The resilient real estate market: Convenience Retail

A study towards the characteristics and attractiveness of convenience retail

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Today, few believe that the business cycle can be quite so easily eliminated... No one can predict where or when a virulent business cycle will next strike.

- Paul A. Samuelson, William D.
Preface

The research “The resilient real estate market: Convenience Retail” sheds light on how this particular real estate sector is performing. While the aftermath of the economic crises of the past few years is still fresh in our memory, the economy is in an upwards trend again. However, a certain level of risk aversion is still wanted among different market players. Retailers, consumers, and investors are not waiting to fall back in the times of recessions and depressions. With this thesis, I analyze a certain type of real estate which, at first glance, seems to be resilient against economic ups and downs. This level of stability is just what the market wants. Thereby, this research will be the final paper of my master study Spatial Planning at the Radboud University in Nijmegen.

Before continuing to the research, I want to thank some people who helped me by writing this thesis. First of all, I want to thank Kaj Deana which was my supervisor at my internship company Bouwfonds Investment Management and helped me greatly by providing me with information, data, and knowledge. During the period of writing this thesis, he helped me with his feedback and possible improvements in order to create more depth within the research. I had a pleasant and useful experience at Bouwfonds Investment Management on which I can build my future career on. I also want to thank my other colleagues at Bouwfonds Investment Management for the amazing and fun time.

Another person I want to thank is my thesis supervisor from Radboud University, Peraphan Jittrapirom. Even though we had different specializations within spatial planning, Peraphan Jittrapirom proved to be a highly adequate thesis supervisor. He not only provided suggestions for improving my thesis, but he was also able to respond quickly to my emails and questions. This made the process of writing my thesis easier.

Enjoy reading my master thesis.

Hobie Smit
Utrecht, July 2017
Abstract

Within this research, the convenience retail real estate market is studied in order to determine its specific characteristics. The title of the research, ‘the resilient real estate market: convenience retail’, is chosen to indicate what was expected of this type of real estate before the research. This real estate market has the reputation of being resilient against economic fluctuations, also known as the business cycle phenomenon, and against compositional aspects of the shopping center is which they are located. The characteristics of this retail sector will determine whether an investor is attracted to invest in convenience retail or not. Therefore, the research question is:

‘What are the causal connections between the performance of the Dutch convenience shopping centers and the national economy as well as the causalities between the performance of the convenience shopping centers and the composition of these shopping centers, and how does this performance determines its attractiveness in the real estate investment market?’

The first part of the research question is answered by determining the annual Dutch economic situation over a certain period, which in this research is 2004 until 2016, and compare it to the annual performance of the convenience retail real estate market in the same period. The combination of the business cycle theory and the real estate performance cycle theory have set the base of the possible level of correlation between the economy and the real estate market. Additionally, Maslow’s Hierarchy of Needs and Engel’s Law have given information regarding the possible resilience of convenience retail. To determine the causal connections, the Granger Causality Test (GCT) is used. This type of analysis seeks out whether two time series are showing a causal connection. The Dutch economy is studied based on six economic indicators (BBP, interest rate, HICP, consumer confidence, consumer spending and employment rate) and the performance of the convenience retail is based on three performance indicators (absorption rate, turnover per square meter and total return). The result of the GCT indicated that the absorption rate is influenced by the BBP and the consumer confidence, the turnover per square meter was not influenced by any economic indicator and the total return was solely influenced by the consumer confidence. Based on the results of the GCT and the comparison between convenience retail and other types of retail, the first hypothesis is not rejected. This means that convenience is more resilient against economic fluctuations compared to other types of retail.

The second part of the research question is answered by selecting and study 270 convenience shopping centers in the Netherlands and compare the composition of these centers with the performance of it. The theory of shopping behavior suggested that the composition of a shopping center which is focused on ‘run shopping’ and doing groceries is not affecting the performance of it. A multiple regression analysis is conducted to determine the causal connections between the composition (size, percentage of convenience retail in square meters, amount of supermarkets, percentage of supermarkets in square meters, quality of supermarket tenant and additionally the location) and the performance (vacancy rate) of the convenience retail shopping centers. The results of the multiple regression analysis indicate that the vacancy of a shopping center is influenced by the size and by the amount of convenience retail in square meters. These results have rejected the hypothesis of the convenience retail being resilient against compositional aspects compared to other types of retail. Even though most compositional aspects had no statistical significant causal connection with the vacancy rate, a broad study has been done to create a ‘success formula’ regarding the composition of a convenience shopping center. This ‘success formula’ described how certain compositional aspects should be in order to reduce vacancy.
The final part of the research question is answered by determining by using the findings regarding the total return and by calculating the Sharpe ratio. The theory regarding investment preferences has set the base on whether a specific market is attractive to invest in or not. Based on the calculations of the Sharpe ratio’s, an image regarding the convenience retail sector has been made. By combing the results of all three parts (resilience against economic fluctuations, composition and investment preferences), the convenience retail real estate market seems to be an attractive investment opportunity in the current market. Therefore, the third hypothesis cannot be rejected.

The research is rounded up by an overview of the results. All causal connections and the ‘success formula’ in addition of an acceptable range of the compositional aspects are shown in the following tables.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variable</th>
<th>B</th>
<th>Sig.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBP</td>
<td>Absorption rate</td>
<td>4,83</td>
<td>0,050</td>
</tr>
<tr>
<td>Consumer confidence</td>
<td>Absorption rate</td>
<td>4,50</td>
<td>0,060</td>
</tr>
<tr>
<td>Consumer confidence</td>
<td>Total return</td>
<td>5,24</td>
<td>0,050</td>
</tr>
<tr>
<td>Total units</td>
<td>Vacancy rate</td>
<td>-0,007</td>
<td>0,015</td>
</tr>
<tr>
<td>Percentage of</td>
<td>Vacancy rate</td>
<td>-0,015</td>
<td>0,001</td>
</tr>
<tr>
<td>convenience retail</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 1: Overview of all statistical significant causal connections - source: own elaboration*

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Ideal:</th>
<th>Acceptable range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size in units</td>
<td>21-30</td>
<td>21 – 50</td>
</tr>
<tr>
<td>Size in square meters</td>
<td>&lt;2500</td>
<td>&lt; 4000</td>
</tr>
<tr>
<td>Percentage of convenience retail</td>
<td>75% - 100%</td>
<td>51% - 100%</td>
</tr>
<tr>
<td>Amount of supermarkets</td>
<td>4&gt;</td>
<td>3&gt;</td>
</tr>
<tr>
<td>Percentage of supermarkets</td>
<td>81% -100%</td>
<td>61% - 100%</td>
</tr>
</tbody>
</table>

*Table 2: 'Success formula' and acceptable range of compositional aspects - source: own elaboration*

Keywords: Convenience retail, Real estate, Investment, Business cycle, Performance measures
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1. Introduction

The global economy is a well-studied phenomenon which brought forth many theories. Plenty of research has been conducted to study the pattern of the economy. These studies showed that there are four cycles within the economy. These economic cycles are the Kitchin Cycle, the Juglar Cycle, the Kuznets Swing and the Kondratiev Wave. Each cycle stands for different products within the economy and is characterized by different timeframes. The Juglar Cycle, also known as the business cycle, is a circular pattern for fixed investments with a timeframe between seven to eleven years (Korotayev & Tsirel, 2010). According to the Juglar Cycle, there are four different stages which the economy goes through before repeating itself. These stages are expansion, peak, recession, and trough (Tarassov, 2009). Figure 1 shows the prediction of the Juglar cycle compared with the real development of the GDP.

![Figure 1: Juglar cycle and GDP development - source: (Tarassov, 2009)](image)

The different stages of the Juglar cycle all have their own characteristics and effect on the investment market. Despite the theory of the cycle, it is not a hard and concrete law in economics, but more of a suggestive pattern. Therefore, Figure 1 shows that the predicted pattern does not match precisely with the development of the trend of the GDP. It is not possible to fully predict when an economy is expanding or it is going into a recession. As stated before, the Juglar cycle influences the performance of the fixed investment market. Part of the fixed investment market is the real estate sector. This market is known for its close relationship with the economy. Besides real estate investments, many investment markets are known to have a relationship with the national economy. The performance of the investments are related to the stages of the Juglar cycle and thereby, real estate investments are not an exception (Mueller & Ziering, 1992).

Although the real estate market is spoken of as a single investment market, it is actually a market which is made up out of a variety of sectors. Each of these sectors reacts to the Juglar cycle in a different way (Wheaton, 1999). The markets of residential and industrial real estate tend to have a considerable correlation between their performance and the economy, while the office and retail market only show some correlation with two of the four latest economic shocks (Goetzmann & Rouwenhorst, 1999). The correlation between the retail submarket and the economy is not the only factor that is influencing the performance of this sector. The retail market is highly dependable on
the consumption rate. Consumption-driven markets, such as retail, have proven a decline in expected returns when consumptions decreases (Campbell & Cochrane, 1999). Within the submarket of retail real estate, there are still different types of retail, which each selling different products that satisfy different needs of the consumer. Again, these different types of retail real estate react differently towards the change in economics that distils from the business cycle. Retail can be split up into seven types: malls, lifestyle centers, factory outlets, power centers, community centers, neighborhood centers and convenience centers. Each of these has different sizes, locations, and range of shops (Ritter, 2016). Due to the different characteristics, the demand towards these shops varies based on the economic situation. In the stages of recession and depression, consumers tend to cut their spending more on luxury products instead of their daily required groceries (Steinmaier, Koster, Bruins, Deguelle, & Averink, 2013). This change in demand between different types of retail shows how complex this construction submarket can be and how far the effect of the business cycle reaches for influencing the performance of a particular market. Figure 2 visualizes the relationship between the business cycle and the construction of the different investment markets. Hereby, the sector of retail that focuses on daily goods (convenience retail) will be the aim further down the research.

![Image](https://via.placeholder.com/150)

*Figure 2: Relation Juglar cycle to retail submarket - source: own elaboration*

The concept of the economy influencing the performance of retail is a phenomenon that occurs in the Netherlands too. However, retail for daily goods, such as supermarkets, tend to react differently towards the Dutch economy compared with other sectors within the retail real estate market. As described above, consumers do not cut their spending on products that they need most (DTZ Zadelhoff, 2011). Figure 3 shows that even in the economic crisis of 2007, supermarket sales volume compared with 2005 kept rising in contradiction to the non-food sector. The non-food and other retail industry saw a decrease in sales volume during the crisis (Annexum Beheer B.V., 2013).
Thereby, Figure 4 shows that the Dutch GDP in 2009 went down, which affected the sales volume of certain retail sectors. Despite this significant drop in GDP, the spending in supermarkets did not drop accordingly while other types of retail did saw a drop in that particular period of time (Annexum Beheer B.V., 2013).

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**Figure 3: Sales volume in the retail sector - source: (DTZ Zadelhoff, 2011)**

**Figure 4: GDP development the Netherlands - source: (Annexum Beheer B.V., 2013)**
The Dutch food sector (convenience shopping) has kept on rising the last five years. This is contradicting the non-food sector, which over the last five years has fallen short on performance (Kuijpers, Küpper, Gi, & Steins, 2016). Expected is that convenience shopping will stabilize in the next three to five years due to the low level of vulnerability for economic fluctuation (IVBN, 2016). The characteristics that the convenience retail sector (daily and food goods) suggest that there is a certain level of stability and safety when looking at it from an investors perspective. The possible resilience against economic fluctuation and the everlasting demand towards daily products can guarantee a solid flow of income and thus promising returns of investment for the investor.
2. Problem statement & research aim

Based on the preliminary research, the reading of previously conducted research and studies, a problem statement and research aim can be formulated. The problem statement will contain further information regarding the phenomenon of convenience retail being a possible attractive market for investments and the research aim contains information regarding the purpose of doing a research towards this type of real estate market.

2.1 Problem statement

The business cycle (Juglar cycle) is a phenomenon that influences the market of the fixed investments. The repetitive wave pattern has a duration of seven to eleven years. Real estate investment portfolios generally have a duration of ten years or more. Meaning that most real estate investment portfolios go through the whole pattern of the business cycle. Due to this cycle, the performance of real estate portfolios tends to fluctuate based on their dependency on the economy (Goetzmann & Rouwenhorst, 1999). Studies showed that within the fixed investment market, real estate is highly dependent on the economy. This high correlation causes real estate portfolios to perform worse in times of recession and depression. However, within the real estate market, different sectors correlate differently towards the business cycle. The retail sector, which is again divided into different types of retail, is affected by the business cycle directly and indirectly. The retail sector is making its earnings by the amount of consumption. When the business cycle comes in the stages of recession and depression, the consumption rate goes down meaning that retailers produce less turnover (Campbell & Cochrane, 1999). A lower turnover for retailers means they will have a harder time paying their monthly bills, with rent as the biggest expense. The variety of retail types complicates the dependency on the business cycle even further. Not only does the retail sector reacts differently than other real estate sectors, but also the different types of retail have different characteristics. The consumption of daily goods in the retail submarket goes through different changes than the consumption of luxury goods does (IVBN, 2016). The demand for luxury goods is based on the economic situation in which the consumers live. A recession or depression goes accompanied with a higher unemployment rate compared to expansion and upswing stages. A higher unemployment rate means less income for households, which results in less demand for luxury goods. The income of a consumer is a major influencing factor regarding their spending’s towards luxury goods (Dubois & Duquesne, 1993). The question that distils from this is the demand of daily goods. Daily goods are mostly seen as a necessity in contradiction to luxury goods. So how dependent are the purchases of daily goods on the economic situation and how does the business cycle influences the performance of retail which mostly sells daily goods? And additionally, is the demand towards daily products so great, that the shopping center itself is not an influencing factor in attracting consumers towards these stores? This leads towards the overarching question: Is a shopping center which is focused on the sale of daily goods an attractive and safe investment regardless on how the economy and the demand towards different types of goods fluctuate?
2.2 Research aim
The aim of this research is to determine how the performance of convenience retail real estate is influenced by the national economy and other physical factors. Within this research, the Dutch economy will be studied in order to determine when the Dutch economy went into a recession or depression. Hereby, the comparison will be made between the performance of the convenience retail real estate and the pattern of the business cycle to determine if there is any correlation. Thereby, after assessing the relationship between the business cycle and the convenience retail real estate sector, object related characteristics (the composition of a convenience shopping center) will be used to determine further influences. This will produce an overview of what characteristics an ideal convenience shopping center has. Based on the characteristics, it is possible to describe how an ideal convenience shopping center will look like regarding its composition which is ideal for the investor to understand how vacancy can be minimalized. This ‘success formula’ together with the analysis of the correlation with the economy will give an overview of how attractive this retail sector is for investments.
3. Research questions

The research question that distilled from the foregoing problem statement and research aim are:

Research Question: What are the causal connections between the performance of the Dutch convenience shopping centers and the national economy as well as the causalities between the performance of the convenience shopping centers and the composition of these shopping centers, and how does this performance determines its attractiveness in the real estate investment market?

Answering the research question cannot be done without dissecting the question in different sub-questions. These sub-questions will shed light on individual parts of the research question and will help to formulate an answer to the main research question.

Subquestion 1: What is convenience retail in the Netherlands and what products does it sell?

Subquestion 2: What are the trends in the Dutch economy during the last decades, particularly between 2004 and 2016, which includes economic fluctuation such as the ‘Great Recession’ and the ‘Euro Crisis’?

Subquestion 3: What are the existing key performance indicators for a convenience retailer?

Subquestion 4: Is there any correlation between the trends of the Dutch economy and the performance of its convenience retail real estates?

Subquestion 5: Which shopping center compositional aspects influences the performance of Dutch convenience retails?

Subquestion 6: What is an ideal composition of a convenience shopping center to ensure optimize investment performance?

Besides having a main research question followed up with sub-questions, it is possible to set a few hypotheses for this research. Based on the preliminary investigation the following hypotheses distills from it:

Hypothesis 1: The Dutch economy does not influence the performance of convenience shopping centers in the Netherlands in a greater way than that of other retail real estate.

