions | | |
|---|---|---|
| **Year** | Budget NHC | Budget full costing |
| **2011** | 0% | 100% |
| **2012** | 10% | 90% |
| **2013** | 20% | 80% |
| **2014** | 30% | 70% |
| **2015** | 50% | 50% |
| **2016** | 70% | 30% |
| **2017** | 85% | 15% |
| **2018** | 100% | 0% |



| Gradual process of full costing to NIC for care institutions | | |
|---|---|---|
| **Year** | Budget NIC | Budget full costing |
| **2014** | 0% | 100% |
| **2015** | 50% | 50% |
| **2016** | 70% | 30% |
| **2017** | 85% | 15% |
| **2018** | 100% | 0% |

## Appendix G). Annuity of the NHC and the known cost parameters

This graph depicts the annuity of the NHC, the maintenance costs and the net result when these costs have been paid. From this graph it becomes clear that the NHC has a negative net result the first couple of years. Gradually there will be a positive net result so that institutions can perform maintenance and save for replacement accommodation of the residents. This analysis resulted in using the VEX norms to estimate the maintenance costs rather than the 0,8 per cent of the construction costs the NZa depicted.



## Appendix H). WACC computation

| Value driver | Variable | Input | Increment |
|---|---|---|---|
| Location and region | Accessibility | Ill | 0,71% |
| | Facilities in the direct environment | Average | 0,39% |
| | urban area or periphery | Periphery | 0,75% |
| | Zip code | 1230 | |
| | Growth or shrinkage area | 0,05 | 0,11% |
| | Relative use of intramural care in the environment | 0,788% | 0,18% |
| | Average age in the area (Years) | 40,94 | 0,18% |
| | Competition in the environment | 3,00 | 0,19% |
| Property object | Quality of the care | No Quality Mark | 0,27% |
| | Night care available | Yes | 0,14% |
| | Lodging possibility | No | 0,27% |
| | Communal rooms | Yes | 0,23% |
| | Landscaping | Yes | 0,23% |
| | Construction year | After 1990 and before 2000 | 0,32% |
| | Number of rooms | 100 | 0,22% |
| | Average size per room in m² | 15,6m² < Room < 20m² | 0,16% |
| Market risk | Market risk and non market characteristics | | 2,86% |
| | | Total MRP | 7,24% |
| | | RFR | 2,41% |
| | | Cost of Equity | 9,65% |
| | | Cost of debt | 4,33% |
| | | Equity proportion | 3,13% |
| | | Debt proportion | 2,92% |
| | | WACC | 6,05% |

## Appendix I). Model Valuation interviewees

| Name | Title | Employed by Company | Sector | Function | Date of interview |
|---|---|---|---|---|---|
| Kees van Corven | | Brabant Wonen | Housing corporation/ consultancy | Director | 30/09/2014 |
| Martine Vissers | Ir, MRICS | Finance Ideas | Consultancy | Director SRR | 02/10/2014 |