Trading with digital ads

A possible future scenario

MOA GÅRDH

ULRIKA AMNÄS
Trading with digital ads
A possible future scenario

by

Moa Gårdh
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Abstract

Up until now, the way advertising space online, also called inventory, is traded has been unquestioned and few attempts have been made trying to predict the future of digital advertising trading, and especially the similarities with other trading markets. One of the major outcomes of this thesis is an analysis of a possible future scenario where a futures exchange for digital advertising will develop. The purpose of the analysis has been to identify which market mechanisms and key factors that will be crucial for a secondary futures market for digital advertising in order for it to be well-functioning and create enough value.

The thesis is based on three different sources of information: observations, a literature study and interviews. Firstly, observations were done to get a holistic view of the digital advertising industry and general understanding for the challenges the industry is facing. Secondly, a literature review of existing research in the field of advertising, finance, and market design has been done. Thirdly, interviews with key players in the two industries were held. The thesis has been commissioned by Schibsted Products and Technology within Schibsted Media Group. A company with their core business in digital advertising, and an advertising platform playing an essential role for their future profitable growth.

The analysis in this thesis has shown that, in order to attract traders, the new market needs to be thick and liquid enough, which requires key functions such as; issuers, market makers and secondary platform providers. However, the underlying asset of these contracts is based on digital advertising inventory - difficult to forecast. This will require a standardized design of the contracts, and put a great pressure on the forecasting and pricing functions of the issuers on this market.
By enable trading and re-trading of standardized contracts through a futures exchange publishers will be able to retain the benefits from direct sales, and reduce the disadvantages of today’s way of selling guaranteed contracts. The futures exchange would provide transparency and imply a “fairer” way of trading and pricing as well as create new revenue streams, building liquidity on the digital advertising market.

Foreword

This thesis project was conducted during the spring of year 2017 at the department of Industrial Economics and Management at KTH Royal Institute of Technology in Stockholm, Sweden.

Acknowledgements

In this section we would like to begin by giving our special thanks to our supervisor Daniel Wentz at Schibsted Products and Technology for believing in us and assisting us during all stages of our study. He has been an appreciated support during this whole time. During the project, several valuable interviews were conducted with Schibsted employees. We would therefore also like to thank all of the participants for the time and valuable knowledge they gave us.

Secondly, we would like to thank our supervisor at KTH Royal Institute of Technology, Professor Martin Vendel for his inspiration and guidance in critical stages of the study. The meetings with him helped us to think in different perspectives and kept us motivated.

Finally, we would like to express our gratitude to all of the many people with different expertise outside of Schibsted who agreed to be interviewed and shared their thoughts and opinions within the area of finance and advertising. Without their knowledge and interest, we would not have completed this project.

We truly hope that the outcomes of this project will be beneficial for Schibsted and other players with different roles within this new emerging ecosystem, and hopefully give them a new perspective on the future of digital advertising and their role in the transformation.

Moa Gårdh and Ulrika Amnäs
Stockholm, June 2017
Abbreviations

**CPM** - Cost per Thousand Impressions

**CTR** - Click Through Rate

**DMP** - Data Management Platform

**DRE** - Dojima Rice Exchange

**DSP** - Demand Side Platform

**KAM** - Key Account Managers

**KPI** - Key Performance Indicators

**Nasdaq OMX DM** - Nasdaq OMX Derivatives Market

**NGM** - Nordic Growth Market

**NRMP** - National Resident Matching Program

**OMX** - Option Market Index

**OTC** - Over-the-Counter

**ROI** - Return of Investment

**RTB** - Real Time Bidding

**SSP** - Supply Side Platform

**TMC** - Tailor-made derivatives contracts

**TRE** - Tokyo Rice Exchange
Glossary for digital advertising

**Ad (s)** - Advertisement online

**Ad Deal** - A deal for an ad sold through direct sales or auctions in real time

**Ad inventory/slot/space** - A slot/space reserved for an ad to be shown on a publisher website

**Ad Exchange** - A marketplace for buying and selling impressions and where the transactions are being made

**Ad Server** - A system that makes it possible to create and distribute ads

**AdTech** - Advertising Technology

**Banner** - An ad appearing on a website in the form of a bar, box or column

**Click through rate** - The ratio of users who click on a specific ad divided by the number of total users who view the ad

**Digital advertising** - All advertising online

**Demand Side Platform** - The buying platform is what the advertiser or agencies use to purchase ads.

**Format** - Video, banner etc.

**Impression** - When a user sees an ad on a publisher’s website

**Inventory** - A publisher’s amount of available ad slots to sell online

**Real Time Bidding** - Auctions matching sellers and buyers in real time

**The Supply Side Platform** - Where the publisher handle its inventory

**Targeting** - Targeted advertising based on the previous actions and behaviour of an user online

**Trading Desk** - The team or person that handles and optimizes the campaigns. A Trading Desk can work with several DSPs at the same time.

**User** - A person who’s surfing online

**Publisher** - An entity providing online content (news paper, blogs etc.) usually through a website
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1. Introduction

This chapter aims to give the reader an introduction to this master’s thesis and the subject it will cover. The first subsection begins by presenting the background and problem formulation leading to the research question. Next, the purpose, delimitation and expected contribution will be presented and discussed.

1.1 Background

Robotic process automation or intelligent automation, replacing the need of the human element and menial tasks, is about to change how business is done in nearly every sector of the economy and the digital advertising sector is no exception. The digital advertising sector is facing a paradigm shift changing the market in many different ways (Deloitte, 2016). The high demand for automation is one of the key drivers for digital advertising being one of the fastest advancing industries (Chen et al., 2014).

The ecosystem for digital advertising is complex and opaque with many involved players and intermediates between the advertiser and the targeted customers. As a result, this industry is facing several challenges with unused and unsold inventory, unfair pricing and lack of transparency (Balseiro et al., 2013, Ghosh et al., 2009 and IAB, 2013).

Today there are two markets operating side-by-side where ads are traded automatically through real-time bidding (RTB) or pre-negotiated guaranteed contracts between publishers and advertisers. Through guaranteed contracts, the publisher agrees to reserve and deliver advertising inventory to a fixed price in a future point in time to the advertiser (Feige et al., 2008 and Sayedi, 2017). During the past decades digital advertising has developed in a fast pace and expectations are that more than 229 billion U.S. dollars will be spent worldwide on digital advertising, in 2017 and increase to 335 billion U.S dollars by 2020 (Statista, 2017).

In light of this development, more research on existing trading markets from the perspective of market design theory are needed in order to form a new design for a potential future scenario of the digital advertising market.

1.2 Problem formulation

There are two major sales channels for digital advertising, through RTB at automated marketplaces and through direct manual sales with guaranteed contracts. Direct sales is the traditional way that includes sell pipelines, such as call centers, emails and face-to-face meetings. This way of selling advertisement is getting more competition from the rapidly growing automated marketplaces (Statista, 2017). The biggest difference is that direct contracts have reserved volume with guaranteed delivery at a fixed price in a future point in time while RTB is non-guaranteed volume and can’t be purchased through a fixed price. For publishers, the
The growing role of ad exchanges with RTB has resulted in a trade off between short-term revenue from ad exchanges with mainly unsold and remnant inventory and long-term benefits of delivering premium inventory through guaranteed contracts (Balseiro et al., 2013). Within the organization of Schibsted the result of this is that direct contracts always have a priority over RTB, which makes it unsure if the publishers maximize the monetization of their inventory.

Even though RTB is considered as the future of digital advertising, there are challenges associated with this way of trading. One of these is the lack of transparency between different players. Data show that marketing professionals agree that the biggest concern for RTB is transparency in the buying and selling process (Statista, 2017).

Given the problems stated above, such as the fact that the pre-negotiated direct contracts are always prioritized over RTB, as well as the lack of transparency, have lead us to believe that the current market design today is not the most favorable design for publishers. A proper design for a secondary market that enables futures trading of digital advertising should be considered and investigated.

1.3 Purpose and research questions

This master thesis will analyze a possible future scenario where a futures exchange for digital advertising will develop. The purpose is to identify which market mechanisms and key factors that will be crucial for a secondary futures market for digital advertising in order for it to be well-functioning and create enough value. Therefore, the objective is to identify key takeaways from a more mature futures market in finance in order to draw new conclusions concerning the future development of a secondary futures exchange for digital advertising.

The research aims to provide new knowledge and guidance for all players involved in the shift from the current ecosystem to the described future scenario, with emphasis on the role of Schibsted as a publisher. The research will contribute to the field of digital advertising through the perspective of frequently used theory within finance, such as market design and market microstructure.

In order to fulfill the purpose and predict how Schibsted should act proactively in this potential new futures market for digital advertising, we will have to investigate the following research questions:

**Research question:** What will be crucial for a future secondary futures market for digital advertising to be well-functioning and create enough value?

**Sub-research question 1:** What are the key drivers and challenges for this development?

**Sub-research question 2:** Which market mechanisms are essential for a well-functioning trading marketplace?
1.4 Delimitation

This thesis is focusing on investigating a future scenario for digital advertising. The outcome of the thesis is general in terms of geographical location. However, all of the interviews were held with respondents operating in Sweden, except of two interviews held with respondents operating in New York, the US. The delimitation of the choice of respondents mainly operating on the Swedish market was first of all done because of the shifting structure of the digital advertising landscape in different countries. Secondly, because of the differences between countries’ national laws, regulations and policies within the field of digital advertising.

Another delimitation of this study is that the finance secondary market has been considered as a marketplace that is mature enough to serve as a template for a well-functioning marketplace. Where its market mechanisms and functions have been identified and thereafter analyzed in the context of a secondary marketplace for digital advertising. This is a delimitation, since the field of finance are an ongoing research field characterized by a high pace of change, where emerging technologies and regulations are triggering disruption and innovation (PwC, 2017). In light of this, the studied part of the design of the finance trading market has been limited to its current design and the development up to this point.

We start to investigate the stated research questions on an industry level. Conclusions made at this level will be used in order to get a general understanding of the future of digital advertising and to define a possible scenario and provide new knowledge and guidance for all players involved. After the investigation on an industry level, the future scenario will be put in a context of Schibsted’s operations, focusing on generating value to Schibsted on a company level. Consequently, the final outcome and conclusions from this study will be generalizable and applicable to other companies with the role as a publisher in this ecosystem, to a limited extent.

1.5 Expected contribution

The intended contribution of this research is to increase the knowledge within the area of Industrial Management by provide further empirical findings on the field of market design, digital advertising and of the players involved in the new ecosystem that might evolve. The research aims to generate new theory and thereby provide knowledge for all players involved, with emphasize on Schibsted’s role as a publisher.

Schibsted Products & Technology was created to keep Schibsted at the forefront of modern media and technology, hence, by request from the management team, the study aims to investigate and analyze how Schibsted should position themselves in this potential future scenario. According to Schibsted’s CEO Rolv Erik Ryssdal, Schibsted’s advertising platform is essential for the future profitable growth for the company (Ryssdal, 2017). The rapid pace of this development will put a pressure on the current ecosystem, the value chain and Schibsted.

In sum, the findings of this research aim to fill the theoretical gap in the literature of the future for digital advertising and how to manage a potential development of a futures market for digital advertising. The findings can serve as a guide for managers’ in decision processes when developing and improving their strategies for digital advertising activities in a market characterized by high paced innovation.
2. Research method

In this chapter we present and motivate the research approach, research design and how the empirical data and material were conducted during the investigation.

2.1 Methods for data collection

With the desired outcome to understand what will be required of a secondary futures market for digital advertising, a qualitative methodology was used. In order to increase the validity and reliability of the study multiple methods were used to obtain triangulation. The data that the analysis in this thesis is based on three different sources: observations, a literature study and interviews. Triangulation of data collection of both primary and secondary sources in this way makes it easier to conduct and capture as much information as possible about this relatively new research field of the potential future scenario. Where the primary sources based on interviews and the observations were done to gain in-depth knowledge about this field within its real-life context (Blomqvist & Hallin, 2014). By combining an extensive literature study with interviews and observations the outcomes and findings will both be based on academic aspects, already covered by other researchers, but also contribute to new knowledge.

2.1.1 Observations

Both non-participant and participant observations have been done in the natural setting at Schibsted’s office in Stockholm, Sweden. The observations served first of all as a great source of inspiration in an initial phase of this research process. In order to define the purpose and the research questions for the thesis, the outcomes of the observations were used to get a holistic view of the digital advertising ecosystem and general understanding of the challenges and problems the industry is facing.

The researchers of this thesis were fortunate in having access to the Advertising Product Team at Schibsted Products & Technology and were able to observe both formal and informal meetings between management in an early stage of the study. Non-participant observations were also done at several occasions during the first phase of the study with the purpose to observe people’s actions and behavior within their everyday setting in their role in the digital advertising ecosystem.