Hypothesis 2: The composition of a shopping center does not influence the performance of a convenience shopping centers.

Hypothesis 3: The characteristics of the convenience retail market are attractive for an investor.
4. Relevance

The relevance of this research can be divided into societal and scientific relevance. This chapter details the significance of this research in mentioned categories with additional information the research can contribute to the field of study.

4.1 Societal relevance

Societal relevance measures the impact of this research on the society. The research aids on explaining the influencing factors on the performance of a specific retail center. The beneficial effect of this research concerns the acting of investors, municipalities, and retailers.

The beneficial effect for the investors is to provide information regarding the attractiveness of convenience shopping centers. In order to invest in a particular object, investors execute a market research in order to determine if a certain investment product is attractive. Based on the knowledge produced in this research, an investor is able to improve its filtering process for possible investment opportunities due to a better understanding of this specific sector. A better understand results in an improved and better-advised selection of feasible investment products. Additionally, the ideal convenience shopping center will be described so investors will be able to use this as their starting point for their own acquisition. By understanding the actions taken in a shopping center by investors, negative results such as a high vacancy rate and low returns can be prevented. In other words, this research adds value by providing a detailed description of shopping center’s typology to aid investors in appreciating the attractiveness of this sector as an investment and can take better-advised actions for future improvements.

The beneficial effect for the municipality is the possible reduction of the vacancy in the shopping centers. Vacancy is considered a negative factor in shopping areas. The vacancy rate in convenience shopping centers can be reduced when the owner, the investor, understands what the effects are from certain actions. A reduction of the vacancy rate does not only improve the cashflow of the investor but also aids the municipality in creating a better image of their shopping areas. A well-filled shopping center will maintain its attractiveness towards consumers which stimulates the local economy. A strong local economy and a positive business climate are attractive for businesses to settle, which improves the tax income of the municipality and creates jobs for the inhabitants of that area. This research adds value by improving the image of a shopping center, region, or city which improves the local economic situation.

The beneficial effect for the retailers is expressed by the better environment created to settle a business. As stated before, the added value of this research is improving the image and the business climate of certain areas. Independent entrepreneurs which are starting their business have a higher chance of succeeding in a well-performing area. Their risk of losing their initial investment (savings or loans) for the business is reduced when they are able to profit from the improved economic situation. When investors understand the dynamics of the convenience shopping center, their tenants have a better chance of succeeding. The results of this research cannot only prevent tenants from going bankrupt due to bad management of the shopping center but also from a bad economic environment created by bad understanding of the shopping area.
4.2 Scientific relevance

The aim of this research is to add more knowledge to the existing knowledge about the influence of business cycles, like the Juglar cycle, on the real estate market. Studies about the influence of business cycles often consider retail as a uniform market without researching the different types of real estate. Like the research of Goetzmann and Rouwenhorst did (1999). However, not yet has there been a study conducted towards retail real estate that focuses on the sale of daily goods. The convenience retail sector is highly underexposed by research. Therefore, this research combines the knowledge of the study from Goetzmann & Rouwenhorst (1999) with the knowledge of the study towards different types of the retail real estate (Ritter, 2016). This research aims to go one step further in depth than the usual real estate studies go by researching a specific type of shopping center. The convenience retail market is not yet been studied this closely before and therefore gives a new insight on how this particular sector is functioning over the past years and how this is related to the trend development of the Dutch economy. The second phase of the research is focused on the composition of a convenience shopping center. Hereby, a success formula will be described in order to understand how an ideal convenience shopping center will look like. This can form the base of future research towards different types of shopping centers or expanding existing knowledge on shopping center management.
5. Theoretical framework

The theoretical framework explains how a variety of theories and models will aid in answering the research question and subquestions. This research will combine the ideas of these theories and models to gain new insights into the problems. The theories and models that this research will be using, are explained in this chapter.

5.1 Retail sector, shopping centers, and convenience goods

The retail submarket is a part of the entire real estate market, which is located in the sector of commercial real estate. Retail properties have certain characteristics that distinguish themselves from other types property markets. Retail locations are places where consumers can purchase a wide variety of goods and services. It comes in different formats but all are dependent on their consumers for their success. Retail relies on the local population in the surrounding areas as their customer base (Grzesik & Lux, 2014). Retail locations are referred to as shopping centers. A shopping center is a group commercial establishments planned, developed, owned, and managed as a unit related to location, size, and type of shops to the trade area is servers. It provides onsite parking relation to the types and sizes of its stores. Besides parking, the shopping center also features sign control, landscaping, and unified management policies. The nature or type of shopping center is described by six criteria. (Vernor, Amundson, Johnson, & Rabianski, 2009) summarize the criteria as follows:

- Shopping center size
- Site size
- Anchor tenant
- Type of products sold
- Distance and travel time
- Consumer base

The size of the shopping center, which is measured in gross leasable area, is a criterion in describing the type of shopping center. Neighborhood (convenience) shopping centers are the smallest, community centers are midsize, and regional shopping centers are the largest. However, it is possible that shopping centers exceed the limits in size (square meters), while still classified as a neighborhood shopping center. Thus, additional criteria are used to determine the type (Vernor, Amundson, Johnson, & Rabianski, 2009). The second criterion is the site size. A larger shopping center (i.e. regional center), requires more space to provide parking spaces. A neighborhood shopping center often has between 12.000 to 40.000 square meters of land, while a superregional mall is built on approximately 240.000 square meters of land (Vernor, Amundson, Johnson, & Rabianski, 2009).

The third criterion is the anchor tenant. An anchor tenant has a function to attract consumers towards the shopping center and generating traffic within the shopping center. This tenant is usually capable of operating by itself due to its strong attractive force. Each type of shopping center requires a specific type of anchor tenant. The usual anchor tenants are supermarkets or department stores (Vernor, Amundson, Johnson, & Rabianski, 2009). The fourth criterion is the type of products sold at the particular shopping center. The goods and services which are being sold to consumers can be classified. Goods can be specified into a) convenience goods, b) shopping goods and c) specialty goods. Convenience goods are unimportant to the consumer and are usually bought on a daily base. Due to their lack of importance, consumers have a low dissonance associated with the purchase which means no dissonance-reducing activities need to occur.
An example of a dissonance-reducing activity is pre-purchase shopping (Kaish, 1967). An important side note is that these products often are essential for a household. The products that are considered convenience goods are (Unit for Retail Planning Information, 2009):

- Food and non-alcoholic beverages
- Alcoholic drink (off license sales)
- Tobacco
- Non-durable household goods
- Newspapers and magazines

The fifth criterion is the distance and travel time from the customers’ points of origin towards the shopping center. The smaller shopping centers attract consumers with the shortest traveling time and the smallest travel distance. Increasingly, large shopping centers are intensifying their attraction meaning that consumers are willing to travel further and longer in order to go there (Vernor, Amundson, Johnson, & Rabianski, 2009). The sixth and last criterion is the customer base. Hereby, the concept of smaller shopping centers is similar to the concept of traveling time and distance. Smaller shopping centers have a smaller customer base while larger regional shopping centers have a larger customer base (Vernor, Amundson, Johnson, & Rabianski, 2009). Based on the six criteria which are described above, the shopping centers can be categorized. The categorization is shown in table 3.

<table>
<thead>
<tr>
<th>Type of center</th>
<th>Population support required</th>
<th>Anchor tenant</th>
<th>Typical size (m²)</th>
<th>General range of size (m²)</th>
<th>Usual minimum site area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience center</td>
<td>-</td>
<td>Minimarket</td>
<td>2.000</td>
<td>Up to 3.000</td>
<td>-</td>
</tr>
<tr>
<td>Neighborhood center</td>
<td>3.000 – 40.000</td>
<td>Supermarket</td>
<td>5.500</td>
<td>3.000 – 9.000</td>
<td>12.000 – 40.000</td>
</tr>
<tr>
<td>Community center</td>
<td>40.000 – 150.000</td>
<td>Supermarket, drugstore, discount department store</td>
<td>17.000</td>
<td>9.000 – 37.000</td>
<td>40.000 – 120.000</td>
</tr>
<tr>
<td>Regional center</td>
<td>150.000 or more</td>
<td>One or two full-line department stores</td>
<td>55.000</td>
<td>27.000 – 84.000</td>
<td>40.000 – 240.000</td>
</tr>
<tr>
<td>Superregional center</td>
<td>300.000 or more</td>
<td>Three or more full-line department stores</td>
<td>93.000</td>
<td>56.000 – 185.000 or more</td>
<td>60.000 – 400.000</td>
</tr>
</tbody>
</table>

Table 3: Categorization of shopping centers - source: (Vernor, Amundson, Johnson, & Rabianski, 2009)

The convenience centers provide for the sale of personal services and convenience goods. This is similar to the function of a neighborhood center. The convenience contains a minimum of three stores. The neighborhood center also provides for the sale of convenience goods and personal services for the day to day living needs of the surrounding neighborhood area. The main anchor of this center is a supermarket. The community center is quite similar to the regional center. However, its size usually smaller. Thereby, the anchor of such a center is a supermarket or drugstore instead of a department store. It combines day to day products, which are typically found in convenience or neighborhood centers, with apparel, hardware, home furnishings, home improvement, and specialty stores. The regional and superregional center are increasingly larger than previously mentioned center. Thereby, the anchor tenant is replaced by a department store while the number of convenience goods (day to day products) is decreased (Vernor, Amundson, Johnson, & Rabianski, 2009).
Convenience retail is the sector that focuses on daily goods which will be researched in this study. Locatus (a Dutch company which is specialized in providing data regarding the retail real estate market on a highly specific level of detail) has produced a list with a variety of types of retail which categorizes them in daily goods and luxury goods. Based on this categorization, this research will include the types of shops that are indicated as daily goods. The types of shops regarding daily goods are (Locatus, 2017):

- Frozen food
- Vegetables/fruits
- Bakery
- Pies
- Toko
- Chocolate
- Coffee/tea
- Deli
- Cheese
- Mini supermarket
- 24/7 night shop
- Nuts
- Poulterer
- Butcher
- Wine shop
- Supermarket
- Tobacco
- Fish
- Sweets
- Hospital shop
- Pharmacy
- Drug store
- Perfumery
- Hair products

Due to their nationwide dataset of retail, Locatus enables this research to include the whole convenience retail market throughout the Netherlands. This categorization is the primary factor in deciding the type of assets includes in this research and determine the categorization of convenience retail.

5.2 Shopping motivation and behavior

A motivation can be described as a driving force of an individual that impels them to action (Schiffman & Kanuk, 1997). It is, therefore, assumed that an action of each individual is triggered by a certain stimulus. This phenomenon happens in the consumption market as well. Consumers are the individuals which are taking the action. Their driving force is to satisfy a certain need. This need can vary between the need of buying an essential product such as food and the need to entertain them.

A distinction is made between the shopping motivations based on a hedonic model, which contains 7 motivations as follows. (Arnold & Reynolds, 2003):

- Adventure motivation – shopping is viewed as an adventure. Hereby, the individuals expect certain levels of thrills, stimulation, excitement produced by sight, smells and sound.
- Social shopping – shoppers see the main purpose of shopping as an opportunity to socialize
- Gratification shopping – shopping is used as a reward. Individuals reward themselves from releasing the built up tension created by nowadays society.
- Idea shopping – this shopping is undertaken to provide the shopper with up to date information on the development of new products and trends.
- Role shopping – shopping motive relates to the shopper’s role in society and feel enjoyment when shopping for others. Finding the perfect gift gives individuals excitement and intrinsic joy.
- Value shopping – the purpose of this activity is to find a bargain. Hereby, the main focus is to find a product with a good value for its quality.
- Anticipated utility – the aim of the shopping is to obtain a product. Shoppers expect to gain the utility offered by the product that they purchased

Based on which motivation a consumer has, their perception on different aspects of shopping changes. The perception of the store atmosphere, social factors, interior layout and store space vary. Hereby, motivations such as social and gratification shopping raise the importance of the perception of these aspects while value shopping and anticipated utility do not seem to be influenced by it (Budisantoso & Mizerski, 2010).
The shopping motivation determines which physical factors consumers consider important during that particular shopping trip. The motivation to satisfy the consumers’ needs to buy necessary products for survival (the first physiological needs in Maslow’s pyramid) is mainly done in convenience retail. Hereby, the experience of excitement, joy, and thrills are less valued compared when the consumer is going for a social shopping trip. The physical aspects of convenience retail are not focused on attracting consumers but are shifted towards efficiency. The increasing time pressure and declining discretionary time have altered the shopping motivation as well as the shopping behavior. Therefore, consumers are not withheld by convenience centers with less physical attraction and stimulants of excitement as long as it fulfills their needs and it is time efficient. The purpose of visiting a convenience center is not aimed at recreational shopping but on fulfilling the need to buy specific products (Geuens, Brengman, & S’Jegers, 2001). In addition to Maslow’s hierarchy of needs, the motivation of buying physiological need-products comes in the first place and the motivation for social interaction during shopping is located higher in the hierarchy as seen in Figure 12. Due to the greater need for survival products (such as food and drinks), the perception of physical attributes like the atmosphere and the social factors of a convenience shopping center are not playing a great role in attracting consumers (Leszczyc, Sinha, & Sahgal, 2004). However, this phenomenon will be described later on.

Besides that, the physical attractiveness is not a major influencing factor on the shopping behavior of consumers which are doing their groceries, the composition of a center does. As described before, the increasing time pressure of nowadays society is changing the consumer’s behavior (Geuens, Brengman, & S’Jegers, 2001). A consumer that is time-constraint and has a single-purpose motivation tends to choose to visit a shopping center that is convenient based on location and efficiency, rather than visiting a shopping center that gives the consumer access to other activities (Leszczyc, Sinha, & Sahgal, 2004). A typical center that is chosen for a single-purpose trip is a grocery store. The choice of the center also depends on the match between the needed product and the shop that sells it (Leszczyc, Sinha, & Sahgal, 2004). In other words, the composition and type of shops need to match the need of the consumer in order to attract it. A shopping center is more attractive when it has a combination of shops that often are visited on the same trip and which have a wide variety of products which are typically convenience products (daily based products such as groceries) (Recker & Kostyniuk, 1978).

5.3 Trends in the retail market
The retail market is just like the other commercial real estate markets very dynamic. The retail market is consumer-driven. Therefore highly sensitive to demographic, technological and social trends. The retail market has to incorporate these trends in order to keep their market share. Retailers that fail to innovate and adapt often fall short to retailers that can (Campbell & Cochrane, 1999). Therefore, trends in the retail market should be taken into account when research this matter.

5.3.1 Scaling of size
The Dutch supermarket sector went through a phase of scale enlargement. The existing supermarkets kept growing in size based on square meters (DTZ Zadelhoff, 2011). The result of this phenomenon is that the amount of supermarkets dropped annually. During the period of 2006 till 2010 The amount of supermarkets dropped from 4.421 to 4.314 (MSCI, 2017). Because consumers are constantly looking for greater, newer and biggest supermarkets, the pressure on the real estate to keep up with this trend is enormous (DTZ Zadelhoff, 2011).
The trend of scale enlargement is been in reverse. The amount of supermarkets are increasing while the size of the supermarkets increases on a stable rate in the period of 2011 until 2017. The amount of supermarket raises from 4.314 till 4.612, which is a sharp increase compared to the size in square meters of the supermarkets. This trend development is shown in Figure 5.

![Amount of supermarkets in units and square meters](image)

*Figure 5: Amount of supermarkets in NL 2004-2017 - source: Locatus (own elaboration)*

The amount of supermarkets and the size of the supermarkets seems to be the influencing factor on the performance of the retail real estate market based on the information of this trend. These two variables will be included in the research to determine if it actually does affect the performance of this particular real estate market.

### 5.3.2 Food safety, health and convenience

Nowadays, consumers are more aware of what products they buy. Food safety is getting more important for consumers. Hereby, consumers place a high level of trust in the food retail. They assume that the food retail is able to buy food which is safe (Fikes & Demeritt, 2016). Consumer worry more about the risks that can happen before the food gets in the store. The increased awareness is focused on the many possible hazards in the food system like contamination by chemical products as well as contamination from malice and mistakes (Fikes & Demeritt, 2016).

