The behaviouristics of risk in the Stockholm industrial real estate market

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The behaviouristics of risk in the Stockholm industrial real estate market
by
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Risk på den industriella fastighetsmarknaden i Stockholm från ett beteendeperspektiv

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Abstract

The interest for investing in Industrial Real Estates in Stockholm Prime market has been growing during recent years. The majority of the real estate investors chose though, not to invest in the Industrial segment. The risk for Industrial properties is considered higher in comparison to other segments in the real estate market which have resulted in a higher risk premium and therefore a higher yield. The Industrial Real Estate market is considered a segment where data is limited and evaluations and risk assessment tend to be more subjective. In markets where evaluations and risk assessment are done mostly in a subjective manor stakeholders perspective on risk gives arise to different biases and heuristics that affects the decision making. In short, the risk premium becomes vulnerable to human biases and heuristics. In this study we aim to investigate the risk perspective among the different stakeholders on the market together with identifying potential biases in the market behaviour. We conducted this study through semi-structured interviews with 15 representatives from investors, consultancy firms and financial institutes. During the interviews, we focused on the different risks and biases observed by the different stakeholders and their attitude towards it. Our findings indicated that the investors consider the risks in general associated with industrial real estate in Stockholm to be of insignificance. Furthermore, we found that the consultancy firms and the financial institutes consider the same risks to be of significance. Finally, we identified seven different biases and then further investigated consequences and remedies for them.

Key-words

Industrial Real Estate, Risk, Behavioural Finance, Stockholm Real Estate Market, Investment
Sammanfattning


Nyckelord

Industrifastigheter, Risk, Beteendevetenskap, Stockholm industrifastighetsmarknad, Investering
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Foreword
This thesis project was conducted during the spring semester 2017 at the department of Industrial Engineering and Management at KTH Royal Institute of Technology in Stockholm, Sweden.

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1 Introduction

In this chapter we introduce the reader to the study by providing a background and illustrate the problematisation and purpose of the study. Furthermore, we introduce the research questions together with other relevant elements for a general introduction to the study.

1.1 Background

In the recent years Swedish markets have experienced an economic upswing and an expansionary monetary policy. As a result of the low inflation rate, the Riksbank decided to cut the repo rate to 0.5 percent in 2016 and it has remained the same ever since (Svefa 2016). Furthermore, the current macroeconomic situation has created a favorable investment climate and in most markets there is an advantageous interest rate gap between the yield and lending rate, not least in the Swedish real estate market. All the sectors that make up the Stockholm real estate market has in recent years experienced a sharp increase in value, primarily as a result of the aforementioned low interest rate environment (Sahlström & Wiman 2016). This can further be explained by the low volatility over time combined with strong and stable yields. Something which has proved industrial real estate to be a safe investment even in an uncertain macroeconomic environment. Additionally, an increasing investor pressure has pushed up both rental levels and market values in Stockholm and as a result, all property markets have experienced decreasing yield levels. On the office market in Stockholm top rents have risen by 29 percent during the past year and the yield in prime areas is currently at 3.7 percent (JLL 2016). In contrast to the office market, the prime yield for industrial real estate is currently at 5.50 percent, something which indicates a higher associated risk.

Furthermore, because a surprisingly limited supply of data, the industrial real estate segment is considered to be highly influenced by subjectiveness when it comes to evaluations and risk assessment. This yields a higher behavioural market dependence where stakeholder risk perspective, biases and heuristics are constantly affecting the decision making. A wrongfully assessed risk can have a large impact on the industry and consequences such as inaccurate yield levels, unfavourable loan conditions, lower liquidity and profitability might already be a fact.

With this being said, according to our commissioner Suburban Properties, investors in the segment have now begun to question the accuracy of the risk assessment and yield level and further whether or not the market is affected by biases and heuristics. With this as background Suburban Properties, an industrial real estate investment company, have required a study that investigates the common attitudes towards risk on the industrial real estate market in Stockholm and how these attitudes affect the market behaviour.

1.2 Problematisation

It is widely recognized, but not statistically tested that industrial properties generally have a higher risk compared with office and retail space and that this has resulted in a higher associated yield level. As the industrial properties are considered to have higher risk than for instance office and retail properties the loan conditions for investments in the industrial sector will be less beneficial. If the lending interest rate is unjustifiably high, the favorable yield gap will decrease and inhibit the profitability of the investment. The investor must then often raise their yield on a compensatory basis. As mentioned earlier this particular market is characterised by subjective and experience driven valuations and risk assessment. Something which leaves the risk premium
vulnerable to human biases and heuristics.

In order to identify the market sentiment and thereby the motivation of stakeholders decision making the common attitudes towards risk needs to be studied. However, this has not yet been done. The lack of such a study has, according to Suburban Properties and other stakeholders participating in our study, has become a problem as professionals disagrees not only on the risk level but also on the risk perception in the market.

1.3 Purpose

The purpose of the study is to investigate the risk attitude of different stakeholders in the industrial property market in Stockholm. We further aim to analyse the market behaviour of different actors ad highlight potential biases. Our objective is to shed light on the variety of risks and the different perspectives associated with these risks and how they affect different stakeholders. As the industry is driven by subjective evaluations, ambiguity across the different stakeholder groups can occur. We therefore hope to help the actors working together to better understand each others risk perspectives in this market. Furthermore, because of the subjectiveness of the risk assessment in the industry we aim to try to identify potential biases in the market and investigate their impact. By uncovering these biases we aim to contribute with suggestions on how to remedy them as well, partly in raising awareness by identifying them per se.

1.4 Research questions

We have stated the following research questions:

RQ1. What are the common attitudes towards risk for the different stakeholders, i.e. investors, consultants and bankers, on the industrial real estate market in Stockholm?

RQ2. Are there any biases amongst the stakeholders?

Sub RQ2.1 In that case, what are the possible consequences and potential remedies for the biases identified?

1.5 Expected contribution

We expect to provide an empirical contribution to existing research and to stakeholders in the Stockholm property market. We investigate a less explored real estate segment intending to answer questions that have not yet been answered. It has been confirmed that several stakeholders in the property market in Stockholm think that the lack of information and studies is a problem when it comes to investments. Thus the need for a study that highlights this area is critical to the development of the industrial real estate properties in Stockholm as an investment segment. This study contains the accumulated experience of the top industrial investors, consultancy firms and the largest financial institutes in Sweden. As the evaluation and risk assessments are done in a subjective manor and the whole industry is experience driven we strongly believe that this study can play an important role in the development of this investment segment. Furthermore, by enlighten how different stakeholders view the risk associated with industrial real estate investment in Stockholm we are hoping to bring clarity and insight and by this enable smoother
communications and prohibit miscommunication. When it comes to biases in the market just presenting the result with the identified biases and heuristics is a remedy per se, but we aim to further contribute with other remedies as well.

1.6 Delimitations
The thesis is only focusing on the industrial real estate investors, financial institutes and consultancy firms perspective on risk towards Industrial real estates and their view on market behaviour. The thesis does not focus on investors in the real estate sector that chose not to invest in Industrial properties. The reason for this is the lack of knowledge amongst the investors unfamiliar with the segment, something that we decided on together with the experts participating in our pre study. Furthermore, the focal point for his thesis is the industrial real estate market in Stockholm. It is important to note that the results could differ a lot if the same study would be applied for other regions or rural areas in Sweden or any other country. The way the real estate market function overall differ much between Sweden and other countries especially with respect to legal structure. We further want to emphasize that we do not focus on right or wrong in this report. Instead we are trying to objectively explain patterns in how the stakeholders think and how they differ in their opinion about risk and biases in the market. And by the same token we aim to analyse the different stakeholders attitude towards risk as a part of the analysis and conclusion. The analysis is hence not a result or conclusion of the stakeholders view but a mere effort to scale and analyse the result based on our own judgement.

1.7 Outline
The rest of the thesis showed here aims to facilitate reading experience.

Section 2: Here we describe the methodology used in this thesis and study. In the methodology chapter we hence try to explain, motivate and evaluate our choices of research methods with the Blomkvist & Hallin (2015) book as our anchor.

Section 3: In this section we describe the relevant theory and literature review. The chapter starts with an introduction to the industrial real estate segment together with market fundamentals. Thereafter we introduce the topic of risk analysis applied on the real estate sector and more particular, industrial real estate. The first research question will be answered by describing and analysing the risk categories brought up by the respondents and subsequently this chapter will include the relevant theory and research for the categories in question. Furthermore, the second research question will handle potential biases in the market and henceforward the risk section of the theory and literature review chapter will also by the same token handle the potential biases brought up in the result. Finally, the theory and literature chapter will contain a chapter dedicated to the real estate market crisis as this has been a rather central topic during the interviews and as it combines both risks, biases, market fundamentals and the implications of the consequences of when these things goes wrong.

Section 4: In this section we present the result from the conducted interviews. The section is divided into two parts. The first part presents the different types of risk identified by the stakeholders. The second part presents the identified biases and market
behaviour. Furthermore, the first part is categorised according to the different risks identified, i.e. vacancy risk, financial risk, macro economic risk, liquidity risk, rent risk and physical asset risk. The various risks are then further subcategorised by the three different stakeholder segments, the industrial real estate investors, the consultancy firms and the financial institutes. The second part of the result that raises the market behaviour is categorized by different stakeholder groups and further subcategorised by the biases brought up by each group.

Section 5: In this section we present the analysis and discussion of the result presented in the previous section. The section is divided into three parts. The first part contains an visual analysis, the second part provides an analysis of the different risks identified and the third part investigates the biases identified in the market. The second part analyze the answers and patterns from the stakeholders attitudes towards risks. The third part analyzes the biases identified.

Section 6: This section covers three different parts; conclusion, implications and future research on the subject. In the conclusion we answer the two formulated research questions.
2 Methodology

In this chapter we explain, evaluate and motivate how the study has been conducted. That is, how the research process has been done, how knowledge has been gained and the principles that have guided us in our research process.

2.1 Research design

In this study we try to understand more about a phenomenon where the knowledge exists but is limited. Also we want to describe something that has not yet been documented, i.e. risk attitudes of stakeholders in the Stockholm industrial real estate market. Blomkvist & Hallin (2015) have defined this purpose as a descriptive purpose, which aims to "describe the underlying processes/events/attitudes/structures in X". This also supports the formulation of our research questions.

Moreover, Blomkvist & Hallin (2015) state that in order to have a non trivial problem one needs to adapt a system perspective. This system perspective means that one considers how the problem expresses itself on three different levels; individual and organisational level, functional level and industrial level. The potential biases that comes with the subjectivity in risk assessment on this market is an issue that affects all three levels. On an individual or organisation level we investigate what the common attitudes are towards different types of investors/companies. That is, if the risk is larger for smaller stakeholders, etc. We also investigate the problem from a functional level, analysing the processes and structures affected by the risk assessment of different stakeholders. This can for instance be bank lending policies, choice of organisational structure and risks associated with different physical aspects of investments. We also have a large focus on how macro economic variables affect risk behaviour and henceforth also obtaining an industrial level of analysis.

According to Blomkvist & Hallin (2015) it is easier to not become biased when the research is not client driven. Even though the project was initiated by the client, we had decided to have research driven thesis, and not a client driven one. This because of the importance of keeping the study objective and uninfluenced by the clients interests.

2.2 Research process

The research process consisted of three main stages; the literature review, the pre-study and the empirical study. Below we will explain, motivate and evaluate the research process and methodology used.

2.2.1 Literature review

The literature review started during the pre-study and continued for the whole research period. However, the largest and most substantial part of the literature review was conducted in between the pre-study and the empirical study. Our pre-study resulted in a research base from which the literature review could be founded on. The purpose of the literature review was to describe the problems and concepts of previous research in this area and also explain theories, models and definitions used. We also wanted to illustrate what previous research have failed to explain and
The essential meaning of performing a scientific study is to find new knowledge and hence it is natural to start exploring the existing knowledge within the same field. This is done by reviewing existing literature, where the word "literature" is referring to all forms of published material in both digital and paper form (Blomkvist & Hallin 2015). Even though our study was research and not client driven, the starting point was the client. Consequently, our starting point was both complex and did not have a clear direction. According to Blomkvist & Hallin (2015) this induces the adaption of an "over learning"- approach, simply meaning that one goes through a lot of literature resulting in only using a few of them. Blomkvist & Hallin (2015) further states that when performing research in Industrial Engineering and Management one needs to consider the interdisciplinary nature of the studies, thereupon investigating several different research areas. In our case those area were:


Our research method started as aforementioned in the pre-study. Here we followed the guidelines stated by Blomkvist & Hallin (2015) and adapted an inductive over reading approach and defined the first key words for our search. Furthermore, Blomkvist & Hallin (2015) recommended to start with just a few textbooks and articles and let the references used lead us to more articles and books. This suited our over reading approach very well and in order to obtain the best starting point the academic specialist interviewed at the end of the pre study where asked to recommend literature and articles.

After the pre-study the most substantial part of the literature began. As seen in Figure 1 the time spent on the literature review increased from 50 percent to almost spending most of our working time on the literature review during February. During March the empirical study with interviews were planned to take up more and more of our time. In April our literature study was finished, needing only minor adjustments and taking up approximately 10 percent of our time throughout the rest of the study.

![Figure 1: Time spent on the literature Review presented as a graph where the x axis represent the point in time and the y axis illustrates the amount of work as a percentage of the time spent on the literature review compared to other parts of the study.](image-url)
During February our primary tool was searching using KTH B and Google Scholar as digital sources and the Stockholm University Library and KTH Library as physical sources. During March the respondents participating in the interviews sometimes also added new literature to the list. Our used sources were categorized in Latex and the digital sources were saved in a shared cloud filing system. We performed searches both in Swedish and English. We used the following key words for our search, including the pre-study literature review:


We chose to write the key words in English as all key words used in Swedish were also used in English.

2.2.2 Pre-study

The purpose of the pre-study was to build a base for the literature review and empirical study. We did this in three stages. The first stage consisted of interviews with the client and two third party respondents where the objective was to form a researchable base for the thesis. The second stage was a preliminary literature-review. The third stage was a second round of interviews, this time with two academic specialists. Together with the interviewees we formulated preliminary research questions based on the previous stages of the pre-study and the advice from the two respondents. These research questions were then communicated to our client together with a briefing on what he could expect from this study.

The first stage of pre-study consisted of initial interviews with the client, Suburban Properties, and a consultancy firm. The purpose of the pre-study was primary to interpret the clients need and based on this formulate a researchable base for the thesis. We started building our base in October 2016, conducting three interviews. Two with the client and one with an experienced third party. The objective of this was to calibrate our research approach and get valuable input on our planned literature study that would be step two in the pre-study process. The selection of a third party respondent was chosen by a non random sample, meaning that one turns to the most convenient choice. In this case the contact was mediated by the client. Subsequently, this falls into the classification of being both a convinience selection and a yes-man selection. (Blomkvist & Hallin 2015) According to Blomkvist & Hallin (2015) the benefit of this type method is that it is time effective but comes with the drawback of jeopardizing the statistical significance. The third party consisted of two respondents from a consultancy firm and the interview was unstructured, where we only stated the subject and a headline for the interview. According to Blomkvist & Hallin (2015) this type of open interviews are suitable for the beginning of an empirical study, when one needs to explore a subject or a research question. They further state that through this kind of interview one can get new input and find new dimensions of the area under review and that it is a wise choice when one needs aiding in specifying the base for a thesis. The interviews with the client were also unstructured (Blomkvist & Hallin 2015).
The second stage was to further develop the research base which meant that a preliminary literature study was conducted. Here we used an inductive over reading approach, knowing that some parts of the literature study might not be needed in the final version. However, the study was needed in order to build a knowledge base to be used for further research. The following keywords were used when searching on KTH B, Google Scholar and university libraries:


The third stage was another round of interviews. After the initial literature study four academics and the client were consulted through further interviews. The interviews were performed in an exploratory manor, and hence unstructured interviews were chosen as the most suitable approach just as in stage one. The purpose of these interviews was to discuss the information gathered and our thesis base with people experienced in academic research and to finally decide on a research topic together with the client. This was the last time the client took part in influencing the study, after this point he was considered a participant just like the other companies.

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Table 1: Overview of Interviews, first Round

2.2.3 Empirical study

We decided on gathering the empirical material through interviews, which is the most common method used in qualitative social sciences studies according to Blomkvist & Hallin (2015). Blomkvist & Hallin (2015) further states that interviews is an effective way of learning about the reasoning of different individuals. Our study concentrates on behavioural patterns and risk perceptions, hence this type of method is the perfect match for gathering data. We used a semi structured interview approach with open questions in order to encourage new dimensions on the topic. For a semi structured interview the questions are not strictly decided before the interview but is rather created throughout the interview process. However, it was important

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Table 2: Overview of Interviews, second round
for us to maintain structure yet keep the openness of the interview. This meant that we instead of strict questions constructed an interview guide to organize the interview around the desired themes or question areas of the study. The different question areas was then brought up in the order that best suited every individual interview. According to Blomkvist & Hallin (2015) this supports a strive for adherence during the interview as the questions are brought up in the most natural way and in accordance with the answers from the respondent. The questions were of varied nature and depended a lot on the characteristics of the respondent. For a talkative and extroverted responded we used introductory, exploratory questions to a wider extent, encouraging initiatives and ideas coming from the respondent. Sometimes more specific questions were asked to retain the structure and avoid drifting too much from the interview guide. Some respondents were more quiet and sometimes even a bit sceptical to answering the questions about their and other behaviour on the market. Here we constructed the questions to be more specific in order to obtain a flow in the interview. The answers were then used to ask interpretative questions, asking the respondent to either elaborate or talk about adjacent phenomenon. Once again, the interview guide was a great help of maintaining structure while still gathering information and exploring the thoughts and ideas of the respondent. Blomkvist & Hallin (2015) firmly states that the only thing that counts as data for the result is what the respondent says not our own thoughts and conclusions. This was something of great importance for us when writing our interview guide and conducting the interviews (Blomkvist & Hallin 2015).