In addition to the non-participant observations active participation in one observation when Richard Kramer at Schibsted Products and Technology held a course within the program; Schibsted Programmatic Competence 2017, with the purpose to increase the knowledge of new ways of selling and buying digital advertising among the sellers at Schibsted. Besides from serving as inspiration in an initial phase of the study, some parts of the outcomes from this observation were used to prepare for the semi-structured interviews. As proposed by Cohen and Crabtree (2006), this data was gathered in order to increase the understanding of the topics
before the interview questions were created. Both the non-participant and participant observations are presented in Table 1.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Setting and/or title</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1</td>
<td>Advertising Product Team</td>
<td>Digital advertising ecosystem</td>
</tr>
<tr>
<td>O2</td>
<td>Advertising Product Team</td>
<td>Digital advertising ecosystem</td>
</tr>
<tr>
<td>O3</td>
<td>Advertising Product Team</td>
<td>Digital advertising ecosystem</td>
</tr>
<tr>
<td>O4</td>
<td>Schibsted Programmatic Competence 2017 /Programmatic Marketing Specialist</td>
<td>Selling and buying processes</td>
</tr>
</tbody>
</table>

2.1.2 Literature review

Collins and Hussey’s definition of a literature review is “a critical evaluation of the existing body of knowledge on a topic, which guides the research and demonstrates that the relevant literature has been located and analyzed” (Collins & Hussey, 2014). The secondary sources of this thesis were obtained from existing literature within the research fields. According to Collins and Hussey (2014) it is important to include all major studies that may be relevant for the thesis. Thus, it is impossible to assure that all relevant literature has been examined.

In order to conduct a rigorous and thorough study, the data gathering when reviewing the literature followed some of the recommended practices and guidelines proposed by Bryman (2011). As a first step, notes were taken during reading and data gathering in order to structure thoughts, ideas, and citations of sources. Next, the literature was analyzed through a critical perspective with content, validity and reliability taken into account. Since the major part of the sources is online-based, due to the novelty of the concept and gathered from many different websites. The information derives from online journals, experts’ blogs, and consultancy reports, among many others. As a result, the risk is high that the gathered information is biased in different ways depending on what is beneficial for the author. With this taking into account the major focus when conducting the literature study was to be clear about what was personal opinions and not. Finally, the literature was studied in an iterative manner, in combination with interviews and discussion on findings.
The following keywords have been used to find relevant literature:


2.1.3 Interviews

In addition to the literature study, primary data were collected through interviews to gain in-depth knowledge about this field within its real-life context (Blomqvist & Hallin, 2014). The interviews were held with experts from each field in a semi-structured manner with open-ended questions. In semi-structured interviews the questions are prepared in advance and the goal with open-ended questions is to encourage the interviewee to talk freely about the main topics that they were intended to talk about. Furthermore, the interviewer is allowed to ask additional questions that could be of interest for the study during the interviews (Collins & Hussey, 2014). This was considered as an appropriate method since the purpose of the interviews was first of all to conduct qualitative insights of the two different research fields and second of all to gain an overall understanding of what experts within the two fields think about the future of digital advertising and this specific scenario. Because of the choice of using semi-structured questions, focus was put on creating questions in beforehand with an emphasize on being introductory, probing and interpreting, as proposed by Blomkvist and Hallin (2014) in combination with opinion questions, as proposed by Haregu (2012).

The interview process

Each interview started off by a presentation of the purpose of the study and the interview. This was then followed by a anonymity check and confirmation, as well as an approval of recording. To simplify the analyzing process of the outcomes of the interviews the validity and reliability of the answers and the knowledge of each interviewee in the studied area are important factors according to Zorn (2005). Therefore a couple of questions about the respondent’s background were asked in the beginning of each interview.

In total, 11 interviews were held, 5 within Digital advertising, 4 within Finance and 2 within the field of ad-tech and fin-tech. Each interview took between 30 - 90 minutes. All respondents approved to be recorded and notes were taken during each interview. As a final step the interviews were transcribed and summarized under key topics to simplify the process of analyzing the data.

An overview of all interviews from each field with a presentation of all respondents, are presented in Table 2, 3 and 4. Interview questions are presented in Appendix 1.
were synthesized and analyzed. Interview method, the respondents’ professions, date and duration of interviews as well as the chosen form of interviews are presented in Table 2.

Table 2. Overview of the interviews at Schibsted

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Profession</th>
<th>Date and duration</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Vice President of Product Management</td>
<td>04/01/17, 60 min</td>
<td>Live interview</td>
</tr>
<tr>
<td>A2</td>
<td>International Account Manager</td>
<td>02/27/17, 60 min</td>
<td>Live interview</td>
</tr>
<tr>
<td>A3</td>
<td>Senior Account Manager</td>
<td>13/02/17, 60 min</td>
<td>Live interview</td>
</tr>
<tr>
<td>A4</td>
<td>Vice President of Advertising</td>
<td>14/03/17, 90 min</td>
<td>Live interview</td>
</tr>
<tr>
<td>A5</td>
<td>Yield Manager</td>
<td>20/04/17, 30 min</td>
<td>Live interview</td>
</tr>
</tbody>
</table>

Finance
Experts with professions within finance shared their knowledge about the finance trading markets and their opinions of a potential futures market for digital advertising. The desired outcome of the interviews was to get a broad and in-depth knowledge within the field that this master thesis concerns and therefore, the goal was to interview people with different professions within digital advertising and the finance market in order to get a holistic overview. Most of the interviews were held face-to-face, however, Skype was used when the respondents were based in other geographical locations. The interviews were mainly held at the respondent's office, at the Schibsted office but sometimes at other locations as well.

In one of the interviews only one respondent was interviewed, however the major part of the interviews were performed with two or more respondents. The interviews were held in such a way that one of the authors managed the questions while the other assisted with documentation and guidance. Information about the respondents and the time and date of the interviews are presented in Table 3 and Table 4.
Table 3. Overview of the interviews with people with profession in finance

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Profession</th>
<th>Date and duration</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Price Management Senior Analyst</td>
<td>07/02/17, 70 min</td>
<td>Live interview</td>
</tr>
<tr>
<td>F2</td>
<td>Head of Trading</td>
<td>16/02/17, 90 min</td>
<td>Live interview</td>
</tr>
<tr>
<td>F3</td>
<td>Market Maker</td>
<td>02/03/17, 60 min</td>
<td>Live interview</td>
</tr>
<tr>
<td>F4</td>
<td>Senior Vice President Market Technology</td>
<td>06/04/17, 90 min</td>
<td>Live interview</td>
</tr>
</tbody>
</table>

Table 4. Overview of the interviews with people within ad-tech and fin-tech

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Profession</th>
<th>Date and duration</th>
<th>Form</th>
<th>City and Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF1</td>
<td>Chief Executive Officer</td>
<td>26/04/17, 45 min</td>
<td>Skype interview</td>
<td>New York, US</td>
</tr>
<tr>
<td>AF2</td>
<td>Chief Technology Officer</td>
<td>18/04/17, 90 min</td>
<td>Skype interview</td>
<td>New York, US</td>
</tr>
</tbody>
</table>

2.2 Qualitative data analysis

Some of the main issues when analyzing qualitative data, according to Collis and Hussey (2014) are:

- There is no clear and universally accepted method of the analyzing process.
- It is difficult to appreciate how the researcher structured and summarized all the gathered qualitative data to arrive at the findings.
- In general, there is a lack of instruction in methods for analyzing qualitative data.

In this study the analyzing process of the gathered data from the three different sources were facilitated and simplified through systematic and continuously summarizing and synthesizing key takeaways from each activity. When analyzing the gathered data a great focus was then put on identifying the primary message of the content, through so called content analysis. This way of analyzing qualitative data was chosen since it is considered relevant when the empirical data is based on interviews and observations (Blomkvist & Hallin, 2014). Qualitative content analysis can be used for analyzing a large amount of open-ended material and involve any kind of
communicated content, such as newspapers, interviews, observations among others, and was therefore considered as the best choice of analysis of the qualitative data (Collis & Hussey, 2014).

The purpose of the analysis was to categories the data in appropriate themes based on the content. The categories were defined based on repeating words and concepts that came up during the interviews, observations and within the literature. The categorization process was facilitated since all data were in text format. Some of the categories were decided in advance, and some occurred during either the synthesizing process or during the analysis. When all relevant data and information were sorted in the categories, each area was reviewed to ensure its contribution to the analysis. In this way the material could be reduced and manageable. As a final step text was then produced under each category based on the analyzed content (Blomkvist & Hallin, 2014).

2.3 Quality of analysis

One of the main criteria for judging the quality of a research design/method according to Blomqvist and Hallin (2014) is to construct the reliability, validity and generalizability of the research. In order for the researcher to do that it is important this is covered and constructed.

To be able to construct reliability and validity it is of great importance to ensure the use of multiple sources by triangulation of either data gathering, choice of method or choice of theory (Blomqvist & Hallin, 2014). In this study triangulation has been used when in comes to the choice of data gathering, since the data is based on three different sources of information; observations, literature study and interviews.

Although triangulation has been used, high reliability throughout the study can only be reached if each data gathering method is based on reliable sources and handled in an as objective way as possible (Blomkvist & Hallin, 2014). In order to increase the study’s reliability further it needs to be constructed in a way that another researcher can repeat it with the same outcome. However, this is hard to achieve due to the nature of this study, where data is mostly gathered from interviews and based on the subjective interpretation by people.

To ensure both the secondary and the primary sources’ reliability and to avoid reporting bias an objective content analysis was conducted, and described more in depth in section 2.4. To ensure the validity only recited articles within the chosen research fields was selected as secondary sources.

Since the primary data in this research is based on interviews and observations generated by attitudes, ideas and behaviors from the interaction of human beings through semi-structured interviews, it is imperative to ensure its validity. To avoid response bias, the human factor needs to be taken into consideration and to avoid bias due to poorly constructed questions; an interview guide for each interview was created in advance of each occasion. Furthermore, in order to strengthen the reliability, the interviews were recorded.
3. Literature study

In this chapter the literature study will be presented. The first section will begin with the theory used behind market design and market microstructure in order to understand and analyze the empirical findings. The second section will cover the definitions and details about the two markets studied in this thesis - the digital advertising market and the financial trading market. The third and final section will present a brief case study of the world’s first futures exchange, to provide a more in-depth knowledge.

3.1 Market design

According to traditional economics, the relationship between supply and demand is, simply put, the driving forces in a market (Roth, 2007). The market forces strive to find the equilibrium price where demand and supply match (Ball and Seidman, 2011). Research from recent years have explored a new field within economics, known as market design where the traditional thoughts about markets are challenged. Market design focus on “two sided matching” and there have been several studies in the literature of Economics and Computer Science focusing of the matching mechanism and auctions in digital advertising (Balseiro et al., 2014, Korula et al., 2016, Klemperer, 2002, Niederle et al., 2014, Muthukrishnan, 2009 and Stavrogiannis, 2015).

The market design theory argue that a well-functioning market depends on several detailed rules, deriving from two other research fields within economics; game theory and strategic behavior (Roth, 2007).

In order to achieve efficiency in a marketplace where matching is a fundamental part Roth (2007) identified three functions that need to be in place for a well-functioning market:

- “They need to provide thickness - that is, to bring together a large enough proportion of potential buyers and sellers to produce satisfactory outcomes for both sides of a transaction.”
- “They need to make it safe for those who have been brought together to reveal or act on confidential information they may hold. When a good market outcome depends on such disclosure, as it often does, the market must offer participants incentives to reveal some of what they know.”
- “They need to overcome the congestion that thickness can bring, by giving market participants enough time—or the means to conduct transactions fast enough—to make satisfactory choices when faced with a variety of alternatives.”

Ünver et al., (2004) did a study in New England where the main goal was to establish a regional and national kidney exchange. However, they discovered that the lack of thickness was a problem, and that it is easier to provide thickness for marketplaces that are centralized. Another benefit with a centralized marketplace they saw, was that clearinghouses and other centralized services are easier to connect (Roth, 2009). However, to be able to achieve maximum results of
an exchange, the study showed that it is essential for market designers to develop rules and processes for the exchange to achieve maximum efficiency (Niederle et al., 2007).

The theory of market design also emphasizes the need of solutions solving market congestion (Roth, 2007). A frequently used solution when congestion is present on a market is to introduce a centralized clearinghouse (Niederle et al., 2007). This was successfully done already in 1950 in a market where new graduates from medical school and employers met. Students listed their preferred job positions and employers handed in a list of candidates to the clearinghouse, The National Resident Matching Program (NRMP), whereupon the clearinghouse matched the best candidates through an algorithm (Niederle et al., 2007). Therefore, a clearinghouse is considered to make a market safer, making the participants of the market secure enough to reveal the information they may have. However, a centralized marketplace with a clearinghouse in place does not ensure a sufficient market since there are other factors that need to be considered, such as incentives to participate in a market (Niederle et al., 2007).

Safety and simplicity are crucial for well-functioning markets according to market design (Klemperer, 2014), which is why the flow of information on the market needs to be considered. Transparency of information is especially important on a market where a transaction depends on another transaction, although the information about the participants must be held private in some markets with other market conditions. An example of such a marketplace is the one where eBay is present, where the information about the participants must be held private until the last seconds of the auction, since participants tend to bid in the final seconds of every auction. In sum, every market is different and facing different challenges due to information, rules and processes (Ünver et al., 2004).