Another trend in the supermarket sector is the upcoming demand of healthy products and convenience. Personalized food boxes with the aim for consumers to be aware of what they are eating is the newest product on the market (Rabobank, 2017). The convenience that comes with it, is that the consumer can eat ready to eat meal at the moment they should while being provided with healthy products. Especially the moment of consumption is changing. The moment of consumption is often at the time of purchase meaning out-of-house consumption is growing. The consumption is
focusing around A-label products or discount brands. The middle segment is decline and this is translated in the market share of premium and discount supermarkets. Despite the focus on these two supermarkets, the upcoming of online food retail is pressuring the whole physical supermarket sector (Rabobank, 2017). These trends all affect the real estate of the supermarkets. Changing demands regarding food safety, health and convenience requires the supermarkets to adapt their strategy which could mean reduce or increase the amount of square meters necessary for activities. The food safety, health factor and convenience factor are not included in this research despite this being a trend in the food retail. The reason is the lack of data regarding this matter.

5.3.3 Urbanization and demographics

The Netherlands has an urbanization rate of 83 percent, which is relatively high compared with other countries. The younger part of the Dutch population moves to the larger cities with the purpose of find work more easily. Therefore, the relative size of elderly people in the countryside grows at a rapid pace. The Randstad is the area in the Netherlands which is most dense. The four biggest cities (G4), namely Amsterdam, Rotterdam, The Hague, and Utrecht are located in the Randstad and therefore have a short distance towards each other. This positioning means that although Amsterdam is the capital city, the Dutch economic, political and social concentrations are spreading throughout the Randstad. The countryside, therefore, is subordinated (Annexum International, 2014). The high urbanization rate means the demand towards retail, in general, is changing. Not only does the demand increases and decreases in certain areas, dependent if they are located in the Randstad or in the countryside, the demand also changes regarding products. Elderly people have a different shopping behavior, purchasing power, and shopping preferences. The demand of products will shift from apparel, beer, and soft drinks towards health, Do It Yourself, and home maintenance when a region having an increasing share of elderly people. The changing demographic requires shopping formulas to adapt due to the level of technology desired by different age groups. Elderly people are not embracing the technological innovation and prefer to avoid it. The self-scanning technology in convenience stores is more desirable in regions with a larger amount of youth. The Randstad would be a better place to upgrade and apply technical equipment compared with the countryside (Sheppard, 2013). The urbanization and demographic change could impact the performance of the convenience retail real estate sector. The location in or outside of the Randstad seems to be in affecting factor. Therefore, it is necessary to include the Randstad into the independent variable section in order to determine the effect of it on the performance of this real estate market.

5.4 Economic developments – business cycles

Economics are focused on the interactions and behavior of economic agents and how the economies function. Economics are made up out of two branches. These branches are the microeconomics and macroeconomics. These two branches of economics differ in their scopes. The scope of microeconomics aims at a single or small number of households or firms, while the scope of macroeconomics focuses on the entire economy. Hereby, is the growth or fluctuation an important aspect. The reason macroeconomics are important is that of the self-interest. Macroeconomics affect our daily life. For example, macroeconomics studies the amount of necessary products needed in a country and the number of employees which is required to produce that amount of products. A drop in production means that fewer employees are required, the unemployment rate will go up, and the chances of finding a job are smaller. The fluctuations within the macroeconomic spectrum play an important role for policy makers and governments (Fernández-Villaverde, 2002). Cyclical patterns are existing everywhere and are interdependent. These patterns are related to everything we live in and they affect human behavior and economic activity (Pyhrr, Roulac, & Born, 1999). The cyclical
pattern is a phenomenon that also occurs in the development of the economy, which is studied in the context of macroeconomics. The economy is always changing. However, this change occurs in recurring periods of growth and decline. This cyclical pattern is called the business cycle. The business cycle indicates if a particular economy and its activities are growing or are in decline (Bernanke, Gertler, & Gilchrist, 1999). Figure 6 shows how the development of the real GDP is growing over time while the real business cycle growth has peaks and troughs.

The business cycle is a phenomenon in macroeconomics. The trend line of the business cycle shows the preferred growth of real GDP and the peaks and troughs are showing the actual growth of the real GDP. The peaks and troughs are caused by inflationary and recessionary gaps. These gaps distil from changes in aggregate demand, which is the total demand of final goods and services in the economy at any given time, and aggregate supply, which is the total supply of final goods and services that firms in a national economy are planning to sell. An inflationary gap occurs when the aggregate demand (AD) and supply (AS) equilibrium is higher than the preferred real GDP growth. A recessionary gap occurs when the equilibrium is lower than the preferred real GDP growth (Handa, 2010). Figure 7 shows both situations. The Inflationary gap produces a peak and a recessionary gap produces a trough in the growth of the real GDP, as seen in Figure 6 (Handa, 2010).
Every time the real GDP hits the trend line the equilibrium of AD and AS is situated on the preferred real GDP growth level which ‘Y’ indicates in Figure 7. Because of these changes, a business cycle consists out of four stages which all affects the production, employment and incomes in a different way (Fanning, 2005). The business cycle cannot be seen as an autonomous phenomenon. There are economic indicators which determine the flow of the business cycle. Due to the irregular nature of both the length as well as the severity, it is hard to predict when and how severe the economic activity changes. Therefore, economic indicators are being used in order to anticipate on it as good as possible (Fanning, 2005).

The phenomenon of a business cycle will be used to describe the dynamic development of the Dutch economy. The expansion and contraction in the economy will be the points of interest in this research. To test the hypothesis, these stages should not interfere with the performance of the convenience retail market in a greater way than it does on other types of retail real estate. The economic indicators that will be used to determine the state of the Dutch economy are (IVBN, 2016):

- GDP
- Interest rate
- Consumer price inflation (HICP)
- Consumer confidence and spending
- Employment rate

The first economic indicator is the Gross Domestic Product (GDP). The GDP is the aggregate of all economic activities and consists of the market value of all final goods and services produced within the borders of a national economy in a year. The GDP is the aggregate activity but this does not mean that all the underlying components move synchronously or all move cyclically (Reijer, 2010). The GDP contain a few components. These components are the personal consumption, government purchases, private inventories, paid-in construction costs and the foreign trade balance. The foreign trade balance is the sum of all the export minus the import of the measured period of time (Barnes, 2010).

The second economic indicator is the interest rate. The amount of borrowed money influences the interest rate. A high interest rate is caused by more borrowed money. That money is borrowed purchase products. However, a lot of borrowed money raises the interest rate which results in consumers buying less. Therefore, producers need to cut their production and this slows down the economy. The interest rate indirectly influences the amount of production within an economy (Peter Dag Portfolio, 2005).

The third economic indicator is the inflation. Inflation is a decline in the real value of the monetary unit of account in an economy and therefore reduces the purchase power over time. The Harmonized Index of Consumer Prices (HICP) is the index that indicates the percentage change. The function of the index is to measure what a large basket of goods and services cost and then renders an overall indexed price as the weighted average of all the prices of the products in the basket. The index prices are often expressed in relation to a base year with the value of 100. The HICP is consists out of five components. These components are unprocessed food, processed food, non-energy industrial products, energy, and services (Reijer, 2010).
The fourth and fifth economic indicator is the consumer confidence and the consumer spending. The consumer confidence influences the business community. A decreasing consumer confidence results in the community to become nervous. However, when the confidence raises, sales are expected to rise which stimulates the employment rate and the economic growth. The consumer confidence indicates how much a consumer is going to spend in the near future. The consumer spending is a reaction on the consumer confidence. This indicates how much the consumer really spent on products and services. These two indicators, together with the interest rate affect the height of production in order to meet the demand (Kinsey, 1993).

The sixth and last economic indicator is the employment rate. This rate indicates the percentage of the total workforce which are actually employed. The employment rate is often seen as a lagged indicator. One which reacts a year later when the economy is expanding or contracting. The employment rate increases when the economy is growing while it decreases rapidly when the economy is in decline (McGuckin, 2001).

These indicators provides an overall view of the state of the Dutch economy at any given time. By collecting the data of these indicators from the past, it is possible to map the historical development of the Dutch economy. Based on that information, the relation between the economy and the performance of the convenience retail real estate can be studied. The performance of the convenience retail real estate should be resilient through the stages of the business cycle. The stages of the business cycle are categorized. Fanning (2005) categorized the stages as follows:

**Expansion**
During this period, the economy is on an upswing. A growth in production and employment can be seen. At this period, the price of consumer goods will increase but parallel with the growth in incomes. The GDP start to increase from a negative point in this stage, meaning that the economic activity increases. The expansion stage can be generally qualified when the GDP growth is around 2-3%. The unemployment rate reaches a natural rate, often around 4% and the height of inflation is near its 2% target (Fanning, 2005).

**Slowdown, peak, and downturn**
The economy continues to grow while reaching its full potential of employment. At this moment, the rate of inflation increases more than the consumer incomes and slows the economy. This phenomenon slowly reaches its peak while the economy sets itself up for contraction. The GDP is positive and reaches its peak at this stage. However, it is on the brink of a downturn. The peak often is indicated by a GDP growth of over 3%. The inflation rate also exceeds its 2% target. (Fanning, 2005).

**Contraction/recession**
A decline in employment, production, and income will be experienced in this period. Prices show stabilization and deflation. At this moment, the economy falls sharply. While the GDP is still positive, it is decreasing. The recession stage is characterized when the GDP growth decreases to a level below 2%. However, the recession starts when the growth rate turns negative and maintains a negative growth for two consecutive year quarters. Thereby, the unemployment rate starts to increase. However, due to a lagging indicator, unemployment rate often starts to increase in a later period of time (Fanning, 2005).
**Slowed, contraction, trough, and upturn**

Once the economy falls, it tries to stabilize rates of employment which slow down the process. The contraction stabilizes unemployment, reaches its trough point, and then set itself up to expand again. The GDP is not positive anymore and reaches its lowest point. However, it is preparing to climb back up again. The interest rate is often low at this point in order to promote economic growth (Fanning, 2005).

The period of a business cycle is not yet determined. Previous studies, such as from Burns and Mitchell have proven that business cycles are unpredictable (Burns & Mitchell, 1946). Another study of Filardo showed that the period of a business cycle is dependent on the length of the contractions and expansions but none could find a solid solution for the exact period of time of a business cycle (Filardo, 1994).

### 5.5 Relationship between business cycle and real estate cycle

The previous section described the interconnectedness between business cycle and real estate cycle. Additionally, changes in the financial market also affect the real estate market (AMP Capital, 2014). Figure 8 shows the relation between the business/financial cycle, the real estate cycle, and the physical cycle. The physical cycle determines the amount of vacancy, which in turn influence changes in rental levels. The financial cycle denotes the flow of capital towards funding real estate developments. New construction leads to changes in the price of real estate (AMP Capital, 2014).

![Figure 8: Relation physical, real estate and financial cycle - source: (AMP Capital, 2014)](image-url)
Figure 8 shows the starting point of each cycle. The economic upturn translates itself into credit expansion and an increased demand for property. From this point out, it follows the steps as shown in the figure above. However, there is still a discussion about the sequence of the cycles. Three different opinions are found related to the relation between the business cycle and the real estate cycle. This first opinion is proposed by Fanning, which states that the real estate cycle is depending on the business cycle (Fanning, 2005). However, the real estate cycle reacts in advance. Economic activities, such as loans and mortgages, would be created by real estate activities which are meant to accommodate the demand for properties on the short run (Hussein, 2011). Figure 9 shows the idea of Fanning graphically.

![Figure 9: Real estate and business cycle sequence – source: (Fanning, 2005)](image)

Another opinion related to the sequence of the two cycles is that the real estate cycles are tailed after the business cycle, meaning that the real estate cycle reacts on the changes of the business cycle. This is the opposite as Fanning stated and what figure 8 shows. Evidence of this phenomenon is that real estate supplies could not fulfill the current demand while at different times, there was an oversupply of real estate due to the low demand (Mueller G., 2002). The final opinion, which was also brought up by Mueller was that these two cycles are a ‘mirror reflection’ of each other. However, they may differ by the influence of a different set of time, locations and other dependents (Mueller G., 2002).

The theory regarding the interconnectivity between the cycles will form the base for the line of argumentation for this research. This pattern should indicate changes in the economic situation, followed up by changes in performance of real estate. The phenomenon called real estate lagging indicates that the opinion of Mueller, about the real estate cycle tailing the business cycle, is the one that seems the most self-evident.

### 5.6 Real estate lagging

The real estate cycle and business cycle are influenced by one another as described in paragraph 6.3. Previous studies from Fanning (2005) and Mueller (2002) have stated a different opinion on which cycle follows the other one. The phenomenon ‘real estate lagging’ will shed more light on this matter.
Real estate lagging in supply adjustment in response to a change in demand is a fundamental reason for the persistence of real estate cycles. This lag stems from the timeframe between the initiation and the completion of the construction. The demand towards a certain real estate object can be significantly changed between the time of initiation and the end of the development process (Brown & Crocker, 2001). A result of this lag is an oversupply of real estate due to attractive market at the moment of initiation. The oversupply occurs when demand is decreasing during the construction periods. Figure 10 shows this phenomenon (Haskell, 2011).

![Figure 10: Demand and Supply cycle - source: (Haskell, 2011)](image)

The long timeframe of development means that the effect of a contraction of the market will only be felt after completion of the construction. This suggests that the real estate cycle is tailing the business cycle (Mueller G., 2002).
5.7 Engel’s law

Engel’s law is a theory in macroeconomics that proposes a relationship between the income of a household and the proportion of that income being spent on food. The nature of this relationship is that the proportion of income spent on food declines as income rises. However, this does not imply that households with a higher income spend less money on food. It suggests as the income of a household increases, the demand, and expenditure on food also rises but at a slower rate (Houthakker, 1957). Figure 11 visualizes Engel’s law:

![Figure 11: Engel’s law visualized - source: (Houthakker, 1957)](image)

Figure 11 suggest that the elasticity of demand for food is between 0 and 1. The reason why the proportion of income spent on food increases slower than the increase of income is because there is a limit on how much food a single household needs. The number of stomachs to fill stays the same which means buying more food is considered excessive. The household consumption preferences shift from meeting basic human needs (such as food, water, and shelter), towards higher level aspirations (such as social status and entertainment) after meeting the limit of required food (Stoltman, 2011). Engel’s law suggests that there is a certain stability in the consumption of food due to the fact that food is a basic need. Figure 11 shows that the amount of money spent on food stabilizes at a certain level of income. Engel’s law suggests that the consumption of food is a relatively stable sector due to the low elasticity. The spending on food is a stable factor regardless of the income of a household. However, the expenditure on should still rises. The amount of necessary food stays the same. However, the same products with a higher quality can be bought for a higher price. Products which are biological or are from a premium brand instead of a discount brand can increase the total expenditure on food while the number of products stay the same. That is the reason why the amount spent on food keeps on rising at a small rate (Houthakker, 1957). Engel’s law complements with the hypotheses which are stated in chapter 4.
5.8 Hierarchy of needs

The hierarchy of needs of Abraham Maslow describes how people are motivated to fulfill basic needs before moving on to other needs. The five different layers in the theory of Maslow are often placed in a pyramid. The most basic needs are placed on the bottom and the more complex the needs become, the higher they are placed in the pyramid. The bottom of the pyramid forms the base of the human needs. Without these, all other needs become secondary. The more complex and higher placed needs become increasingly more psychological and social of nature (Cherry, 2017). Figure 12 shows the pyramid based on the theory of Maslow.

![Maslow's Hierarchy of needs pyramid](source: Maslow, 1943)

The hierarchy of needs as described by Abraham Maslow consists out of five different layers of needs. These are from top to bottom: self-actualizing, esteem, belongingness and love, security and physiological needs (Cherry, 2017).