The interview guide was also sent out to the respondents together with the interview request in order for them to prepare and also increase the Accept Frequency. This might be a reason for the high accept frequency of 75 percent.

\[
\text{Accept frequency} = \frac{\text{Number of accepts}}{\text{Number of requests}} = \frac{15}{20} = 75\%
\]

Another thing that might have helped inducing such a high accept frequency was our sample choice method. We chose to have a non random sample adapting a so called snow ball approach, finding new respondents by asking the respondents if they knew someone on an eligible firm that they thought would be willing to participate. Furthermore, Blomkvist & Hallin (2015) recommended approximately 10 to 15 interviews for gathering empirical data for a Master Thesis. They further stated that if the empirical saturation was high, fewer interviews can be motivated. Empirical saturation is measured according to three factors:

- Eligibility of respondent
- Length of interview
- Extensiveness of answers

Our level of empirical saturation scores high on each of the three levels and subsequently a fewer number of interviews could be justifiable. Nevertheless, we chose to have 15 interviews during our study arguing that in order to capture the market sentiment we must aim for engaging as many of the stakeholders on the Industrial Real Estate market in Stockholm as possible. An overview of the conducted interviews can be seen in Table 3. The participants were given company aliases for the result and discussion part of the study, a full list of company names can be found in the Appendix.
When it came to documentation and processing of the interview we followed the guidelines stated by (Blomkvist & Hallin 2015). We used our cell phones (iPhone version 6) to record the interviews and took notes on a computer. To encourage a natural conversation with the respondents both of us participated at all interviews and we took turns taking notes.

According to Blomkvist & Hallin (2015) one can either choose to have the objective of finding the truth and hence strive for comparable answers, or one can aim for more complexity and ambiguity. The last mentioned approach means having a more critical and impartial approach together with some curiosity and it will also yield a complex and ambiguous result. As we are trying to capture the market sentiment and the attitudes towards risk there can be no true answers, only opinions which are the subjective interpretation of reality. Hence we adapted the later approach. However, we needed a structured way of presenting and analyzing the results and decided to have a thematic analyze method. This meant that the answers needed to be comparable to some degree even though it wasn’t our primary focus. This was also one of the reasons for why we did not choose to have a completely unstructured interview process.

A thematic analysis is a very common method for analysing qualitative empirical data within social sciences according to Blomkvist & Hallin (2015). Here one creates categories for sorting the empirical material and then based on the categories the result can be analysed and the research questions can be answered. Our choice of categories were founded on the literature study, the interview guide and the answers provided by the responded. Blomkvist & Hallin (2015) advices to organize for instance by respondent or by company. We organized the result per company but also on a higher level of company type and furthermore we created theme categories in order to sort the documented interview results. These theme categories were based on different types of risk which enabled us to compare what different companies felt about different risk areas.

<table>
<thead>
<tr>
<th>Company Alias</th>
<th>Main Focus of Operations</th>
<th>Date, Duration</th>
<th>Interview Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>Industrial Real Estate Investments</td>
<td>20170131, 90 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company B</td>
<td>Consultancy Firm</td>
<td>20170214, 45 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company C</td>
<td>Industrial Real Estate Investments</td>
<td>20170220, 40 min</td>
<td>Phone</td>
</tr>
<tr>
<td>Company C</td>
<td>Industrial Real Estate Investments</td>
<td>20170221, 45 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company D</td>
<td>Industrial Real Estate Investments</td>
<td>20170222, 75 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company E</td>
<td>Consultancy Firm</td>
<td>20170223, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company F</td>
<td>Consultancy Firm</td>
<td>20170224, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company G</td>
<td>Consultancy Firm</td>
<td>20170227, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company H</td>
<td>Investments and construction</td>
<td>20170228, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company I</td>
<td>Consultancy Firm</td>
<td>20170301, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company J</td>
<td>Financial Institute</td>
<td>20170314, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company K</td>
<td>Financial Institute</td>
<td>20170317, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company L</td>
<td>Financial Institute</td>
<td>20170320, 30 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company M</td>
<td>Financial Institute</td>
<td>20170320, 60 min</td>
<td>Live</td>
</tr>
<tr>
<td>Company N</td>
<td>Industrial Real Estate Investor</td>
<td>20170324, 60 min</td>
<td>Live</td>
</tr>
</tbody>
</table>

Table 3: Interview overview, empirical study
2.3 Scientific quality

According to Blomkvist & Hallin (2015) science can be defined as a systematic, independent and critical quest for new knowledge based on a problematization. One of the most important aspects of a thesis is logical consistency, something that can be defined as by the following criteria:

- A systematical work process
- An impartial approach to result and empiricism
- Critical analysis
- A problematization based foundation

Blomkvist & Hallin (2015) advises to keep this as a list to continuously return to throughout the work process. This is an advice that we strictly followed.

Furthermore, to ensure a high degree of scientific quality we actively participated in peer review seminars. According to Blomkvist & Hallin (2015) all scientific work should be open for critical review. A foundation within academic research, or within science in general, is the respondent-opponent-thought. This means that the opponents critically reviews the work during the development process and after the final stage. The respondents, us, continuously presents their results and can hence explain, clarify and get feedback throughout the process. The peer review process consisted of four seminars:

- **Mid February:** Introduction review (5-10 pages)
- **Mid March:** Introduction, method and theory review (20-25 pages)
- **Mid May:** Raw script review
- **Late May-early June:** Final seminar

The purpose of the first seminar was to create an understanding for the introductory part of the thesis and the fundamental argumentation. Here we had formulated the problem and purpose of the thesis and made a rough sketch of the method which was the main focus of the presentation and opposition. The next seminar aimed to create an understanding for the theoretical background. Here we had considered the feedback from the first peer review and hence this seminar focused on the improvement of the introduction together with an essentially complete version of the method. The third seminar was a raw script review and the fourth was the final review on the finished thesis.

2.3.1 Validity and reliability

The aforementioned criteria for logical consistency are highly linked to the scientific quality. However, the scientific quality is according to Blomkvist & Hallin (2015) mostly estimated based on the reliability and validity of the study. Simply put, validity can be defined by as studying the right thing whilst reliability can be defined as studying it in the right way. These variables are independent and have no causation or correlation. We have aimed for a high degree of both validity and reliability, thus following the guidelines stated by Blomkvist & Hallin (2015).

Subsequently, our literature review focused the areas stated in the problematisation, purpose and research questions. Furthermore, the theories and definitions brought up in the literature review
and analysis was in coherence with what the purpose and research questions demanded. Our choice of collecting empirical data was anchored in the problematisation, purpose and research questions. We considered at first a more quantitative method, but came to the conclusion that a qualitative method was a better match. The evaluation, analysis and decision of data collection method was done in collaboration with the client and academic specialists in order to ensure the highest degree of validity possible. When it came to interpreting the empirical material impartiality and clarity were the primary focus in order to obtain dialogic reliability. It was also strictly based upon the advice and guidelines stated by Blomkvist & Hallin (2015). Lastly, our discussion and analysis were designed in line with the purpose of the thesis (Blomkvist & Hallin 2015).

2.3.2 Generalisability

Generalisability means the extent to which this study can be generalized and applied to different cases Collis & Hussey (2014). This study contains parameters that are very specific and dependent on the current circumstances. For instance, the macro economic environment is a crucial factor influencing the market sentiment. Would interest rates increase or policies change, so will the market sentiments and also the perception of risk. Subsequently, the level of generalisability will go down if important macro economic variables change. However, this study enlightens market behaviour and general findings and this can still be applicable for other cases. In behavioural finance studies all research that investigates human behaviour and decision making around investments are of value as the literature brings up examples from everything from trading to basket ball (Ackert & Deaves 2010).

In conclusion we judge the generalisability to be neither high nor low. The applicability to other cases is dependent on the research area, the macro economic conditions and the market conditions.

2.3.3 Ethics

During the research process Blomkvist & Hallin (2015) firmly states that it is of great importance to follow ethical codes, or a so called codex. On a national level the following ethical codex applies to all research within social sciences.

- All respondents or subjects must be informed of the purpose of the study
- All respondents or subjects must give their consent
- All gathered data and material must be treated with confidentiality
- The gathered data and material shall not be used to anything other than the intended purpose of use

It was of great importance to us to follow the codex. Before starting the interviews we introduced the respondents to the purpose to the study. We further stated to the respondent that the answers were anonymous and asked for permission to use the company name in a participation list. However, it was crucial to us that the participation list should not give any indication to which company alias that was connected to the company. We were also very strict with handling the data, saving it on password protected devices. We asked for permission for recording the interviews and ensured that the interview material would be protected.
One substantial measure that we took in order to follow the codex and maintain objectivity was to switch from a client driven method to a research driven one. We did not want the study to be influenced by the preferences of the client and hence we treated the client as a respondent after the pre-study. Thereby, the client could only influence our research direction and our choice of method not our empirical result or analysis. This study was also financially independent and we received no funding from the client.

2.3.4 Limitations

According to Blomkvist & Hallin (2015) a master thesis conducted by interviews should consists of 10-15 respondents to have high enough empirical saturation. Our study is based on 15 interviews, excluding the interviews made in the pre study. We therefore consider the number of respondents sufficient for the a high degree of empirical saturation, however, one could say that the study is limited by the number of participants. Perhaps the conclusion would have been of more significance had the number of respondents been higher. Furthermore, another limitation of this study is that the findings are solely based on subjective data. If there would have been data to compare some statements to, such as future market conditions, biases such as overconfidence, optimism and risk aversion would have been easier to prove. Notwithstanding, this study can still act as a foundation for future research where such a comparison could be conceivable.
3 Theory and literature review

In the following chapter we bring up relevant theory and research by reviewing the associated literature. We do this by explaining and investigating both what has been covered by existing literature and what needs to be further researched.

3.1 Risk analysis

In this subchapter we introduce the reader to the topic of risk analysis. First of all we will introduce a theoretical background to the different risks identified in this study, together with relevant research. Thereafter we will discuss the yield both in research and theory. The yield is a strong indicator on risk perception as it is based on the risk premium in the market segment. Finally, we will introduce the biases and heuristics relevant for the study accompanied with related studies.

From an non real estate investors perspective real estate is considered to be low risk assets, but this only applies for long investment horizons. The average profit yield is highly influenced by inflation and other macroeconomic factors, making it a risky investment over short periods of time (Bokedal & Ehring 2014). The risk in the real estate industry can be motivated by decomposing the premium into different macroeconomic and business specific types of risk. The risks relevant for understanding this study are described below.

Macroeconomic risk

The macroeconomic risk is generally associated with vulnerability to macroeconomic changes, crises and crashes. According to Artell & Dorph (2003) a well diversified tenant profile, with multiple tenants holding leases with different maturities will decrease the business risk. Hence the opposite scenario will yield the contrary. This would mean that real estate sectors associated with a low number of tenant per property ratio are more likely to have a higher business risk affecting the risk premium. This because the tenants are usually exposed to changes in the macro economic climate. The risk of tenants going bankrupt in crises or crashes is considered more severe for industrial tenants (Artell & Dorph 2003). This should, according for instance Hansson & Jönsson (2008), be in disadvantage for industrial properties as they are more commonly single tenant and long leased. However, according to Blomgren & Ullmark (2008) industrial properties might nonetheless be the least sensitive to macroeconomic conditions. In their research they have tried to explain various segments in real estate in Sweden on a national and regional level. It was showed that the industrial segment had the lowest explanation degree and could only be explained to 75 percent of the macro economic variables under examination.

Financial risk

Financial Risks in real estate investments are mainly associated with the debt. This includes the debt equity ratio, the cost and the structure of the loan. One indicator of financial risk is the loan-value-ratio (LTV). When the LTV increases the financial risk also increases. The usual requirement from financial institutes, or lenders, are that the loan amount should not exceed 75-80 percent of the property value. Thus the property can be used as a security for the loan. With a LTV of 80 percent the property value would need to decline by more than 20 percent for the lender to jeopardize the outstanding loan balance. In short, the higher LTV the higher the financial risk and the more expensive the loan (Brueggeman & Fisher 2011).
Another risk measure used by underwriters is the debt coverage ratio (DCR). This measure is used to hedge against default risks. The ratio measures the extent that the NOI is expected to exceed the mortgage payments. This gives the lender an indication of the financial risks associated with not being able to pay the mortgage as a consequence of an NOI decline.

\[
DCR = \frac{NOI}{Mortgage \, Payments}
\]

To summarize, when lenders underwrite loans they use benchmarks or targets for LTV and DCR to estimate the financial risk level. These measures can therefore act as indicators on whether or not the financial risk of a certain property type has been properly assessed (Brueggeman & Fisher 2011).

**Vacancy risk**
The vacancy risk is the risk of the property not generating any income due to lack of tenants. In industrial properties it is more common to have one or only a few tenants per property, which increases the vacancy risk. This risk is handled by longer lease contracts. If the property has more tenants, shorter lease lengths can be justified (Artell & Dorph 2003). According to (Marton & Petterson 2006) a longer lease length is beneficial when the market rents are increasing but risky when market rents are decreasing. Short lease lengths can imply high re-adjustment costs that might not always be compensated by higher rents. Thus it is of great importance to consider the lease portfolio when deciding the vacancy risk.

**Physical asset risk**
According to Khumpaisal (2011) physical risk is the probability that unexpected costs may arise due to the state of the property. Older properties tend to have more risks, some of them hidden, and might lead to costly renovations and reconstructions. Lenders or investor can investigate the physical asset risk through consulting a third party that can examine the physical state of the asset. During an acquisition these aspects are often included in the price or terms (Khumpaisal 2011).

**Rent risk (business risk)**
Business risk is the risk for business failure, in the form of loss of income or uncertain profit. As the real estate investor are in the business of renting space the business risk is mainly associated with the variability of income produced by the property. As the primary business risk is the loss of income, fluctuations in economic conditions affecting rent levels are of importance. For a more descriptive title of this risk, rent risk might be more straightforward compared to business risk. The economic condition depends on the location of the property, lease length and also property type. There are also macroeconomic variables affecting the business risk such as regional specific growth fluctuations, tenant demand, population growth and business cycles (Brueggeman & Fisher 2011).

### 3.1.1 Yield
The yield level is strongly linked to the risk level. By this section we aim to show how.
According to Lind (2004) the yield can fundamentally be defined as

\[ \text{Yield} = \frac{\text{Net Operating Income (NOI)}}{\text{Market Value}} \]  

(1)

Where

\[ \text{NOI} = \text{Rental Income} - \text{Operating expenses} \]

When empirically deriving the current yield level one can assemble data from current transactions to obtain market values. By computing the Market Value against the NOI from for instance annual reports one can obtain an empirical yield level. However, this require a substantial amount of data, something that is not easy to come by Lind (2004).

**Formula determinants**

The Market Value is generally derived from recent property transactions. The property value are often estimated with a discounted cash flow methodology (DCF). Here the present value of future cash (CF) flows are summarized over T years. They are discounted with a risk adjusted-required return, \( r_i \). The final value includes an expected net sale value (NSV), this means that the terminal value becomes \( CF_T + NSV \). (Clayton 2009) The formula for the Market Value (MV) thus becomes:

\[ MV = \sum_{n=1}^{T-1} \left( \frac{CF_n}{(1 + r_i)^n} \right) + \frac{(CF_T + NSV)}{(1 + r_i)^T} \]  

(2)

This formula shows that that the yield is a function of the discount rate \( r_i \) and the expected future cash flows. With the NOI in the nominator, the denominator dominates only if the future cash flows are expected to increase, thus giving a higher market value. Further this means that a simplification of the yield is possible making the yield a function of the discount rate \( r_i \) and the growth \( g \). Further expressing \( r_i \) as the risk free rate \( r_f \), i.e. the yield to maturity on default free government bonds) plus a real estate risk premium \( RP \) (Clayton 2009).

\[ \text{yield} = r_i - g = (r_f + RP) - g \]  

(3)

Thus this decomposition shows that the yield can be illustrated by three key determinants:

1. The risk free rate \( r_f \)
2. A Real estate risk premium \( RP \)
3. Property income growth expectations \( g \)

The risk premium \( RP \) from formula (3) is a premium that is added to every risky asset to determine the price or influence other profitability measures such as the yield (as in our case). Risk premiums and asset prices are negatively correlated and thereby making asset prices to go down when the risk premium goes up (Damodaran 2011). Hence, when investigating the yield level one should be aware of the impact of the different components. More importantly, the risk level affects the yield among other important market indicators. Thus, a biased or wrongfully assessed
risk can have large consequences (Clayton 2009).

When it comes to the present yield levels in the market an increasing investor pressure has pushed up both rental levels and market values in Stockholm and as a result, all property markets have experienced decreasing yield levels. On the office market in Stockholm top rents have risen by 29 percent during the past year while the yield in A and B areas is at 3.7 per-cent (JLL 2016). In contrast to the office market, the prime yield for industrial real estate is 5.50 percent. This indicates on a higher associated risk for the segment. However, as mentioned, the yield level is decreasing which is illustrated in figure 2.

![Figure 2: Here the yield level for Stockholm Industrial Real Estate market is presented. We can see a decreasing trend in both prime yield and secondary yield. The time period is 10.5 years. Source: (Savills 2016).](image)

**Measurement errors**

According to Lind (2004) measurement problems are usually correlated to difficulties regarding the subjective definitions connected to the variable in question. *Yield* is a rather vague variable as it is easily affected by different interpretations regarding the underlying definitions of NOI and Market Value. The variable is easily exposed to the fallacy of multiple interpretations as people often comes to different conclusions regarding the value of the variable in question. In addition to this type of measurement problems, lack of data makes the yield even harder to define (Lind 2004).

According to the aforementioned definition of the yield as a variable, there are two main types of measurement errors, connected to the Market Value and NOI respectively. Even though there is a common agreement on the real estate market regarding the definition of Market Value, there is a problem regarding the availability of data. This because of rather few transactions together with the uniqueness of the objects in question. When it comes to NOI the main problem is anchored in different accounting models, where companies define their rental income or Operating expenses differently. The main theme of the measurement problems regarding both NOI and Market value is lack of standardisation and comparability together with lack of sufficient data.
Lind (2004) states that the largest measurement errors are mainly due to cost estimation parameters. For instance the difference between maintenance costs and investments can be rather hard to define, hence leading to non-standardized NOI’s. This further complicates the comparability between different NOI’s and thereby also the comparability of the yields. Another common measurement problem regarding cost estimation is that the fluctuation of the expenses. The energy consumptions are highly correlated to the outside climate, making cross regional comparison difficult without any calibration with respect to temperature difference. Moreover, building year or rather how modern the facility is with respect to energy efficiency, has a great effect on operating expense. Also the maintenance costs differs from year to year depending on the current circumstances and where the building is in its life cycle. Another internal measurement error is the separation between what should be classified as company expenses versus property expenses (Lind 2004).

Misjudging the underlying variables can have a high influence on the yield level. Lind (2004) states an example where a NOI of 2,000 SEK/sqm and a Market Value of 30,000 SEK/sqm is given. The resulting yield hence becomes:

\[
\text{Yield} = \frac{\text{NOI}}{\text{Market Value}} = \frac{30000}{2000} = 6.7\% 
\]

Assuming a five percent deviation the yield can in the most extreme cases differ with 1.4 percentage units.