With today’s high intelligence and speed of computers, smart markets are designed where economics and computer scientists need to collaborate. Computers can handle hundreds of thousands auctions simultaneously, and the number of different combinations are increasing. Consequently, it is more difficult to determine the best possible outcome of every auction, putting a greater pressure on the capabilities of the markets. (Ünver et al., 2004).

A safe environment, where all participants in the market are trustworthy, is required for efficient matching in markets. Several studies, show that a clearinghouse is preferred in order to establish a safe environment where all participants have the possibility to reveal and act on the information they have (Niederle et al., 2007).

3.2 Trading through a market microstructure perspective

Market microstructure is a part of financial economics where trading and the organization of markets are investigated. This branch of the financial economics research field has grown in size and importance during the recent years (Krishnamurti, 2009). The common definition of market microstructure is; “...the study of trading mechanisms used for financial securities.” and O’Hara describes market microstructure as “the study of the process and outcomes of exchanging assets under a specific set of rules.” (O’Hara, 2003).
According to the National Bureau of Economic Research (NBER), market microstructure is defined as a field of study that is devoted to theoretical, empirical, and experimental research on the economics of the security markets. Where the role of information in the price discovery process, the definition, measurement and control of liquidity, transactions costs and their implication on the efficiency and welfare are included.

In general theory of this field the specifics of market liquidity and trading mechanisms are studied. A perspective not fully covered in the theory of microeconomics and macroeconomics, where general models are studied based on market forces striving to find the equilibrium price where demand and supply match, under the assumption of perfect liquidity (Ball and Seidman, 2011).

Market microstructure is essential when it comes to designing efficient markets with high quality. Through the theory of market microstructure, it is easier to understand how a market works, and how the regulations of governments and exchanges affect them. Market microstructure helps us understand how prices reflect information about fundamental values, who makes markets liquid, and why some traders lose and some profit from trading in a market (Harris, 2002).

According to Harris (2002), market quality is based on five characteristics, where each of them is affected by the microstructure of the market. These five characteristics are stated below, and have served as a framework throughout the literature review of this thesis:

- **Liquidity** - Both traders and regulators often talk about liquidity as an important factor in the market, sometimes without knowing what they mean. According to Harris (2002) a greater emphasis should be put on the understanding of liquidity, its origin and which market mechanisms affect it and in what way.
- **Transaction costs** - Traders must effectively manage their transaction costs to be able to succeed with their trading. It is therefore of interest to understand how the measurement and management of transaction costs work on a market.
- **Informative prices** - Traders acting as speculators have to understand how and when prices on the market are informative and uninformative, to be able to succeed with their trades. Informative prices are also essential for the sustainable economic welfare.
- **Volatility** - Volatility is of interest for traders since it can have a great impact on their wealth. It is therefore important to understand how prices become volatile, and how government regulations affect the volatility in the market.
- **Trading profits** - Trading is a so called zero-sum game, where it all comes down to that some traders win and some traders lose. How to profit on trades is therefore something that concerns all traders active on a market and is therefore also an important aspect to understand when designing one.
3.3 Digital advertising market

In this chapter we try to simplify the digital advertising ecosystem by illustrating the interplay between the different players and technical platforms. Against this background a short introduction of digital advertising is presented and thereafter the buy side and the sell side are described, followed by the marketplaces and finally the intermediaries are described.

Digital advertising includes all online advertising in devices like desktops, laptops, mobiles and tablets. Digital advertising generates the majority of all revenue for content providers and publishers online which is one of the reason why users can have free access to internet (Korula et al., 2016). According to a forecast provided by Statista (2017) the worldwide spending in digital advertising is expected to grow every year and the industry worldwide is expected to generate 335 billion dollars in 2020 (Statista, 2017). The digital advertising landscape is based on a complex, vibrant, technology-driven industry that changes every few months (Dickey and Lewis, 2012). In Figure 1, the flow from where the advertisement investment take place on the buy side to the sell side is illustrated.

![Figure 1. The digital advertising ecosystem](image)

3.3.1 The buy side

**Advertiser**

In recent years, the use of digital advertising has become a more common way for advertisers who wish to promote a product or a brand. By buying ad space at a publisher’s website advertisers have the possibility to show relevant and customized ads to potential customers (Yuan et al., 2012). Advertisers are usually focused on different key performance indicators (KPI) for tracking the outcome of their advertising. Return-on-investment (ROI) (Downes and Goodman, 1991) and click-through rate (CTR) are two common metrics for tracking the performance (Yuan et al., 2012). Furthermore, there are several other players on the demand-side, operating on the behalf of an advertiser where media agencies and trading desks are two examples (Estrada et al., 2016).
3.3.2 The sell side

**Publisher**
The most well-known and long-standing so called content creator are publishers and the content they provide online is mainly through websites. 50 percent of Sweden's population read news online on a daily basis (Davidsson & Findahl, 2016). Newspapers and other publishers’ content attracts users to visit their websites. On top of being a creator of media content, publishers usually need to sell advertising slots on their websites in order to provide their content for free. Therefore, publishers’ business models often include ads (Estrada et al., 2016).

Publishers’ supply is hard to predict since the amount of future visitors an online website will have over a certain period depends on several factors (Centintas et al., 2013 and Sayedi, 2017). A challenge for publishers is therefore to predict their entire advertising inventory available to sell in guaranteed contracts. If the publishers fail to deliver the amount of impressions agreed on in the guaranteed contracts, i.e. under deliver, they usually have to pay penalties to the advertiser (Sayedi, 2017).

**Sales house**
Publishers usually have their own sales department in-house and key account managers (KAM) handle the sales of the inventory. The term key account has been ill-defined but Millman and Wilson’s (1995) definition seems to be the most common definition (Gosselin and Heene, 2003). “A key account is a customer in a business-to-business market identified by a selling company as of strategic importance” (Millman and Wilson, 1995).

The core competence of a KAMs is to build a strong and long-term relationship with key customers (Lacoste, 2016 and Gosselin & Heene, 2000). KAMs are the ones who negotiate the publisher’s contracts with an advertiser, an ad network or a media agency (Muthukrishnan, 2009). Key customers are important for the overall business and therefore it is of great importance to dedicate resources to these customers to secure long-term profitable growth (Gosselin & Heene, 2000).

3.3.3 Market places

**Direct sales**
There are two major sales channels of selling digital advertising; through direct sales (guaranteed contracts) and ad exchanges (non-guaranteed) (Korula et al., 2016). Direct sales are mostly handled by KAMs that are employed by the publishers and they negotiate the contracts directly with the advertiser or with the media agency. The advertising inventory sold on guaranteed contracts is usually highly valued ad slots on high quality websites, also called premium inventory (Stavrogiannis, 2014).

The contracts typically include three different metrics: targeting, volume and price (Korula et al., 2016 and Sayedi, 2017);
● **Targeting** is when the advertiser can show their ads to users based on their online behavior (reading articles about fashion, sports etc.) and demographics (gender, age, geo).

● **Volume**, the most common and used term for volume of sold ads is impression. An impression is when a user has seen an ad on the publisher’s website. However, the goal of the advertisers’ campaigns can be other metrics then impressions, such as clicks.

● **Price**, is how much the advertiser i.e. media agency, is willing to pay for their ads to be shown on the publisher’s web page with the right targeting. Prices are usually determined through negotiation.

Through contracts the publisher agrees to deliver a guaranteed amount of impressions that match the targeting, to a fixed price. Publishers need to forecast their supply of impressions in order to decide how many impressions they will be able to sell. It is hard to predict how many visitors a web page will have in the future and therefore, errors and wrong predictions can occur (Hojjat et al., 2014). The publisher usually agrees to pay a penalty to the advertiser if they under deliver the guaranteed impressions (Feige et al. 2008). Due to these challenges publishers must decide how many impressions they should sell through guaranteed contracts and through auctions, to avoid penalties for under delivery and to maximize their revenue (Sayedi, 2017).

There is a demand for guaranteed contracts both from an advertiser and publisher point of view. Advertisers want to hedge against uncertainty in supply and publishers want to ensure revenue in advance (Ghosh et al., 2009).

**Ad exchange**

An ad exchange is a centralized marketplace for buyers and sellers and was initially introduced to the market in order to make the ad trading more efficient, increase competition and provide liquidity (Stavrogiannis, 2014). On the ad exchange, digital advertising space is traded in a similar way as stocks are traded on the spot market (Muthukrishnan, 2009).

Through auctions in real time, called real time bidding (RTB), impressions on publishers’ sites are sold to advertisers or through an ad network that bid for an advertiser's behalf (Ben-Zwi et al., 2015). With RTB an advertiser has the opportunity to target specific users in real time since the technology is based on browser cookie information (Sayedi, 2017). The majority of the ads traded through the ad exchange is usually the remaining advertising space after the premium inventory have been sold through guaranteed contracts (Stavrogiannis, 2014).

Every time a user visits a publisher’s website the publisher sends the relevant data to the ad exchange. AppNexus, The Rubicon Project and Google’s DoubleClick Ad Exchange are all examples of companies who are providing exchange platforms for trading with ads (Muthukrishnan, S., 2009). Thereafter, an auction will be held through the ad exchange where the highest winning bid will win and pay the second highest price and thereafter, the ad will be shown for the user on the publisher’s web page (Mansour et al., 2012 and Sayedi, 2017). Billions of transactions are made on ad exchanges every day. Consequently, the process from when a user enters a web page, the entire auction procedure and finally when the ads are shown to the user, can’t take more than 100 milliseconds (Mansour et al., 2012).
The companies who are providing the ad exchanges charge the customers through a fixed price and by taking a percentage of every transaction. The competition between different exchanges is very high and advertisers can easily change provider or negotiate directly with publishers. Therefore, it is essential that the companies providing the exchanges evaluate the prices of the platform and the percentage of each transaction. Otherwise they might lose customers due to the high competition (Ben-Zwi et al., 2015 and Korula et al., 2016).

3.3.4 Intermediaries

The digital advertising ecosystem consists of multiple intermediaries and the landscape is opaque and quite complex (Stavrogiannis, 2014). Moreover, the presence of several intermediaries makes it more challenging to optimize the revenue (Korula et al., 2016). In this section the sell side and buy side intermediaries is described.

**Ad Server**

The purpose with an ad server is to serve and manage advertising content into various digital channels like mobile apps and websites etc. Another important function provided by the ad server is forecasting which is crucial for publishers’ holistic yield. An ad server is also a system where impressions and clicks are counted to track performance. There is a difference between brands’ ad servers and a publisher's ad server. In order to simplify advertisers and media agencies’ working processes they normally use a centralized ad server. A centralized ad server makes it possible to manage and update content from one place and to have a unified tracking system across different channels. Publishers on the other hand have separate ad servers for their different domains. Having separate ad servers that are not connected to the advertisers’/media agencies’ makes it easier for publishers to access content they require (AppNexus, 2017).

**Supply side platform**

Supply Side Platform (SSP) is the selling side of the business. These systems have been developed with the needs of publishers in mind and are used to sell advertising in an automated way (Marshall, 2014). The systems act like exchanges, enabling publishers to manage the programmatic sale of their inventory by allowing them to connect it to multiple ad exchanges, DSP’s and networks at once. The difference between SSP and DSP is that an SSP throws impressions into an ad exchange on behalf of the publisher, while a DSP analyzes and purchases impressions for marketers depending on attributes on targets. As a result, the impressions are opened up for as many buyers as possible and publishers can maximize the prices their impressions sell at, through, for example, data augmentation and effective use of RTB. SSPs are therefore sometimes referred to as yield-optimization platforms (Marshall, 2014).

**Media agencies**

Advertisers use media agencies and media buyers for media planning and buying, as well as the activities devoted to the choices of what channels and platforms advertisers want to place their advertising in. Agencies are used to increasing cost effectiveness through their ability to scale buying (Soberman, 2009).

Ad networks are the players on the markets that connect advertisers to inventory on web sites to host their advertisements. By aggregating ad inventory and packaging it based on the context and
audience the ad networks help brands and agencies to select the media with highest quality in terms of ad performance (Yuan et al., 2012).

Trading desk
Trading Desk is usually a centralized organization and was developed by large agency holding companies to help manage programmatic media acquired through a bidding system. This is typically done through a demand side platform (DSP) which intends to seek a certain audience. By pooling available data for all their booked campaigns they manage to enrich their data value of all their buys, as well as increasing the efficiency and scale. In that way, the trading desks help advertisers reach the specific target audience on a large-scale and buy all media through one trading desk in real time instead of execution of hundreds individual client campaigns (Berger et al., 2014).

Demand side platform
Demand Side Platform, often referred to as a DSP, is the platform where advertisers, media agencies or trading desks can access and buy the advertising inventory. Through the DSP it is possible to manage multiple purchases simultaneously. In other words, the DSP is equivalent to the buy side of the business. The ad inventory accessible through a DSP is generally via an ad exchange. The role of a DSP is then to conclude how much available inventory there is for the targets, place the buys, connect it into the ad server and optimize the campaigns (Ebiquity, 2014).