The bottom of the pyramid represents the physiological needs. These needs are the most basic needs which are vital to survival. It contains needs such as water, air, food, and sleep. These physiological needs are instinctive and form the base for humans in order to have any demand towards other needs (Cherry, 2017).

The second layer is the need for safety. This layer is also considered important for survival. However, the physiological needs are much more demanding than safety which means that without the physiological needs, safety will not be a priority. Examples of safety needs are safe neighborhoods, steady employment, shelter from the environment and health insurance (Cherry, 2017).

The third layer in the pyramid of needs is the belongingness and love needs. This layer of needs helps to fulfill the need for companionship, acceptance, and involvement in the community and social or religious groups. These needs are less basic towards human existence. Examples of this type of need are relationships, as well as romantic as friendships and family relations (Cherry, 2017).
The fourth layer consists of the esteem needs. This type of needs comes into play after the other previous needs are fulfilled. The esteem needs include aspects that reflect on self-esteem, personal worth, social recognition and accomplishment (Cherry, 2017).

The final layer, and top of the pyramid are the self-actualizing needs. This highest level of the hierarchy of needs includes the need of self-awareness, personal growth, fulfilling their potential and being less concerned about the opinion of others (Cherry, 2017).

As the pyramid in Figure 12 shows, the physiological needs is the starting point for this motivation theory. A person who is lacking these needs (foods, sleep, water, etc.) will probably crave for these strongly (Stephens, 2000). Other needs, which are placed higher in the pyramid, will not be demanded as long the physiological needs are not met (Tikkanen, 2007). This principle can be translated towards the needs in shopping. Food is on the bottom of the pyramid. Food retail, which is considered as part of the convenience retail, gives consumers easy access towards one of their most basic needs which they require to survive. The convenience retail is a sector that can provide consumers with those basic physiological needs. As the theory of Maslow’s states ‘Other needs become secondary when the physiological needs are not yet have been satisfied’ (Stephens, 2000). This means that convenience retail represents the physiological needs of Maslow’s theory and so becomes first priority. It should indicate that the performance of convenience retail should maintain its level regardless of the economic situation due to the fact that humans will always need those basic needs.

5.9 Measuring the performance of retail – absorption rate

The absorption rate indicates the strength of the local real estate market in a particular sector. This indicator measures the amount of demand for a certain type of real estate by the market, and thus by potential retailers (Sivitanidou & Sivitanides, 1999). This measure of performance is the indicator for the first hypothesis. A high absorption rate for retail means that many retailers want to start or continue an existing business in the researched area. Absorption is the amount of space being leased within a market or submarket. This is calculated over a certain timeframe, which is usually a year. The absorption rate takes into account the change in occupied space, as well as the change in the existing stock. By considering both new constructions as well as demolitions, a realistic view on the absorption rate is calculated (IREM, 2015). The absorption rate is calculated as followed (Hussein, 2011):

\[
\text{Absorption rate} = \frac{\text{Occupied space (t)} - \text{Occupied space (t - 1)}}{\text{Existing Stock (t)} - \text{Occupied Space (t - 1)}} \times 100
\]

The absorption rate indicates the amount of vacant retail space is being occupied again. It gives an indication of the amount of demand towards a certain type of real estate. When the demand exceeds the supply, the absorption rate is positive and vacancy decreases. However, when the supply is greater than the demand, vacancy increases because of a negative absorption rate (IREM, 2015).

5.10 Measuring the performance of retail – turnover per square meter

Turnover/sale per square meter gives an indication of how efficient the retailer is with the use of sales space and assets. This measure of performance represents the sales productivity of a retail object compared to its size and thus can be used as a measure for the first hypothesis. It is calculated by dividing the turnover of a retailer by the amount of floor space it has (Nicasio & Stanley, 2016). This is an important indicator for evaluating location-related turnover potential (Doplbauer, 2015).
This measure of performance is added in this research to give additional insights on the performance. Despite, the demand towards the real estate by retailers, which is calculated with the absorption rate, sales productivity adds a dimension on the performance of retail real estate from the consumer’s side. By using both variables, light will be shed on the demand and the turnover as performance indicators which shows both the demand of retailers as well as the demand for convenience retail by consumers.

5.11 Real estate investment preferences

Investing is an act of putting money into financial schemes, shares, property or a commercial venture with the expectation of achieving profit. Investing in real estate is characterized by high transaction costs, large lot size, a lack of liquidity, and products that are fixed at their location and which are heterogeneous. Real estate objects are not on a centralized exchange and the market has a low transparency level due to a lack of public information. The lack of transparency and public information results in a relatively high risk-adjusted return profile (Georgiev, Gupta, & Kunkel, 2003). Based on the Modern Portfolio Theory, the risk and the return of an investment are the leading indicators whether to invest in a certain product or object. The theory of ‘Behavioral Finance’ suggests that investors have a certain level of risk aversion. An investment is not worth making when the return does not cover the potential risks (Buunk, 2013). Different real estate investment objects can be compared by determining the Sharpe ratio which is calculated by the average total return minus the risk-free rate divided by the risk (a smaller standard deviation means less risk). The risk-free rate is often represented by a short-term government bond. The height of the Sharpe ratio determines how ‘safe’ a particular investment is, i.e. the higher the ratio, the more return you get for a certain level of risk (IVBN, 2016).

The return on real estate can be dividend in direct and indirect return. The direct return is the annual net rental income of the property, which is called income return. The direct return is the growth of capital over the years of owning the property. Together, the direct and indirect return make up for the total return on the property (Buunk, 2013). An investor sets a target of the minimum total return which they expect to have on a certain investment. With this target total return, there is a risk. The risk in real estate investments is measured by the standard deviation. The standard deviation measures how far the annual returns differ from the expected average return. A high stand deviation means that the returns are highly volatile and are not close to the expected average return. This means more risk due to the uncertainty about the height of the return (Buunk, 2013). An investor is investing in properties with a good Sharpe ratio, meaning a return that matches the investor’s target (or higher) with a low standard deviation.

Based on the information regarding the returns and the risk of investing in real estate, the convenience real estate market would be a great investment opportunity when the Sharpe ratio is good compared to other sectors. This can be done by having a high annual total return or a low risk.
6. Conceptual framework

This chapter will provide an explanation on how the variables are related to each other and what data will be used to operationalize them. The research is divided into two phases with each a different set of independent variables.

6.1 The framework

![Conceptual framework](image)

Figure 13: Conceptual framework - source: own elaboration

6.2 Operationalization

The conceptual framework in Figure 13 shows the relation between the different variables. This paragraph will explain how each variable will be used in the research and what kind of data it requires.

6.2.1 Independent Variables

Phase 1 (economic indicators and convenience retail performance)

**GDP - BBP**

The Gross Domestic Products (GDP) is a monetary measure of the market value of all final goods and services produced minus imports in a certain period of time, which can be quarterly or yearly. The nominal GDP is being used to determine the economic performance of a region or a country. In this way, areas can be compared internationally. The GDP is a sum of the consumption, investment, government spending and net exports and is expressed as US dollar per capita (OECD, 2016). To use this in the Dutch content, the BBP is being used. Bruto Binnenlands Product (BBP) is the Dutch equivalent of the GDP.
Interest Rate
The interest rate is measured by the annual interest rate of a 10-years government bond. This interest rate represents the level of risk of investing in a particular country. Over the past 20 years, the Netherlands have a low interest rate compared to other EU Member States, which indicates the low level of risk for investments in the Netherlands (IVBN, 2016). The interest rate is measured in percentages.

Consumer Price Inflation (HICP)
The consumer price inflation is measured by the Harmonized Index of Consumer Prices (HICP) in the Euro area, also known as inflation. The term Harmonized indicates that all countries in the European Union follow the same methodology. This makes the data comparable for each country. The HICP represents the development in the prices of all goods and services available for purchase within the euro area for the purposes of directly satisfying consumer needs. In other words, it measures the average change over time in the prices paid by households for a specific, regularly updated basket of consumer goods and services. The aim of the European Central Bank (ECB) is to maintain a stable price level, which is defined as an annual HICP inflation rate below but close to 2% (ECB, 2017). The HICP is measured in percentages.

Consumer Confidence & Spending
The consumer confidence and spending are highly correlated economic indicators. The consumer confidence measures the degree of optimism among consumers about their personal financial situation and that of the local economy. A higher consumer confidence translates itself into more spending. The consumer confidence is measured by surveys which register how many households were optimistic and how many were pessimistic. The level of optimism is represented by a scale between -100 and 100. The higher the number, the more confidence the consumers have. A negative number indicates the level of pessimism and a positive number indicates the level of positivism of that period of time (TE, 2017).

Related to the consumer confidence is the consumer spending. As stated before, more confidence results in more spending. Consumer spending measures the amount of voluntary private consumption or an exchange of money for goods and services. The spending indicates the demand side of the production (Amadeo, 2017). The consumer spending is measured in euro.

Employment Rate
The employment rate is defined as a measure of the extent to which available labor resources are being used. Labor resources are people which are available to work for at least one hour and are over the age of 15. The employment rate is sensitive to the business cycle, meaning that the rate drops when the business cycle goes into contraction/recession (OECD, 2016). The employment rate is measured in percentages.

Phase 2 (composition shopping center and convenience retail performance)
Total units per shopping center
The total units per convenience shopping center measure the number of shops located within the convenience shopping center. This variable is measured in number of shops. This variable is included as part of the influence of the composition of the shopping center on the performance of the convenience retail real estate sector.
Convenience retail in square meters
The convenience retail in square meters determines how many shops of the convenience shopping center are having the function as described in the list in paragraph 6.1. This variable is calculated by dividing the number of square meters of convenience retail from the total amount of square meters of the entire convenience shopping center. Therefore, this variable is measured in percentages.

Amount of supermarkets
The amount of supermarkets indicates how many supermarkets are located in the convenience shopping center. This variable is measured in number of supermarkets. This variable is included as part of the influence of the composition of the shopping center on the performance of the convenience retail real estate sector.

Supermarket in square meters
The supermarket in square meters indicates how many square meters of the convenience shopping center are being used by supermarket tenants. This variable is calculated by dividing the amount of square meters used by supermarkets from the total amount of square meters of the entire convenience shopping center. Therefore, this variable is measured in percentages.

Quality of tenant
The quality of tenant indicates if the supermarket tenant in a particular convenience shopping center is qualified as high-quality. Supermarket tenants are being rated based on their financial survivability and on how attractive they are towards consumers. This variable is a dummy within the regression model which means that a 1 indicates that there is a high-quality supermarket tenant present in the convenience shopping center. A 0 indicates that there is not a high-quality supermarket tenant present in that convenience shopping center.

City
The city indicates in which of the preselected cities the shopping center is located. This purpose of this variable is to see if a particular city is having an influence on the performance of the convenience retail shopping centers. This variable is a dummy in order to use it in the regression model. The Hague is being used as the reference and the other cities are labeled 1 till 19.

Randstad
The Randstad indicates if a particular shopping center is located within the area called ‘Randstad’ or not. The Randstad is considered as a more attractive location due to the increasing population and the settling of business which create jobs (Nabielek, Hamers, & Evers, 2016). Due to this attractive environment, this variable is being used to detect any different regarding the performance in or outside of the Randstad. This variable is a dummy in order to use it in the regression model. A 1 indicates that the convenience shopping center is located within the Randstad and a 0 indicates that it is located outside of the Randstad. The difference between shopping centers within the Randstad and outside of the Randstad could be a result of urbanization. Urbanization leads to an increasing amount of youth to move to the Randstad. Therefore, the proportion of elderly people in the countryside raises. The different shopping motivations, shopping preferences, and behavior could lead to differences in the performance of the convenience retail real estate markets.
6.2.2 Dependent Variable

Absorption Rate
Absorption is the amount of space being leased within a market or submarket. This is calculated over a certain timeframe, which is usually a year. The absorption rate takes into account the change in occupied space, as well as the change in the existing stock. By considering both new constructions as well as demolitions, a realistic view on the absorption rate is calculated (IREM, 2015). The absorption rate is measured in percentages.

Turnover per square
Turnover per square meter measures the sales productivity of a retail object. By calculating the turnover per square meter instead of turnover in general, it eliminates the size of the retail object which makes different objects comparable. Turnover per square meter is measured by dividing the turnover of a retailer by the number of square meters. It is expressed in euro.

Total return
Total return measures the return an investor receives annually upon their investment of a particular investment. This included capital growth (indirect return) and income return (direct return).

Vacancy per square meter
The vacancy per square meter indicates how much square meter in the shopping area is not being rented by any retailer. Hereby, the square meters of vacancy are divided by the amount of total square meter of the shopping center. This will provide the percentage of how many square meters are vacant within the entire shopping center.
7. Methodological framework

The methodological framework defines how I will conduct the research. This framework contains a research strategy, research methods, and an approach to analyze the gathered data. Hereby, it is important to describe the validity and reliability of the research. This chapter will describe all these aspects.

7.1 Research strategy

The research strategy guides the way on how the research will be conducted. Within the research strategy, there are three key decisions to be made (Verschuren & Doorewaard, 2007).

The first key decision in the research strategy is the preference between depth or breadth of this research. It is chosen for a breadth research. A Large-scale approach will be used to analyze all the convenience retailers as described according to the theoretical framework. By choosing this approach, the depth, complexity, and elaboration will be limited. However, this enables generalization of the results which is preferred for this subject (Verschuren & Doorewaard, 2007).

The second key decision is whether the research will have a quantitative, qualitative or a mixed methods nature. The purpose of this research is to determine a correlation between the Dutch economy and the performance of its convenience retail real estate. The determination of the correlation will be assessed quantitatively. Quantitative research is characterized by the use of a large data set (Verschuren & Doorewaard, 2007). The nature of this research requires the use of a large data set and thus means the research will have a quantitative approach. Another reason for a quantitative research is due to the use of a historical analysis, which is characterized by a quantitative approach (Verschuren & Doorewaard, 2007). A combination of tables, charts, numbers, and calculations will be used to compile the research findings. Qualitative research will not be needed because the focus of this type of research is not on the motive behind the data.

The final key decision is whether empirical or desk research will be used. The nature of this research requires a large quantity of data which is accessible by existing literature. This makes empirical research unnecessary. This research will be conducted by using desk research to gather a large quantity of data quickly (Verschuren & Doorewaard, 2007).

7.2 Research methods

As stated in the previous paragraph, this research will use desk research as a method. However, within the method of desk research, there are two variants. These two variants are literature survey and secondary research. Literature survey is being used by researchers to gather knowledge produced by other while secondary research is being used to gather data produced by others (Verschuren & Doorewaard, 2007). Both of the variants will be used. Literature survey is necessary to answer the sub-questions that do not require data, such as: What is convenience retail and what products does it sell? Secondary research will be used for the sub-questions that do require data to answer them, such as the sub-question of the trends of the Dutch economy. Table 4 shows what method will be used for each of the sub-questions.
7.3 Approach to data analyses, validity, and reliability

The approach to analyzing the large quantity of data from a quantitative research will be done with SPSS. This program helps setting up a database which can be later used for the analyses. SPSS can perform the Granger Causality Test (GCT) which is necessary to determine if there is any relationship between the economic trends in the Dutch economy and the performance indicators of the convenience retail real estate.

The second phase will focus not on all the convenience retailers in the Netherlands. Hereby, a set of 20 cities will be chosen to see how compositional aspects influence the performance of the convenience shopping centers. Hereby, SPSS will be used in order to conduct a multiple regression analysis to determine the relation between the performance indicators and the performance of the convenience shopping centers.

The validity of a research measures if the research is conducted in such a way, that the right conclusions can be made. Validity can be divided in internal and external validity. Internal validity in quantitative research measures if the independent variables are the actual cause of the effect on the dependent variable. To make sure that all effects on the dependent variable are taken into account a major preliminary research will be conducted to include all possible independent variables that can be related to the dependent variable (Verschuren & Doorewaard, 2007).