<table>
<thead>
<tr>
<th>NOI</th>
<th>28,500</th>
<th>30,000</th>
<th>31,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,100</td>
<td>7.4%</td>
<td>7.0%</td>
<td>6.7%</td>
</tr>
<tr>
<td>2,000</td>
<td>7.0%</td>
<td>6.7%</td>
<td>6.3%</td>
</tr>
<tr>
<td>2,000</td>
<td>6.7%</td>
<td>6.3%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

Table 4: Yield sensitivity analysis with 5 percent standard deviation (Lind 2004)

Lind (2004) further adds that a standard deviation of 5 percent is rather narrow considering the common assumptions regarding the uncertainty of valuations and NOI measurements.

### 3.1.2 Biases and heuristics

As mentioned in the introduction, when it comes to subjective risk assessment, as in the industrial real estate market, biases and heuristics are a natural consequence. Hence, in the following chapter we will describe a brief overview of theory and research on the biases and heuristics discovered during the study. As mentioned in the previous chapter, measurement errors can have a vast impact on valuations and yield levels. This means that biases and heuristics in decision making can have a substantial impact on risk assessment and valuations.

**The availability bias**

According to Tversky & Kahneman (1974) people tend to confuse the frequency of a class or the probability of an event with the level of availability, i.e. how easily instances or occurrences can be brought mind. For instance events that one have experienced or have a strong emotional attachment to might be more likely. Also things seen, heard or read about can also cause an availability bias. There are different types of availability biases. One is *biases due to retrievability* where the most recognizable characteristics of a group is used to draw conclusions of the
whole sample overlooking the less noticeable samples. Tversky & Kahneman (1974) conducted an experiment where participants estimated the ratio between men and women from a list of names where the actual ratio were 50/50. The results shows that if the were more famous women names in the list people overestimated the share of the women in the group and vice versa for the opposite. This means that given a number of asset the decision maker might draw conclusions about the risk of unfamiliar samples based on samples that are more recognizable.

**The anchoring heuristic**

According to Epley & Gilovich (2006) a common way to make judgements under uncertainty is to anchor on information that comes to mind and adjust until a plausible estimate is reached. Many experiments have been performed by various behavioural researchers, nonetheless by Kahneman and Tversky. Epley & Gilovich (2006) writes that in each experiment anchoring is used to explain why judgements tend to be excessively influenced by an initial impression, perspective or value. One of the biggest difficulties when it comes to research on the anchoring bias is that it is anchoring is often something that happens subconsciously. It is difficult for researchers to know if a subject is anchoring in past experiences as it is something that happens in the mind without the subject necessarily being aware of it. Be that as it may, researchers have tried to "plant" anchors in the mind of their subjects. This can be done by for instance introducing a reference point or a starting point. Tversky & Kahneman (1974) have done experiments asking people to estimate the number of African countries in th UN given two different starting points. Those given the number 10 gave an estimate of 25 in average and those given the number 65 arrived at 45. Another experiment conducted by Tversky & Kahneman (1974) was to give a group of high school students five seconds to estimate the following product sums:

\[
1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8
\]

and

\[
8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1
\]

The first product sum was on average estimate to 512 whereas the other was estimated to 2,250. The correct answer was 40,320. According to Tversky & Kahneman (1974) the cause of this underestimation was anchoring in the first part of the product sum. \(1 \times 2 \times 3\) results in a smaller number than \(8 \times 7 \times 6\), this causes underestimation as one anchors in the resulting sum. Likewise, the reason why the second sum were so underestimated was also due to anchoring in the first products.

**Categorization bias**

Human processes information with the aid of categories. Fryer & Jackson (2007) has stated an idea that the number of categories available for decision making is limited and hence the decision maker is forced to group heterogeneous experience or objects into the same category. The decision makers then base their model for predicting outcomes, estimating risk or return on their accumulated experience or statistic from the category in question. If for instance assets are grouped according to a certain characteristics the decision maker might draw conclusions about the asset that are not correlated with the heterogeneous aspect that defined the categorization. This in turn can lead to wrongful estimations of risk or return. (Fryer & Jackson 2007)
The conservatism bias
When people anchor in what things normally have been they are said to suffer from the conservatism bias. According to Ritter (2003) people tend to be rather slow to pick up on changes. What they further have found is a conflict between the conservatism bias and the representativeness bias. The representative bias generally makes people overestimate the likelihood of things correlating to recent events, as it is a form of the availability bias. But according to Ritter (2003) the conservativeness bias might cause people to underreact when things change. Per contra, when the pattern is long enough people might overestimate instead.

Herd behaviour
The herd mentality is the simply people being influenced by others, exactly like a herd. Anchoring and herding are closely related and also seen in real estate. In an real estate appraisal experiment, if one agent had been told that a second agent had come up with a certain appraisal, the first agent’s appraisal would be pulled toward this value. Professional financial analysts that estimate values, makes recommendations and forecasts are said to herd. There have been studies backing up this statement. There is also a behaviour called anti-herding, where people goes completely against the crowd, presumably because they want to make themselves visible for the purpose of career advancement and believe they have private information (Ackert & Deaves 2010).

Overconfidence and optimism
According to Ackert & Deaves (2010) people suffering from the overconfidence bias tend to overestimate knowledge or ability and more important misjudging risk. They further states that people are overconfident when it comes to financial decision-making. Moore & Healy (2008) presents a reconciliation of three different ways in which the research have defined overconfidence:

- Overestimation of one’s actual performance
- Overplacement of one’s performance relative to other
- Excessive precision in one’s beliefs

The optimism bias is closely related to the overconfident bias. To enable us to prepare our actions to avoid harm or gain an award inferences of what will occur are critical in decision making according to Sharot (2013). Considering the importance of the accuracy of some future projections one might believe in an unbiased foresight, she continues. One might also think that people tend to underestimate to prepare for possible unfortunate events, but humans do in fact exhibit a pervasive bias called optimism. According to Sharot (2013) people generally tend to overestimate the possibilities of fortunate events happening in their personal life and underestimate the likelihood of unfortunate events. We expect to live longer than the mean, not to die in a car accident or cancer, not get divorced, have success in the job market and have talented children. Sharot (2013) states that the optimism bias is one of the most consistent, prevalent, and robust biases documented in psychology and behavioral economics. Optimism is measured by comparing expectations to outcome, by which is hard to prove that a person is being optimistic about a future event (Sharot 2013).

Risk aversion
Risk aversion is simply a tendency to be unwilling to take risks. In contrast there is a risk taking bias and in the middle the risk neutral Ackert & Deaves (2010). As seen in Figure 3a risk aversion can be described by a concave utility function over wealth. Rabin (2000) describes the function by the simple statement: a dollar that helps us avoid poverty is more valuable than a dollar that helps us become very rich. This can be seen by the diminishing marginal utility slope
and can help us explain the concept of risk aversion.

According to Grossman & Eckel (2008) there is a difference in gender when it comes to risk aversion tendencies. They state that in most studies, women have been proved to be more risk averse than men. The difference in risk perspective between men and women is an important economic question. For instance if the studies are accurate and women are more risk sensitive than men, this is something that will influence all of their decision making.

![Risk Averse Utility Function](a) Averse Utility Function
![Risk Neutral Utility Function](b) Risk Neutral Utility Function

Figure 3: Utility Functions for risk aversion and risk neutralness is presented in the graphs above. Risk aversion illustrates that the attitude towards utility of increasing wealth decreases above a certain threshold. The marginal utility for increase in wealth is smaller for a risk averse person compared to a risk neutral person. Source: (Ackert & Deaves 2010).

3.1.3 Research on bias remedies

According to Byrne & Utkus (2013) biases naturally influences the daily choices we do. When it comes to financial decisions the biases can prohibit the achievement success in the long run, not the least when investing. It is quite unlikely that one can completely overcome the biases, as it is a natural element of the human behaviour. However, awareness of biases and their influence on investing behaviour is of importance and can improve the way we think and act when making decisions (Byrne & Utkus 2013).

For advisers to be aware of clients risk attitudes and behaviour, questions regarding risk should be assigned to clients according to Byrne & Utkus (2013). The questions should not only consider risk versus return, but also the client’s tendency towards for instance overconfidence in rising markets and unwarranted loss aversion in regressions. The questions should also focus on understanding what lies behind the client’s decision-making. Some states that a client’s wealth is of importance when analysing the client’s decision making style. Advisers can for instance use checklists to identify potential investment traps because of biases that affect decision-making. These can for example be:

- Am I, or my client, being anchored by an irrelevant factor, or being affected by the way the issue is framed?
• Am I, or my client, responding to an available memory, or judging based on superficial similarity?
• Am I, or my client, being too conservative in updating views based on recent changes in information?

Furthermore, Byrne & Utkus (2013) states that to really understand why specific investment decision have been made can mitigate the effects of behavioural biases. It is common that investors and advisers formalise their investment objectives and requirements in an investment policy statement. This statement acts as a commitment device and is based on more rational evaluation. This can further help from making bad decisions based on emotions, something which is easily done when there is a movement in the market. Additionally, framing is considered a valuable tool for advisers. It is of importance for portfolio discussions to be framed in terms of long-term goals and the client’s total wealth picture. Considering risks, the approach suggests that clients and advisers should respond to market downturns by reviewing long-term risk and return characteristics of the asset (Byrne & Utkus 2013).

What’s more, interest in the use of checklists in decision-making has increased during the recent years. Checklists can be used in some situations as to aid decision-making under pressure. Use of checklists could help in financial planning in an effort to avoid the behavioural pitfalls. The list can check for common behavioural biases, such as overconfidence, availability and representativeness biases, as well as anchoring and conservatism (Byrne & Utkus 2013).

3.2 Industrial real estate

In the following chapter we bring up relevant theory and research on industrial real estate and market fundamentals. Here we define industrial real estate as property used for industrial activities, i.e. manufacturing, warehousing, logistics, assembling etc. in accordance with the definition made by Hansson & Jöhnsson (2008). More specifically the definition stated by Svenskt fastighetsindex (Swedish Real Estate Index) is a property where more than 50 percent of revenues comes from industrial spaces.

One distinguishing characteristic for industrial real estate is that they commonly concern one or just a few tenants per property that don’t have high demands on the daily maintenance and operation. The property does not usually require high maintenance costs and is easy to manage. The leasing agreements are usually designed so that the tenant pays for a large part of the rolling operating expenses together with other reimbursement costs and practical maintenance such as cleaning and snow clearance (Artell & Dorph 2003).

3.2.1 Market fundamentals

When macroeconomic conditions, real estate space and capital market fluctuates, so does the yield level and the associated risk. The local supply / demand fundamentals influences property specific income and expectations of future growth. The yield or the rate of capitalization also varies depending on market conditions with respect to the opportunity cost of capital and the risk perception associated with the real estate asset class in question (Clayton 2009). Vacancy rate, rental growth and yield level are directly linked to the current market supply and demand. The demand side constitutes both tenants and real estate investors and is affected by market cycle fluctuations together with employment rate, inflation levels, rent levels and other macroe-
Clayton (2009) states that when investigating the risk free rate \( r_f \) one should look at the capital markets, i.e. the part of a financial system concerned with raising capital by dealing in shares, bonds, and other long-term investments. The real estate risk premium \( RP \) is influenced by both the capital markets and the real estate space market, i.e. the supply side of the real estate market. Hence the yield is primarily influenced by three macroeconomic sources; the capital markets, the real estate market supply and the real estate market demand.

**Capital market influences**

The Swedish repo rate is currently at \(-0.5\%\) after being cut by 15 basis points in February 2016 and it has remained the same ever since. This creates a beneficial yield gap between yield and lending rate, hereby increasing the investment attractiveness among investors. This further enforces the growing demand from investors, especially since the yield gap has decreased when it comes to risk free investments (Savills 2016).

According to Artell & Dorph (2003) financial institutes tend to be rather conservative when it comes to their lending attitude towards industrial real estate. A preferable loan candidate should have large, well consolidated tenants with long leases. In addition to this the properties should be located in attractive areas. Furthermore, the financial institutes are very focused on cash flow and the tenants ability to attract customers and their repayment ability. The primary object of investigation is the real estate investor, because it is the investor that amortizes the loan. Since the tenants plays a central role in the investors financial stability, the tenants financial situation is also investigated. Looking at simplified version of the yield, formula (3), the risk premium \( RP \) is affected by the vacancy risk determined by the financial institutes. With perhaps one, maybe two tenants per property the vacancy risk is rather high. When it is not possible to hedge against the vacancy risk by diversification, i.e. several tenants with different lease maturity dates, longer lease contracts may be preferable. Another factor that adds to the vacancy risk is the cost of readjusting the property for a new tenant. This means that some characteristics associated with industrial real estate will push up the risk premium \( RP \) and hence the yield level according to formula (3) Artell & Dorph (2003).

When it comes to real estate properties there are limited alternative usage. This results in a smaller terminal value. A smaller terminal value will decrease the Market Value \( MV \) according to formula (2). This in turn will push up the yield level, see formula (1) (Artell & Dorph 2003).

**Real estate market demand**

The Swedish Economy is growing strong compared to most mature economies in Europe, which is mostly due to the ongoing expansive policy in Sweden. According to the National Institute of Economic Research, Swedish GDP grew by 4.2 percent in 2015 and 3.9 percent during the first half of 2016. According to Savills (2016) employment rate is increasing and the employment workforce is growing, thus creating a growing tenant demand (Savills 2016).

Hansson & Jönsson (2008) consider that industrial real estate tenants tend to be more sensitive to market fluctuations. They motivate this assumption by pointing out that industrial real estate requires a higher degree specialisation. They further argues that the operators or tenants might want cut down their production during a recession, thus selling of parts of their industrial real estate space. During an economical upswing the tenants reacts in an opposite way and the demand for industrial space increasing, pushing up the rent levels (Hansson & Jönsson 2008).
the NOI dominates, i.e. if the Market Value does not increase proportional, the yield level will go up.

According to Savills (2016) the confidence indicators for the industrial production industry indicate an optimistic outlook, meaning that the industrial tenants are expected to do well in business thus indicating a lower financial risk.

**Real estate market supply**

According to Hansson & Jönsson (2008) the demand for industrial real estate increases during an economic upswing in the market. Today, the low repo rent has created a beneficial climate for investors thus contributing to enforcing the investment demand side. Savills (2016) proclaims that the transaction market is extremely liquid and has seen record high transaction volumes during 2015 since 2007. This trend has continued and in 2016 the industrial market reached and all time high. The transactions in 2015 were 48 percent higher compared to 2014. Further worth mentioning is that the transaction pace in the industrial sector has remained stable in the years after the financial crisis. According to Savills (2016) the industrial sector has managed to withhold decent transaction levels in spite of market conditions whereas other commercial segments have not.

![Figure 4: Transactions volume (number of) in Industrial real estate sector (here defined as the logistics, warehouse and industrial sector) between year 2006 and 2016. We can see record high transaction volumes in 2015. We can also notice that the trend is somewhat stable, despite some high peaks. Source: (Savills 2016)](image-url)
Figure 5: Transactions volume [SEK Million] in Industrial real estate sector (here defined as the logistics, warehouse and industrial sector). Both the trend and the average value is presented in the graph. The graph illustrates a time period of 9.5 years. Source: (Savills 2016)

The construction pace in the sector is currently strong according to Savills (2016). This means that there is a growing supply to meet the increasing demand whereas the majority of the construction has been made primarily in Stockholm and Gothenburg.

3.3 The real estate market crisis in the 90’s

The financial crisis that erupted in 1992 was the first major crisis to hit an industrialized country since the 1930’s. It has taken a central role in the crisis management discussion (Englund 2015).

3.3.1 The crisis begins

The common view among Swedes during the early 1990’s was that the crash "will never happen here". People saw to the advanced welfare, full employment and strong union influence and the upcoming crash was completely unexpected (Jonung 2009). According to Johansson & Pihlgren (2009) the financial crisis during 1990’s where due to the effects of demand and the supply on credit. During the late 1980’s and the early 1990’s Sweden’s tax regulations made it attractive for households and companies to lend money. The three most important regulations that was deregulated was the liquidity ratios, interest controls and lending regulation. Year 1983 the liquidity ratios was removed. This regulation meant that banks was obliged to hold a certain percentage of their capital in government securities and mortgage bonds, this part was set to 50 % and in the early 1980’s the banks had reached the limit. The Governor then decided to remove the regulation. In May 1985 the interest controls from the Governor was deregulated. The regulation controlled the upper and lower limit of interest rates taken by banks when lending out money. This was done by determining a fixed minimum- and maximum interest rate and also by prohibit increases in interest rates. In November 1985 the third regulation, the lending regulation was removed as well. The regulation determined the upper lending limit which the
banks were not allowed to exceed (Johansson & Pihlgren 2009).

Other signs that a financial crisis was soon to come was an increasing unemployment ratio a decrease of the production in the industry. In October 1990 a shock in the change of interest rates came, the short-rate increased to 17%. The effects of a much higher short rate was that the value of assets with a long maturity, for example shares and real estates, fell. The value of the assets often fell short of the lending amount. The expectations about a continued price drop resulted in an actual price drop of the real estates. Real estate investors was negatively affected when their equity disappeared as an effect of a higher interest and a hollowed market value of the real estates. The consequence of a changed evaluation in the Swedish real estate capital was an abrupt stop of investments in the construction sector. The real estate sector which earlier was considered stable were now the one sector that was most affected by the high unemployment rate and bankruptcy. This lower the demand for lending money and also lower the capacity of repayment which led to enormous losses for financial lending institutes (Johansson & Pihlgren 2009).

3.3.2 The real estate aspect of the crisis

The real estate market accounted for 80% of the lending institutes credit losses in the beginning of the 1990’s, which was loans for financing real estate investments. During the 1980’s the prices in the real estate sector had risen with over 100 percent. When the incline decreased in the beginning of 1990’s the real estate sector suffered from huge price drops and a new real estate crisis was born. The segment that was most affected by the price drops was the commercial sector, and the hardest hit was taken on by the office spaces. The office spaces experienced higher vacancy than both industry- and retail spaces. The tenant demand for office spaces is mostly driven by the space needed for the employments. During year 1985 the demand of space increased due to the high growth of companies that demanded office spaces. Speculations of an increased demand in office spaces resulted in higher rent levels but in year 1989 the rent levels started to decrease and continued to decrease in a fast pace until year 1993. The crisis in the segment can be explained by the high loan to value of investments in the sector, as well as the high unemployment ratio (Johansson & Pihlgren 2009).