Data management platform
Data is one of the most valuable assets for businesses in digital advertising. The fast development of technology has made it possible to collect enormous amounts of data about users using different devices. To store and analyze all the data that are collected, a data management platform (DMP) is needed (Greene and O’Connell, 2011). DMPs were developed to handle the processing, integration and implementation of data. In digital advertising a DMP is mostly used to manage cookie IDs. By collecting data companies can identify and categorize users by location, demographics etc. and create specific data segments in order to target specific audiences (Elmeleegy et al., 2013).

3.3.5 Challenges in the industry

Transparency
Recent studies show that a majority of the respondents among marketers and agencies believe that programmatic buying enables a more effective consumer targeting and customer experience. However, data show that marketing professionals agree that the biggest concern for programmatic is transparency in the buying and selling process (Statista, 2017). Technology fees are included in the cost per thousand impressions (CPM) prices and due to the lack of transparency it is hard to evaluate the true value of the inventory. In order to simplify for buyers and sellers to get access to accurate information, prices and fees should be transparent across the value chain (IAB, 2013).
Publishers’ uncertainty in inventory supply
The contracts are made several months in advance and when a publisher enter into a guaranteed contract with the advertiser, the publisher agrees to deliver a fixed amount of impressions with a specific targeting over a certain time. Publishers’ challenges connected to forecasting are first of all, to predict months in advance how many visitors a website will have, and secondly the targeting, which could consist of hundreds of different combinations of the user's online behaviors and demographics (Cetintas et al., 2013 and Sayedi, 2017).

Another factor affecting the supply of impressions are macroeconomic factors which is explained and clarified through the example by Chen below (2012):

“in June 2009 when Michael Jackson passed away, the front page of Yahoo! experienced humongous internet traffic as this breaking news attracted significant attention and was clearly unpredictable. Likewise, some spikes of internet traffic are likely to arise right after natural disasters (earthquakes and hurricanes), terrorism, scandals of political and/or movie stars”.

Furthermore, both over-forecasting and under-forecasting could potentially cause problems for publishers. Over-forecasting could lead to under-delivery, which could have a negative effect on the publisher’s trustworthiness and relationship with the advertiser, since they will not be able to deliver their part of the contract. Another consequence connected to over-forecasting is the fact that the publisher may need to pay a penalty to the advertiser when under-delivering. On the other hand, under-forecasting could result in unsold inventory and therefore potentially revenue loss for the publisher (Bharadwaj et al., 2010). Normally publishers allocate the majority of impressions through guaranteed contracts and the leftover, unsold inventory is thereafter allocated and sold through RTB auctions (Sayedi, 2017).

Yield management
Ads are sold through guaranteed contracts or the ad exchange and publishers facing challenges in how they optimally should allocate their inventory in order to maximize their revenue and reduce their risk with unsold inventory (Balseiro et al., 2014 and Ghosh et al., 2009). Considering that two impressions on the spot market could fetch two different prices instead of generating the same revenue by guaranteed contracts, it might not be the best option to allocate the majority of the impressions to guaranteed contracts - even though it ensures long-term revenue and reduces publishers’ risk related to unsold inventory (Ghosh et al., 2009).
According to Roels and Fridjersdottir (2009) and Feige et al. (2008) it is of importance for publishers to actively yield and allocate their inventory for guaranteed contracts in order to maximize the revenue. Publisher may have the ability to increase their revenue generated from their inventory by using a more scientific approach for pricing of their guaranteed contracts (Heavlin & Radovanovic, 2012).

3.4 Financial trading market

This chapter aims to provide a brief overview of the primary and secondary financial trading market, i.e. the spot market and the futures market. We try to give the “big picture” of trading in order to understand the details and to be able to apply the theories on the advertising trading industry. We will first investigate who trades and the key players involved. Then we will examine which instruments that are used and on which markets the instruments are traded. Finally, we will dig deeper into the Swedish trading market and how regulators oversee trading on the Swedish market.

The financial market attracts many different players. However, the foremost important players are the people who actually trade, i.e. the traders. Traders include the people that arrange their own trades, have people arrange trades for them or arrange trades for others. According to Harris (2002) markets are only effective when people trade in them. If a new market is about to be designed it is therefore of great importance to understand why and how people will trade in the new market (Harris, 2002).

Traders who own something of their own have long positions. This type of trader profits when prices rise, and accordingly they try to buy low and sell high. Traders with short positions on the other hand, hope that prices fall, so that they can repurchase at a lower price. Thus, traders with short positions have sold something that they do not own.

The trading industry in any sector always has got a buy and a sell side. The buy side consists of traders who buy the exchange services. In the finance trading industry, the services are liquidity. Liquidity is the ability to trade when you want to trade. Consequently, on the sell side traders sell
liquidity. According to Professor Larry Harris (2002) it is of importance to understand how the interactions between traders in the buy side and the sell side affect the price of the liquidity.

3.4.1 The sell side

The sell side of the finance trading market consists of dealers and brokers who provide exchange services, i.e. liquidity, to the buy side. Both of these types of players help to enable traders on the buy side to trade whenever they want to trade, which is one of the cornerstones in a well-functioning and efficient market, according to Professor Larry Harris (2002).

Issuer

On the financial trading market, the investment sponsors are also called issuers. The issuer is a legal entity on the market that develops, registers and sells securities to be able to finance its own operations. An issuer could be a corporation, an investment trust, or domestic and foreign governments. There are a couple of responsibilities and obligations that an issuer has to follow in order to be approved on the marketplace and be able to issue their securities. These are legal responsibilities, reporting of financial conditions, material developments and other operational activities that are required for the regulations of their jurisdictions.

According to Swedish law, certain rules exist for issuers. Including both specified requirements for financial instruments to be accepted for trading on the exchange as well as specific conditions regulating the issuer’s information obligation towards the market and the exchange. As an issuer of financial instruments on the Swedish exchange you have to be able to provide the exchange with continuous information about your business and other necessary information that could be of importance for the exchange to fulfill its duties. Furthermore, according to the law, the issuers have to maintain a certain transparency and publish all information relating to their business and their financial instruments (Nasdaq, 2016).

On Nasdaq an issuer has to commit and thereby undertake to apply the relevant parts of the acquis. By signing, the issuer commits to comply with the prevailing rules and submit to the sanctions that may occur as a result from any breach of the rules (Nasdaq, 2016).

Dealers

Dealers are the players who make markets by accommodating trades that their clients want to make by trading with them when they want to trade. Consequently, dealers in the financial market are merchants who supply liquidity to their clients who want to buy and sell trading instruments.

Dealers make their profit by buying at low prices and selling at high prices. As a result, dealers lose money when they are forced to sell at low prices or buy at high prices, due to conditions in the market. Depending on the amount of information the traders have, the dealers’ outcome of the trading varies. If a dealer trades with an uninformed trader, they normally make money. Correspondingly, when a dealer trades with an informed trader, they often lose money.

According to market microstructure theory it is important to understand how traders behave in markets where dealers are the primary suppliers of liquidity, since the cost of liquidity in such markets depends on the factors that determine dealer profits (Harris, 2002). In the finance market
one of the key players who acts as a dealer in the spot exchange, option exchange and futures exchange is the **market maker**.

**Market makers**
A market maker can be an individual or a company facilitating the trading and acting like a bridge between companies who want to buy and sell their assets. In practice, there is a very low probability that two companies want to sell and buy exactly the same amount of an asset in real time, that is why market makers commit to continuously trade on the exchange and bring liquidity to the market. By actively participating in the exchange all the time market makers ensure that the price does not vary too much since the supply and demand will be more consistent (Hall, 2006).

Market makers actively count on the risk they are willing to take when they are trading with different assets and they earn money from so called market spreads, which is the difference between the bid and asked price of a security or asset (Hanson, 2003).

As a member of Nasdaq Stockholm, which is the biggest trading platform provider in Sweden, you have the possibility to become a market maker. There is a need of market makers on Nasdaq, to be able to maintain a high level of liquidity of the order books for financial instrument and products such as options and futures. To attract members to become market makers Nasdaq provides a number of benefits for those who do, such as market maker fees and multi-quote functionality (Nasdaq, 2017).

**Brokers**
In contrast to the dealer, brokers trade on behalf of their traders. Brokers are the players on the market that arrange trades that their traders want to make by finding other traders who will trade with their clients. In that way, brokers earn their profits by charging their clients a commissions fee for their services. Consequently, many brokers are also financial advisors to their clients, advising them in terms of investments or financial plans.

In general, clients use brokers because they are better at arranging trades at a lower cost. Below there is a list of five reasons why a broker is a low cost trader, according to Professor Larry Harris (2002):

- “Brokers can solve clearing and settlement problems at a lower cost than their clients can.”
- “Brokers can access exchanges and dealers that their clients cannot access.”
- “Brokers generally know better than their clients who might be willing to trade.”
- “Brokers are often better negotiators than their clients are.”
- “Brokers can represent orders from their clients when their clients are unavailable to represent them themselves.”

One of the most important aspects of the role of a broker is the clearing and settlement part. This is according to Harris (2002) one of the main reason to why clients choose to use brokers to arrange their trades.
3.4.2 The buy side

The buy side of the financial trading market consists of individuals, funds and firms. These players are all trying to use the market to solve problems outside of the trading market. Investors use the security markets to buy stocks and bonds to be able to move income from today to the future. Speculators try to use information about future security prospects to obtain a better return on their investment, and gamblers try to entertain themselves by putting all their focus on the favorable outcomes of a trade than the potential undesired outcome of the same.

Many of the players on the buy side are institutions such as funds, mutual funds, trusts, endowments, and foundations that invest money. These so called investment sponsors manage their funds by employing investment advisors, also called investment counselors, investment managers, or portfolio managers.

3.4.3 Instruments

On the financial trading market trading can occur with many different instruments. Some of these are stocks, bonds, warrants, options, swaps, commodities, forward contracts and futures contracts, among others. Numerous legal definitions have been created to make it easier to distinguish between instruments called securities and derivative contracts. Securities are often referred to when talking about instruments that represent ownership of assets, such as stocks and bonds. Instruments with values deriving from commodities or other security values are referred to as derivative contracts.

Since this thesis investigates how a potential futures market will affect the current digital advertising landscape, the only instrument presented in this section is the derivative contract called futures contracts.

Futures contracts

A futures contract, is a standardized forward contract where two parties agree to buy or sell an asset for a price agreed upon today (the forward price), with delivery and payment occurring at a future occasion, the delivery date. When a future contract is agreed upon, both parties are obliged to fulfill the agreement (Hull, 2006). In Sweden, futures contracts are normally traded on the Nasdaq’s options and futures exchange, which was one of the first electronic options in the world with an integrated clearing function (Nasdaq, 2017).

The main reason why futures contracts were introduced to the market was to reduce and manage the price risk for a certain asset. By locking in a future price, traders have the ability to predict their expenses and profits (Nasdaq, 2017). The underlying asset traded with futures contracts are mainly commodities, such as gold, sugar, wool etc. (Hall, 2006).

The price of futures contracts are based on an estimation of the amount of supply and demand. The estimation of supply and demand is highly dependent on information that may affect the asset. Therefore, multiple sources of information and high transparency are needed in order to predict the future price on the market. Futures are traded in two different contracts, where an OMX-futures contract normally consists of 100 underlying assets and a stock futures contract
normally consists of one underlying asset per contract. The trading is done in electronic marketplaces (Avanza, 2017).

The contracts must be standardized and specified, with information such as where and when the delivery will be made. Since there are a lot of different commodities that are traded with varied quality, it is important for the exchange to specify the quality of each commodity. The exchange normally grades the commodity where different commodities have their own system for grading, compared to financial assets that doesn’t need to be graded, since a Japanese yen for example, always will be a Japanese yen (Hall, 2006).

3.4.4 Marketplaces

Today there are two main types of marketplaces: regulated markets (including traditional exchanges) and trading platforms (also called Multilateral Trading Facilities). According to the Swedish Riksbank there were two regulated marketplaces in the end of 2015 in Sweden: Nasdaq Stockholm and Nordic Growth Market (NGM Equity) (The Swedish Riksbank, 2016).

Marketplaces are a type of auctioneer that enable trade by bringing traders together to the same place, and sometimes even at the same time. Over time the role of the auctioneer has evolved, and today we can see modern electronic markets with matching algorithms as auctioneers. The two main types of auctioneers on the Swedish trading market today are: Exchanges or Over-the-Counter (OTC).

Exchanges

An exchange could be a regulated marketplace where members have to fulfill certain requirements from both the Swedish legislation and from the specific marketplace in question. These requirements could be related to the size of the company, publishing of information and/or corporate governance. Another type of marketplace is a trading platform that can either be driven by an exchange or a security company. These trading platforms have a simpler regulatory framework than a regulated market which makes the trading less costly and thus more suitable for newer and smaller companies. The purpose of enacting rules on regulated marketplaces and trading platforms has to do with the importance of access to the same information for all parties involved to protect the investors and creating confidence in the market (The Swedish Riksbank, 2016).