External validity is important in order to ensure that the results of the research are generalizable. To do so, it is important to have a sample which represents the entire population. A biased sample of retailers will deform the results of the research and this could lead to wrong generalizable conclusions. It is important for this research to select a sample size that represents the whole population (Verschuren & Doorewaard, 2007). To make generalizable conclusions for the first phase of the research, all convenience retail real estate objects will be included in the research. This means that the research has a sample that reflects the entire convenience retail market which will prevent biased samples. The second phase of the research will be conducted and ensure of external validity to using all convenience shopping centers within the chosen cities. The cities are geographically spread out through the Netherlands which raises the external validity.

Finally, the research should be reliable. The reliability of a research relates to the consistency of a measure. Reliability in quantitative research means that if a research is conducted twice, in the same way, it would produce the same results. To ensure the research to be reliable, the method of which the data will be gathered and analyzed will be preliminary researched. By having a solid and well-thought-out base on how to conduct the research, it will increase the reliability of the research (Heale & Twycross, 2015). Thereby, the quantitative analysis will be done by following the rules which are set for Granger Causality Tests and multiple regression analysis.
8. Analysis – economic influence

This chapter will describe and explain the results that came forth from the analyses. The research is split up into two phases. The first phase starts with a descriptive analysis of the economic indicators, of the retail investment market and the performance indicators of the real estate. It will describe the development of each individual variable. After the descriptive analysis, a Granger Causality Test (GCT) will be conducted to seek out any relationship between the economic indicators and the performance indicators of the convenience retail real estate. The next phase is working towards a ‘success formula’ for convenience shopping centers. The relationship between the compositional aspects and the performance of the retail will be tested by a multiple regression analysis. From this point, it is possible to determine how an ideal convenience shopping center will look like.

8.1 Trend development of the Dutch economy

Before describing the trend development of the Dutch economy over the timeframe of 2004 till 2016, an important note should be added. The timeframe of 2004 till 2016 includes the ‘Great Recession’ which began in December 2007 and lasted until June 2009. These 19 months requires special attention due to the downfall of the economy in that period (Elsby, Hobijn, & Ahin, 2010).

8.1.1 BBP

The first economic indicator to analyze is the BBP, the Dutch equivalent of the GDP. The BBP development has a general upward trend. However, as described in paragraph 6.2 this development has several stages which represent the business cycle. Figure 14 shows the development of the BBP over the timeframe.

![BBP Development](image)

*Figure 14: BBP Development NL - source: Oxford Economics (own elaboration)*
The development of the BBP has an upward trend, as expected based on the theory of the business cycle in paragraph 6.2. Thereby, the real development of the BBP shows the peaks and troughs as the theory describes. The pattern of a business cycle is represented well in the timeframe of 2004 till 2016. The influence of the ‘Great Recession’ is seen in Figure 14. The BBP growth starts to stagnate in 2007 to be followed up by a huge decline. In the year 2009, the recession is announced due to the BBP development being negative for over two successive quarters. The BBP does increase in 2010 and 2011. However, this increase stops in 2012 when the ‘Euro crisis’ strikes (CBS, 2013).

Based on the preliminary research, the hypotheses states that convenience retail is a resilient real estate sector towards economic fluctuations. The BBP development shows that there are two troughs in the economy within the chosen timeframe. These two troughs (2009 and 2012) should have no to little influence on the performance of the convenience retail real estate sector if the hypotheses are correct. However, an important side note is that the retail real estate market seems to correlate with great economic fluctuations. When proven that big economic shocks do influence the performance more than that of other retail real estate, regardless of the performance of the convenience retail real estate sector during no economic stability, the hypothesis as described in the beginning of this research can be rejected.

8.1.2 Interest rate
The interest rate, which is expressed by the annual return on a 10-year government bond, indicates the level of risk for investing in a certain country. A higher interest rate is being used to curb inflation while lowering the interest rate, it promotes inflation and growth. The Interest rate is being used by the central bank to speed up or slow down the economic development. Mainly to prevent the unwanted peaks and troughs of the business cycle (FOREX, 2016). The interest rate of the Netherlands over the chosen timeframe is shown in Figure 15.

![Interest Rate Graph](image-url)
Before the ‘Great Recession’, the interest rate was relatively high, which indicates the central bank was promoting economic growth due to the rapid development of the BBP. The peak of the business cycle created in 2008 was confined by a high interest rate. However, the striking of the ‘Great Recession’ requires the central bank to lower the interest rate to promote growth again. A lower interest rate would make it more attractive to borrow money to purchase products on the market. The ‘Great Recession’ steered the economic growth down. By lowering the interest rate, the trough was limited and economic growth was stimulated. The downward trend of the interest rate indicates that economic growth is still being promoted.

8.1.3 HICP

The Harmonized Index of Consumer Prices (HICP) indicates the growth of the price consumers have to pay for goods and services also known as inflation. As described before, the aim to have an inflation of just under 2% is favorable for a smooth growth of the economy. The HICP of the Netherlands is shown in Figure 16.

![HICP NL - source: Oxford Economics (own elaboration)](image)

The recession stage of the business cycle is characterized by an increasing inflation, particularly when it exceeds the 2% norm. Figure 16 shows the moment the HICP exceeds the 2% in 2009, it is followed up by a contraction which is similar to the movement of the BBP in 2009. This indicates the recession stage of the business cycle. In the case of 2009, this is the ‘Great Recession’ that causes the contraction. A low inflation as seen in the period of 2014 till 2016 is unwanted due to the risk of deflation. Deflation slows down the economic growth of a country because consumers tend to postponed purchases (Rogoff, 2003). The low HICP results in a slower growth of the BBP in the Netherlands during this period.
8.1.4 Consumer confidence and spending

The consumption done by the Dutch population and their confidence in the economy indicates how willing they are to spend on products and services. Figure 17 shows the consumer spending and the consumer confidence over the chosen timeframe.

The pattern of the development of the consumer confidence looks about the same as the pattern of the BBP development. When the economy is on an upward trend (in the expansion or peak stage of the business cycle), the confidence of the consumers goes up as well. The confidence indicates that consumers are more willing to spend money. Therefore, the consumer spending goes accompanied by confidence in Figure 17. The difference between the consumer spending and confidence occurs because the attitude of the consumer does not always match with the amount of money they need to spend on required items, such as food. Therefore, a mismatch between the level of consumer spending and consumer confidence is a natural phenomenon (Deutsche Bundesbank, 2004). However, they do correspond to a certain level in times of big changes, such as financial crises or geopolitical tensions (Dées & Brinca, 2011). The ‘Great Recession’ and the ‘Euro crisis’ are examples of when consumer confidence went down and the consumer spending reacted according to this decrease. This is shown by the drops in 2009 and 2012/2013.

![Figure 17: Consumer spending and confidence NL - source: Oxford Economics (own elaboration)](image-url)
8.1.5 Employment rate

The employment rate is the last indicator for the economic development of the Netherlands in this research. A higher employment rate indicates a greater economic situation. More employees are required when the production goes up during economic expansion while in the recession stage, employment goes down due to less demand for products. Figure 18 shows the employment rate in the research period.

As predicted, the employment rate drops during the time of the ‘Great Recession’ and the ‘Euro crisis’ including their aftermath. These two periods are highlighted in the figure. The employment rate follows the same pattern as the BBP does. When the BBP goes up, production goes up because there will be more demand for products and services. This increased level of demand requires more employees. An example of this is the year 2008. The amount of consumer spending increase which is translated in an increase of the employment rate. However, during the occurrence of the ‘Great Recession’, the BBP falls which results in less consumer spending the following year and this translates itself into a lower employment rate.

8.1.6 Overall development of Dutch economy

The development of the economic indicators over the chosen timeframe are individually described in previous paragraphs. Each indicator helps understanding in which stage the Dutch economy is regarding the business cycle. Each stage can be observed by the characteristics as described in the theoretical framework. By reviewing each individual indicator of the researched years, it is possible to determine the stage of the economy. The results of this review are shown in table 5. The stages of the business cycle vary over the years. The theory of the business cycle describes that it is hard to determine a length of a full cycle. The timeframe of 2004 till 2016 confirms this due to the irregular changes between the different stages of the business cycle. The stages of the business cycle follow each other up with a change in pace.
Some of the stages of the business cycle prolong over a few years will others end in a year. This verifies the statement that the business cycle is not a law, but a suggestive pattern within the economy.

<table>
<thead>
<tr>
<th>Year</th>
<th>BBP</th>
<th>BBP growth</th>
<th>Interest rate</th>
<th>HICP</th>
<th>Consumer confidence</th>
<th>Consumer spending</th>
<th>Employment rate</th>
<th>Business cycle stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>579,532</td>
<td>1,80%</td>
<td>4,105%</td>
<td>1,264%</td>
<td>-33</td>
<td>279,064</td>
<td>92,850%</td>
<td>Expansion</td>
</tr>
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<td>2005</td>
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<td>2,16%</td>
<td>3,376%</td>
<td>1,688%</td>
<td>-30</td>
<td>281,461</td>
<td>92,750%</td>
<td>Expansion</td>
</tr>
<tr>
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<td>613,814</td>
<td>3,67%</td>
<td>3,788%</td>
<td>1,101%</td>
<td>-4</td>
<td>280,611</td>
<td>93,700%</td>
<td>Expansion</td>
</tr>
<tr>
<td>2007</td>
<td>636,507</td>
<td>3,70%</td>
<td>4,293%</td>
<td>1,614%</td>
<td>15</td>
<td>285,883</td>
<td>94,725%</td>
<td>Expansion</td>
</tr>
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<td>2008</td>
<td>647,317</td>
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<td>4,253%</td>
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<td>288,479</td>
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</tr>
<tr>
<td>2009</td>
<td>622,935</td>
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<td>3,712%</td>
<td>1,190%</td>
<td>-29</td>
<td>282,462</td>
<td>94,425%</td>
<td>Recession / Trough</td>
</tr>
<tr>
<td>2010</td>
<td>631,206</td>
<td>1,33%</td>
<td>3,009%</td>
<td>1,275%</td>
<td>-10</td>
<td>282,463</td>
<td>93,850%</td>
<td>Expansion</td>
</tr>
<tr>
<td>2011</td>
<td>641,713</td>
<td>1,66%</td>
<td>2,988%</td>
<td>2,341%</td>
<td>-13</td>
<td>282,921</td>
<td>93,925%</td>
<td>Peak</td>
</tr>
<tr>
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<td>1,951%</td>
<td>2,456%</td>
<td>-37</td>
<td>279,657</td>
<td>92,925%</td>
<td>Recession</td>
</tr>
<tr>
<td>2013</td>
<td>634,178</td>
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<td>1,970%</td>
<td>2,507%</td>
<td>-39</td>
<td>276,915</td>
<td>91,100%</td>
<td>Trough</td>
</tr>
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<td>1,455%</td>
<td>0,976%</td>
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<td>277,651</td>
<td>90,975%</td>
<td>Expansion</td>
</tr>
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<td>0,689%</td>
<td>0,600%</td>
<td>-8</td>
<td>282,534</td>
<td>91,350%</td>
<td>Expansion</td>
</tr>
<tr>
<td>2016</td>
<td>669,322</td>
<td>2,07%</td>
<td>0,288%</td>
<td>0,317%</td>
<td>4</td>
<td>287,436</td>
<td>92,675%</td>
<td>Expansion</td>
</tr>
</tbody>
</table>

Table 5: Economic indicators and business cycle stages of the Dutch Economy over the years - source: own elaboration

8.2 Development of the convenience retail performance

The preliminary research suggests that convenience retail is a resilient real estate sector towards economic fluctuation. In the previous chapter, the development of the Dutch economy is described over the timeframe of 2004 till 2016. The conclusion of mapping this development shows that the economy fluctuates in the way as the theory of the business cycle suggested. Regardless of these developments, the peaks and troughs that occur should have little to no influence on the performance of the convenience retail real estate. In this chapter the development of retail market will be described, followed up with the three variables, the absorption rate, the turnover per square, and the total return that indicate the performance of this real estate sector.

8.2.1 The Dutch retail market

The retail market is one of the major real estate markets in the Netherlands, not only based on size but also on investment activities (Deutsche Asset Management, 2017). This section reports the examination of the retail real estate market in the Netherlands. The descriptive analysis in this section will shed more light on this market and helps to understand its relative values in a better perspective through several market variables.

The retail real estate market in the Netherlands has a size of 44,198,860 square meters in 2016 (Locatus, 2017). Figure 19 shows how these square meters are divided over the provinces. From these total amount of square meters is 10,83% vacant, meaning that the vacancy consists of 4,784,894 square meters. The convenience retail takes up about 20,6% of the total amount of retail square meters. The convenience retail sector has a market of 9,117,959 square meters.
The South Holland province has the biggest retail market due to the presence of two of the four biggest cities of the Netherlands (G4) and a large amount of medium sized cities. Therefore is not only the overall retail market the biggest in South Holland, but also the amount of vacancy and convenience retail is the largest here. Despite its size, it does not have the most vacancy in percentages.

<table>
<thead>
<tr>
<th>Province</th>
<th>Percentage of total retail</th>
<th>Vacancy rate</th>
<th>Convenience retail %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zuid-Holland</td>
<td>17,38%</td>
<td>10,62%</td>
<td>20,02%</td>
</tr>
<tr>
<td>Noord-Brabant</td>
<td>16,31%</td>
<td>10,67%</td>
<td>14,67%</td>
</tr>
<tr>
<td>Noord-Holland</td>
<td>15,99%</td>
<td>9,54%</td>
<td>16,34%</td>
</tr>
<tr>
<td>Gelderland</td>
<td>12,72%</td>
<td>10,72%</td>
<td>12,12%</td>
</tr>
<tr>
<td>Overijssel</td>
<td>7,40%</td>
<td>12,78%</td>
<td>6,96%</td>
</tr>
<tr>
<td>Limburg</td>
<td>7,33%</td>
<td>14,88%</td>
<td>7,12%</td>
</tr>
<tr>
<td>Utrecht</td>
<td>5,59%</td>
<td>8,63%</td>
<td>6,91%</td>
</tr>
<tr>
<td>Friesland</td>
<td>5,18%</td>
<td>12,60%</td>
<td>4,26%</td>
</tr>
<tr>
<td>Groningen</td>
<td>3,89%</td>
<td>14,17%</td>
<td>3,64%</td>
</tr>
<tr>
<td>Drenthe</td>
<td>3,81%</td>
<td>11,94%</td>
<td>3,22%</td>
</tr>
<tr>
<td>Zeeland</td>
<td>2,74%</td>
<td>10,43%</td>
<td>2,60%</td>
</tr>
<tr>
<td>Flevoland</td>
<td>1,66%</td>
<td>12,48%</td>
<td>2,13%</td>
</tr>
</tbody>
</table>

Table 6: Retail market per province in the Netherlands - source: Locatus
8.2.2 Absorption rate
The absorption rate is the first key performance indicator to measure the performance of the convenience retail real estate. A high absorption rate indicates an increase of net leased units. The change in units being leased is due to the demand towards this type of real estate. More demand results in more units being used which results in a lower vacancy rate. The absorption rate of the Netherlands over the timeframe of 2004 till 2016 is shown in Figure 20.

![Absorption rate](image)

Figure 20: Absorption rate NL - source: own elaboration

The calculation of the absorption rate is based on the change of leased units in relation to the previous year. The absorption rate of the convenience retail real estate is positive nearly throughout the study period; every year more units are being leased compared to the previous year. However, the absorption rate seems to fluctuate. Based on the comparison of the standard deviation (s.d.) between the convenience retail (s.d. of 0,90), the non-food (s.d. of 1,61) and the total retail sector (s.d. of 1,03), the convenience retail fluctuates the least meaning it is the most stable retail sector of the three. The fluctuation of the convenience retail absorption rate does not seem to follow a similar pattern compared to the trends of key performance indicators of the Dutch economy. An example is the year 2009. That year is characterized by a decrease in most economic indicators. This year is in the recession stage of the business cycle. However, the absorption rate in this year reaches a relatively high percentage. The observation could verify the hypothesis of the resilience of this real estate sector. However, to keep in mind is that the influence of economic indicators can have a lagged influence. Studies showed that in times of big economic changes, such as peak and depressions, the retail sector can be influenced by the economy (Goetzmann & Rouwenhorst, 1999).