3.3.3 A further explanation to the 1990’s crisis

Hassler (2010) has studied the the crisis in the 90’s and states that it is apparent that the crisis came as a consequence of the government mismanaging the economy for a long time. Furthermore, the change that had taken form in the real estate market can be explained through Wicksells and Fishers theory about the cumulative process. The cumulative process states that there are two types of interest rates. One is the capital rate which represents the yield that the new investment is expected to generate. The other rate is the lending rate which is the interest rate paid to the lending institute for the lending capital needed to finance the investment. When the yield or capital rate is higher than the lending rate it becomes favorably to lend money for investments. The banks therefore increased the amount of loans to real estate investors and the bank credits therefore accelerated. The result of this led to a higher demand of investments within the real estate sector which increased the level of prices of the real estates and in turn led to an inflation. If the lending rate would instead be higher than the capital rate the investments would have stagnated, since it wouldn’t be favorable to invest with debt. The lending institutes
would decrease their amount of loans and it would result in a deflation. When there is a difference between the two interest rates the price level won’t stay constant. This means that the course is cumulative. During the 1990’s this theory states that the demand on real estates in a beginning was very high, higher than the supply. The Swedish lending institutes came to higher their amount of loans and offered favorable lending rates. This triggered the demand for lending credit even more and the prices on the real estate rose. When the interest for investing in real estate decreased the lending rates came to growth. The lower investing demand for real estates resulted in higher lending rates and thereby the demand of real estates and their value decreased. The result of this created problem for the real estate owners and the lending institutes with real estates as securities (Johansson & Pihlgren 2009).

The uniqueness of the events in the 1980’s that led to a real estate crisis in the beginning of the 1990’s, was the deregulation of the credit market. The freedom that the deregulation gave the lending institutes created chances for them to earn more money, in exchange to be more risk taking. When the banks came to suffer from credit losses, most was due to financing of real estate loans. Explanations to why the banks considered it attractive to lending money for investments in real estates during the 1986 and 1990 was due to the thriving climate in the commercial real estate market and the optimism that the investors felt for commercial spaces. Other explanations are that it was one way of attracting new customers and that in Sweden lending institutes preferred lending money against collateral, where real estate was considered a reliable collateral Johansson & Pihlgren (2009). According to Baker (2008) the central banks has a enormous responsibility to ensure that the financial bubbles do not grow to such dangerous proportions.
4 Result

This section will be based on interviews from the different stakeholder groups; Industrial Real Estate Investors, Consultancy Firms and Financial Institutes.

The chapters will be divided according to the different types of risk categories identified during the interviews, i.e. vacancy risk, financial risk, macro economic risk, liquidity risk, regulatory risk, rental risk and physical asset risk. Furthermore, the second part of the result will focus on market behaviour.

4.1 Vacancy risk

In the following chapter we present the results on the vacancy risk amongst the different stakeholder groups.

4.1.1 Industrial real estate investors on vacancy risk

All investors interviewed states that, in the industrial real estate sector, 10 year leases with only one tenant per property is very common. They further state that kind of loan associated with this kind of investment is positively viewed by financial institutes, because of their similarity with bonds. However, some industrial real estate investors are choosing a more diversified tenant portfolio with shorter lease contracts to hedge against the vacancy risk that occurs at the end of the ten year contract. Company A determinedly stands by this concept stating that this both means a lower vacancy risk and higher return. Furthermore, a portfolio closer to Stockholm city with diverse and shorter maturities will decrease the vacancy risk according to Company D, something that Company H agrees with saying that a multi tenant property minimizes the risk if the maturity dates differs. However, if the area is not well known, locking in the cash flow might be preferable and hence longer contracts might be necessary to handle a vacancy risk according to Company D. When it comes to drawbacks with long leases, Company A states that even though the vacancy risk is rather low during the initial period of the 10 year lease contract, it becomes very substantial when the maturity date is closing in. Company D agrees with this statement saying that they estimate the vacancy risk for single tenant production properties in rural areas with long 10 year leases to be rather low during the lease period. However, Company D continues, when maturity date is closing in there is a substantial risk in the terminal value of the property that is very likely.

When it comes to cash flow calculations, vacancy rate is of importance according to Company D. The calculated vacancy risk is benchmarked and added to the terminal cash flow value in the cash flow analysis. The vacancy rate might lie between 2 - 15 % and exactly where in the span depends on assumptions and benchmarking. The estimated vacancy in Prime Stockholm Office market might be 2 % compared to one tenant production properties in rural areas like Falun might be 15-20 %.

Company A further states that for typical properties with only one contract the adjustment period between tenants can be long and expensive. It is not unusual that the property will stand empty without generating any income for as long as 18 months. The investors with a higher tenant per property ratio in their portfolio will have a much lower risk of complete vacancy due to different maturity dates, thus decreasing the impact of lease expiration. Also this kind of
property usually have a more flexible and mobile technical structure, making the adjustment costs smaller or perhaps even zero. This kind of industrial property would hence have a lower vacancy risk. However, Company A argues that this goes unnoticed by the financial institutes that tend to value both kind of lease structures the same when it comes to vacancy risk. This means that the financial institutes may be prone to a categorization bias according to Company A, where they overestimate the risk of a certain property by linking them to the the average industrial property that might have another vacancy risk profile.

Company N argues that the vacancy for industrial real estate is lower compared to offices, this is mostly due to the low supply and the high demand of industrial properties in central Stockholm. Company N states that in industrial real estate the tenants often are dependent on the infrastructure built for the specific property, and therefore they are sensitive to moving to another property. This is something that will decrease vacancy risk even further. According to Company H industrial properties are often rather simple, and larger less complicated buildings needs to be further from the city when the ground is cheaper. Furthermore, Company A argues that financial institutes does not take the geographical aspects into consideration when estimating the vacancy risk. For instance, the Stockholm region compared to country side regions are extremely different when it comes to tenant demand profile. Industrial properties in Stockholm have less surrounding land which results in less alternatives for the tenants if they would like to move. This increases the value and demand for the existing properties, thus pushing up the market value, NOI and growth rate and thereby compressing the yield level and lowers the vacancy risk. On the contrary, tenants in the rural area always has more bargain power as they have the option to build another property on the nearly located land according to Company A. This leads to more supply options and hence decreased tenant demand in rural areas, which equals a higher vacancy risk. As aforementioned, Company A argues that financial institutes or lenders does not take this difference in vacancy risk into account when assessing the risk premium for investments in the Stockholm prime area. Thus once again by the categorization bias, the risk premium might be overestimated for Stockholm industrial properties. According to Company C the vacancy rate has never been below 90%, not even during the 90’s crisis. This is because Stockholm has relatively low level of production related real estate. Instead there are a lot of service properties, their purpose is to deliver repairmen for office property service. Hence the industrial properties can be seen as a derivative to office properties and consequently they correlate in the same way. This means that the supply and demand on the industrial real estate market in Stockholm highly correlates with the GRP which is high in the Stockholm Region and also the size of the population. Company C further states that despite the fact that the vacancy risk is low, tenants becomes less expansive in economic downturns. Moreover, Company C argues that one of the main focuses is the risk of not being able to rent out and hence the tenant demand. Since most of the building are built during the 1970’s many tenants still have office spaces in the industrial properties in addition the industrial spaces. This means that these properties have a constant vacancy of approximately 10 %. Finally, Company C stresses the importance of vacancy risk and that tenant demand is the main focus when assessing risk.

A final argument for lower vacancy risk stated by Company H was that industrial real estate tenants are less demanding and take more responsibility for facility management. Office properties requires more maintenance initiatives from the property owner. The more general the building is, the lesser the vacancy risk. Company N agrees with this statement saying that the adjustment costs for having a new tenant are often lower than for offices.
4.1.2 Consultancy firms on vacancy risk

Company G states that according to research contributed by Company G in 2016, the vacancy rate for industry properties in Stockholm was estimated to 4.8% whereas the vacancy rate for office buildings were 10.3%. The research was based on 10 million square feet of Industry buildings in Stockholm. The vacancy rate is very individual depending on the property. Properties situated in central Stockholm lower the vacancy risk. Properties close to Stockholm tends to be smaller and multi tenant properties, also they are often standardised. Furthermore Company B proclaims that the vacancy risks are highly exaggerated, especially among financial institutes. This because they underestimate how costly it is for tenants to move. Also, Company B, says that the supply is scarce in the Stockholm region since there is lack of land for new construction. Also many industrial facilities are being remade into residential properties. This means that possible vacancies are being absorbed quickly. On the contrary, Company F argues that the tenant demand for the industrial sector is lower than for the office market.

Company B states that office leases are going towards longer leases, mostly because the tenants have higher quality demands and the landlord stands for the refurbishment costs. This makes short contracts where the tenants either wants to move or refurbish, risky for office investors as they might have to refurbish at maturity and take the cost. Industrial properties, on the other hand, does not share this characteristic according to Company B. Here the tenant pays for refurbishment or re-adjustment, either directly or in the form of higher rents. Company E contradicts this statement made by Company B. They argue that the customization of industrial real estate makes the refurbishment more substantial and hence more costly. If the tenant would stand for the refurbishment costs, it would affect the willingness of tenants to move into customized properties. This makes the tenant demand weaker, hence increasing the vacancy risk. If the landlord pays for refurbishment it leverages the vacancy risk by making it costly to install new tenants. Furthermore, at the end of lease agreements (where negotiations often are made) if the tenant wants to install new equipment that the property could not handle, for instance heavy machinery, the landlord needs to find new tenants. Subsequently, Company E argues that long leases with single tenants are the most beneficial from a risk perspective. It is harder to rent out industrial real estate today compared to office spaces, according to Company E. Company F, however, argues that the customization of industrial real estate makes the refurbishment more substantial and more costly but interpret the consequences in a slightly different way. They state that it is harder to fit the tenants in the industrial sector into the real estate spaces since their technical requirements are higher. For example, often tenants demand a more specific area size, which makes them not wanting to rent the whole building, and there is often hard to fit another tenant for the space left, hard to optimize the rental space. There can also be a problem combining multiply tenants in the same property, which increase the vacancy risk. Subsequently, Company F argues that long leases with single tenants are often most beneficial from a risk perspective, this since the landlord can lock in the cash flow as well as the one tenant often is more stable than a few smaller ones. This is something that Company I agrees on also stating that increasing demand means good business for investors. Company G, however contradicts saying that the vacancy risk tends to increase for a larger property with only one tenant. Furthermore Company F states that when tenants is growing in size in the industrial sector and therefore demand larger spaces, it is usually hard to build out the properties which forces the tenants to move. This makes the vacancy risk higher for the industrial sector compared to the office sector.
4.1.3 Financial institutes on vacancy risk

The vacancy levels is of importance according to all financial institutes. Company J states that the tenant quality is crucial, if they have a bad credit rating that will increase the vacancy risk. Company L talks about the importance of how much vacancy can the investor afford and that the LTV ratio required is strongly linked to vacancy risk. Hence the vacancy risk is a very important measure of how much loan the investor can get.

It is however a greater risk associated with vacancy for industrial properties compared to office properties, even in Stockholm, according to company K. This as it is very easy to find new tenants in Stockholm office prime and the landlords are less vulnerable as they have a higher tenant per property ratio. Company J adds to this statement that when it comes to tenant structure fewer the tenants per property should be compensated with longer contracts in order to keep vacancy risk down and this is being done in some industrial properties in Stockholm. Company K further states that the vacancy risk is judged to be low in Stockholm in compare to industrial properties in more rural areas or other cities. Company L also thinks that the Stockholm market is less risky as it is easier to find new tenants.

Furthermore, Company J thinks that it is generally easier for industrial property tenants to move as the technical standard might be lower. Company L elaborates a bit on this statement saying that the customization of industrial real estate properties has a lock in effect as long as the client is stable and doing well. But in the case of bankruptcy or tenant movement the vacancy risk is really high. Company M also talks about the simplicity of industrial real estate saying that this aspect increases the vacancy risk. The ground is cheap and it is easy for competitors to build new properties. According to Company M Industrial Real estate has a much bigger vacancy risk because of this. Company M also talks about price elasticity comparing industrial properties to wheat flour, if you change the price too much no one will buy your goods.

4.2 Macro economic risk

In the following chapter we present the results on the macro economic risk amongst the different stakeholder groups.

4.2.1 Industrial real estate investors on macro economic risk

According to Company A the higher supply of alternative premises in the rural areas increases the risk would to be higher. Hence, with the same principle, the investors in the Stockholm industrial segment have more power when it comes to decisions and business bargaining. The higher demand and lesser supply in the Stockholm area thus acts as a leverage in business negotiations, which decreases the business risk and the risk premium. Company A continues by stating that this however, goes unnoticed by the lenders or risk assessors. Furthermore Company A argues that it is often unnoticed that industrial real estate demand also increases in growing cities. This is however not unnoticed by Company C. They state that the supply is highly correlated to the GRP (Gross Regional Product) and the size of the city. One of the parameters that are affected the most by fluctuations in the economy is the exploitation rate. The least attractive property type during economic upswings when it comes to exploitation rate is industrial real estate, according to company C. During a profitable macroeconomic climate, with high GRP, the land area is more expensive. This means that the property value per square meter needs to
be higher in order to make a profitable investment. Offices can have an exploitation rate at 100-200%, yielding 1-2 square meter office space per square meter land. Industrial properties only have less than 50% exploitation rates, making them a less profitable choice when GRP is high. This also explains why most of the industrial properties are built during economic down turns, at least according to Company C. As the aforementioned increasing tenant demand trend that Company C subscribes to an economic upturn, the supply should not be increasing at the same or a faster rate than the demand. By this Company C implies that during economic upswings the profitability is leverage by increasing demand but stalling supply, thus making the macroeconomical risk very low. However, when the economy is not doing so well, the market is not so sensitive.

Company D agrees with the topics discussed above and adds that as the city of Stockholm develops and grows, the demand from both tenants and investors increases. However, the supply decreases as many industrial properties are being re-developed to residential properties. An example of this is Hammarby Sjöstad. Company D further states that one needs to consider the estimated future tenant demand when valuating investment. Company H also discussed the growth of Stockholm saying that Stockholm city is growing, but it is a slow process. The gravity induced by the city growth will turn low value ground into high value growth. An example of this is industrial real estate turning into higher value properties. The Stockholm community needs logistic properties and warehouses and a large city puts high pressure on infrastructure. Just food supply in large cities is a major issue that needs these kind of properties. Company H does not want to speculate in e-commerce but says that there is a problem in having the warehouses and logistic properties far from the city kernel, however the infrastructure needs to be built in such a way so that the goods can be distributed in an effective way.

Company N provided a deeper insight in the topics discussed above. They discussed growth, supply, demand and also a broader macro economic perspective. Company N states that Stockholm city is growing larger, both in area and population. We can see a trend of urbanisation and globalisation. A growing population demands more residential properties, which the politicians struggles with and put up goals to build, both short and long term. The effect on the industrial segment has been that the industry is pushed further away from the city centre. This results in lower supply for industry properties in central areas and the demand is growing larger which increases rent levels. The tenants in these properties are often companies that serves the city and are sensitive to increasing rents. On the other hand, the city in long term are dependent on example service and e-commerce, if these are pushed further away it will have implications on the transport and availability of these services. In a investors perspective, this is not an economical risk, instead it makes an exit possibility and a way of generating higher multiples. There is a risk in believing in exit possibilities, since it pushes up prices for industrial properties in central areas and is dependent on the demand of conversion to residents. If the demand of building new residential properties decreases this will effect the market values on the industrial properties negatively. Company N doesn’t believe that Stockholm is protected if there would be a global crisis. Although, we can see that the bigger cities are the ones that are the first ones to recover from the crisis.

4.2.2 Consultancy firms on macro economic risk

Company E argues that the tenant demand is lower for Industrial Real Estates compared to Office properties which increase the risk for the sector. Company F argues as Company E that the tenant demand is lower for Industrial Real Estates compared to Office properties which increase the risk for the sector. Company I, however, states that Stockholm is growing larger and the
industry sector is pushed further away from the city centre. The supply of Industry properties is decreasing in the central areas and as an effect of this the demand and rents are increasing. There are several of industry areas which has been converted into offices and residents in the later years and we can see ongoing examples of this as well, frihamnen is one. Company I means that there is no larger downside in investing in industry properties in central areas if the goal is to generate money in long term, since the possibility of conversion into residential properties is very high which usually generates a higher exploration rate. Company B was the most optimistic, talking about low local supply and high demand and stability through macro economic cycles.

Company E states that there is a great macroeconomic global risk that will hit the industrial sector hard if market conditions would worsen. This is something that company F agrees on. Company E further states that the market in Stockholm Prime will be affected more by macroeconomic factors than the local supply and demand. The industrial market in Stockholm has a lot of upcoming new investors. They have less financial capacity, which implies higher debt which makes them more sensitive to interest rate changes. If the lenders would sharpen lending policy they would take the greatest hit on the market. The risk is further leveraged by the general state of the tenants and lease structure for industrial properties on the Stockholm Prime market. The tenants are often small and sensitive to market conditions and the short leases increase doesn’t ensure a stable cash flow over time. However, small investors might survive on lower cash flows since they have much less administrative costs. Another important risk factor, according to company F, is that investors in the industrial sector often has a high financial leverage, and are therefore sensitive to changes in the interest rate. As well, the tenants in the industrial spaces are often small and sensitive to market conditions.

Furthermore, Company G says that export and import are the primary macro economic variables that drive the local supply and demand. E commerce is a great opportunity that will benefit logistic properties and warehouses. The consumption rate is an indicator one needs to keep track of and which will affect the import and export rate.

4.2.3 Financial institutes on macro economic risk

As the city develops and grows the ground is becoming more and more valuable. Both investors and Company J sees opportunities in higher exit values in the form of reconstruction to residential properties. However, as a lender it can be dangerous to speculate in future opportunities and to be too optimistic, instead Company J focuses more on cash flow and what they know for certain. Furthermore, the e commerce industry development might induce major changes in the future. Goods might not be delivered to grocery stores any more and robot and digital development have opened opportunities for industrial properties. The technical advancements are already resulting in warehouses with several floors.