The biggest part of the Swedish stocks trading takes place in an electronic trading system on a regulated marketplace or trading platform. However, it is possible to trade stocks outside these as well. One part of the trading outside the system takes place under the conditions of Nasdaq Stockholm’s rules and is reported as a regular exchange transaction. Telephone, e-mail and chat are all examples of means through which such trading can take place. The remaining part of the trading outside the system is done directly between the buyer and seller through so called over the counter-trading, OTC, and are not subject to the rules of Nasdaq or any other regulated marketplace (The Swedish Riksbank, 2016).

The major part of the derivatives trading on the Swedish marketplaces takes place under the auspices of Nasdaq Stockholm, where trading of futures and options with shares and shares indices as underlying assets are common. Nasdaq provides clearing for derivatives traded on
their marketplaces and for certain derivatives traded through OTC (The Swedish Riksbank, 2016).

**Over-the-counter**

Over-the-counter or OTC, is the name for a marketplace where securities are traded via a dealer network of geographically dispersed dealers, instead of a formal and centralized exchange such as Nasdaq. This type of market is a decentralized marketplace and is for securities not listed on a stock or derivatives exchange. OTC refers to both stocks, debt securities and other financial instruments, such as derivatives, traded via network of market makers connected by telephones and computers (Nasdaq, 2011).

Compared to exchanges the OTC markets are less formal, although often well-organized networks of trading relationships centered around one or more dealers. In an OTC market the dealer takes on a kind of market maker function by quoting prices that they are willing to buy or sell an asset for to other dealers, their client or customers. However, the dealer acting as a maker function in the OTC markets is not obliged to quote the same prices to other dealers as they post to customers. They do not even necessarily quote the same price to all customers. Consequently, the dealers on this market can withdraw from the market maker function at any time, making the market vulnerable to fluctuations in liquidity. Moreover, the OTC markets are less transparent and operate with less rules than exchanges (Dodd, 2012).

3.4.5 Intermediaries and trade facilitators

Many institutions on the financial market help buyers and sellers to make their trade. Basic market design tells us that in order for trade to occur, traders must meet at the same place and time. If traders never meet, they cannot trade, and we have a market failure (Roth, 2007). In this section we describe the most important players on the financial market that enable and facilitate trading.

**Clearinghouses**

A clearinghouse is an intermediary between buyers and sellers of financial instrument. After a deal between a buyer and a seller the clearinghouse steps in as the counterpart to both parties. In this way the transactions go through the clearing house instead of the buyer and seller. The clearinghouse ensures that both buyers and sellers will meet their commitments by claiming margins from both parties involved in the transaction. The purpose of a clearing house, therefore, is to improve the efficiency and stability of the markets.

The importance of a clearinghouse increases with the complexity of the product traded on the market. On a futures market a clearinghouse is very important, since the futures contracts that are traded are high complexity products. To stabilize these types of market an intermediary is required. Each futures exchange on the financial trading market has therefore its own clearinghouse, through which all members have to clear their trades at the end of each trading session (Nasdaq, 2017 and Handelsbanken, 2017).

The active clearing house on the Swedish derivatives market is Nasdaq OMX Derivatives Markets (Nasdaq OMX DM). Nasdaq OMX DM offers a fully integrated Nordic derivatives market with trading in standardized equity derivatives instrument and central counterparties.
clearing (CCP clearing) for all Nordic countries as well as Russia and the Baltic. (Bank for International Settlements, 2011).

In order to conduct trading and have the role as CCP on the Swedish derivatives market, Nasdaq OMX DM is regulated by Swedish legislation as well as rules and regulations in-house. Nasdaq OMX Stockholm AB is authorized as an exchange and has a permit from Finansinspektionen to conduct clearing operations in accordance with the Swedish legislation and is therefore under supervision of Finansinspektionen and the Swedish Riksbank (Bank for International Settlements, 2011).

**Rating agencies**
For investors to be sure about the credibility of the issuers, in the same way as credit bureaus create credit profiles and scores for individual consumers, ratings systems exist for issuers as well. These ratings are done by rating firms such as Standard and Poor’s and Moody’s. The system is based on scores pegged to letters. For example, an entity with an AAA rating has the highest possible rating indicating a history of repaying its debt and boasts a very low rate of default (Securities and Exchange Commission, 2016).
3.5 The world’s first futures exchange - the Dojima Rice Exchange

In the late 17th century the world’s first fully functioning futures commodities exchange was developed by the Japanese. As the world’s first futures market, the Dojima Rice Exchange (DRE) serves as a relevant reference case for this study, creating a deeper and solid understanding of how a futures market could be developed and which market characteristics that have been essential for its success.

Emergence of the exchange

In literature there is no doubt that the general agreement of the emergence of the DRE is that it was a consequence of the sellers’ and buyers’ demand for a structured marketplace (Schaede, 1989 and Hamori et al., 2011). In the beginning, the government had very little impact on the development of the exchange. In fact they did the opposite and tried to prevent the expansion of the marketplace, especially futures trading, until they finally accepted it in 1730.

One of the main objectives behind the efforts done by the government to prevent the development in the 1650s-1720s was to hold down the inflation of the rice price. Even though the government introduced restrictive regulations the physical trading and the futures trading in Dojima bloomed. As a result, in 1730 prices were so low due to the increased rice production that the government had to change their policy and declare the DRE as the only rice exchange in Japan (Schaede, 1989 and Hamori et al., 2011).

Drivers and inhibitors of the DRE’s success

During DRE’s existence the market survived three periods of great importance of Japanese history; politically, economically and socially. Even though the exchange was established in the late 17th century under the samurai-dominated Tokugawa government, the exchange has managed to evolve together with the Japanese national economy. The exchange has gone through the Tokugawa shogunate (1603-1868), the turbulent years of the Meji era (1868-1912), the Taisho period (1912-1926), and through the totalitarian regime of prewar Showa period (1912-1945). Consequently, the final success of the exchange is a combination of internal and external dynamics that have affected the DRE in different ways at different times.

Internal dynamics are the mechanisms that were self-regulating in the market. These are the mechanisms that help maintain healthy competition, effective incentives for participants to follow the rules, and the needed infrastructure, both physical (warehouses, transportation, etc.) and virtual (information-sharing and communication channels etc.) (Conceição & Kaul, 2006).

External dynamics on the other hand are both a reflection of the government and its role in the market as well as other factors that are outside the control of the DRE and the government, such as external macroeconomic factors affecting the Japanese economy. Examples of such factors are money supply, commodity-to-currency exchange, market competition from other markets trading the same commodity, development of substitute products, and the composition of Japanese imports and exports. Other factors that fall into the external category are natural disasters and weather conditions that had an impact on the commodity traded. Finally, external forces such as geopolitical events are also examples of external factors that could have had an impact on the spot and futures market, or curb trade flows in general.
Internal dynamics

The active players within the market were warehouses, clearinghouses, credit houses, and merchant coalitions (Kintgen and Moss, 2009). The merchant coalition was the self-regulatory function that held the license to operate on the exchange. This function had a positive impact on both contract enforcement as well as trust- and reputation building during a period of stability of the exchange between the years 1740-1830. The merchant coalition played a role in the establishment of important market structure factors, such as contract enforcement and market order mechanisms. Since these partly relied on trust and reputation within the merchant coalition.

From the beginning the exchange was an autonomous, voluntary, non-profit organization where members were responsible for the costs of organization and operations. Despite this the payment was soon to be taken over by warehouses (Schaede, 1989). The emergence of warehouses on the market came to play a big role for the exchange, as well as credit houses and clearinghouses, as they gradually acquired leading roles in the exchange. All three institutions as well as individual merchants licensed to participate in the DRE had financial obligations towards the exchange and therefore had to pay for various services provided by the exchange.

Warehouses were this market’s issuers. They were responsible for issuing rice bills and silver bills, organizing auctions, and keeping record of all transactions. At first the warehouses were owned by feudal lords but managed by merchants that were assigned to be responsible for overseeing and as financial agents. As financial agents they got access to the revenues from all sales of the warehouse and could grow their wealth by investing in interest-free funds. In this way the agents became a kind of creditors to their lords and the power balance shifted between the two.

At the beginning of the development of exchanges the number of transactions were manageable for warehouses and traders to keep track of. As a result, the role of clearinghouses was no more than a simple money changer. As the amount of transactions grew, so did the needed work load for keeping track of them and consequently clearinghouses had to take on the role as objective record keepers. Clearinghouses acted as intermediaries between exchanges and participants and were not allowed to trade on their own. As intermediaries they kept a record of the traders’ transactions, monitored their trading partners, and facilitated payments (Kintgen and Moss, 2009). In exchange the clearinghouses charged a margin and a small commission, regulated by the exchange, for the services they provided (Schaede, 1989).

Credit houses are the fourth player on this market with an internal effect on the marketplace’s development. During the development of the exchange the significance of the credit houses developed and grew. At the time the credit houses were merchants offering credit to other participants in the exchange. Securities that were accepted for credit could be rice bills, silver bills, physical commodity and other assets. The credit houses charged an interest for the credits and earned profits from trading with the bills they had accepted. In this way the credit houses where not only members of the marketplace, the also played a big role when it came to increasing the liquidity on the marketplace.
Other internal factors that affected the development of the DRE were the size of the marketplace and its entry barriers. The market was relatively small with a limited number of participants and had high entry barriers, which made it difficult for the market to develop in the way it could have done.

**External dynamics**

Examples of external factors that had an effect on the DRE’s performance are political and economic influence from the two major cities close to Dojima, Osaka and Tokyo, population growth, the role of rice in the society, as well as the positioning of the Japanese economy in regional and world markets.

The government at different times pushed different regulatory practices forward. Such regulations were initiatives such as a license regime, a stamp requirement, commitment to purchase dishonored rice bills, and dissolution of the so-called merchant coalitions. Even though many of these regulations didn’t last for such a long time, the license regime was one of the more durable initiatives by the government. Thanks to its timing of establishment which was at the same time as the exchange, it gave the license holders the exclusive right to enter and participate in the rice market.

When the DRE later started to decline, it was a result of the struggle for political and economic influence between the two major cities of Osaka and Tokyo. Where the economic status of Osaka fell in comparison to that of Tokyo. Consequently, the government decided to close all rice exchanges in early 1930s. The first thing to put a pressure on the DRE was that it started to lose its role as the only price setting platform in Japan as a result of the loss of its position as a dominant trading hub. The Tokyo Rice Exchange (TRE) became more and more influential as a cause of several external factors, such as a relocation of the home of the Emperor at the time, from Kyoto to Tokyo, as well as an expansion of regional railroads and port facilities in Tokyo. In the mid-1900s the TRE had so much advantage over the DRE that it was dictating the futures prices on the DRE (Ito et al., 2014).

Another external factor that had a significant effect on the position of DRE as the dominant trading hub was the increased population growth and improved living standards in the region, which caused an impact on the rice consumption. As a result, the external trade increased as well as non-standardized imports that undermined the price discovery function of the DRE. In addition to the changed rice consumption there was both a shortage of rice as well as a ballooning import of rice of another breed than the japonica rice that the DRE dealt with. Even though imported rice with indica breed were cheaper than the traditional rice, the first were never fully accepted by the consumers. Which, in turn, resulted in that the only rice listed on the futures market on the TRE and DRE were the domestic japonica rice and the imported indica rice on the spot market. Because of this non-standardization of the commodity the futures price on the DRE was not a fine index of the expected price of rice in the regions (Ito et al., 2014).

Even though the Japanese government policy promoted the production of japonica rice and thereby triggered the standardization of imported and domestic rice, the DRE kept losing its position on the rice market. This because they kept trading with imported rice with lower quality and price whereas the TRE continued to deal domestic rice. However, by the mid-1920s the DRE
reclaimed a share of the domestic rice trade. In combination with the standardization of the traded commodity both the DRE could then finally recover and reclaim their functions of price discovery and price hedging again.

**Summary**
The DRE was more dependent on the internal system of checks and balances than the regulations done by the government. Even though government arrangements that decreased the barriers to entry had an impact, the induced permissions and restrictions done by the government were not the main factors shaping the market. Internal mechanisms formed a structural foundation of the market whereas the government-imposed measures established the rules of conduct. However, the market itself also had its own means of governing operational aspects of the spot and futures trading, many times so powerful that they overshadowed the government regulations, such as formal and informal market practices of trust- and reputation-building.

This case shows that the fundamentals of a marketplace are the cornerstones of the development of the market. How important government regulations may be, they cannot create a market without the fundamental need for a market. However, government regulations can on the other hand have a huge impact on the survival of a market, since they easily can destroy even a mature market through anti-market measures.
4. Empirical findings

In this chapter the empirical findings that were conducted through interviews are presented. In the first section the findings from experts within digital advertising are presented, followed by a section with findings from the finance market and finally, findings from these two industries combined are presented.

4.1 Digital advertising

This part comprises findings from semi-structured interviews with key account managers, yield managers and experts within digital advertising at Schibsted Media Group.

4.1.1 Distribution between sales channels

There are two major sales channels for digital advertising; direct sales (guaranteed contracts) and RTB (non-guaranteed) (A2, A3). Schibsted offer a wide range of different media content and ad placements. Ad placement at websites such as Svenska Dagbladet with good content and many visitors is considered as premium inventory with high quality (A3). Premium ad inventory at Schibsted is mainly sold through direct/guaranteed contracts months in advance. The illustration presented in Figure 3 is an ad at Svenska Dagbladet front page, referred to as premium ad inventory.