8.2.3 Turnover per square meter
The turnover per square meter is the second key performance indicator to measure the performance of convenience retail. The turnover per square meter measures the sales productivity of convenience retail, which represents how much consumers spend in convenience retail. The turnover per square meter over the research timeframe is shown in Figure 21. The turnover per square meter is transformed to index numbers in order to have a better comparison between different types of retail.
Figure 21: Indexed turnover per square meter NL 2004 - 2016 - source: MSCI (own elaboration)

The turnover per square meter is on an upward trend during the whole study period. The trend is interrupted by a period of no significant growth nor decrease during the time of the ‘Great Recession’ and the ‘Euro crisis’. The figure suggests that the turnover per square meter is not highly affected by fluctuations of the economic indicators. The reason of no significant change in the turnover per square meter can be the result of Engel’s law, which suggested that in times of recession and depression, the spending on food and other basic human needs is the last sector that would see a decrease due to the need of these products for survival. This phenomenon is confirmed by the low standard deviation of the convenience retail sector (s.d. of 3,46) compared to the total retail (s.d. of 5,34) and the non-food retail (s.d. of 8,45). When examining the income return, convenience centers have a relatively high return due to this ongoing demand towards daily goods. The comparison between convenience retail, non-food and the total retail sector indicates that convenience retail is more resilient against economic fluctuations than other types of retail. This complements with the first hypothesis.

8.2.4 Total return
The total return is the third performance indicator to measure the performance of convenience retail. This performance measure important from the investors’ perspective. The annual total return between 2004 and 2016 is shown in Figure 22.
The total return looks highly influenced by the economy. The harsh drop in the return of 2008/2009 indicates the financial crisis which hit the Netherlands. The decreasing return till 2015 could be the result of the Euro crisis. The average return over the period of 2004 till 2016 is 7.33% with a standard deviation of 5.03. The return of the total retail market has a similar pattern as the convenience retail market. However, the standard deviation is slightly lower. The standard deviation of the total retail market is 4.63. This indicates that the total return of the convenience retail market reacts harder on the economic situation. However, in chapter 10, the total return will be further explained including why this return reacts more on fluctuation.

8.3 Granger Causality Test

The previous paragraphs showed how the trend of each variable develops over the timeframe of 2004 till 2016. However, the descriptions and graphs do not give any concrete insight on how these variables are connected with each other. The causality connections will be investigated by using the ‘Granger Causality Test’ (GCT). This test seeks out if variable ‘X’ Granger-causes variable ‘Y’, meaning if variable ‘Y’ can be better predicted based on the historical data of both variable ‘X’ and ‘Y’ instead of just the historical data of variable ‘Y’. Thus, if there is a relationship between the two variables of interest (Lin, 2008).

Before the Granger Causality Test can be conducted, the data have to meet two requirements. The first requirement is that the data is stationary. To make data stationary, there should not be a trend or seasonal fluctuation in the time series data. De-trending and removing seasonal fluctuation can be done by differencing the data. Differencing the data means to create a new variable which contains solely the change between the original variable and the original variable of the previous time point, which in this research is the previous year (Lin, 2008). The second assumption is that the data is free of outliers. Outliers can be detected by using standardized Z-scores. The Z-score indicates how many standard deviations an observation is removed from the mean. An observation is considered to be an outlier when the standardized Z-score is over 3 or under -3 (Seo, 2002). The data is transformed to meet these requirements so the Granger Causality Test can be conducted. The results of the Granger Causality Test are shown in table 7. The exact results including the tables are shown in appendix A.
Granger Causality Test Result

<table>
<thead>
<tr>
<th>Independent variable (X)</th>
<th>Dependent variable (Y)</th>
<th>X = Y</th>
<th>Y = X</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F value</td>
<td>P value (sig.)</td>
<td>F value</td>
</tr>
<tr>
<td>BBP</td>
<td>Absorption rate</td>
<td>4.8307</td>
<td>0.05 **</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Absorption rate</td>
<td>0.0344</td>
<td>0.85</td>
</tr>
<tr>
<td>HICP</td>
<td>Absorption rate</td>
<td>0.0655</td>
<td>0.80</td>
</tr>
<tr>
<td>Consumer confidence</td>
<td>Absorption rate</td>
<td>4.5079</td>
<td>0.06 ***</td>
</tr>
<tr>
<td>Consumer spending</td>
<td>Absorption rate</td>
<td>2.6894</td>
<td>0.13</td>
</tr>
<tr>
<td>Employment rate</td>
<td>Absorption rate</td>
<td>0.2718</td>
<td>0.61</td>
</tr>
<tr>
<td>BBP</td>
<td>Turnover per square meter</td>
<td>2.3051</td>
<td>0.16</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Turnover per square meter</td>
<td>0.1346</td>
<td>0.72</td>
</tr>
<tr>
<td>HICP</td>
<td>Turnover per square meter</td>
<td>1.7528</td>
<td>0.22</td>
</tr>
<tr>
<td>Consumer confidence</td>
<td>Turnover per square meter</td>
<td>0.6533</td>
<td>0.44</td>
</tr>
<tr>
<td>Consumer spending</td>
<td>Turnover per square meter</td>
<td>2.0349</td>
<td>0.19</td>
</tr>
<tr>
<td>Employment rate</td>
<td>Turnover per square meter</td>
<td>0.0331</td>
<td>0.85</td>
</tr>
<tr>
<td>BBP</td>
<td>Total return</td>
<td>0.5682</td>
<td>0.47</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Total return</td>
<td>0.7614</td>
<td>0.40</td>
</tr>
<tr>
<td>HICP</td>
<td>Total return</td>
<td>0.6644</td>
<td>0.43</td>
</tr>
<tr>
<td>Consumer confidence</td>
<td>Total return</td>
<td>5.2440</td>
<td>0.05 **</td>
</tr>
<tr>
<td>Consumer spending</td>
<td>Total return</td>
<td>9.4935</td>
<td>0.99</td>
</tr>
<tr>
<td>Employment rate</td>
<td>Total return</td>
<td>0.2388</td>
<td>0.63</td>
</tr>
</tbody>
</table>

** 5% sig.
*** 10% sig.

Table 7: Granger Causality Test results - source: own elaboration

As described before, the Granger Causality Test calculates which variables are viable predictors for each other. Table 7 shows two columns, one where the independent variable (X) is tested to Granger-cause the dependent variable (Y) and the other column is the other way around. Based on the preliminary research, the hypothesis is that the economic indicators are not influencing the performance of the convenience real estate sector more than it does of other retail real estate. To see if this hypothesis is correct, the column X = Y is of major importance. The result of the Granger Causality Test shows that there are two variables which are viable predictors for the absorption rate namely, the BBP and the consumer confidence, none for the turnover per square meter and one for the total return namely, consumer confidence. The independent variables BBP and consumer confidence are viable predictors for the absorption rate and thus influence the performance. The BBP is statistically significant on a 5% level and the consumer confidence is statistically significant on a 10% level. For the total return, the consumer confidence is a viable predictor on a 5% significance level.
Based on the result of the Granger Causality Test and the comparison of the performance indicators of different types of retail, the first hypothesis cannot be rejected. Some economic indicators appear to have a relationship with the absorption rate and the total return. Therefore, the performance of the convenience retail is influenced by the economy. The graphs from the previous paragraph suggest that the absorption rate had a similar pattern of development over the year and therefore, it is not unexpected that some economic indicators are viable predictors. The reason why the consumer confidence correlates with the absorption rate can be explained. Retailers are also regular consumers. When consumers are having a low confidence about the economy, they will save their money and spend it only on the essentials. A financial crisis makes consumers, and therefore also retailers, more risk-aware (Buunk, 2013). A consumer which has the intention of opening a store will not be stimulated when he or she is not confident about the current economic situation. This also works the other way around. Confident consumers are more stimulated in potentially opening a store. The result of confident consumers is that they are more likely to open a store and therefore the absorption rate of vacant units increases. Despite the significant relations between some economic indicators and the performance indicators, the influences on convenience retail is overall smaller compared to other types of retail. This means that the convenience retail is more resilient and ensures the investor a certain level of stability.
9. Analysis - Composition of the shopping center

The previous analysis, based on the information of the aggregate of all convenience retail real estate in the Netherlands, showed that the GDP and consumer confidence influence the performance of the convenience real estate sector. However, the aggregation of the convenience retail real estate omits information on object related influencing factors. As the previous analysis stated, some economic indicators do have an influence on their performance. Despite this result, further research is necessary to determine other local factors that may influence the performance of this real estate sector. In this section, a sample of convenience centers will be selected to analyze their composition characteristics using a multiple regression analysis. However, by going in depth by selecting individual centers, the data of absorption rate, turnover per square meter and total return is lost. This data is only available at a macro level. Therefore, the vacancy rate will be used instead, to determine the performance of the convenience real estate.

9.1 Shopping center selection – the sample

The first step to research influencing factors any further is to select the shopping areas. A sample size of 268 shopping areas allows it to do a multiple regression analysis later on. The selection of the shopping area has a variety of requirements. The requirements are aimed to create a sample with differences in shop-compositions within a shopping area and geographical spread in order to see the influence of the location and size. The selection of the shopping areas is done with the following requirements in order to create a highly diverse sample for the analysis:

- Location: inclusion of shopping centers within the Randstad and outside the Randstad
- Quality of tenancy: inclusion of both, high- and low-quality tenants
- Size: inclusion of shopping centers with different sizes
- Convenience: shopping centers with high and low level of convenience retail should be included
- Supermarket: shopping centers with a high and low amount of supermarkets should be included

9.1.1 Location

The location of the shopping center can have an influence on the performance of the convenience retail shopping areas. A shopping center on growing major city can show a different level of performance compared to a similar shopping center in an area where the population is shrinking. Therefore, both types of shopping centers are included in the sample for this research.

Within this research, location refers to the geological placement through the Netherlands. The Randstad is known for its increasing amount of population, which are all potential customers for the convenience retail shopping center (Nabielek, Hamers, & Evers, 2016). Therefore, shopping areas in these locations can have a locational advantage which improves its performance. For this research, the Netherlands is divided into different areas. These areas are the Randstad, North of the Randstad, South of the Randstad and East of the Randstad. An extra category is added which is the G4. The G4 represents the four major cities in the Netherlands. Each of this category is represented by four cities, meaning that a total of twenty cities are selected throughout the Netherlands for this research. The selected cities are shown in Figure 23. In the legend, the selected cities are mentioned (the cities are mentioned order from the most northern in the category to the most southern in the category).
Figure 23: Geographical spread of the selected cities - source: Locatus (own elaboration)

- **G4** (Amsterdam, Utrecht, The Hague, Rotterdam)
- **Randstad** (Haarlem, Amstelveen, Leiden, Dordrecht)
- **North of Randstad** (Groningen, Leeuwarden, Assen, Zwolle)
- **South of Randstad** (Den Bosch, Breda, Tilburg, Eindhoven)
- **East of Randstad** (Harderwijk, Enschede, Amersfoort, Nijmegen)
9.1.2 Tenants

The quality of the tenants has a major influence on the performance of the whole shopping center. High quality tenants bring a variety of advantages for the owner of the shopping center. Firstly, they are able to pay the rent bumps which have built up into the rental period. Secondly, their attractiveness secures a certain flow of consumer traffic towards them and finally, they often are looking to expand which can fill in additional space in the shopping center. Therefore, having a high quality tenant serves as an anchor for the whole center in the form of stable rent income, additional attractiveness and possible expansion. A typical anchor for a convenience retail shopping center is a supermarket due to its size and type of products (Block, 2011). Therefore, within the sample, centers are selected that have high quality supermarket tenants (such as Albert Heijn and Jumbo) and lower quality tenants (Coop and local supermarkets). Based on the distinction between low and high quality supermarket tenants, the sample contains 165 centers with at least one high quality tenant and 103 centers with only low quality tenants. The Dutch supermarkets are described in table 8.

<table>
<thead>
<tr>
<th>Supermarket</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albert Heijn</td>
<td>Considered a high quality tenant. Albert Heijn is one of the leading food retailers in the Netherlands. In 2016, Albert Heijn had 955 shops nationwide with four types of formats. The annual turnover was €12.7 billion and nowadays it has a market share of 35.2%. The focus of Albert Heijn is based on an affordable everyday supermarket where special and fresh products are also available. Consumers which use the Albert Heijn as their primary supermarket are generally highly educated, one or two person household, and young families with children in the higher social class (Bord Bia, 2010).</td>
</tr>
<tr>
<td>Jumbo</td>
<td>The supermarket which is part of the ‘Bijeen Buying group’, is seen as the strong competitor to Albert Heijn. Therefore, Jumbo is considered as a high quality tenant as well. Jumbo is significantly grown over the past few years due to a large amount of acquisition. In 2016, Jumbo had 583 stores nationwide with an annual turnover over of €6.7 billion. This has improved greatly over the year and nowadays their market share is 18.4%. The aim of Jumbo is unique because they combine a high service level with discount prices. The consumer base is highly diversified because of the mixture of high service levels and low prices. A large percentage of the consumers are families with children (Bord Bia, 2010).</td>
</tr>
<tr>
<td>Plus</td>
<td>The supermarket which is focused on expressing themselves as a sustainable supermarket. With a few acquisitions over the past few years, the supermarket chain grew strongly. Despite its status of sustainable supermarket, Plus is not considered as a high quality supermarket. Their size of 262 stores with a market share of 6.2% in 2016 is too small. The annual turnover is €2.3 billion (Bord Bia, 2010).</td>
</tr>
<tr>
<td>Aldi</td>
<td>Discount supermarket. The store is considered a low quality tenant. The small and undeep assortment combined with the focus of being a hard discounter attracts consumer from the lower social classes as well as ‘fun’ shoppers (Bord Bia, 2010). Their market share is 7% and their annual turnover is unknown in 2016. Aldi has 507 stores nationwide.</td>
</tr>
<tr>
<td>Lidl</td>
<td>Known as the largest discounter in Europe. Despite their position, they have a smaller range of products. Their market share in the Netherlands is 10.3% with 409 stores nationwide in 2016. The annual turnover of 2016 is unknown. However, the annual turnover of 2015 is €4.6 billion (Bord Bia, 2010).</td>
</tr>
</tbody>
</table>

Table 8: Dutch supermarket descriptions - source: own elaboration
9.1.3 Size and composition
The size of the shopping center can have an influence on the attractiveness and therefore influence the performance. To analyze the effect of the size of the center as best as possible, the selected shopping centers vary in size. Hereby, the smallest shopping center has 160 square meters of shopping area in which 9 shops are located. The biggest shopping center has 6,391 square meters of shopping area with 93 shopping located in it. The average of the sample is 3,340 square meters with 24 shops.

The selection regarding the composition of a shopping center is based on the amount of convenience retail in square meter. In the sample of this research, shopping centers with more than 40% square meter dedicated to convenience retail are included. Thereby, another aspect regarding the composition of the shopping centers is the number of supermarkets. To analyze the effect of a supermarket, shopping centers with 0 to 5 supermarkets are included. The amount of square meters of supermarkets in a shopping area will determine if the size of the supermarket has an influence on the performance.

9.2 Assumptions multiple regression analysis
The multiple regression analysis serves the purpose of analyzing the relationship between several independent variables and a dependent variable (Mason & Perreault, 1991). However, before conducting a multiple regression analysis there are some assumptions that have to be met in order to ensure reliable outcomes of this analysis. There are six assumptions regarding the multiple regression analysis (Tremblay, 2013).

9.2.1 Assumption 1: Continuous level
The first assumption is that the variables which will be used in the multiple regression analysis are measured at the continuous level. Meaning that these variables are either interval or ratio variables. When this assumption is not met for a particular variable, it has to be transformed into a dummy variable in order to include it in the multiple regression analysis. The variables of location (city and in or outside the Randstad) and the quality of the tenant are transformed into dummies due to the fact that they were not on a continuous level. The other variables did not have to be transformed (Tremblay, 2013). By using dummies, this assumption is not violated.