Company L has a large focus on macro economical factors and stating that what happens in the US will affect the Swedish market in perhaps two years. They think that we have already reached the lowest point in yields and that we in northern Europe will catch on the US faster because of our more beneficial climate. Yields and interest rates is the most central factors and one of the highest risks. There are things happening that could affect things, we had Trump and Brexit. Two things we didn’t expect, but we have to expect the unexpected. We have an election in Netherlands, where a right wing might win. France, Germany, Russia, Hungary, Italy and then Sweden. According to company L, GDP is growing which is good for the real estate
sector. Unemployment is decreasing which is good, unemployment is very bad for industrial real estate. Unemployment rate differs a lot between foreign born and domestic people in working age, they see that politicians need to handle integration and education better among refugees with low level of education. Once again, high unemployment negatively affects real estate.

According to company J the banks lending regulations affects the whole market. Today we have a peculiar macro economic climate with growth and negative interest rates, company J continues. This have created a very beneficial real estate investment climate. Company K talks about the market being doped by the low interest rate climate in combination with a growing economy. Interest rates are highly linked to the profitability in real estate and thereby the investors are very exposed to the macro economic risk associated with interest rate increase, says company M. Company K further state that the macro economic risk is lower in Stockholm than in rural areas. Company L states that the interest rates affect the market in many ways. We have gotten used to low inflation and low interest rates. In August 1992 the interest rate for housing loans where 12% and in November 1992 the interest rate was 28%. Today you can fix your housing mortgage for approximately 2.75%. This should be approximately the same for industrial real estate. If the federal reserve would increase rates at a higher pace the rates in Sweden should follow. What happens in the US will happen in Sweden in 10 to 12 months. This highly affect the Real Estate Market. What happens in the world really affects the Swedish economy. Company L continues with stating that if the repo rate would increase it would mean that the market is getting healthier, this current state means that the market is not in balance.

According to Company J, everybody is always saying that a crash is just around the corner, but it still hasn’t happened. This might create a "the boy who cried wolf" effect. If interest rate increases things might go south. According to Company J smaller industrial properties in Stockholm made a quick recovery and together with residential properties. When it comes to supply and demand Company M states that there is a high supply and low demand in the Stockholm market, contradicting the other financial institutes that stated the opposite.

4.3 Liquidity risk

In the following chapter we present the results on the liquidity risk amongst the different stakeholder groups.

4.3.1 Industrial real estate investors on liquidity risk

Company A states that investors might be regulated by certain requirements limiting their investment options. This can have a negative effect on the market demand for industrial properties and consequently the liquidity risk. For instance an investment fund might be required to invest in real estate markets with a certain yield spread and thereby they might ignore what kind of properties that lies beneath the numbers. Investors might feel pressured to invest to give their stakeholders value for their money as fast as possible in order to generate return. This means that they might overlook less liquid markets, such as the industrial real estate market, decreasing the investor demand further. This results in a spiral effect, where the demand for industrial real estate is decreasing while other real estate types are pushed up according to company A. Increased liquidity risk results in a higher risk premium and thereby a higher yield.
Company C is not convinced that the liquidity risk is higher in industrial real estate. They referred to needing to calibrate liquidity data considering market size and value. They indicated that by others implied lower liquidity in industrial real estate might be a consequence of not taking differences in market specifics into consideration. Company D states that demand is high in Stockholm prime and thus follows that the market is very liquid. Company H and N agrees with Company D. Company H states that the liquidity is especially high for newer more modern properties and that older industrial real estate properties are less desirable. Company N means that though the high liquidity, it is not as high as the liquidity for the office market.

4.3.2 Consultancy firms on liquidity risk:
Company G sees that more institutional investors are engaging in the market because of the lack of liquidity in the Office Market. They also state that this is a slow industry, there are few transactions per year and this means that decisions might be made based on old or insufficient data. Company I states that many investors are not willing to sell to today. They say that today the market is very illiquid but the transaction rate increases year by year.

Company B says that the market is liquid and the number of transactions have remained stable over time. There is a growing supply through new construction which is a consequence of a growing demand.

Company E talks about the effect macro economic conditions have on liquidity. Stating that all markets are often more liquid in this type of macro economic climate. However, when market conditions will worsen, industrial real estate will be the first to go according to Company E.

4.3.3 Financial institutes on liquidity risk
According to company K the liquidity risk is higher in industrial real estate. However, there is a lot of capital coming into real estate as the risk free assets does not have any return, thus real estate becomes the new risk free asset. This means that more and more funds and institutions are buying real estate properties. Company M completely agrees with company K. If a good Office property will yield 7% return for one year investors might prefer this over an index generating 5%.

Company M believes that the industrial real estate market in Stockholm is less liquid than Office properties. Hence the liquidity risk should be higher and as a bank one does not want to have a high liquidity risk. If the bank would need to realise the property value and would not be able to sell it would be very bad. This is however quite unlikely, but if the rents would decrease a lot it is important that the investor has the opportunity to sell the property and be able to pay back the loan. According to Company J large institutional investors are not very interested in Industrial properties something that might push down market value according to Company J.

4.4 Financial risk
Financial risk was interpreted very differently amongst the different stakeholder groups. Interesting to note was that the definition was the same within the stakeholder groups. The investors and Company B considered the financial risk to be rather unimportant whilst the rest considered the risk to be of significance.
4.4.1 Industrial real estate investors on financial risk

When asked about financial risk the investors, all of them, turns to talking about financial institutes. None of them have a positive view about financial institutes as lenders, talking a lot about how banks overestimate risk and are prone to various biases etc. There is not a great focus on the financial risk in itself.

According to Company A when evaluating risk for industrial properties the lenders might be acting according to an availability bias. This might lead to overconfidence when it comes to well known property types such as Office Properties and risk aversion towards less known properties such as Industrial properties. According to Company A financial institutes allows a low loan to value ratio at only 60 percent approximately, compared to 80 percent for office buildings. This is a clear sign of the lenders assessing a much higher risk premium for industrial real estate. Company D and H agrees with Company A that the financial institutes have a more strict lending policy when it comes to industrial investments. Company N states that the banks has changed its lending policy after the financial crisis in 2008. Before 2008 the banks when financing industrial properties focused more on the property rather itself than the company they were financing the loan to. When the crash happened the banks were exposed to smaller players on the market which were not able to pay back their loans due to bankruptcy. Therefore the banks today put a lot of value in the lending companies and their existing portfolios, to hedge against risks. Company N also argues that the banks have no problem financing industry properties, if they believe in the property and the company they are financing. According to Company N the banks though often value the industrial properties lower than the market value, this is due to a quick rise in the industrial sector and don’t value the exit value as high as the investors. The LTV rate is put up due to the banks valuation.

Company D firmly states that financial institutes fails to notice the difference in risk between multi-tenant modern industrial real estate and single tenant property. However, they admit that they are partly responsible for proving these differences to financial institutes.

Company H does not have a positive view on financial institutes, and according to their view banks lack a long term perspective. They do not want to point the finger at any bank in particular but clearly states ”Banks are very unprofessional” sounding quite upset. They further state that it is in the banks nature to overestimate risk and they do this in order to build profit and that they want to ”lend out as much as possible in order to build profit through interest income”. The banks or lenders are not, according to Company H, interested in credit restrictions and they want to lend out as much as possible. Lending out as much as possible is their entire business model according to Company H. They further state that an important issue is the cash flow generated by tenant and hence the vacancy risk is prioritized when it comes to financial risk. Hence also tenant demand.

4.4.2 Consultancy firms on financial risk

Company B states that financial institutes are strict in their lending policy towards investors in the industrial real estate market. This is shown in a lower loan to value ratio. Company B says that the financial institutes overestimate risk and that they are risk averse towards the Industrial real estate market. Company E firmly states that financial institutes have been kind on industrial real estate investors but lately they are becoming more strict in their lending policies. This is however, fair since industrial real estate investors are the ones who takes the greatest hit when
the market conditions worsen. Company F states that the industrial investors often have a high loan to value ratio, and argues that these are the investors who will go bankrupt first if market conditions will worsen.

According to Company I smaller investors might have a harder time getting a loan. Different types of investors prefer different contracts lengths and it is hard to say which is the most beneficial. If one does not speculate in rental growth longer contracts are preferable and this is usually preferable by banks and larger investors. Smaller investors that speculate in rental growth might prefer shorter contracts. Multiple tenants are always more preferable. This is because of diversification, that can be achieved in other ways as well. One can diversify by tenants, property type, geographical area etc. Company G states that they are not to worried about newcomers in the market when it comes to financial stability. This because the nature of the newcomers has changed, during the crisis ten years ago the newcomers were less experienced and often non-corporate. They might even have a lower LTV ratio, creating a safer business climate.

4.4.3 Financial institutes on financial risk

Company L has a great focus on the financial risk. After the 90’s crisis they realised that cash flow is more important than market value. This has made them more reluctant to lending out to companies that are highly leveraged and are less financial stable. This has also made them wanting to prefer longer contracts up to 10 years instead of 3-5 years. Company J, K and M also states that longer contracts are almost always preferable as this will lock in the cash flow and decrease the financial risk. Company M states that longer contracts, up to 10 years are preferable as it will generate a stable long term cash flow so the investor can pay the interest rate payments.

Company J states that one needs to consider the characteristics of the individual properties and especially tenant structure, location, regional market conditions. Here Stockholm is considered a good market. High tenant per property ratio in a well diversified portfolio acts as a good hedge against financial risk. They point to what happened before the 90’s crisis when the lending policy was more about value growth rather than a safe cash flow. The market value matters, if everything goes wrong one can always realize the loan by selling the property. The cash flow needs to generate the market value and also a premium. Company M states that the largest risk is the risk associated with tenant and cash flow. The tenants does usually not have a good financial stability. If the tenants are more stable the bank is more willing especially if this is in combination with long contracts. Smaller tenants makes Company M more reluctant to lending out. Company M sees a financial risk in the simplicity of real estate and the excess of adjacent ground. This means that vacancy risk increases and hence also the financial risk as the investor will not be able to remain financial stable if the tenants move.

Company L states that Larger companies with a more diversified portfolio with stable contract structure and tenants are prioritized. If a smaller confident investor gets a loan they will have a lower LTV at 40 %, it all has to do with how sensitive the loan taker will be for changes and their risk profile. A larger more stable investor will get an LTV of around 60 %. Depending on the loan taker the roof for Office properties can be up to 75 %. This is something that is constantly revised and depend on the current market conditions. Company J states that the LTV roof for industrial properties is approximately 60 percent. Company J states that when deciding on the financial risk the company asking for a loan is important, a known and financial stable costumer is preferred. They also see differences in types of investors, many larger corporations does not want a high LTV ratio while others seek leverage and wants to loan as much as possible. The latter is believed to be more short termed in their investment policy. Company K states that
when it comes to LTV, industrial properties and logistic properties lies between 50-60% while office properties have a LTV of 60-65%. According to Company K there is a difference and a gap between industrial properties and office properties and believes that this gap will always be there as industrial real estate are generally more risky. Office properties in good locations have a roof of 65-70 % while industrial properties are closer to 50 %. Company M states when it comes to LTV a portfolio of industrial real estate and a known costumer would probably get 60 % and a new costumer would have more difficulties and perhaps get 50 %.

Company J argues that if an investor is interested in a loan Company J stresses the importance of having a portfolio perspective considering the number and diversification of the properties. Company K sees the company as the most important factor of the loan. Hence the financial stability of the loan taker is of great importance. The financial industry needs to make sure that the company will be able to handle the interest payments.

### 4.5 Physical asset risk

In the following chapter we present the results on the physical asset risk amongst the different stakeholder groups.

#### 4.5.1 Industrial real estate investors on physical asset risk

Company D sees extremely high risks associated with one tenant properties in rural areas because of uncertain terminal values. If the properties are custom designed for one certain tenant it can be hard to find buyers which could also affect the liquidity risk. But most importantly, it might require extensive re-construction due to reconstruction and damage repair. The valuation is also highly based upon what the rent level could be since it highly affects the cash flow. Company H states that when investing in industrial real estate the market value is of great importance. The customization of industrial real estate is a very important risk to consider. They further state that the physical asset risk is more substantial compared to office properties. Sometimes large investments has to be made in order to prepare the ground for the property base and this affects the price. It can be difficult to find even and buildable ground for this kind of property while still being located in the Stockholm prime area. Company H have seen examples where investors has invested in less beneficial ground in order to come closer to the city. Company N in contrast states that the properties in the industrial segment are usually not very specialised and the price for building industrial properties are not very high in comparison to office properties.

According to Company C, the physical asset risk is more of a pricing issue. If the building has physical defaults this is not considered to be a serious risk as this will be included in the price. They state that it is not about if they would need to fix a broken roof, they know they will. It is rather about "when", and as they are long term owners, and "when" is not as important.

Company D further state that there are no typical industrial real estate in the Stockholm area, since the properties are modified and designed in a very different way compared to traditional industrial properties. This causes wrongful risk assessment as some stakeholders does not realise these difference due to potential categorization biases.
4.5.2 Consultancy firms on physical asset risk

Company E presses the issue with the customization of industrial real estate, and hence the related costs. They agree that office tenants indeed have high demand on their refurbishment. However, industrial tenant needs to make physical changes that might affect the whole property. They compared new tables and chairs in office spaces with equipment rooted in the ground in industrial properties. The changes are more substantial and hence more costly and they affect the quality of the building. Company F agrees with Company E on the issue with the customization of industrial estates and that it can be very costly. Often industrial real estates are old which affect the quality of the buildings and the cost of refurbish these conditions is very costly.

Company G states that the physical asset risk varies between properties and tenants. For instance, properties with cooling rooms are very customized and might be difficult to remake. However, cooling rooms have high demand among food e comancers. They believe that the general opinion is that industrial real estate have high physical asset risk. However, they do not agree. Industrial properties are very simple construction wise, and thereby easy to maintain. If damage happens it is mostly due to the tenant. Company G also argues that tenant prefer to be located near central Stockholm in relation to the modernity of the property. Company I states that smaller industrial properties that are rather simple are easier to rent out have lower risk while larger more customized properties have a larger risk.

4.5.3 Financial institutes on physical asset risk

Company J states that Physical Risk is of importance. An older building that might be highly customized might need to compensate with longer contracts. Larger industrial properties in Norrland however have a higher physical asset risk due to their location which Stockholm properties don’t have. Having to much office space in an industrial property might increase risk in forms of vacancy, cash flow etc. Company L and M states that a more modern less customized facility is more beneficial and decreases the physical asset risk. Company L means that low roof heights for instance limits the options when a tenant leaves. The location is of great importance as well. If the location is good there might be a possibility for re construction to for instance a go cart arena. Company M also states that the value of the ground is of greater importance. Industrial properties are often rather simple and this makes it easy for competitors to just build a new property on the cheap ground and lure the tenant to change landlord.

Company K states that the customisation of industrial real estate properties is in the benefit of the owner as it makes it more difficult for tenants to move. Older properties have a higher risk and thereby the LTV needs to be lower for older properties. However, diversification by region, properties, tenants etc. will decrease risk and allow higher LTV.

4.6 Rent risk

In the following chapter we present the results on the rent risk amongst the different stakeholder groups.

4.6.1 Industrial real estate investors on rent risk

Company A were very optimistic regarding rental growth and saw great opportunities in short contracts enabling to benefit from a rental upswing. They thereby believed that the tenants
hade the ability to pay higher rents, arguing that they could increase rents with as much as 40\% during lease negotiations without the tenants minding.

According to Company D the rental agreements are based on extremely a conservative basis, where landlords are using the same agreements for years, not questioning the standards or calibrating for differences. They estimate the rental risk for single tenant production properties in rural areas to be rather high because of the excess of available land, making alternative premises available. This even pushes down the rental levels. Company D prefers multi-tenant properties with different maturities in Stockholm Prime areas. They are also seeing that more and more companies are catching up on this trend, increasing the competition. This is something one needs to handle by active management. One common prejudice is that industrial properties does not need maintenance from landlords, that is not true according to Company D. One very important aspect of handling rental levels is active management.

Company H states that the rental risk is highly important for industrial real estate according to company H. The risk associated with loss of income due to the rental payments is of more substantial here compared to for instance office properties. This because it is easier to find new tenants for office properties. The higher rental risk increases the risk premium resulting in an upward adjustment in the yield level. They state, however, that the rents are much less volatile in industrial real estate but that the Stockholm market is one of the most volatile in Europe.

According to company N the rental risk doesn’t differ from the risk level in office buildings in CBD.

4.6.2 Consultancy firms on rent risk

Company B states that their research points to less volatility in rents for industrial real estate compared to office spaces. Also they point out that their research says that industrial real estate is less sensitive to market conditions and changes in the economy, and that the rents have not gone down for at least ten years. This can be explained by the rent levels in industrial versus office spaces. For office tenants, the rent is often number two or at least very high up in the list of largest expenses. For industrial tenants, the rent is one of the smaller expenses. This yields that the rents are more affected by budget cuts, for instance in a bad economy, for office properties. This makes the rent risk for industrial properties almost zero according to Company B.

Company E states that Industrial tenants in prime location in Stockholm are smaller, and therefore more vulnerable when it comes to financial capacity. Company F agrees with Company E that the Industrial tenants in prime location in Stockholm are smaller, compared to the tenants in the Office market, and therefore more vulnerable when it comes to financial capacity.

Company I states that there are many optimists on the market speculating in increasing rents. This is reflected in shorter contracts which are believed to maximize the benefit of rental growth.

4.6.3 Financial institutes on rent risk

Company K states that the rent risk is highly dependent on the tenant structure. Having only one tenant makes the portfolio more vulnerable and hence the rent risk increases. Company I brings up the risk of it being easy for tenants to move and that tenant quality and credit rating
is of great importance. In other property types the tenant might not be as important, but here tenants matters more as these type of properties are more vulnerable for risks associated with tenants and rental payments.

Company M states that as financial institutes don’t have an upside in increasing rents, they only have the downside if rental payments does not cover interest rate payments on the loan.

Company M does not think the ”actual rent” has increased that much. At least they would not count on increasing rents. Even when we talk about Stockholm Prime. This is because Stockholm prime location will change geographical location, this might mean that there are more ground available for competitors to build nearby logistic properties and compete in rent levels.

4.7 Market behaviour

In the following chapter we present the results on market behaviour by bringing up the potential biases and heuristics identified by the respondents.

4.7.1 Industrial real estate investors

When it comes to biases in the market, the investors point out availability and categorisation biases. They further notice conservativeness, herd behaviour, overconfidence and optimism.

**The availability bias**

Company N states that there is an availability bias in the market. One example is the investment preferences of international investors. International investors outside Scandinavia tend to invest in office buildings referring to invest in the industrial market. One explanation could be that international investors have the experience and excess to data for the office segment whilst industry properties are more complex lack sufficient data. This might make international investors more risk averse towards the segment. European investors outside of Scandinavia and investors from U.S. tend to not invest in Sweden’s residential market, a strong reason is that their residential market differ in the way that they use social housing.