![Figure 3. A premium ad at Svenska Dagbladet](image)

The leftover ad space, also called the remnant inventory, have lower quality and are usually sold through auctions in real-time (RTB) (A2, A3, A4). The illustration presented in Figure 4 is an ad shown far down in the feed, at a low quality website kokaihop.se and often sold through auctions.
Schibsted choose to sell most of their inventory through direct sales. By selling the majority of the inventory in advance, Schibsted ensure revenue from advertising and reduce the risks related to unsold inventory. Guaranteed contracts are a way for publishers to hedge themselves towards unsold inventory (A1). According to A2, there will always be a demand for pre-booking and sell inventory in advance, from both an advertiser’s and publisher’s point of view, and today, guaranteed contracts solve this (A2).

Furthermore, Both A2 and A3 conclude that it is more secure to sell guaranteed contracts since the inventory is reserved months in advance and therefore, also their bonuses. In terms of salary and bonuses, these remain the same regardless of which sale channel the seller uses (A2, A3).

**4.1.2 Challenges in the digital advertising industry today**

**Forecasting and under-delivery**

For guaranteed contracts, KAMs use a booking tool for checking available inventory for that given time period. Forecasts are made internally by Schibsted in order to predict the amount of impressions available at each publisher’s site (A1). Since errors can occur in forecasts it happens that the predicted volume on a publisher’s site doesn’t match with the real supply. Consequently, guaranteed campaigns sometimes under-deliver. A2 argue that it is quite common that guaranteed campaigns might under-deliver and customers needs to be compensated. The first and most common way to compensate buyers is to extend the dates of the campaign. The second is through additional discounts or repayments. Approximately, 80 percent of the customers get compensated by extending the dates (A3).

When selling ads on guaranteed contracts KAMs commit to deliver a certain amount of impression on a publisher’s behalf to the customer. The rule internally for booking and locking in inventory for a specific time is, first come wins (A2, A3). There is no prioritization for orders except on Black Friday where every order must be approved by yield managers since they want to prioritize the premium customers who normally pay the most (A2). However, A4 argue that Schibsted needs to become more intelligent in how to price and yield their inventory around peak demand (e.g. salary weekends, black friday, christmas). In order to do this, forecasting becomes increasingly important as a function, both technically and on a macro level. In order to understand factors impacting the amount of available inventory, this is important and not in place today (A4, A5).
Pricing and discounts
Direct/guaranteed contracts are sold manually and often negotiated between buyers and sellers face-to-face, which is an old fashioned way of selling ads. Discounts are rule rather than an exception in this industry (A2). Ads sold through direct contract does not ensure market based pricing since the sellers are highly involved in pricing of the contracts (A2). Moreover, it’s not sure whether the sellers’ negotiate the contracts that are most favorable from their perspective or the company’s perspective (A1).

KAMs mainly work towards budgets and each seller have an individual budget. Their salaries depend on the percentage of their budgets they are able to deliver. Since the KAMs’ bonuses depend on the budget instead of price it happens that sellers get “sugar tooth”, which is an expression for when sellers give customers discounts that are higher than normal in order to close the deal and deliver the budget. Thereby, the seller reaches hers or his budget and get the bonus, but the actual amount that the seller sold the inventory for might not be optimal from a publisher perspective. The expression, sugar tooth, is most common among KAMs with a short-term perspective and when there are no consequences for giving high discounts (A2). The amount of the discount the sellers are allowed to give without permission from yield managers normally depends on the seller's experience (A2).

According to A2, the pricing model of digital advertising at Schibsted is linear. A linear pricing model means that the prices of the products are determined in the beginning of each year by yield managers and normally the prices remains the same over the entire year. This why A2 prefers to close all deals with customers in the end of each year before the new list of prices is released with prices higher than the year before in most cases.

KAMs are highly involved in price-setting since they have the possibility to give discounts (A1, A2, A3, A5). Schibsted encourage sellers to negotiate contracts with customers on a year-to-year basis. However, A1 raises the concern that KAMs might give too high discounts on guaranteed contracts. A5 argues that the price for guaranteed contracts should correspond more to market demands and by using a more scientific approach.

A1, belive that KAMs at Schibsted sells their inventory too cheap and with discounts that are disproportionate and not based on good underlying arguments. The relationship between publishers and media agencies/advertisers are unbalanced when it comes to discounts, compensations and negotiations where the media agencies and advertisers have almost all the power (A1).

Yield management
Even though guaranteed contracts ensure revenue and give the publishers the opportunity to predict their revenue throughout the year, Schibsted have not investigated whether the same inventory could be sold on an exchange to another buyer for a higher price. As a result, A1, highlights the fact that Schibsted might not have a proper business model in terms of revenue.

A2 highlights the fact that auction-based sales channels ensure market-based pricing and clarifies that a dream scenario would be one where everything is sold through auctions within five years’ time. Therefore, Schibsted needs to investigate which business model is the most sustainable in a
long term perspective (A1). A3 argue that Schibsted should go from a linear pricing to dynamic pricing.

In January 2017, Schibsted Sweden established a yield team with the purpose to maximize the revenue generated from Schibsted’s inventory. Their job is to have a holistic yield of all campaigns running of Schibsted different properties and analyze their performance and risk for under-delivering. Moreover, their job is to identify new business opportunities through their knowledge about Schibsted ad inventory and act as support to the sales team internally (A5). A5 also believe that dynamic pricing should be considered for pricing of the guaranteed contracts.

**High pace of automatization**

The lack of competence among buyers and their trust in the technology are the biggest challenges for the increased use of automated sales channels (A3). According to A3, an increased automatization will probably affect the relationship towards buyers in a negative way since it reduces the need of human interaction. Even though an increased automatization might replace some sellers, A3 thinks that it will most likely just change the role description of a seller and A3 believes that KAMs will work more as a consultant or a trader.

4.2 Finance

This part of the empirical findings was conducted through interviews with finance experts with relevant core competences and experiences within various parts of the finance industry and its futures markets. Interviews have been held with key players such as market makers, stock brokers and price management analysts, among others.

4.2.1 Finance futures market

F3 explained shortly why futures was first introduced to the market. Farmers did not want to produce goods without a secure demand and companies wanted to hedge themselves towards changes in prices or lack of supply for a certain time in future. Before, the futures market was completely manual and F2 argue that one part of the market will remain manual because of its positive impact on long term relationship building. The manual part of the business is firstly for key customers where the relationship is highly important and secondly, for small companies lacking the economic resources to act on the automated exchange (F2). Moreover, F2 also state that the preferred way of trading with big and highly important customers is over-the-counter which is a contract directly between two parties.

4.2.2 Essential market mechanisms

F4 argues that transparency is key in a futures market since the pricing is based on the spot price for the underlying asset. Actors acting on the finance market have full visibility of the market prices and therefore to gain competitive advantage one of the most crucial part is the time it takes to get the information. Other crucial factors are; who receives the information first, the receiver's knowledge and possibility to read, understand and act on the information (F2). There are several external actors providing information to the finance market and Reuters is one actor who provides information of the volatility of the market (F4).
In Sweden, there are many different financial institutions controlling the regulations around the futures market (F4). The strict and complex regulations have resulted in high entry barriers for new customers and in addition, banks are more cautious when it comes to risks. This is also one of the reasons behind why the interest in futures markets has decreased in recent years (F3). Moreover, F4 argues, that the rigorous regulations highly affect the time span before new customers can start to trade, which usually is approximately six months.

One fundamental cornerstone for developing a well-functioning futures market is the possibility to value the underlying asset (F4) and in order to evaluate the asset properly, standardized products are needed (F2). F3 states that the underlying asset must be very specific, making it easy for the customers to know exactly what they will buy. To exemplify the importance of specifications of an asset, F3 explained an unsuccessful case when Husqvarna and Electrolux developed a shared cart for trading. In this case the complexity of the product resulted in that no one wanted to trade the product. Therefore, standardized and simple products are crucial for making an asset attractive for trading (F3). If the product is standardized and simple it is also easier to replace the asset with another, which is preferable for a clearinghouse as well (F4).

4.2.3 Key players

According to F4 there are several key players, institutions and rules that need to be in place for a functional futures market. Two players involved when it comes to sales are KAMs and risk managers - also called price manager, yield manager etc. (F2). They are the intellectual capital, specialized in a certain area with the main task to forecast volatility and identify macroeconomic aspects and risks that could have an impact on the goods that will be traded (F3). Companies normally have a separate team working with price management internally and volatility is one parameter that is considered when it comes to pricing (F1). KAMs are provided with market insights and can thereafter act on the revealed information on their customer’s behalf (F2).

The clearing house is a fundamental institution on the futures market, guaranteeing that both seller and buyer get paid. By handling the risk, a clearing house takes out the risk in the financial system which brings security to the system and the participants on the exchange dare to trade (F4). The players most frequently mentioned during the interviews are presented in Table 5.
### Table 5. Some of the key players within finance

<table>
<thead>
<tr>
<th>Players</th>
<th>Description</th>
<th>Key use case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td>• Cash instruments: Securities, deposits (F1, F2, F3)&lt;br&gt;• Derivative instrument: Futures contracts (F1, F2, F3)</td>
<td>• Any contracts that creates a financial asset asset of one entity and a financial liability or equity instrument or another (F1, F2 F3)</td>
</tr>
<tr>
<td>Primary Market Platform</td>
<td>• Platform to facilitate transactions (F1, F4)&lt;br&gt;• Nasdaq is one key player (F1, F4)</td>
<td>• Spot-market transactions (F1)&lt;br&gt;• Other instruments traded OTC (F1, F2)</td>
</tr>
<tr>
<td>Rating Agency</td>
<td>• Rates debt instruments risk profile through several dimensions (F2)&lt;br&gt;• Well-known and dominant rating agencies: Moody’s, Standard &amp; Poor, Fitch Rating (F1, F2)</td>
<td>• The rating facilitates the trading of the instruments (F2)&lt;br&gt;• No rating – no risk profile - low liquidity (F1)</td>
</tr>
<tr>
<td>Market Maker</td>
<td>• With certain boundaries – buys and sells an instrument (F3)&lt;br&gt;• Guarantees liquidity in a specific instrument (F3)</td>
<td>• Guaranteed the liquidity of a stock: SEB is a market maker of the Eriksson stock (F3)&lt;br&gt;• In return, the market maker is granted a spread-profit, information and trade advantage (F3)</td>
</tr>
<tr>
<td>Clearing House</td>
<td>• In the futures market, clearinghouses ensure that the buyers and sellers fulfill their obligations (F1, F2, F3)&lt;br&gt;• Oversee the proper delivery of the underlying asset (F1, F2, F3)&lt;br&gt;• Nasdaq is one key player (F1)</td>
<td>• Daily clearing to reduce market risk&lt;br&gt;• Create efficiency, stability and liquidity (F1, F3, F4)</td>
</tr>
<tr>
<td>Secondary Market Platform</td>
<td>• Platform facilitating the stock and futures market (F1, F4)&lt;br&gt;• Trading and re-trading&lt;br&gt;• Nasdaq exchange platform is the largest globally (F4)</td>
<td>• Facilitation of the Stockholm OMX and Nasdaq stock- and futures markets (F4)</td>
</tr>
</tbody>
</table>

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4.3 Ad-tech meets fin-tech

This part of the empirical findings was conducted through interviews with experts within a new digital advertising futures market. In addition to the interviews, empirical results related to challenges and drivers for a potential futures market for digital advertising collected from experts in the digital advertising and finance industry will also be presented.

4.3.1 New market trends

In recent years, the company that F4 is working for, has started to attract more non-financial markets and recently they stated;

"Anything that can be traded, will be traded”

(F4)

One current project is a system for loyalty currency points for airlines’ bonus systems (F4). F4 state that the company has identified this emerging trend of new marketplaces for non-financial products as a great business opportunity, since the entry barriers are higher for other companies to build their own marketplaces. The company’s core business is to build marketplaces and they support hundreds of different markets today which gives them a strong market position. The company F4 is working for tries to differentiate themselves more towards fintech and they provide different technological solutions with global scalability, where blockchain, cloud technology and machine learning are some examples. Consequently, they have the ability to offer a variety of services within this new business area (F4).

4.3.2 The world’s first futures exchange for digital advertising

During the spring when this master thesis was conducted, a company announced that they in partnership with a company with leading experience in financial trading, have developed a transparent advertising futures marketplace in New York in the U.S. (F4, AF1, AF2). In this marketplace, advertisers and publishers can sell, buy and re-trade premium advertising inventory, which will allow publishers to sell more premium inventory at guaranteed prices and advertisers to gain new access to premium inventory - in a future point in time (AF1, AF2). This market has a huge potential and today, only in the U.S., the digital advertising annual spending is currently $32 billions and is expected to increase to $47 billion by 2019 (AF1, AF2).