9.2.2 Assumption 2: Linear relationship
The second assumption is that there needs to be a linear relationship between the two variables. To verify if this assumption is met, a scatterplot with the dependent variable and each independent variable has to be made. Within the scatterplot a certain level of linearity has to be seen in order to meet this assumption (Tremblay, 2013).

9.2.3 Assumption 3: No significant outliers
The third assumption is to have no significant outliers within the data. Outliers can have a negative effect on the regression analysis and therefore needs to be removed. Detecting an outlier can be done by examining the Z-scores of the variable. The Z-score indicates how many standard deviations a certain observation within that variable is removed from the mean. An outlier can be detected when the Z-score is greater than 3 or lower than -3. Observations of the variable that exceeds these limits will be removed in order to ensure that the used dataset does not contain any outlier which can influence the outcome of the multiple regression analysis (Tremblay, 2013). The Z-scores are calculated and all observations with a score that exceeds the limit is removed. Therefore, all outliers are removed and this assumption is not violated.
9.2.4 Assumption 4: Independence of observations
The fourth assumption is that each observation needs to be independent. In other words, the data need to be examined to detect autocorrelation. Autocorrelation can be detected by using the Durbin-Watson statistic. This statistic has a scale from 0 to 4. Hereby, a Durbin-Watson score of 0 means that there is perfect positive autocorrelation and a Durbin-Watson score of 4 means that there is perfect negative autocorrelation. The middle of the scale, a score of 2, means that there is no autocorrelation. The aim is to have as little autocorrelation as possible within the dataset. Therefore, a score around two is preferred. However, an acceptable range is between 1 and 3. Scores that exceed that limit means that this assumption is violated (Tremblay, 2013). The Durbin-Watson score of the multiple regression model of this research is 2.387. This score is close to 2, which indicates that there is nearly no autocorrelation. Therefore, this assumption is not violated.

Besides autocorrelation, each individual variable needs to be examined on multicollinearity. Multicollinearity checks if two independent variables are correlating with each other. Two independent variables that correlate with each other measure approximately the same aspect which will result in incorrect results of the multiple regression analysis. Multicollinearity can be measured by the Variance Inflations Factor (VIF). The lower the VIF, the less the independent variables correlate with each other. When the VIF exceeds the boundary of 10, it indicates that two independent variables are too highly correlated, meaning it should be removed or replaced by another variable (Tremblay, 2013). The VIF of each individual variable is calculated. The highest VIF is 4.384. This does not exceed the boundary of 10 and therefore it can be concluded that there is no multicollinearity in the model. The assumption of independence of observations is not violated.

9.2.5 Assumption 5: Homoscedasticity
The fifth assumption is homoscedasticity. The data needs to show homoscedasticity, meaning that the variances along the best fitted line of the model remain the same when moving along that line. In order to detect homoscedasticity, a scatter plot with the regression standardized residuals and the regression standardized predicted values can be used. Homoscedasticity is present when this scatterplot shows observations in a random cloud without clustering (Tremblay, 2013).

Figure 24: Scatterplot homoscedasticity - source: SPSS own elaboration
9.2.6 Assumption 6: Normally distributed residuals

The sixth and final assumption in order to conduct a multiple regression analysis is to examine if the residuals are normally distributed. This assumption can be checked by creating a histogram and a normal probability plot. Normally distributed residuals follow the normal overlay displayed on the histogram and the observations in the normal probability plot follow the same normal line as displayed. When the histogram and the normal probability plot show that the residuals are not normally distributed, the data can be transformed (Tremblay, 2013). In this research, the percentage of the vacancy in square meters was not normally distributed. The residuals were skewed to the right. In order to remove a right skew, the data needs to be logarithmic transformed (Benoit, 2011).

Figure 25: Histogram normally distributed residuals - source: SPSS own elaboration

Figure 26: Normal probability plot - source: SPSS own elaboration
9.3 Results multiple regression analysis

After meeting all the six assumptions as described in paragraph 10.2.1 till 10.2.6, the multiple regression analysis can be conducted by using SPSS. The variables that are being used are:

Dependent variable: Percentage of vacancy in square meters

Independent variables:
- Total units
- Percentage of convenience retail in square meters
- Amount of supermarkets
- Percentage of supermarkets in square meters
- Dummy of high quality supermarket tenants
- Dummies of all the selected 20 cities
- Dummy of the centers that are located in the Randstad

The multiple regression analysis of the percentage of vacancy in square meters is conducted by using SPSS. The output of the multiple regression analysis contains several tables, each containing information regarding the produced model. The null hypothesis for this model is that there is no significant influence of the independent variables on the dependent variable. The alternative hypothesis is that there is a significant influence of the independent variables on the dependent variable.

The first table is the Model Summary, which is shown in appendix B. The most valuable information in this table is the R Square. The R Square is a statistical measure to determine how well the data fits to the regression line. In other words: it is the amount of percentage of variable variation that is explained by the linear regression model. A higher R Square indicates that the produced regression model fits better with the used data (Israeli, 2007). The R Square of the multiple regression model of this research is 0,332. This means that 33,2% of the variable variation is explained by the model.

The second table is the ANOVA, which is also shown in appendix B. This table contains the significance level of the overall model. The significance level of the overall model in this research is 0,000. The model is significant on the 1% level, the strongest level, and therefore the null hypothesis can be rejected; the composition of a shopping center does influence the performance of it. It ensures that at least one of the independent variable is influencing the percentage of vacancy in square meters and thus that the model fits with the data.

The third table is the coefficients. This table contains the significance levels of each individual independent variable and the strength and direction of the relationship between that variable and the percentage of vacancy in square meters. Within this research, five independent variables seem to influence the percentage of vacancy in square meters. These variables are the total units, the percentage of convenience retail in square meters, and the dummies of the cities Amstelveen, Groningen and Enschede. The result is shown in table 9.
Table 9 shows the coefficients of the multiple regression analysis. However, this output should be interpreted with caution. Due to the fact that the residuals of the dependent variable were not normally distributed in the first instance, they had to be logarithmically transformed. This causes the residuals to be normally distributed but the side effect is that the interpretation of the coefficients of the multiple regression analysis should be adjusted. Without a logarithmical transformation, the interpretation of a coefficient is (Benoit, 2011):

* The change in the dependent variable for a one-unit change in the independent variable

However, when the dependent variable is logarithmical transformed, the coefficients should be interpreted as follows (Benoit, 2011):

* The percentage change in the dependent variable for a one-unit change in the independent variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.983</td>
<td>.000</td>
</tr>
<tr>
<td>Total units</td>
<td>-0.007</td>
<td>.015 **</td>
</tr>
<tr>
<td>Percentage convenience square meter</td>
<td>-0.015</td>
<td>.001 *</td>
</tr>
<tr>
<td>Supermarkets</td>
<td>-0.078</td>
<td>.132</td>
</tr>
<tr>
<td>Percentage supermarket square meter</td>
<td>0.001</td>
<td>.756</td>
</tr>
<tr>
<td>Dummy Amsterdam</td>
<td>0.190</td>
<td>.231</td>
</tr>
<tr>
<td>Dummy Rotterdam</td>
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<td>.783</td>
</tr>
<tr>
<td>Dummy Utrecht</td>
<td>0.082</td>
<td>.568</td>
</tr>
<tr>
<td>Dummy Amstelveen</td>
<td>0.337</td>
<td>.076 ** *</td>
</tr>
<tr>
<td>Dummy Haarlem</td>
<td>0.025</td>
<td>.883</td>
</tr>
<tr>
<td>Dummy Leiden</td>
<td>-0.118</td>
<td>.530</td>
</tr>
<tr>
<td>Dummy Dordrecht</td>
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<td>.741</td>
</tr>
<tr>
<td>Dummy Groningen</td>
<td>-0.287</td>
<td>.095 ** *</td>
</tr>
<tr>
<td>Dummy Zwolle</td>
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<td>.214</td>
</tr>
<tr>
<td>Dummy Leeuwarden</td>
<td>0.039</td>
<td>.844</td>
</tr>
<tr>
<td>Dummy Assen</td>
<td>0.274</td>
<td>.234</td>
</tr>
<tr>
<td>Dummy Eindhoven</td>
<td>0.006</td>
<td>.968</td>
</tr>
<tr>
<td>Dummy Breda</td>
<td>0.073</td>
<td>.655</td>
</tr>
<tr>
<td>Dummy Den Bosch</td>
<td>0.192</td>
<td>.487</td>
</tr>
<tr>
<td>Dummy Tilburg</td>
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<td>.367</td>
</tr>
<tr>
<td>Dummy Enschede</td>
<td>0.327</td>
<td>.039 **</td>
</tr>
<tr>
<td>Dummy Amersfoort</td>
<td>-0.070</td>
<td>.681</td>
</tr>
<tr>
<td>Dummy Nijmegen</td>
<td>0.123</td>
<td>.427</td>
</tr>
<tr>
<td>Dummy Harderwijk</td>
<td>-0.073</td>
<td>.788</td>
</tr>
<tr>
<td>Dummy Randstad</td>
<td>-0.006</td>
<td>.968</td>
</tr>
<tr>
<td>Dummy high quality tenant</td>
<td>-0.014</td>
<td>.834</td>
</tr>
<tr>
<td>R Square</td>
<td>0.332</td>
<td></td>
</tr>
<tr>
<td>Significance model</td>
<td>0.000</td>
<td>*</td>
</tr>
</tbody>
</table>

* 1% significant level
* * 5% significant level
* * * 10% significant level
Based on the interpretation of table 9, and as expected by the preliminary literature review, the performance of a convenience shopping center is influenced by the composition. The total units have a negative relationship with the vacancy rate in square meters on the 5% significance level. An increase of one unit in the shopping center will reduce the vacancy rate in square meters by 0.7%. The other significant influencing factor is the percentage of convenience retail in the shopping center. This variable is significant at the 1% significance level. This strong significant relation between the percentage of convenience retail in square meters and the vacancy rate is also negative. An increase of 1 percent of convenience retail in the shopping center results in a decrease of the vacancy rate with 1.5%. Based on the results of the multiple regression analysis and the comparison between the convenience retail and other types of retail, the second hypothesis can be rejected.

The multiple regression model shows that three cities have a significant relationship. The city of The Hague is selected as the reference. The variables of the cities can interpreted as follows:

The percentage difference between the reference and the independent variable

Based on the way of interpretation and the output given by SPSS, the city of Amstelveen has 33.7% more vacancy compared with The Hague on a 10% significance level. The city of Groningen has 28.7% less vacancy compared with The Hague on a 10% significance level and last, the city of Enschede has 32.7% more vacancy compared with The Hague on a 5% significance level. These variables are being added as fixed effects. This means that it increases the chance of producing a realistic model.

9.4 ‘Success formula’
The previous analyses showed that the performance of convenience retail shopping centers is not entirely resilient against fluctuations of the Dutch economy and that they are influenced by physical aspects, such as composition. Investing in this sector seems relatively attracting because it will provide a certain level of safety, while still having a reasonable total return, a positive absorption rate and turnover per square meter. Based on the multiple regression analysis, it is possible to set some criteria for a convenience shopping center in order to create a ‘success formula’ of which centers perform the best.

9.4.1 Size
The first aspect of the success formula is the size of the whole convenience shopping center. The size of the shopping center is measured in the total amount of units as well as in square meters. The number of units was used in the multiple regression analysis. Hereby, the analysis suggests that there is a negative relationship between the vacancy rate and the total amount of units. Figure 27 shows that it is not a straight line. Therefore, it can be concluded that there is no preference on investing in any particular shopping center based on the amount of units.
The other measurement of size is the total amount of square meter. This variable is not included in the multiple regression analysis because it would violate the assumption that all variables are independent of each other. The vacancy rate of the size in square meters is shown in Figure 28. The vacancy rate raises when the amount of square meters increase, meaning that a smaller convenience shopping center, has on average, a lower vacancy rate.
9.4.2 Amount of convenience retail

The second aspect of the success formula is the percentage amount of square meters of convenience retail in the shopping center. The multiple regression analysis showed that there is a negative relationship between the amount of convenience retail and the vacancy rate. Figure 29 confirms this relationship. The vacancy rate appears to decrease when there is a larger amount of convenience retail.

![Figure 29: Vacancy rate per category of convenience retail 2016 - source: own elaboration](image)

9.4.3 Supermarkets

The third aspect of the success formula are the supermarkets. The number of supermarkets is being used as a variable for the multiple regression model. The relationship was not significant but the suggested relationship would be negative as shown in Figure 30. The higher quantity of supermarkets, the lower the vacancy rate of that particular shopping center is. It is noticeable that the vacancy rate is higher at the category of two supermarkets, so these centers could be less attractive. This is most likely dependent on other aspects such as the quality and type of the building.

![Figure 30: Vacancy rate per category of supermarket 2016 - source: own elaboration](image)
Besides the number of supermarkets, the size of the supermarkets can also influence the vacancy rate. Therefore, the percentage of the total amount of square meters supermarket will be studied. Because this will show a more consistent correlation. Figure 31 shows the categories for this composition aspect. As expected, the vacancy rate drops when more square meters of a shopping center are rented to a supermarket. Therefore, it can be suggested that supermarket-anchored shopping centers are attractive to invest in.

![Figure 31: Vacancy rate per category of percentage supermarket 2016 - source: own elaboration](image)

The final aspect of the effect of a supermarket on the vacancy rate is the type of tenant. The multiple regression analysis shows a negative relationship between a high-quality tenant and the vacancy. However, this relationship is not significant. Figure 32 shows that the vacancy rate between shopping centers with a high-quality supermarket tenant is slightly higher than shopping centers with a low-quality supermarket tenant. The type of supermarket seems to have a low influence on the vacancy rate of a shopping center.

![Figure 32: Vacancy rate per category of quality supermarket tenant 2016 - source: own elaboration](image)
Based on the figures above, an investment in a convenience shopping center with certain characteristics can result in a lower vacancy rate. In table 10 the characteristics of an ideal convenience shopping center are described. Additionally, an acceptable range is given in which the vacancy is also relatively low.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Ideal:</th>
<th>Acceptable range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size in units</td>
<td>21-30</td>
<td>21 – 50</td>
</tr>
<tr>
<td>Size in square meters</td>
<td>&lt;2500</td>
<td>&lt; 4000</td>
</tr>
<tr>
<td>Percentage of convenience retail</td>
<td>75% - 100%</td>
<td>51% - 100%</td>
</tr>
<tr>
<td>Amount of supermarkets</td>
<td>4&gt;</td>
<td>3&gt;</td>
</tr>
<tr>
<td>Percentage of supermarkets</td>
<td>81% -100%</td>
<td>61% - 100%</td>
</tr>
</tbody>
</table>

*Table 10: Characteristic preferences convenience shopping centers - source: own elaboration*
10. Analysis – Investment opportunity

The retail market is one of the major investment sectors in the Netherlands. In this paragraph, the retail market will be compared with the other sectors based on the Sharpe ratio. The Sharpe ratio over the research timeframe of 2004-2016 will be compared to the Sharpe ratio over the timeframe of 1996-2016. This will give a better view on the performance of the real estate regarding the returns and risk. The Sharpe ratio of both timeframes are shown in Figure 33.

Figure 33: Sharpe ratio and average total return of real estate sectors NL 2004-2016 and 1996-2016 - source: MSCI (own elaboration)

Figure 33 shows the two Sharpe ratios over the two periods. The retail sector has the highest Sharpe ratios in both of the periods. This is caused by retail having the lowest risk (standard deviation) and the highest total return. Therefore, the retail market is the sector which is the most interesting for investments. A noticeable change between both timeframes is that within each sector, the Sharpe ratio dropped. This is caused by the significant decrease of the average total return during the crises. The drop of the Sharpe ratio, however, is minimalized by the average low risk-free rate in the period of 2004-2016. The drop of the Sharpe ratio in all sectors indicates that the whole real estate market has felt the negative influence of the economy recently. However, the drop in the retail sector is only 0,11 while the other sectors dropped twice or three times as hard. Therefore, the retail sector seems to perform quite stable during this period. This could be an indication that the retail sector, in general, is more resilient toward economic fluctuations compared to other real estate sectors.