Company C says that people associate risk with the crash, making them more risk averse, especially banks.

**The categorisation bias**

Company D states that people are prone to the categorisation biases, and argues that especially financial institutes and valuation firms does not consider the differences in modern multi-tenant logistic properties and classic one tenant production properties. Company D believes that evaluators and risk assessors tend to put properties that are very different from a risk perspective in the same category; industrial real estate. From there they draw conclusions regarding different risk aspects based on the traditional industrial property; that is a single tenant property focusing on production in rural areas. Even though the property might be a multi-tenant logistic property in Stockholm Prime areas.

Company D states that evaluators sets the yield one percentage unit higher solely because it is an industrial property and that they believe that the risk is categorically higher in industrial real estate. Company D doubts that rent volatility, tenant relocations are any different from Office
properties and capex for re-adjustment should even be lower for industrial properties.

**Conservativeness**
Company D states that when it comes to market behaviour, they believe that the stakeholders in general are extremely conservative. They also believe some are more conservative than others, and it is in their opinion that the most conservative ones are the financial institutes. Furthermore, Company D states that people are mainly driven by experience or rather perceived experienced, anchoring in what always has been. This means that people use older valuation methods and that everyone follows the same education background with very few new influences. Moreover, Company D states that cash flow valuations are made in the same way and with the same rules as 20 years ago, even though the market conditions are changing. Company D states that people generally think "If condition A holds, increase the yield by 25 %, because that is what we always do." Because of the lack of data, or perhaps just convenience, people look at old uncalibrated data and draw conclusions about the current state and the future.

**Herd behaviour**
Company N states that there is a herd behavior in the industrial sector. The banks influence investors where to invest. If banks consider a segment interesting, they are also willing to lend out money with favorable conditions and therefore investors also tend to invest more money. A more favorable lending policy becomes more attractive for lenders, which also attract new stakeholders.

**Overconfidence and optimism**
Company N states that the investors in the industrial sector are driven by the consumers i.e. the possible tenants outlook. If the consumers believe in a thriving future, the investors tend to be positive to investments.

Company N believes that investors in the sector today tend to be less optimistic about the near future since it has been an upswing for a long period of time. Most of the investors have experience from the crash in 2007-2008 and are well aware of one more day of an upswing results in one day closer to a recession where investments will intermit. Company N believes that there won’t be any investor that won’t go bankruptcy if a crisis would take place. And states that after a crisis investor will start invest again when the banks want to lend out money for investments.

Company N states that their contracts have a maturity of ten years. Company N sees a trend of having shorter contracts for properties closer to the city centre. The reason for having shorter contract is the possibility to utilize the rise in rents in a thriving climate. Another reason is that if there is a possibility to convert the property to residents the manager doesn’t want any tenant to deal with.

**4.7.2 Consultancy firms**
When it comes to biases in the market, the consultants point out anchoring, availability and categorisation biases. They further states that there are herd behaviour, overconfidence, optimism and risk aversion present in the market.

**The anchoring heuristic**
The consultants notice that some investors might withdraw from a bidding process due to anchoring in the span that should be suitable for real estate. They see that many investors might
withdraw if the bids exceeds 17,000-18,000 SEK/sqm as they believe that real estate properties should per definition lie between 10,000 - 15,000 SEK/sqm. Company I see people anchoring in ratios. For instance during a bidding investors might think that SEK/sqm for a certain type of property should lie between two values and if the value should exceed the anchored value people might exit the bidding. This means that investors might ignore arguments and factors motivating the value. This does not only indicate an anchoring bias but a combination of anchoring in conservativeness while also being prone to a categorization bias. Company J also argues that there is an anchoring bias present in the market behaviour, due to similar arguments.

The availability bias
Company G states that there is a availability bias among banks. Compared to office buildings Industrial Real Estates are not that familiar. Generally speaking, people are rather unfamiliar with this property type and subsequently they might have an availability bias.

The categorisation bias
Company E contradicts the categorisation bias implied by many investors as they state that valuations are very property specific and they have never heard of anyone assessing a different risk just because the property is in the industrial sector. However, Company G agrees with the investors and states that there is a categorization bias in the market which is due to lack of knowledge in the Industrial sector between different stakeholders.

Herd behaviour
Company E states that their task is to analyse what makes buyers buy and sellers sell. This means that they can observe market behaviour from both sides. They say that evaluators does not focus on data, formulas and hard values. They base most arguments on experience, assumptions on future cash flows and the company specific risk profile. They argue that risk assessment and market values varies between buyers. Even though they press the individuality of the market stakeholders they are also observing a clear herd behaviour. The industrial industry is relatively small and people talk. Company E has observed various cases where a property was hard to sell until they found one buyer. When they did others caught on, because they wouldn’t want to miss out on an opportunity.

Company G also sees herd behaviour amongst investors together with Company I that sees herd behaviour when it comes to speculating in high exit values in the form of re construction to residential properties.

Overconfidence and optimism
Company E also indicated that investors just focusing on supply and demand indicators in their judgement of the future might suffer form an overconfidence bias. They forget to look at the bigger picture and that there are bigger forces than regional ones effecting the sector.

Company G notices an eager market where the trend is to speculate in future residential areas. This means that many investors buys properties expecting high residual or exit values as they believe that the area will be converted into residential properties. This might however be a result of overconfidence. They state that one should be carful when speculating on the residential market because of potential bubbles.
Risk aversion
Company B states that the common attitude towards risk on the industrial real estate market in Stockholm is risk aversion or overestimation of risk. This means that many funds does not even consider investing in this property type, except Alecta. This market behaviour hinders a higher liquidity rate in the transaction market and inhibits possible value growth. However, Company B sees that some investors share their view on risk in this market. Company B says, that those investors see no need in having long contracts since that would be missing rising rent levels in the market due to increase in demand. According to Company B there are two types of investors, those who understand that the risk in industrial real estate is overestimated and those who do not. Those who do not will refrain from investing in these type of properties and those who notice that the risk is not that high will profit from a growing tenant demand. However, Company B also states that the risk averse attitude from lenders makes it difficult for investors in the industrial real estate market.

4.7.3 Financial institutes
The financial institutes were the one bringing up the most biases. They talked about availability bias, categorisation bias, conservativeness, overconfidence and risk aversion.

The availability bias
Company K states that when something is hard to evaluate, for instance due to lack of data, this often indicates a higher risk. They are rather unsure on whether or not industrial real estate is more risky, something that was mentioned several times during the interview. Company M follows the same line arguing that the lack of information and available data for industrial properties is a problem. Office properties might have data going back to 1980’s and have a lot more transactions, while industrial properties does not have the same amount of data. This makes the risk assessment more difficult and hence perhaps also more risky. Moreover, knowing the customer is really important for all the banks interviewed. The lender is more willing to lend to someone they know and their current clients. Company M firmly states that customers that the bank already knows have an easier time loaning money, as what is known is perceived as more safe. Finally, Company K sees a drawback when it comes to lack of experience among investors, if one hasn’t experienced any of the crashes they might underestimate the probability and also the impact of a potential crash.

The categorisation bias
According to Company J the fact that the LTV roof is the same for all industrial property types might indicate a categorization bias. With this they mean that the LTV roof does not change despite the large differences in different types of industrial properties, regions and contract structures. Nevertheless, where the investor ends up in the LTV span is highly calibrated according to the aforementioned factors. However, when deciding on lending policies Company J states that it is better to be safe than sorry which means that looking to history is a safer option than speculating in the future, even if it might induce a conservativeness or categorisation bias.

Conservativeness
When it comes to the LTV ratio Company J states that the LTV roof has been the same for a long time and hence it might be affected by a conservativeness. Company I adds to this statement that as younger people enter the industry the conservativeness of the industry is about to change. If one looks to the investors Company K states that for larger noted companies,
debt does not increase in relation to NOI which indicates conservativeness in larger investors. Company K can see that larger companies are preparing for worse times, going for endurance throughout different market cycles.

**Overconfidence and optimism**

Company K sees many "fortune seekers" coming into the industry. They might be overconfident and optimistic inspired by the people being successful in the industry. If they also lack experience they might be in a very risk scenario. Company K also see that lending to overly optimistic investors includes a high risk. Speculation in increasing rents and high exit values without any financial stability in tenants or landlord is not something that will lead to the financial institutes lending out money. When the economy is going well and there are a lot of available capital and buyers there will be a lot of mistakes. Investors coming in now might be a bit late, much like investing too late in a stock that has gone up a lot. This means that you have missed a large part of the increase in stock value and are more exposed. If one also are highly leveraged the risk is substantial. Company L agrees that overoptimism is something that will not speak in the favor of loan takers. Company K further adds that some investors acts like they want to win the lottery. Overall Company K sees a more willingness towards taking risk now compared to a few years ago after the crisis, indicating an availability bias.

According to Company L some people are overoptimistic and smaller opportunistic investors are very exposed to changes in the microeconomic climate. The smaller investors have smaller financial muscles whilst larger investors with bigger portfolios and cash flows are more resistant. From an objective view point it should be the larger more stable investors that can afford to take bets on the market, but it is usually the smaller ones that do. It is usually the smaller ones taking these bets. These types of investors will not get any loans. Company L sees that these investors have overconfidence in both ability and future possibilities. This will bite them back according to Company L. They saw overly optimistic people during the 90's crisis buying properties just because they want to take a part of the upswing in the market. They were happy and eager to work hard but they did not have the knowledge. Theses were the ones taking the greatest hit during the crisis. What the banks learned from this was to focus on cash flow rather than value. The banks were left with a lot of properties during the financial crisis because of these fortune seekers and they have learned from this experience and are restrictive to lending out to this type of investors. When looking back to the 90’s financial crisis Company K remembers everyone focusing on value growth and building more and more properties, but the there were no buyers. This was an example of how overoptimism can turn out. When it comes to the Lehman crash the Stockholm market was not that affected. When people was not exposed to the crash their perception of the probability of a crisis is different from the people that were affected.

**Risk aversion**

Company M states that as they are bank they are naturally risk averse. There are things happening in the outer city of Stockholm where the prime location for industrial properties are. For instance they know for sure that attractive office properties in the CBD of Stockholm will always be an attractive location for office properties. So even though there is a chance that logistic properties will have a high exit value if they can be turned into properties the financial institutes only cares about cash flow. They want what is safe before what is unsafe, better safe than sorry. Especially as they do not have any benefit of this high exit value and it cannot guarantee safety. Company I also state that banks are risk averse as they won’t profit from value growth or rental growth. They are only interested in investors being able to pay the interest rates. Company K
further states that they have no benefit of being optimistic as they only take risk. If the value
increases or rents increase they cannot benefit from it. This means that lenders are naturally
more risk averse.


5 Analysis and discussion

This section contains an analysis and discussion of the presented results. This is done by presenting both a written and a visual analysis. We will also discuss how the research methods used could have affected the results.

This chapter begins with a visual analysis of the result. Here the statements and arguments made by the respondents, presented in the result, are translated into a color scale representing the different stakeholders attitudes towards the different risks. Important to note is that the visual analysis should not be confused with the actual result, this is a mere interpretation of the result. That is, an analysis made in order to scale the attitudes and thereby provide a base for the analysis and eventually also the conclusion. After the visual analysis of the results, each risk presented in the result is analysed with the support of the visual analysis. With the analysis and discussion presented we also aim to explain the nature of the result, using behaviouristic theories and other relevant methods.

5.1 Visual analysis of result

In Figure 6 a visual analysis is presented. The analysis was performed by us, the authors. We have examined the company specific responses regarding each risk and highlighted statements and opinions that indicated that the risk was considered either important or not important. Further we took the behaviour and tone of the conversation into consideration. For instance, when asked about vacancy risk Company A talked a lot about risks being misunderstood and was eager to talk about opportunities, something that indicated that the risk in question was not of importance. Company A was also very passionate and felt offended by people considering the risk important, an aspect that leverage the established sentiment. This, among other factors mentioned in section 5.2, led us to believe that Company A did not consider the vacancy risk to be of importance. This is not a result, but an analysis made by us and the conclusions might be different if the companies or any other person where asked to to make the same analysis. We present the arguments and explain the colours assigned in further detail in sections 5.2 to 5.7.

The colour scale consists of three colours red, green and gray. Risks considered important, i.e. of significance or extra risky etc., have been assigned the color red. Risks that have not been prioritized, i.e not important, small, insignificant etc., have been assigned the color green. We have also applied two lighter version of the colors red and green, this to illustrate a softer attitude in both directions. If the respondent did not express an opinion, the color light gray is applied. An alternative approach would have been to interpret lack of opinions as "not important", i.e. a green color. But this can be misleading, since there can be many other factors involved as reasons to why not the subject was brought up. As the interviews were semi structured, we could not push the respondents too much to discuss all the risks. For instance many respondents when asked about the rent risk they only answered that they have no opinion. Pushing them to form an opinion both contradicts the method and would influence the result.

It is important to note that this is not a result, but an analysis of the result. The result is complex and ambiguous and is more than what can be measured on a scale, however in order to be able to compare the different attitudes and get a proper overview of the result scaling the results was necessary. The scaling is also based on soft data such as the interpretation of
how the respondents acted and answered the questions during the interview, i.e. how the statements in the result were presented to us. If the respondent spoke a lot about a particular risk, this could mean that the risk is of more importance. However, as in the case of Industrial RE investors on vacancy risk the majority of the time spent on vacancy risk was spent arguing on why it was not so significant, this instead emphasized the attitude of the risk not being important.

An alternative approach would have been to create a survey asking the respondents to scale the different risks discussed. We choose, however, not to do so. Firstly this would have rendered Figure 6 to be a part of the result instead of being an analysis of the result. Secondly, this part of the result would not have been so valuable, as it would present soft data as hard data and thus missing the complexity and ambiguity of the result.

**Figure 6: Visual Analysis of the Result.** The table shows respondents attitudes towards the different risks identified in the Industrial Real Estate sector. The green color states that the risk is of insignificance and the red color states the risk is of significance. The grey color states that the respondent had no opinion about the risk.

When observing Figure 6 one can see a pattern of green among the investors. We also see that the investors and financial institutes are two homogeneous groups, this in contrast to the consultancy firms where the results differs between different companies. Here company E and F completely agrees with each other on every point, whilst company B breaks the red pattern showing more similarities with the investors. Company G and and I have opposite attitudes towards macro economic, financial and physical asset risk. The financial institutes are like the investors more homogeneous, showing a light red trend in the matrix. If one ignores Company B, the financial institutes and the consultancy firms are more similar in their attitudes compared to the investors, showing a light red trend. This visual analysis will later on be used in the conclusion where we
answer our research questions. Before a conclusion can be reached a more extensive analysis must be presented, we thus introduce the following chapters where we analyse each of the risks identified in the empirical study.

5.2 Vacancy risk

We start broad, looking at the visual analysis. Here we can see divided opinions, six red (five dark red) and eight green (four dark green). The investors consider this risk to be insignificant in general, whilst the financial institutes states that it is of importance. The consultancy firms are divided. In order to understand and interpret this one needs to analyse the statements made in the results.

Starting with the investors, when asked about the vacancy risk most of them immediately began passionately explaining the misunderstandings associated with this risk. There was a trend where the investors argued that the vacancy risk was overestimated, especially by financial institutes. However, they stated that single tenant long lease buildings had a higher vacancy risk, something that was misunderstood by the market as they stated that many prefer this type of investments. Interesting to note was that, when they were asked to discuss a risk they talked about how it was not a risk and the fantastic opportunities associated with industrial real estate investments. This opportunities mainly consisted of increasing demand, decreasing supply and the possibility of a multi-tenant short contract portfolio (that would enable to benefit from increasing rents). We believed both the statements made by the investors and their way of arguing indicated optimism, however, as the vacancy risk is not calculated in a qualitative manor it is impossible to say whether the financial institutes overestimates or if the investors are overconfident.

The consultants are a divided group, spanning between dark green and dark red. What is even more interesting is the statements behind the color rankings, that is even more diverse. Company B shared the optimism of the investors, analysing how they answered our questions we could see that they clearly cared about convincing us that the vacancy risk is misunderstood. They strongly argued that that the vacancy risk was lower for industrial real state compared to offices, and that the vacancy risk was highly exaggerated especially among financial institutes. They, like the investors seemed to focus on opportunities rather than risks even though they were asked about risks, not opportunities. Company G was similar in their opinions, also stating that the vacancy risk is lower for industrial real estate compared to office properties. They were however, more objective as they based their arguments in facts and numbers in greater extent than Company B. However, Company E and Company F had completely opposed opinions. What was interesting to note was that their arguments were almost identical, even though they were completely independent on each other. They argued that refurbishment costs and low tenant demand were the main reasons of why the vacancy risk was higher in industrial real estate compared to office. Also they had opposedviews compared to many of the investors, arguing that long lease single tenant properties were the safest option or they had no opinion on the matter.

Financial institutes, however, were not so diverse in their opinions. All argued for the importance of vacancy risk, however company L had a bit of a softer opinion. They also argued for long lease single tenant solutions in order to handle the vacancy risk.

In conclusion, there is a possibility that instead of the market overestimating the vacancy risk, as stated by the investors, the investors might suffer from overconfidence, optimism or confir-
information bias. Interesting to note is how we felt that almost all the investors tried to convince us. Furthermore, the opinions on contract structure were divided. The investors preferred in general multi-tenant short lease solutions whereas the financial institutes preferred long lease single tenant options. The consultancy firms either had no opinion or preferred long lease single tenant, except from Company I. The question is what motive the investors had for preferring the short leases and whether or not they were based on a risk perspective and not a return perspective. The arguments for short leases were to benefit from increasing rents, however, multi-tenant solutions enabled diversification in the portfolio which is beneficial from a risk perspective. Financial institutes were the ones focusing the most on the risk instead of opportunities, they have nothing to win and hence they might be able to study the risks in an more objective manor. However, they also are the ones taking on the risk which might make them biased in the other direction thus they might be more risk averse.

5.3 Macro economic risk

When it comes to macro economic risk both the color scaling and the arguments differs a lot between the different stakeholders. The investors consider this risk to be insignificant in general. Whereas the financial institutes consider the macro economic risk is of importance and significant. The consultancy firms differ in their opinion about the risk. Company B and Company I’s opinion are more similar to the investors while company E, F and G are more similar with the banks. In order to understand and interpret this one needs to analyse the statements made in the results.