From a publisher’s point of view, an exchange for premium inventory will allow publisher to sell their inventory months in advance and guarantee long-term revenue (AF2). Moreover, AF1 and AF2 also argue that an exchange will reduce operational costs and therefore increase publishers revenue.

From a buyer’s point of view, they will have the opportunity to reserve and buy advertising inventory months in advance, which will make the media planning easier and more efficient. Since the buyers have the possibility to buy the inventory months in advance, it’s not sure whether the buyers will have the same demand later on. Therefore the introduction of re-trading
of contract will give the buyer the opportunity to sell the purchased inventory if they not need it or if they want to make a profit (AF1, AF2).

**Technology**
The company F4 is working for will act as a pure technological supplier in this partnership where financial trading will be combined with advertising technology. The company will use blockchain technology and therefore push the market to be fully transparent (AF1). Blockchain is a way to transfer ownership of the guaranteed contracts (premium inventory) without making a copy. The exchange based on blockchain, working in the cloud, will probably transform the digital advertising industry and allow global scalability (AF2). The company providing the platform will take a fee for all transactions, which is typical in financial exchange operators (F4, AF1, AF2).

**Products**
The underlying asset that will be traded and re-traded on this ad exchange is premium advertising inventory packaged into guaranteed/media contracts. However, how the advertising inventory will be packaged into durable and standardized contracts can not be shared since the information is confidential until the exchange is released later on this year, 2017 (AF1, AF2). The financial framework of F4 will be used in order to making the asset standardized and attractive to trade (F4).

4.3.3 Challenges and drivers when bringing futures in to an advertising context

One key driver for bringing finance architecture and technology to the advertising industry is to increase the transparency in the market and create new revenue streams (A4, AF1, AF2). Bringing in futures to a digital advertising context is a quite simple concept when it’s translated to the language used in digital advertising (A4). The biggest difference between these two markets today are; that guaranteed contracts can not be re-traded and the contracts are limited to manual negotiation, comparable to contracts sold over-the-counter in finance (A4).

All respondents within finance (F1, F2, F3, F4) agree that there are probably similarities to be found between the futures market for commodities and a potential futures market for digital advertising. F4 especially highlights the similarities with the cash settled trading with gold in Japan.

**Standardization of the contracts**

In a futures market every unit must be identical with another unit in the same category (A1). A1 points out that the value of advertising inventory depends on several parameters and as a result of the different possible combinations, it is hard to standardize and value the asset. Moreover, A1 argues that the asset is impossible to sort in different categories, which is the case in the futures market with stocks as the underlying asset. F1, F2, F3 and F4 raised their concerns for how advertising inventory should and could be packaged and valued properly and F2 states that it is crucial to value and rate the asset properly. However, A4 highlight that the finance market have automated complex products and abstract instruments before in a transparent way.

Parameters that might be of interest in futures contracts in advertising are the context, the size of the ad and the time of delivery (F3). A4 believe that the instrument will be inventory bundled
with data and the rating of the asset will be valued in terms like viewability, fraud, stability and financial status.

New market positions
AF1 and AF2 argue that new positions probably will be needed when the futures market for digital advertising is mature enough; bringing liquidity, safety and transparency to the market (F4).

On one hand, new market positions could be seen as a challenge since the digital advertising industry lack of competence for this shift (A4). On the other hand, many of the respondents believe that this is an opportunity for companies to take any of these new positions and as a result, have first mover advantage and understand current and alternative market trajectories for the digital advertising market (A4, F2, F4, AF1, AF2). Regulations often lagging behind in new markets, which lowers the entry barriers that first movers could take advantage of (F4).

AF1 and AF2 believe that a clearinghouse, rating agency and market makers are some of the positions that will be needed in this new market. This statement is also supported by all respondents within finance (F1, F2, F3, F4) where they highlight that a new market allows new positions and enable new revenue streams. A4 believes that a liquid secondary market will attract new positions, such as market makers, which could be of interest due to its marginal dynamic. However, further risk management competence will be required. Risk management competence will be of great importance, especially if the asset will be re-traded (F2, F3). A secondary market will force the market to become more intelligent in order to ensure that the prices of the guaranteed contracts reflect the market price of the asset (ad inventory) as far as possible (A4, A5, F3).

Being a publisher in the market today could also result in first mover advantages in this new market, since publishers have access to valuable data and price points from the primary market (A4, F3, F4, AF1, AF2). Moreover, companies that are willing to follow new disruptive technologies have the chance to come out on top and be well-positioned in the new market (A4, AF1, AF2). Schibsted, as a market leader in digital advertising in Sweden, is probably well-positioned to take any of these positions in the new market - especially as an issuer, due to their wide publisher network reaching half of Sweden’s population every day (A4).

Macroeconomics factors and forecasting
Macroeconomic factors have a big impact on the price of a commodity, which is one of the things risk analysts within finance are trying to predict (F1, F4). F3 believes that macroeconomic aspects probably would have an impact on an advertising futures market as well. The amount of impressions a publisher will be able to sell in the future depends on the amount of traffic to a site. Geopolitical events, such as the election in The US, is just one example of an event that most likely have an impact on the amount of traffic to a news site. Which is why it will be important to forecast the website's traffic with macroeconomic aspects in mind and difficult as well (F3).
Cost related to the production
Another dimension that F2 raised as a challenge for an advertising futures market is the cost related to the production of the advertisement. If the advertisers produce campaigns that never get shown to end customers, it implies high unnecessary costs for the advertisers. Therefore, alternative costs should to be taken into account when re-trading with ads (F2).
5. Analysis and discussions

In this chapter we aim to answering our research questions. The analysis is divided into four sections: Essential market mechanisms, Drivers and Challenges for a futures market, The future of digital advertising and Potential roles for Schibsted in this new emerging market. The analysis is based on the literature review and the empirical findings conducted during the study.

5.1 Essential market mechanisms

According to market design theory one of the three most important functions in any well-functioning market is thickness. In other words, there must be enough of potential buyers and sellers in the market in order to satisfy both sides of a trade. To be able to achieve the right level of thickness a market needs to attract traders and establish incentives to participate in a market.

The major part of traders are interested in making profits and therefore the most crucial factor to consider when designing a new marketplace is liquidity. This is also supported by the market microstructure theory where liquidity is emphasized as one of the most important characteristics of market quality. The quality and efficiency of the market derive from the amount of traders that will be present in the market and the market’s ability to trade on a large scale at low costs when the traders want to trade. Basically, what it all comes down to, as long as there is liquidity in the market, is the equilibrium point of supply and demand. Where liquidity is the bilateral search in which buyers look for sellers and sellers look for buyers.

There are different ways of promoting liquidity and thickness on a market. In market design theory the key is to centralize the market. One way of doing this, based on our empirical findings has been to establish a clearinghouse. As seen in the world’s first futures exchange, where the establishment of a clearinghouse was essential in order for the market to grow. Clearinghouses had to take on the role as objective record keepers as the needed workload grew, due to an increased amount of transactions. In other words, the clearinghouse enabled an increased thickness in the market, and thereby the liquidity.

Today, ad exchanges serve as the main provider of liquidity to the digital advertising market. In fact, ad exchanges were initially introduced to the market to make the trading more efficient, increase competition, and provide liquidity. However, Niederle et al., (2007) argues that a centralized marketplace, with or without a clearinghouse in place, does not ensure a sufficient market. As mentioned above, other important factors need to be taken into consideration, such as the need for incentives to participate in the market.

One examples of such incentives is the transparency of the market. For traders to be able to make a profit on a market, respondents from within the finance industry argue that they need the information about the underlying asset to be transparent enough for them to make an assumption about its value. Otherwise, they will not trade on the market. F4, argues that transparency is key in a futures market, since the pricing is based on the spot price for the underlying asset.
However, transparency requires an environment that is safe for all participants. Which is the second most important function in a well-functioning market. Since the outcome of a market often depends on the participants’ willingness to reveal or act on confidential information they may hold, the market must provide incentives for them to reveal some of what they know. Not before they do so, one can expect the prices of the asset/contract/product to be informed, i.e. close to its fundamental value.

Currently this is a problem in digital advertising, where technology fees are included in the CPM prices, making it hard to evaluate the true value of the inventory. In the world’s first futures exchange, DRE, the lack of standardization of the traded commodity was one of the main reasons for which the futures prices were not a fine index of the expected price of the commodity in the region, causing a turn in the development of the DRE. With all this taken into consideration, a simplification and a standardization of the traded products in a futures market are essential in terms of both transparency and safety.

Although thickness is preferred on a market, thickness can also bring congestion. Meaning that the participants of the market don’t get enough time to make the best choices or means to perform transactions fast enough. In the finance markets today the thickness has increased the importance of being first to receive new information. According to respondents from within finance, the increasing importance to be the first to receive information, has even had an impact on the allocation of offices so that the computers are put as close as possible to where the data is stored.

With this in mind, a technical platform capable enough to handle the possible thickness a new futures market might muster, in combination with market functions simplifying the trading, such as clearinghouses, that are of great importance when designing a new futures market.

5.2 Drivers and challenges for a futures exchange for digital advertising

Almost three hundred years after the world’s first futures exchange was developed in Japan there is still a demand from buyers and sellers to hedge against uncertainty in supply and demand in a future point in time. Adopting this concept to advertising, publishers want to reduce the risk with unsold inventory to ensure long-term revenue and advertisers want to ensure enough supply for their advertisement, to a specific price in the future.

The digital advertising industry is characterized by its high pace of innovation, complexity, unfair pricing, lack of transparency and many intermediaries. Therefore, many respondents raised their concerns about the fact that the market is getting more complex and opaque, pushing buyers further away from the sellers. Due to the many challenges the industry is facing we believe that the digital advertising landscape will enter into a new paradigm, where the next step most likely will be financial trading mechanisms entering the advertising trading market, disrupting the value chain of digital advertising.

Financial exchanges promote factors that are crucial for a well-functioning market, such as transparency, liquidity, price discovery and fair pricing, in a better way than guaranteed contracts traded in digital advertising do. All these factors driving the shift to a futures market for digital
advertising and according to market design theory a centralized exchange for guaranteed contracts would make the market more efficient, transparent and liquid.

There are several other factors paving the way for this shift. First of all, an emerging trend of new marketplaces for non-financial products has been identified, strengthening the believes that the future for ad trading will converge to how assets are traded on the financial exchange. A trend supported by the fact that the company who is providing the world’s largest financial exchange has stated that anything that can be traded, will be traded in the future. Secondly, the fact that a company has announced that they have developed a transparent advertising futures marketplace where advertisers and publishers can buy, sell and re-trade premium advertising inventory by guaranteed contracts also speaks for that a new paradigm is about to change this industry.

A challenge is that an automated futures exchange requires standardization of contracts and products. The guaranteed contracts today are unique and customized for each advertiser. However, to make the inventory attractive to trade on the exchange the design of the contract needs to be standardized. The standardization and design of the contracts will most likely be difficult. Worth mention though, is that the finance market has automatized complex and abstracts products and instruments before.

There are many different metrics that could be included in the design of the contract. For example; front page, two pages, the size of the ad, the time of delivery (week or weekend) and the contracts could be rated on metrics like; viewability, fraud, stability, financial status etc. What needs to be considered is the fact that an impression is always connected to a specific user on the contrary to a stock, which is always connected to one company and therefore easier to replace with another stock to fulfill futures contracts. Therefore, the design of the contracts might be more focused on audience connected to the impression rather than the actual impression.

Another driver to the shift is that most of the inventory sold through guaranteed contracts are high valued ad slots and therefore, often classified as premium inventory. Consequently, the inventory traded through RTB are the remnant and unsold inventory and considered to be less attractive to trade. Which is one of the major driver for the establishment of an automated ad exchange specifically targeted to reserved premium inventory.

An advantage from the publisher’s point of view is that an exchange will force the publishers to become more intelligent and use a more scientific approach for efficient pricing and monetization of their inventory. The demand for advertising inventory change over time, where special occasions like; black Friday, Christmas and salary weekends are more attractive than others for advertisers to run their campaigns. Therefore, publishers might need to price their guaranteed contracts differently according to peaks in demand.

Respondents believe that macroeconomic aspects such as geopolitical events will affect the future supply of inventory, which is supported in the literature. In finance, price managers are employed to forecast the impact of macroeconomic events on the future price of an asset. Notable is that impressions are non-storable like many assets traded on the financial exchange. With this background, forecasting in digital advertising will be highly important.
This shift will probably lead to that new competence is required, supported by the fact that there are no available technologies in digital advertising today for efficient pricing for futures contracts (guaranteed contracts). Furthermore, we believe that this market will adopt many concepts from the finance market in the near future, which also lead us to believe that the risk management competence will be required in the digital advertising market, in order to monetize on their asset properly.

Another driver of the shift is the fact that the development of the digital advertising market has until now followed the finance market trajectories. First, the introduction of the spot market (RTB), followed by the futures market for ads which was launched during this spring, 2017. Moreover, the finance market is classified as the most mature and closest to “ideal” market, which also indicate that the market for digital advertising will continue to develop towards the architecture of the finance market, with intermediaries like; clearinghouses, market makers and technologies available to support efficient forward pricing.