The next figure zooms in on the different types of shopping centers. Figure 34 shows that in the most recent period, the city centers and in-town shopping high streets are performing better even when the total return dropped slightly. The other shopping centers have a decrease of the Sharpe ratio as well as a decrease in the average total return. This indicates that these shopping centers, including the convenience centers, are possibly affected by the financial crisis in the period of 2004-
2016. The convenience centers even shows the second hardest drop in the average total return and the hardest drop of the Sharpe ratio which indicates that the performance could be influenced by the economy. The total return drops from being the highest (8.9% - the same as city centers) to the fourth place. Despite the big drop, the convenience retail sector outperforms some of the other shopping centers.

![Sharpe ratio retail types](chart.png)

*Figure 34: Sharpe ratio and average total return of retail types NL 2004-2016 and 1996-2016 - source: MSCI (own elaboration)*

The drop in total return is mainly the responsibility of the decreasing capital growth (indirect return). The value of the convenience shopping center has seen a decrease in the year 2009 and did not recover itself sufficiently. The income return (direct return) remained stable around 7%. The stability in income return is the result of the continuous demand towards daily goods which is explained by Maslow’s hierarchy of needs. The annual capital growth and income return are shown in Figure 35.
Based solely on the Sharpe ratio, it seems that the retail market provides better opportunities to invest in. The Sharpe ratio is not the highest compared to other types of shopping centers and it saw a huge decrease in the period of 2004 till 2016. However, the reason for this decrease is the decline of capital growth. Figure 35 shows that the income returns of convenience retail as well as total retail are stable factors. The income return of convenience retail, however, is higher.

Figure 35 indicates that the main problem of a huge decline in total return in times of economic crises is the capital growth (indirect return). The standard deviation of the capital growth of convenience retail is slightly higher than the total return.

Based on the investment characteristics of convenience retail in comparison towards other types of retail, it seems to be an attractive investment due to its stability and high resilience against economic fluctuations. The drop of the capital growth, which occurs throughout most of the other retail sectors as well, means that there is still a potential to reach historical levels when the economy is recovering. Figure 34 shows that convenience retail had the second best total return. This means that the convenience retail’s total return will rise when the indirect return rises. Due to its potential of the indirect return and the stability of the direct return, the third hypothesis is not rejected.
11. Conclusion

The research towards the performance of the convenience retail real estate sector has been conducted in two phases. The focus within the first phase was on the influence of the Dutch economy on the performance of the convenience retail real estate market. The preliminary research suggests that the demand towards products sold by ‘convenience’ shops would remain stable regardless of the fluctuation within the Dutch economy. The research question that distils from the preliminary research towards the relation between the performance and the economy was:

**What are the causal connections between the performance of the Dutch convenience shopping centers and the national economy as well as the causalities between the performance of the convenience shopping centers, and the composition of these shopping centers and how does this performance determines its attractiveness in the real estate investment market?**

Hereby was expected that there would be no causal connections between the economic indicators and the performance of the convenience retail real estate, which were measured by the annual absorption rate, the annual turnover per square meter and the total return. The analysis which was conducted to determine if there would be any causality connection between the different time series was the Granger Causality Test. The Granger Causality Test determines if two time series are having a type of relationship that causes them to be viable predictors for each other in the future. Within this research, the focus was if the economic indicators served as possible predictors for the trend development of the performance. The Granger Causality Test is conducted three times, the first Granger Causality Test was conducted with the economic indicators and the absorption rate, the second Granger Causality Test was conducted with the economic indicators and the turnover per square meter, and the third was conducted with the economic indicators and the total return. The first analysis proved that the economic indicators GDP and Consumer confidence have a significant correlation and therefore serve as viable predictors for the development of the absorption rate in the upcoming years. The second Granger Causality Test proved that none of the economic indicators were having a significant relation with the turnover per square meter. The economic indicators do not serve as viable predictors for the development of the turnover per square meter. The third Granger Causality Test was conducted with the economic indicators and the total return. This test proved that one variable, the consumer confidence, is a viable predictor for the total return of the convenience retail real estate. Based on the comparison between the convenience retail sector and other types of retail, and on the results of the Granger Causality Test, the first hypothesis cannot be rejected, meaning that convenience retail is more resilient to economic fluctuations than other types of retail.

The second phase of the research was focused on the effect of the composition of a shopping center on the performance of that particular shopping center. Previously conducted researches suggest that depending on the type of shopping trip, the shopping motivation and the demand towards daily goods, consumers would rather visit a convenience shopping center in order to save time and purchase the necessary products. Hereby was expected that there would be no causal connection between the composition characteristics of a shopping center and the vacancy rate of that particular shopping center. Because these variables were no time series, it was possible to conduct a multiple regression analysis. The output of the multiple regression analysis indicates that two variables regarding the composition of the shopping center have a significant relation with the vacancy rate. The number of units in the shopping center and the percentage of square meters being used for
convenience retail compared to the total amount of square meters. Based on the results of the multiple regression analysis, the second hypothesis is rejected.

The third hypothesis is not rejected due to the level of resilience against economic fluctuations and the relatively attractive return/risk-profile.

The findings of the entire research (relation between economy and convenience retail, the relation between composition and convenience retail, and the ‘success formula’) will be summed up here:

- Convenience retail real estate is influenced by some economic indicators (GDP and consumer confidence) however, it is more resilient against it than other types of retail.

- Convenience retail real estate is influenced by some compositional aspects (size in amount of units and percentage of convenience retail in square meters) but certain compositions do reduce the chance on vacancy

- The ‘success formula’ for a convenience retail shopping centers is:
  - A small shopping center (preferably around 21-50 units and under 5000 square meters)
  - A high percentage of convenience retail (preferably above 75%)
  - A high amount of supermarkets (preferably over 3)
  - A high amount of square meters of supermarkets (preferably above 61%)

- Convenience retail is a good investment opportunity
  - Relatively high total return
  - Relatively low risk
  - Average Sharpe ratio but outperformance most other types of retail
  - Certain level of stability and safety due to continuous demand for daily products (a high and stable income return)

- The significant relations found during the research are:

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variable</th>
<th>B</th>
<th>Sig.</th>
</tr>
</thead>
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<td>BBP</td>
<td>Absorption rate</td>
<td>4,83</td>
<td>0,050</td>
</tr>
<tr>
<td>Consumer confidence</td>
<td>Absorption rate</td>
<td>4,50</td>
<td>0,060</td>
</tr>
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<td>Consumer confidence</td>
<td>Total return</td>
<td>5,24</td>
<td>0,050</td>
</tr>
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<td>Total units</td>
<td>Vacancy rate</td>
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<td>0,015</td>
</tr>
<tr>
<td>Percentage of</td>
<td>Vacancy rate</td>
<td>-0,015</td>
<td>0,001</td>
</tr>
<tr>
<td>convenience retail</td>
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<td></td>
<td></td>
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<tr>
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<td>The Hague</td>
<td>0,337</td>
<td>0,076</td>
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<td>Groningen</td>
<td>The Hague</td>
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<td>0,095</td>
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<tr>
<td>Enschede</td>
<td>The Hague</td>
<td>0,327</td>
<td>0,039</td>
</tr>
</tbody>
</table>

Table 11: All significant relations between dependent and independent variables - source: own elaboration
12. Reflection and recommendation

Based on the research and the results that came forth out of it, there are some recommendations for further research. This chapter describes what future researches could take in account when studying this topic and what method could be used in order the reach that goal.

The methodology of this research is based on desk research. The data which is being used to conduct this research is gathered by data providers online. The limitation that comes with this method is that the researcher can only use the data that is collected by these data providers. Whenever a research requires data which is not collected and thus not available, the research needs to be adjusted. That problem occurred when this research began with phase 2. Phase 2 was aimed to measure the performance of the convenience retail real estate sector, similar to what phase 1 measured. However, the data regarding the performance of this real estate sector was only available on national level. The aggregate absorption rate and turnover per square meter were used in phase 1. The problem with phase 2 is that the aggregate of these performance indicators were useless when researching individual shopping centers. Therefore, the research required to be adjusted by using the vacancy rate as a measure of performance in phase 2. The limitation by using only the data which are already available instead doing an empirical research led to a change in the research which was undesirable. Another problem that distils from just using desk research, is that some trends could not be included in the research due to the lack of existing data. An example is the trend about food safety, health and convenience. Empirical research would have the possibility to include this matter.

Additionally, future research towards convenience retail and the convenience shopping centers can be done by changing the method of data collection. This research was only focused on economic indicators and on the composition of the shopping center in relation to the performance of the convenience retail market. Therefore, the experience and perception of the shopping center were not taken into account. Future research can be done on these aspects. By having questionnaires in a variety of convenience shopping centers, light can be shed on the importance of the experience of the shopping center and the effectiveness regarding time saving. The perception and experience could have an impact on the shopping behavior of consumers. This would be a valuable addition to this research. It would provide more information about the reason of going to a particular convenience shopping center and what could be done to change the current shopping behavior to increase the performance of these center. Examples of factors that could be researched regarding shopping behavior is the duration of the shopping trip, the frequency of visits and the total spending in the center. These could be affected by factors like perception of the shopping centers appearance, quality, travelling time, parking facilities or other physical aspects of a shopping center. An important aspect to include is the food safety, health and convenience factor. This research was not able to include it due to the method chosen to conduct this research. However, this is an upcoming trend in the convenience retail sector which should be studied further. Besides the trends which are stated in this research, other more general trends are influencing not just the convenience retail, but the whole retail market. E-commerce is not mentioned in this research while in reality Albert Heijn is delivering products at people’s homes after they bought the products online. These general trends have to be included in future research in order to determine if these trends have an influence on the performance of convenience retail real estate.
This research towards the relationship between the economy and the convenience retail real estate sector is completely in the Dutch context. However, the nature of this research enables it to transfer it to another context. The high transferability makes it possible to apply and conduct this research in any other country and in any other real estate sector. Once the findings are transferred in to practice and it is the universal of analyzing a certain real estate sector, it will create a standard format on how different parties within the market are looking against that type of real estate. The performance indicators all represent a party. The absorption rate is a performance measure from the retailers because it measures how many stores are being opened in a year, the turnover per square meter is the performance measure from the consumers because it measures how much they spend and the total return is the performance measure of the investor. While these performance measure just scrape the surface of each party, it is possible to create a more in-depth study by adding different performance measures. The effect on the long run will be an extended version of this research in which each party has a wide set of performance measures to analyze the real estate. Future research can be conducted towards these other performances measures to go more in depth compared with this research.
Bibliography


FOREX. (2016). *Economic indicators and their impact on currencies*. FOREX.


MSCI. (2017). Retail Data.


Appendix

A. Granger Causality Test results*

* based on the website: http://www.wessa.net/rwasp_grangercausality.wasp

A.A. GCT BBP – Absorption rate

<table>
<thead>
<tr>
<th>Model</th>
<th>Res.DF</th>
<th>Diff. DF</th>
<th>F</th>
<th>p-value</th>
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<td></td>
</tr>
<tr>
<td>Reduced model</td>
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<table>
<thead>
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<th>Diff. DF</th>
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<th>p-value</th>
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<tr>
<td>Complete model</td>
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<td></td>
<td></td>
<td></td>
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<td>Reduced model</td>
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A.B. GCT Interest rate – Absorption rate

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<th>Diff. DF</th>
<th>F</th>
<th>p-value</th>
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</tr>
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<table>
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<th>p-value</th>
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</thead>
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<tr>
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<td></td>
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</tr>
<tr>
<td>Reduced model</td>
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</table>
A.C. GCT HICP – Absorption rate

<table>
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<th>Diff. DF</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete model</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Reduced model</td>
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Granger Causality Test: $Y = f(X)$

A.D. GCT Consumer confidence – Absorption rate

<table>
<thead>
<tr>
<th>Model</th>
<th>Res.DF</th>
<th>Diff. DF</th>
<th>F</th>
<th>p-value</th>
</tr>
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<tbody>
<tr>
<td>Complete model</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced model</td>
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<td>-1</td>
<td>0.0655641702884647</td>
<td>0.804369514344916</td>
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Granger Causality Test: $X = f(Y)$

A.D. GCT Consumer confidence – Absorption rate

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Granger Causality Test: $X = f(Y)$

A.D. GCT Consumer confidence – Absorption rate

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A.E. GCT Consumer spending – Absorption rate

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Granger Causality Test: X = f(Y)

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A.F. GCT Employment rate – Absorption rate

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Granger Causality Test: X = f(Y)

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**A.G. GCT BBP – Turnover per square meter**

Granger Causality Test: \( Y = f(X) \)

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Granger Causality Test: \( X = f(Y) \)

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**A.H. GCT Interest rate – Turnover per square meter**

Granger Causality Test: \( Y = f(X) \)

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Granger Causality Test: \( X = f(Y) \)

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A.I. GCT HICP – Turnover per square meter

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Cross Correlation Function (raw data)

A.J. GCT Consumer confidence – Turnover per square meter

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Cross Correlation Function (raw data)
A.K. GCT Consumer spending – Turnover per square meter

Granger Causality Test: $Y = f(X)$

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Granger Causality Test: $X = f(Y)$

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A.L. GCT Employment rate – Turnover per square meter

Granger Causality Test: $Y = f(X)$

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Granger Causality Test: $X = f(Y)$

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A.M. GCT BBP – Total return

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A.N. GCT Interest rate – Total return

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**A.O. GCT HICP – Total return**

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**A.P. GCT Consumer confidence – Total return**

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**Cross Correlation Function (raw data)**

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**Cross Correlation Function (raw data)**
A.Q. GCT Consumer spending – Total return

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A.R. GCT Employment rate

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### B. Multiple Regression Analysis results

**Model Summary**

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<th>Durbin-Watson</th>
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<td>.208</td>
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a. Predictors: (Constant), Percentage_convenience_m2, D_high_q_tenant, D_Utrecht, D_Harderwijk, D_Leiden, D_Leeuwarden, D_Amstelveen, D_Den_Bosch, D_Assen, D_Groningen, D_Enschede, Supermarkets, D_Zwolle, D_Amersfoort, D_Haarlem, D_Dordrecht, D_Tilburg, D_Nijmegen, D_Breda, D_Amsterdam, D_Eindhoven, D_Rotterdam, Total_units, Percentage_supermarket_m2

b. Dependent Variable: Log_Percentage_vacancy_m2

**ANOVA**

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a. Dependent Variable: Log_Percentage_vacancy_m2

b. Predictors: (Constant), Percentage_convenience_m2, D_high_q_tenant, D_Utrecht, D_Harderwijk, D_Leiden, D_Leeuwarden, D_Amstelveen, D_Den_Bosch, D_Assen, D_Groningen, D_Enschede, Supermarkets, D_Zwolle, D_Amersfoort, D_Haarlem, D_Dordrecht, D_Tilburg, D_Nijmegen, D_Breda, D_Amsterdam, D_Eindhoven, D_Rotterdam, Total_units, Percentage_supermarket_m2

**Model**

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<td>.073</td>
<td>.162</td>
<td>.041</td>
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<td>D_Den_Bosch</td>
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<td>.055</td>
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<td>D_Tilburg</td>
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<td>D_Amerfoort</td>
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<td>D_high_q_tenant</td>
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<td>.067</td>
<td>-.017</td>
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<tr>
<td>Percentage Supermarket m²</td>
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<td>.005</td>
<td>.047</td>
</tr>
<tr>
<td>Total_units</td>
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<td>.003</td>
<td>-.299</td>
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<tr>
<td>Percentage Convenience m²</td>
<td>-.015</td>
<td>.004</td>
<td>-.462</td>
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Histogram

Dependent Variable: Log_Percentage_vacancy_m²

Mean = 1.63E-15
Std. Dev = 0.919
N = 155
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Log_Percentage_vacancy_m2

Scatterplot

Dependent Variable: Log_Percentage_vacancy_m2