When it comes to the investors, they are even more optimistic than they were about the vacancy risk. Even though Company C did think that the risk was slightly significant arguing on lower exploitation rate and GRP dependence, all the others pointed to high demand and low supply together with a growing city. This resulted in a dark green scaling for all other investors.

Company B and Company I were of the same opinion as the investors, with the same arguments but a bit softer arguments. Company B further argued that the industrial segment had managed well through financial cycles. Company E and Company F had opposed opinions arguing on lower demand than office. They also discussed the vulnerability of new up comers, highly leveraged companies, a large global risk and unbefitting tenant characteristics. Company G also ranked the risk as significant arguing on a large dependence on sensitive macro variables. Overall the consultancy firms ranked this risk a bit higher than the vacancy rate.

The financial institutes on the other hand did not consider this risk as significant as the vacancy risk, however still really important. Almost all of them discussed the dangers of the interest rate climate and the impact of the global economy. All financial institutes were assigned a red colour in the visual analysis, but Company K and Company J were a bit more optimistic referring to a better climate in Stockholm and an ability to quickly recover after financial crisis historically.

If we analyse the trend of arguments amongst the different stakeholders, we once again notices a tendency among the investors to talk about opportunities instead of risks. They also have a rather narrow mindset compared to the other stakeholders, only focusing on the supply and demand of the city of Stockholm as the (almost) only macro economic risk aspect. The consultants are a bit broader, and even though two of them discussed local supply and demand they still had a broader perspective. Also when asked about risks they talked about risks. The ones showing the most interest and insight in the macro economic climate were the financial institutes. They were also the only ones discussing the interest rate climate, something that according to the
literature study plays a very central role in an investment. The financial institutes also discussed the historical crises. There might be an availability bias in people that have not experienced previous crises.

5.4 Liquidity risk

Regarding the liquidity risk the investors differs in their opinion about the importance compared to the other stakeholders. The investors consider this risk to be insignificant in general, but differs from light red to dark green showing more diverse opinions. All of them are of the opinion that the market is either liquid or very liquid. Company A, despite being overall optimistic, talks about various factors decreasing the liquidity in the market. However, the dark green dominates the scale making the investors having the general opinion of the risk not being important. Company B is optimistic even here being the only one among the consultants to consider this risk to be unimportant. The other consultancy firms spans from stating that the market is very illiquid to illiquid but getting better. Also the consultants provided more arguments and explanations behind the statements in contrast to the investors who only made statements. The financial institutes have exactly the same grade of opinion according to our analysis, saying that the market is less liquid than the office market and also providing some facts connected to the statements.

It is interesting to see how much the opinions differs between the respondents. Some say that the market is very illiquid, while other state that the market is very liquid. Why the opinions differs so much is hard to say. We might find an explanation in the anchoring bias, perhaps the respondents have different reference points. We could see a trend among the banks where they compared the liquidity in industrial real estate with the liquidity in the office market. The investors did not provide a benchmark. The consequences in market behaviour will be discussed later on.

5.5 Financial risk

Financial risk was a bit difficult to analyse. It had many similarities with the macro economic risk as the respondents seems to interpret the risk very differently. The investors did not consider this risk important at all, on the contrary they firmly stated that this risk was highly overestimated especially by financial institutes. The consultancy firms were not as optimistic, even though both Company B and Company G were assigned green colours. The financial institutes were once again considering the risk important.

The inventors immediately began talking about banks and lending policies. The common opinion was that the financial institutes were biased, in the way and just not positive. They did not discuss cash flow or interest costs, some of them discussed LTV but only to point out that there is an unfairness in the LTV levels as investors Industrial real estate should be able to have higher LTV ratios. Among the consultants Company B agreed with the investors once again, arguing that banks are too strict and the LTV is too low. Company G said that investors are not as exposed as they used to be but a too high LTV is risky. The others argued that the LTV levels were too high already, making investors vulnerable to market changes. Some of them even stated that banks have been a bit too kind to investors considering the importance of financial risks. The common opinion among banks were that industrial real estate should have a lower LTV ratio, this as they and their tenants are more vulnerable when it comes to financial stability. They also added that they calibrated for factors as tenant characteristic, company specifics,
other assets in the portfolio, type of properties, location, physical conditions etc.

The major conflict considering this type of risk is the LTV ratio. The investors argued that they would like a higher LTV ratio, the consultancy firms (almost all of them) and the banks stressed the improtance of keeping the LTV rather low. A high LTV ratio means vulnerability to interest rate changes, market changes and value decrease. And wanting a higher LTV ratio is a good indicator that the investors speculate in a stable and up going market and see no need to hedge against a financial risk. Once again an optimism bias, that will be later discussed, comes to mind.

5.6 Physical asset risk

Regarding the physical asset risk the investors were the most divided compared to the other groups, spanning between dark red to dark green. The others tend to considering the risk to be important. Two out of the respondents did not express any opinions on the matter. The investors were, as aforementioned, diverse on the matter. Some argued that it was not a risk since it was already included in the price and that the simplicity of the buildings works in their favour, whilst others pointed to a more substantial risk than for offices. The consultancy firms considered the risk to be important, only company G pointed to actors generally overestimating the physical asset risk. Although almost all the consultants agreed on the importance of the physical asset risk he arguments differed. A central topic was reimbursement costs, management and a tendency towards older properties. Nevertheless, the importance lies in the arguments backing up the statements of a more significant physical asset risk. Furthermore, the financial institutes once again considered the risk to be important, but perhaps the least important of the risk categories. Company K and Company L had opposed views on the impact of customization of industrial real estate properties on physical asset risk. Common to all financial institutes were a detailed and nuanced argumentation, where a lot of different factors were taken into account.

As industrial properties are rather different from the typical Stockholm property (office, residential or retail) we expected a more continuous and straight forward response from the interviewees. However, this was not the case. The results were ambiguous and complex. This might be due to the large variety within the industrial real estate segment. Taking this into account the results seemed rather unbiased, it would be easy for the respondents to adapt to a cathegorization bias trying to bundle up all the different types and draw conclusions from there.

5.7 Rent risk

Rent risk was the risk that had the most gaps, as many of the respondents failed to express an opinion. The attitude differ though between the different stakeholders. The majority of the investors believe that the risk is insignificant, except from company H which on the contrary believe the risk is of importance. The consultancy firms are rather united in their opinion and believe that the risk is of importance. Company B though share an attitude more similar to the investors. Furthermore, the financial institutes share the same believe that the risk is of significance.

The investors goes from stating that the rent risk is generally the same as for office properties or that increasing rents diminishes the rent risk to saying that the risk is highly important. One topic brought up is conservativeness during rent negotiations, which can be interesting from a
behavioural perspective in the upcoming chapter. When it comes to consultancy firms, once again Company B is very optimistic. They point to research stating that rent levels are less volatile and less exposed compared to office properties. The other consultancy firms thought the rent risk was quite substantial, except from company G which did not express an opinion. The financial institutes all states the same, that the industrial segment are very vulnerable to rent risks. They point to the characteristics of the tenants and that it is easy to compete in rent levels.

To summarize the final risk category we can say that even though three of the respondents did not express any opinion we still can form an overview of the opinions of the different stakeholders. Once again we see optimism amongst the investors, were they point to the opportunities and some even base their business model on speculation in increasing rents. The financial institutes are more risk averse, as they do not want to trust the financial stability of the tenants. The consultancy firms seems to share this view, except from Company B that tend more towards the investors.

5.8 Market behaviour

In the following section we analyse the biases and heuristics brought up during the interviews.

5.8.1 Availability bias

When analysing the different responses we find two main types of availability bias. The first is based in the lack of hard data, something that was brought up among the consultants and financial institutes. The other type is founded on experience. Regarding the lack of data it is known and brought up by many of the respondents that the supply of financial data regarding industrial real estate is scarce compared to for instance offices. When it comes to experiences, many of the respondents see differences in business men that have experienced crashes and worse economic climate and those who have not. The ones who have not are often more optimistic or even over confident, whilst does who have are said to be more risk averse.

A form of availability biases mentioned in the literature review is the retrievability bias, where the most recognizable characteristics of a group is used to draw conclusions of the whole sample overlooking the less noticeable samples. An example of this, that would have been noticed during the interviews, would have been if the respondents only discussed the obvious risk aspects not taking less noticeable risks into account. We often noticed that the respondents, across all stakeholder groups, got caught talking about a particular risk. However, if we asked a question about another type of risk no one had any troubles discussing their opinion and the impact of the subject in question. Nevertheless, some assumptions regarding other stakeholders where brought up were especially investors proclaimed financial institutes to have a categorization and / or a retrievability bias. It was in the opinion of many that financial institutes did uncalibrated decisions regarding industrial real estate, especially when it comes to risk assessment. It is hard for us to objectively evaluate the truth in these statements, nevertheless, when the financial institutes were interviewed they stressed the importance of calibration for different types of clients, portfolios and properties. All of them brought up the diversity present amongst the properties in this segment and the importance of not categorizing or calibrating. They did this without us mentioning any of the accusations made by the other respondents.

When it comes to consequences in the market behaviour due to a potential availability bias the most prominent one would be a general risk aversion against industrial real estate. The question
is, however, if the risk aversion is healthy or not. As Company M stated; the lack of data makes the risk assessment more difficult and hence perhaps more risky. In this case an availability bias making one refer from to risky choices might not be a market disadvantage. When it comes to the experienced based availability data the consequences are either a risk aversion or optimism/overconfidence. However, even though the respondents indicated that a fear of crashes is induced by real physical experience the literature suggests otherwise. In the literature review we learned that event read, seen or heard about also could induce an availability bias. For instance, a young investor without any experience from a crash can still be risk averse due to the availability bias by being exposed to information in a way that makes risks associated with crises or crashes be closer in mind. Furthermore, even though we couldn’t identify any representativeness bias we saw assumptions being made on how the risk was being evaluated by the financial institutes. This can lead to mistrust in the lender - loan taker relationship and seeing how financial institutes value their client relations this is something that might matter a great deal to them.

If we were to speculate in remedies for the availability bias solving the lack of data issue is an important aspect. When it comes to risk assessment of large and usually quite leveraged investments eliminating the bias or ignoring it might not be the wisest choice. More data and complimentary quantitative analysis could decrease the degree of randomness in the risk assessment and hence also the risk level. Though, there is a limited supply of data within the Industrial real estate sector. The amount of similar industrial properties within the same area is very small in comparison with the office sector. As well, for the data to be of significance, you must stress the importance of having a time series of data that involves both upturns and recessions. Today, according to all respondents, the risk assessment is made in a completely qualitative manor. If one believes in the basic economic principles of equilibrium, demand and supply should meet. Subsequently, if there has been no need for data there might not be surprising that there is very little data. Furthermore, when it comes to the assumed representativeness bias we believe that this might be based in miscommunication between investor and financial institute. Interviewing the banks on how they assessed risk made us believe in the decisions being well calibrated. Perhaps if the investors that stated otherwise had been with us they might have had a different opinion.

This is also a part of what we are hoping to contribute by this thesis. Finally, there are some things that might be difficult to help such as the exposure or non exposure to crises and crashes. However, diversity in a team with different experiences and age groups might be a good hedge.

5.8.2 The anchoring heuristic

When it comes to anchoring the respondents have seen people anchoring in ratios, market values and also, each other. An interesting observation made by an consultant from Company E was anchoring as a type of herd behaviour. They recalled that when property owners are looking to sell there can be relatively hard to find new buyers (they argued that the market was illiquid opposed to others). Suddenly someone places a bid, and not short after the other bids comes rolling in. The industrial real estate segment is a small industry and people know each other enabling them to manifest their anchors through herd behaviour. What’s more is that people usually anchors in ratios. These anchors can be based on experience, thereby anchoring in conservativeness, research, other people etc. Company I, a consultancy firm, tells us that it is very common to dismiss a valuation or a ratio just because ”it shouldn’t be so high or low”.

As mentioned in the literature review anchoring is an heuristic that is hard to study and define. We noticed this by realising that it was a heuristic that was rather hard to spot, simply put; it is hard to know what is going on subconsciously in peoples minds. However, when the respondents
were asked straight forward about anchoring we came across results among the consultancy firms. Here, the anchoring heuristics brought up during interviews tended towards conservativeness and herd behaviour. Nevertheless the consequences stands quite clear. First of all the anchoring acts like a leverage for other biases. Conservativeness is further established by people anchoring in "what always has been" and herd behaviour is enforced by people anchoring in the common opinion. In addition, as anchoring was so hard to spot by both us and the respondents this heuristic has further leverage of being well hidden. Many of the respondents answered that there were no anchoring in the industry, which is an interesting result in itself.

What can then be done when it comes to the anchoring heuristic? It is a well hidden, complex phenomena and perhaps a remedy is to enlighten it and raise awareness. This also one of the objectives with this study.

5.8.3 The categorisation bias

The categorisation bias was brought up by all stakeholder groups. This was however done in a variety of ways where different respondents had different perspectives. One perspective was the variety of subcategories within the category industrial properties another was differences in tenant structure and a third, lease length. The common opinion among investors where that people in the market where very prone to the categorisation bias, especially financial institutes. Company D for instance argued that financial institutes did not consider differences between a multi tenant short lease logistic property and a singe tenant long lease production property. Company D further stated that evaluators and risk assessors tend to put properties that are very different from a risk perspective in the same category; industrial real estate. From there they draw conclusions regarding different risk aspects based on "the traditional industrial property". This was backed up by other investors. However, none of the respondents said that they were prone to this bias, just that "others" were. Furthermore, when interviewed the financial institutes stressed the importance of considering the variance in the segment and the individual characteristics of not only each property but each loan taker and each portfolio. Company J, a financial institute and lender, told us that where the investor ends up in the LTV span is highly calibrated according to the factors such as location, tenant structure, lease length, portfolio, loan take profile etc. However, all the financial institutes had a fixed LTV roof for all property types, where the industrial properties have a lower percent. This per se can be seen as a light version of a categorisation bias, but it is rather hard to prove without having access to the assumptions and motivations behind the LTV roof.

It is hard to say whether or not there is a categorization bias among the respondents. Company E for instance contradicted the categorisation bias implied by many investors and stated that valuations are very property specific and they have never heard of anyone assessing a different risk just because the property is in the industrial sector. Even though the investors arguing that many, especially financial institutes, did have a categorisation bias we did not find any indications on that they did in our study, except from perhaps the LTV roof. Nevertheless, during the literature review we encountered many categorization bias indicators were writers stated that vacancy risk is higher in industrial real estate due to the single tenant long lease structure of the typical industrial property. Consequences that would come from a financial institute acting on this for instance would be a wrongful risk assessment and unfair lending conditions. If an investor would act on this management, risk assessment and price could be wrongfully evaluated. Consultancy firms would be having troubles as well. In short, the categorisation bias can have grave consequences in the form of over or underestimation of risks, costs, profits and management.
When it comes to remedies to the categorisation bias in industrial real estate sufficient data to ease the calibration process for different types could be a start. If sufficient data could be collected further research could focus on modelling risk aversion associated with deviations from mean. Company G, that stated that there is a categorization bias in the market blamed the lack of knowledge in the Industrial sector amongst some stakeholders. Modelling different cases in a quantitative manor could help investors compensate for lack of knowledge when they encounter a new type of object to evaluate och acquire.

5.8.4 The conservatism bias

Company D talked a lot about conservatism during our interview and stated that the market is extremely conservative. This can be noticed in several different ways according to Company D pointing to people having similar backgrounds, few new influences, same models and that people are experience driven. The financial institutes all noticed some conservatism regarding the LTV ratios, or rather the LTV roofs. Almost all have had the same LTV roof for years and some said that it might need an update. Nevertheless, the loan takers seldom reach the LTV roof and if the risk evaluation would let them exceed the roof this would be possible.

According to our literature review the most common consequence of conservatism is underestimating the consequences when change is happening. This due to the fact that people generally react rather slow to change. According to many of the investors there is a change happening as the Stockholm market is under a profitable upswing and in a safer climate than before. They further argue that there has been changes in the types of properties located in Stockholm and opportunities such as profitable exits as residential opportunities have now presented themselves. According to Company D for instance, this goes unnoticed by many, nonetheless financial institutes. In short, underestimating the consequences of this type of change would be overestimating risk and underestimating profit opportunities. Furthermore, conservatism in hiring employees would act as a leverage for biases such as herd behaviour and anchoring.

Company D further stated that the lack of data makes people look at old uncalibrated data and then draw conclusions about the current state and the future. This being said, one can say that the lack of data further enforces the conservatism and therefore data could be a remedy for this bias. When it comes to the remedies mentioned in the literature review, experience is not helping in this case. Be that as it may, checklists might still be a good remedy for helping decision makers to be more bias attentive.

5.8.5 Herd behaviour

Many of the respondents sates that the industrial industry is relatively small and people talk. Company E has observed various cases where a property was hard to sell until they found one buyer. When they did others caught on, because they wouldn’t want to miss out on an opportunity. Company N also sees herd behaviour across stakeholder groups where banks for instance can favour a particular asset and thereby increase the willingness to invest among investors.

Consequently, herd behaviour influences the industry in many ways. Firstly the price is influenced by herd behaviour in the bidding process and also the willingness to invest as objects that are popular are seen as more attractive. Moreover, herd behaviour is much similar to anchoring in this context. As mentioned earlier, many anchors in the common opinion when it comes to ratios for instance. This also creates a leverage on conservativeness. Except from leveraging biases such as conservativeness and anchoring, the herd behaviour can cause wrongful risk assessment, over
and underestimation in valuations. The common attitude today is that the macro economic climate is very favourable and some believe in an upcoming crash and others don’t. This means that if a group is too homogeneous, for instance all believe that the crash is just around the corner the herd behaviour will affect them to be more risk averse, whilst the opposite would cause optimism.

As mentioned in the literature study there is a large difference between a diverse crowd and a homogeneous group. Whilst a homogeneous group could be victims of a herd behaviour when faced with a problem taking the mean answer of a diverse crowd provides the correct answer 90 percent of the time. With this being said diversity as a goal when hiring could really help herd behaviour in the industry. Almost all our respondents had similar education and background, and people often knew each other which could be seen in respondents usually recommending us to interview the same people recommended by other respondents.

5.8.6 Overconfidence and optimism

Financial institutes and consultancy firms states that there is both optimism and overconfidence among investors. Company L for instance, sees that these investors have overconfidence in both ability and future possibilities, checking of two of three types in Moore & Healy (2008) list. Both stakeholder groups sees these biases as investors speculating in high exit values in the form of residential properties, perhaps ignoring potential bubbles and the financial stability of the own company. They also see that the narrow mindset of just focusing on a growing demand and decreasing supply, ignoring global macro economic indicators is a sign of overconfidence in the local market. Furthermore, some of the financial institutes have stated that there are optimism and overconfidence in the form of fortune seekers looking to other success stories in the industry. They further state that investors acts like they want to win the lottery. However, the investment firm Company N, believed that investors in the sector today tend to be less optimistic about the near future since it has been an upswing for a long period of time and investors are preparing for worse times. We have, however, not encountered any of these investors, except Company N of course. All other investors interview had a very positive view on the market outlook. This is perhaps not particularily strange. As mentioned by Sharot (2013) in the literature review people tend to be optimistic regarding their personal future and since investors have the most prominent personal bond to this property type it might be natural that they are also the most optimistic.

When it comes to consequences some of the more experienced respondents sees a connection to the 90’s crisis. Company L and K saw overly optimistic people during the 90’s crisis buying properties just because they want to take a part of the upswing in the market. They were happy and eager to work hard but they did not have the knowledge. Company K remembers everyone focusing on value growth and building more and more properties, but the there were no buyers. Theses overconfident and optimistic investors were the ones taking the greatest hit during the crisis. This experience have made the financial institutes reluctant to lend to people exhibiting signs of this bias. Company K and L firmly states that they do not want to lend to overly optimistic and overconfident. Finally, the most prominent consequence of these biases is a risk taking behaviour. Some respondents have stated that willingness to take risks have increased over the past years amongst investors.

As stated by Byrne & Utkus (2013) in the literature review a remedy for overconfidence and optimism is to turn to checklists with questions. The questions should not only consider risk versus return, but also the client’s tendency towards overconfidence in rising markets and unwarranted loss aversion in regressions. Furthermore, we believe that diverse groups where people have different degrees of risk taking in their nature is a good hedge againsts optimism and overconfident.
Especially, as mentioned in the literature review, studies have found that women are naturally more risk averse so having a more equal ratio of men and women could prohibit optimism and overconfidence. Furthermore, the financial institutes stated that what they learned from previous events such as the 90’s crisis is to focus on cash flow rather than expected value or expected value growth.

5.8.7 Risk aversion

We encountered two type of stakeholders being assigned by respondents to exhibit the risk aversion bias. One type is the "other" people in the market, or the common opinion, that is said to be risk averse. Company made the following statement: "there are two types of investors, those who understand that the risk in industrial real estate is overestimated and those who do not. Those who do not will refrain from investing in these type of properties and those who notice that the risk is not that high will profit from a growing tenant demand.”. Thus, we assume that "others in the market” refers to those not investing in industrial properties. However, it might be a little drastic to assume that all investors that refrains from betting their money on industrial real estate are risk averse. The other stakeholder type being assigned the risk aversion bias by our respondents were the financial institutes. Both investors, consultancy firms and the financial institutes themselves were of the opinion that banks or financial institutes are generally risk averse. But perhaps this is not a surprising matter, as banks have nothing to win and everything to lose on being the opposite (risk taking). As Company I stated; banks are risk averse as they won’t profit from value growth or rental growth. They are only interested in investors being able to pay the interest rates. Company K agreed by further stating that they have no benefit of being optimistic as they only take risk.

We see two main consequences that comes from being risk averse. Assuming that Company B’s statement is verifiable being risk averse can prohibit the opportunity of profiting from lucrative investments. Furthermore, if a risk averse nature is refraining investors from investing in the industrial real estate segment, the liquidity of the market is affected. Something pointed out by some respondents is that many institutional investors are not very fond of investing in this property type. Whether or not this is because of risk aversion is a cause for speculation. When it comes to the second stakeholder type, a consequence from risk averse lenders are difficulties for investors when it comes to lending, this was for instance stated by Company B.

Remedies for risk aversion are a bit similar to those for overconfidence and optimism. Naturally gender equality and diversity in business team could balance risk aversion and optimism and perhaps create a more neutral group environment. Byrne & Utkus (2013) stated in the literature review a remedy for overconfidence and optimism is to turn to checklists with questions, this should be applicable for the risk aversion bias as well.
This section contains three parts, in the first part we conclude the analysis and answer the research questions. In the second part we discuss implications of the study and finally we end the thesis by discussing ideas on further research.

6.1 Answering the research questions

In this section we will present the answer for the two different research questions and by this we will conclude the study.

6.1.1 Answering RQ1.

The following section presents the conclusion of the analysis made in section 5.1. provided to answer the first research question which is presented below:

**RQ1.** What are the common attitudes towards risk for the different stakeholders, i.e. investors, consultants and bankers, on the industrial real estate market in Stockholm?

Figure 6 is showing each of the stakeholders' attitudes towards different risks identified and analysed in section 5.1. Here we have aimed to scale the attitudes on a colour scale in order to compare the results and get a general overview, see Chapter 5.1 for greater detail. We will now conclude the analysis visually by compiling the visual analysis first by stakeholder group and then by general risk perspective.

![Figure 7: The three stakeholder groups common attitude towards the different risks identified in the Industrial Real Estate sector. The Investors show great optimism towards the risks while the consultancy firms and the financial institutes value the risks more higher.](image)

The conclusion of the the analysis is shown in Figure 7. This hence shows the common attitudes for the different stakeholders towards the different risks. We can now conclude that the investors general attitude to the different risks are that they are insignificant. Furthermore the investors consider the liquidity and financial risks to be of less importance compared to the other risks. The consultancy firms consider the vacancy risk less significant where as the other risk they consider important. The financial risk and the physical asset risk are of most importance. The financial institutes consider all of the risk of importance, though the liquidity and physical asset risk is of less importance and the vacancy and the rent risk are the most significant.
The common attitude towards the average of all risks are shown in figure 8. The investors consider the overall risk for industrial real estate non significant while the financial institutes and the consultancy firms consider the risk of almost equal importance. According to us, the financial institutes are in a logical place since they are the ones taking on the risk with nothing to win and everything to loose. As aforementioned by some of the respondents the larger banks will have rather small variations throughout the market cycles when it comes to their attitudes towards risk. We are not completely assured that the investors would remain as stable. According to our study we are in a strong and optimistic macro economic environment, some respondents even referred to it as ”doped” by the interest rate climate and other macro variables. The investors, unlike the financial institutes does not have everything to loose and nothing to win. They are constantly playing the field weighing risk against possible return. It is our belief that the reason why they are being so far to the left in our Figure 8 is that they are currently prioritizing return maximisation over risk minimization. This also aligns with our results where investors have had a significant tendency of discussing opportunities even if they were asked about risks. This is perhaps not particulary strange. As mentioned by Sharot (2013) in the literature review people tend to be optimistic regarding their personal future and since investors have the most prominent personal bond to this property type it might be natural that they are also the most optimistic. What is more, the consultancy firms are positioned in between the investors and financial institutes as they have nothing to win and nothing to loose. Hence, it would be natural for them to take a position in the middle of the risk scale. Instead they ended up in the far right, being the most risk averse. There is a variety of ways to interpret this result. First of all, the consultancy firms where the most diverse group, but as seen in figure 6 they also had two respondents with almost identical opinions. The diversity was instead founded on Company B, standing out as even more optimistic than many of the investors. The other consultancy firms spanned between dark red and neutral. With this being said one could interpret their position as an indicator of them as a group being hard to scale. However, we choose to see them as a more unbiased indicator of the actual risk. After all, the whole idea of having consultancy firms in the study was to have an objective party with nothing to loose and nothing to win.

6.1.2 Answering RQ2. and sub. RQ2.1

The following section concludes the key points made in the analysis providing a summarized answer to the research questions RQ2 and Sub.RQ2.1, seen below:

RQ2. Are there any biases amongst the stakeholders?

Sub RQ2.1 In that case, what are the possible consequences and potential remedies for the biases identified?
Below we have made a list that concludes the analysis on market behaviour. The list is divided into the different biases in the same manor as the analysis made in chapter 5.8. In each sections we introduce the biases followed by a summary of consequences and remedies for each bias. For more detailed information we refer the reader to the chapter 5.8. The foundation of the analysis and thereby also this concluded section, see the result chapter and in particular chapter 4.7.

☐ **The availability bias:** We found two main types of availability bias. The first is based in the lack of hard data, the other type is founded on experience.

- **Consequences:** Overestimation or underestimation of risk. The root cause of the bias, i.e. lack of data, might lead to difficulties assessing risk hence making the investment more risky.
- **Remedies:** Diversity in working teams and increasing demand for data.

☐ **The anchoring heuristic:** Respondents have witnessed people anchoring in ratios, market values and also, each other. The anchoring heuristics brought up were intertwined with herd behaviour and conservativeness and was primary brought up by consultancy firms.

- **Consequences:** As the anchoring heuristics identified were linked to herd behaviour and conservativeness we believe that it acted as a leverage for those biases.
- **Remedies:** Raise awareness making people attentive to biases in their decision making.
- **The categorization bias:** Some respondents indicated that the bias is present in the market saying that especially lenders do not calibrate for tenant structure, lease lengths, regions, property types etc. Other respondents argue against saying that risk assessors always calibrate for object specifics.

  - **Consequences:** The categorisation bias can have grave consequences in the form of over or underestimation of risks, costs, profits and property management.
  - **Remedies:** Further research and risk modelling to ease the calibration process. For that, however, more data would be necessary.

- **The conservatism bias:** Similar backgrounds among employees, same models and an experience driven industry according to some respondents.

  - **Consequences:** Underestimation of consequences associated with market change. Leveraging biases such as anchoring and herd behaviour.
  - **Remedies:** More and newer data could help as many decisions are being made based on outdated time series. Checklists and attentiveness are also possible remedies.

- **Herd behaviour:** Respondents have claimed the industry to be small, consisting of homogeneous groups with similar backgrounds. Furthermore people know each other well across and within stakeholder groups. All of this makes up a beneficial environment for people being victimized by herd behaviour.

  - **Consequences:** Wrongful risk assessment, overestimation or underestimation etc.
  - **Remedies:** A larger focus on diversity when hiring. Additionally, more data and independent research could provide an objective reference point.

- **Overconfidence and optimism:** Some respondents have witnessed overconfidence in ability and future possibilities among investors. Others argue on the opposite saying that investors are preparing for worse times.

  - **Consequences:** Underestimating risks, overestimating profits, vulnerability and perhaps also difficulties getting a loan if there is no financial capacity backing up speculations in future values.
  - **Remedies:** Focus on cash flow rather than value growth. Diverse groups could also help, especially with respect to gender equality. Checklists could also be useful.

- **Risk aversion:** Respondents have seen risk aversion among those who does not invest in industrial real estate and in financial institutes. However, it might be drastic to conclude that all those not investing in this property segment are risk averse even though some might be.

  - **Consequences:** Missing out on lucrative investments and prohibition of profit opportunities. If lenders are risk aversive investors might get less favourable loan conditions.
  - **Remedies:** Diverse groups could help, especially with respect to gender equality. Checklists could also be useful.
6.2 Implications

This study contains the accumulated experience of the top industrial investors in Stockholm, consultancy firms that have watched the segment with objective eyes and helped in numerous affairs together the largest financial institutes in Sweden. As the evaluation and risk assessments are done in a subjective manor and the whole industry is experience driven we strongly believe that this study can play an important role in the development of this investment segment.

This study enlightens how different stakeholders views the risk associated with industrial real estate investment in Stockholm. By this, we are hoping to bring clarity and insight and thus enable smoother communications and prohibit miscommunication. For instance, investors today are, according to this study, a bit negative towards the risk assessment done by financial institutes. We have heard a lot of assumptions that turned out to not correlate with what the financial institutes actually were doing. Interviewing the banks on how they assessed risk made us believe in the decisions being well calibrated, something that was wildly contradicted by many investors. By reading this thesis, the investors that stated otherwise, might agree with us. Furthermore, by learning about the risk perspectives of others taking on a different angle can shed light on risk areas that might be overseen by some of the respondents. As this is an experienced driven industry, this study grants stakeholders to take part of an in dept investigation of the experience of others and by this we hope to help to broaden the competence among the individuals. Another aspect of the implications of the study is the lack of information that is said to refrain investors from investing in this property type. A phenomenon that some respondents believe suppresses the liquidity of the market. This study can be used by investors considering to invest in this segment, but are unsure on the risks associated with this particular property type.

As mentioned throughout the paper the industrial real estate industry in Stockholm is a rather small industry with close relationships between and within stakeholder groups. The risk is assessed in a subjective manor the possibility of disagreements and different risk perspectives are a fact. This means that there are also biases present in the market. One of the most effective remedies towards biases according to our literature review is awareness. This means that in addition to the suggested remedies, just presenting the result with the identified biases and heuristics is a remedy per se.

To summarise, we see great possibilities in the implication of this study. The quality of the participating companies, where most respondents have had partner or executive positions, gives the result a high validity and should induce a high impact. Furthermore, this study can fill a gap in the research made on industrial real estate in Stockholm together with the behavioural aspects of risks.

6.3 Future research

We see a lot of opportunities for future studies on this topic. Behaviouristics is a complex subject and the attitudes of the respondents may vary throughout market cycles. During the time of this study a favourable macro economic climate flourished and this most certainly affected the perspective amongst the respondent. We believe that biases like optimism and overconfidence was particularly influenced. If a similar study were to be conducted during an economic downturn the results might differ and provide complementary empirical research material.

Furthermore, this study was geographically limited to Stockholm which is quite a peculiar market influenced by city growth and residential reconstruction. Also the increasing demand and
decreasing supply are a particular element in the regional market. It would be interesting to see a similar study performed focusing on the rural areas or in another country.

We were fairly pleased with the type of respondents. We managed to involve the most prominent industrial real estate investors, consultancy firms and banks with respondents in high positions such as CEO’s, Partners and executives. However, new respondents and different companies could be a refreshing contribution.
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Appendix

Appendix I. interview guide for empirical study

The following interview guides have been used during interviews. Note that they have been translated from Swedish and some comments have been added to help the reader understand the guide.

□ **General guidelines:** This is what we aim to focus on. The notes should remind us during the interview to keep within scope and help us to get as much empirical saturation as possible.

- Focus on Stockholm City
- Keep to industrial real estate, if benchmark is needed for examples encourage office properties to keep a theme in the responses.
- Try to make risks the focal point, even if the respondent is eager to discuss opportunities.
- Use the interview questions but do not pressure the respondents to come up with opinions on every risk. If the respondent lack an opinion on a particular subject that also counts as a result.

What we are trying to find out:

- What are the respondents attitudes towards risks?
- How does the respondent categorise the different risks?
- Are there any biases in the market?
- Can they see any consequences of these biases?

Based on the above we formulated two main interview questions:

□ What are the main risks on the industrial real estate market in Stockholm?
□ Do you see any biases or heuristics in the market?

The main interview questions above should be presented with an introduction on biases and heuristics if they are unfamiliar with the concept. Furthermore, after letting the respondent talk freely about risk more specific questions were asked about risks that we had encountered during our literature review.
Notes where added to the interview guide based on previous answers, this to enforce the thematic analysis and make the answers more comparable.

Examples of focal points added:

• Future rent levels

• The 90’s real estate crisis

• Rent risk, not found during literature review

• Contract and tenant structure

for the financial institutes the following two focal points where added:

• Lending conditions

• LTV ratios

*Most importantly: remember the code of ethics, inform them about confidentiality, ask for allowance to publish, allowance to mention company name in the appendic etc.*
Appendix II. Description of Participating Companies

The following companies participated in the study. Not linked to their company aliases as this list is in alphabetical order and the company aliases in chronological order.

**Catella:** Catella is a financial advisor and asset manager with specialist expertise within property, fixed-income and equity, with operations in 12 European countries. Source: [Annual report 2016 (Catella 2017)].

**Colliers:** Colliers International is a leading global commercial real estate company offering comprehensive services to investors, property owners, tenants and developers. Colliers is also one of the leading advisers within real estate in Sweden. Source: [Annual report 2015 (Colliers 2016)].

**Corem:** Corem is a property company that owns, manages and develops warehouse, logistics, industrial and commercial properties in central and southern Sweden and in Denmark. The goal is to be the leading real estate company in the segment. Source: [Annual report 2016 (Corem 2017)].

**C&W:** Cushman & Wakefield deliver integrated solutions to landlords, tenants and investors at each stage of the real estate commercial property process. Source: [Company website (?)].

**Danske:** Danske Bank Group is one of the largest financial enterprises in the Nordic region. The Group offers our customers a wide range of services in the fields of banking, mortgage finance, insurance, leasing, real-estate brokerage and asset management. Source: [Annual report 2016 (Group 2017)].

**NCC:** NCC develops and builds residential, commercial, industrial and public buildings, roads and facilities, as well as other infrastructure. Source [Annual report (NCC 2017)].

**Nordea:** Nordea is the largest financial services group in the Nordic and Baltic region. Nordea holds leading positions in corporate and institutional banking, as well as in retail and private banking. They are also the leading provider of life and pensions products in the Nordic countries. Source: [Annual report 2016 (Nordea 2017)].

**Nordier:** Nordier provides qualified strategic advice and deal-making for property owners, investors and entrepreneurs who are active in the Swedish real estate market. Source: [Company website (Nordier 2017)].

**Savills:** Savills public listed company is a global real estate services provider listed on the London Stock Exchange. With more than 700 offices, Savills offering a broad range of specialist advisory, management and transactional services to clients all over the
Sagax: Sagax is a property company whose business concept is to invest in commercial properties, primarily in the warehouse and light industry segment. Sagax owns properties in Sweden, Finland, Germany and Denmark. Source: [Annual report 2016 (Sagax 2017)].

SEB: SEB is a leading Nordic financial group. In Sweden and in the Baltic countries which offer a wide range of financial services and advice. In Denmark, Finland, Norway and Germany, they focus on business and investment banking based on a full-service concept for companies and institutions. Source: [Annual report 2016].

SPS.: Suburban Properties Stockholm is a private property company focusing on warehouse, industrial and handicraft houses in Stockholm County. Source: [Company Website (Properties 2017)].

Sv. Hus: Svenska Hus is a project developer and manages residential and commercial premises in the regions of Stockholm, Gothenburg and Skåne. Source: [Annual Report 2015 (Hus 2017)].

Swedbank: Swedbank is a modern bank with its roots firmly anchored in Swedish savings bank history. Swedbank is the bank in Sweden with the most customers and also with a leading position in Estonia, Latvia and Lithuania. Source: [Annual Report 2016 (Swedbank 2017)].