The clearinghouse plays an important role when it comes to guarantee that both sellers and buyers get paid. By handling the risk, a clearinghouse takes out the risk in the financial system, which brings security to the system, and the participants on the exchange dare to trade.

Another driver of the shift is that a secondary market is a new potential revenue stream for traders acting on the exchange. However, when re-trading with ads the alternative costs for wasted media production should be considered.

Today, the sellers’ relationship with buyers is considered to be highly important in the digital advertising market, since guaranteed contracts are pre-negotiated by KAMs and most often connected to discounts and special agreements between the buyers and sellers. The introduction of a futures secondary market will result in further automation of the industry and probably reduce the need of human interaction. A challenge will therefore be to predict how the market will react due to this change.

5.3 The future of digital advertising

In this section we focus on analyzing what a futures exchange for digital advertising will need to provide and why this is required, in order for the exchange to be well-functioning and to create enough value. The analysis is based on the identified essential market mechanisms and the drivers and challenges of the shift and a possible development of a futures exchange for digital advertising is illustrated below. The development is based on three different phases in order to facilitate the analyze. Each phase is described in more depth in this section.
5.3.1 Current phase

Phase zero is the current situation of the digital advertising market. Today there are two markets operating side-by-side in digital advertising; one where ads are traded through real-time auctions (RTB), comparable to the spot markets in finance, and one through guaranteed contracts, comparable with contracts traded over-the-counter (OTC) in finance. However, there are some differences between these two. First of all, futures contracts in advertising are limited to OTC and manual trading only and second of all, the contracts are not standardized where every contract is pre-negotiated by KAMs, usually employed by publishers.

In fact, having two markets side-by-side causes difficulties for publishers since they need to calculate the trade-off between the revenue gained from pre-negotiated contracts and the short-term revenue gained from the ad exchange.

In Table 6, a comparison between the finance market and advertising market are shown, in terms of marketplaces, traded products and their delivery and payment agreements.

<table>
<thead>
<tr>
<th>Market</th>
<th>Marketplace</th>
<th>What is traded</th>
<th>Delivery &amp; payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance</td>
<td>Futures exchange</td>
<td>Standardized contracts</td>
<td>Future point in time</td>
</tr>
<tr>
<td></td>
<td>OTC</td>
<td>Commodities</td>
<td>Cash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stocks, bonds etc.</td>
<td></td>
</tr>
<tr>
<td>Advertising</td>
<td>OTC</td>
<td>Guaranteed contracts</td>
<td>Future point in time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reserved inventory</td>
<td>CPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impressions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Audience</td>
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</tbody>
</table>
5.3.2 First phase

The first phase of the future scenario, an ad exchange with the possibility to trade guaranteed contracts will be established. The exchange will be based on a media trading platform working in the cloud, where all ad inventory will be transformed into standardized and durable securities. The ad exchange will be appreciated by the media buyers since it will provide a transparent and trusted marketplace where they can secure future advertising inventory through the possibility to connect the exchange to their planning tools. Which will facilitate the work for media buyers and be a great support in their everyday tasks.

Through a publisher’s perspective the ad exchange for guaranteed contracts will be beneficial in terms of the capabilities it provides to help them increase revenue by growing sell-through, retaining CPMs and reducing fees. An ad exchange will grow publishers’ revenue by facilitating selling of inventory in advance, since guaranteed contracts is a way for publishers to hedge themselves towards unsold inventory. Through a centralized and automated ad exchange the “first comes wins”-rule established among KAMs will not remain. The exchange will enable trading with all inventory, both remnant and premium, and expose all inventory for bidding. In this way the CPMs will be retained, since the prices will be informative throughout the whole sales process and never compromised or pre-negotiated with big discounts. Prices on the exchange will be set by publishers and derive from forecasts made of their reservation of inventory. Solid made forecasts made by publishers, as informed traders, will hopefully result in prices close to the fundamental value of the traded asset, and thereby meet traders’ expectations and minimize penalty fees.

Through an advertiser’s perspective the exchange will provide a new way of finding and purchasing inventory and make it possible to gain new access and secure premium inventory in advance. A centralized exchange will reduce the need for third-party intermediaries, such as media agencies and trading desks and give the advertisers direct buying power. This will improve the advertisers’ ROI, since they can buy inventory through the exchange by themselves. The greater transparency that an ad exchange imply between advertisers and publishers will create assurance as to where ads will appear and decrease fraud.

In order to understand how to design the exchange for guaranteed contracts, implement the new systems and attract traders, phase one will in an initial stage include a period of investigating and finding out different use cases for all players within a potential futures market for digital advertising. At this stage the main focus will be to create tradable contracts based on inventory volume, targeting and context as well as formulate exchange regulations such as timeframes, time of delivery, and other specific terms and agreements. Phase one will also include a period for discovering the need of a forecasting tool for publishers’ forecasted reservation of inventory, to be able to create contracts attractive to trade.

5.3.3 Second phase

In the second phase of the development the futures exchange will be mature enough for an introduction of technology and features enabling re-trading with the contracts. The option to re-trade ad contracts will be possible several times before delivery date and therefore facilitate the media planning process for advertisers in the changing media landscape. In order for this new
trading market of digital advertising to be thick enough it must provide incentives for traders to enter. By enabling re-trading of the contracts the exchange will attract new type of players, such as speculators interested in arbitrage possibilities. Compared to the futures market in finance high entry barriers for new entrants caused by strict and complex regulations are not yet established on the advertising market. The lack of regulations will make the entry barriers low and shorten the time span for new traders on the market. In this way a new revenue stream will arise more easy and further building liquidity on both the primary and secondary market.

However, even though the entry barriers will be low, the design of the guaranteed contracts will at this stage be the foremost crucial factor to achieve market thickness. To avoid a similar market failure as the Husqvarna example mentioned by F3, a standardization and simplification of the contracts will be of great importance when re-trading. Especially when the aim is to attract and obtain players outside of the advertising industry, interested in arbitrage possibilities.

In the second phase, the technology capable enough to support efficient trading with futures contracts need to be in place in order to obtain the thickness on the market and prevent potential congestion. Since the futures market in finance has a well-tested structure and technology that supports this kind of secondary market, a similar technology could be applied on the futures market for digital advertising. Either through a partnership with already established players with solid experience or by new players providing similar technology solutions.

With the second phase, the need of new competence will emerge. In addition to its available and suitable technology platform, the finance futures market’s architecture with its market functions simplifying trading, such as clearinghouses, rating agencies and market makers, will be needed and in place for this stage to develop. Other competences required are how to manage risk and price in a better way, because of the increasing need of forecasting volatility. In finance futures market, there are normally dedicated teams for these tasks, which might be a necessary next step for publishers to develop.

With a fully automated advertising exchange with both RTB, trading and re-trading of standardized contracts, the friction of executing each deal will be reduced, and traders, both on the buy and sell side, will be able to focus on a more holistic and forward-looking view that emphasis planning and strategy, rather than chasing short-term revenue. Through the exchange with enabled re-trading, the traders on the digital advertising market will be free to trade guaranteed contracts whenever they want. At this point the key focus for informed traders, such as publishers on the sell side, will revolve around what they plan to sell or re-sell in the future, empowering informed traders to use their full expertise on the market.
5.4 Schibsted

The purpose of this section is to provide Schibsted with a few recommendations concerning how they should act proactively in this potential new futures market for digital advertising. In order to do that, a SWOT analysis has been done, where Schibsted’s internal strengths and weaknesses, as well as external opportunities and threats on this potential new market are identified and analyzed. Followed by a description and analysis of the potential roles that we recommend Schibsted to take in this new ecosystem.

5.4.1 SWOT

Table 7. SWOT

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
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<tbody>
<tr>
<td>● Market leaders in digital advertising in Sweden (A4)</td>
<td>● Uncertainty in supply as an online publisher (Chen, 2012 and Sayedi, 2017)</td>
</tr>
<tr>
<td>● Wide range of different media content and inventory they can work with (A3)</td>
<td>● Forecasting function is not enough developed - problem with under-delivery (A1, A2, A3, A4, A5)</td>
</tr>
<tr>
<td>● Able to guarantee the necessary volume of inventory and liquidity that will attract traders (A4)</td>
<td>● Linear price model with big discounts (A1, A2, A3)</td>
</tr>
<tr>
<td>● Brand awareness and market insight already on place</td>
<td>● KAMs are highly involved in pricing of guaranteed contracts - have a lot of freedom and ability to give buyers discounts (A1, A2, A3, A5)</td>
</tr>
<tr>
<td>● Advertising team and new yield management team (since January) (A5)</td>
<td>● Established relationship towards buyers where discounts are rule rather than an exception (A2)</td>
</tr>
<tr>
<td>● Access to valuable data and price points from primary spot market (A4, F3, F4, AF1)</td>
<td>● Lack of competence (A4)</td>
</tr>
<tr>
<td></td>
<td>● Already some resistance towards automated sales channels within the organization (A3)</td>
</tr>
<tr>
<td></td>
<td>● Customized, unique guaranteed contracts based on needs analysis with a lot of manual impositions (A1)</td>
</tr>
<tr>
<td></td>
<td>● Lack of competence among players within the ecosystem, such as media agencies etc.</td>
</tr>
<tr>
<td></td>
<td>● Already a complex ecosystem with a lot of intermediaries and resistance towards RTB (spot-market) (Balseiro et al., 2014, Ghosh et al., 2009)</td>
</tr>
<tr>
<td></td>
<td>● Volatile market with products difficult to forecast (Chen, 2012 and Sayedi, 2017)</td>
</tr>
<tr>
<td></td>
<td>● Potential market failure if traders don’t see ad inventory as a tradeable asset and therefore non-attractive to traders outside of the digital advertising market (lack of thickness) (Roth, 2007, F3)</td>
</tr>
</tbody>
</table>

Opportunities

- >300 billions USD market (2020) (Statista, 2017)
- Disruptive move that could result first mover advantages (A4, F2, F4, AF1, AF2)
- Cloud technology enables scalability and a global reach to a greater extent (AF2)
- Provides an opportunity to understand current and alternative market trajectories (A4, F2, F4, AF1, AF2)
- Potential new positions enable new revenue streams (A4, AF1, AF2)
- Lack of regulations lowers the entry barriers (F4)
- Might improve peak demand tactics (A4, A5, F3)
**Strengths**
Schibsted is market leaders in digital advertising in Sweden and one of their strengths is their big publisher network which includes a wide range of different media inventory and famous websites like; Blocket, Aftonbladet and Svenska Dagbladet. Their network with publishers will increase the probability that the volume of inventory will be enough to ensure liquidity and to attract traders.

Together, all of their activities reach half of the population in Sweden every day which give them an unique market position. Their presence and dominant role in the market provide them with valuable data and price points from the spot market (RTB).

Furthermore, Schibsted is a large company with a lot of capital in terms of economy and expertise within the field of advertising. Today, they have one advertising team and from January, a yield management team for monetization of their inventory, will be established.

**Weaknesses**
Schibsted’s ad inventory is very hard to predict since it depends on several factors mentioned in previous chapters. The fact that they have an uncertainty in their supply and that every contract is customized and unique is a weakness since the tradeable asset needs to be accurate and standardized in this new potential market. This lead us to another identified weakness, which is the forecasting function of Schibsted. Today, the forecasting function at Schibsted is not capable enough to handle the requirements of this new market.

Another identified weakness is Schibsted’s internal setup for pricing of guaranteed contracts. Today, the price model is linear on a year-to-year basis where KAMs have a lot of freedom to give away discounts to buyers. The result of this freedom is that their sales organization is highly involved in pricing of their inventory. Moreover, the sales team have established a relationship towards buyers where discounts are a rule rather than an exception.

Lastly, there are resistance towards RTB and new technology within the organization today, which might reflect how the organization could react to this new market. Moreover, the organization’s lack of competence for entering this market, is another internal weakness.

**Opportunities**
According to Statista the digital ad spending will be around > 300 billions USD year 2021, which is a potential opportunity for new revenue streams for Schibsted. A disruptive move in this new market could be a business opportunity for Schibsted as a result of first mover advantages and provide an increased understanding of current and alternative market trajectories. Schibsted could take different positions in this market where new positions could open up for new revenue streams.

The exchange that was launched during this spring, when this thesis was done, is based on cloud technology which would enable Schibsted to have a global scalability for their ad inventory, if they used the same technology. This new market will probably put a lot more pressure on
Schibsted’s current organization and force them to be more intelligent in order to monetize on their inventory - which might lead to improvements in peak demand tactics.

Regulations often lag behind in new emerging markets, which is an opportunity for Schibsted, since the lack of regulation will probably result in low entry barriers for both Schibsted and traders.

**Threats**

There are several threats identified with an entry on a new market. However, there are also threats coming with not entering the market. By not entering, Schibsted risk to lose some of their competitive advantage towards many of their competitors.

The digital advertising market is already complex and by introducing complex finance trading mechanisms to this industry, a result could be more resistance within the industry, which should be considered as a threat against market success.

Moreover, this exchange will be one of the first exchanges for non-financial assets in the history and risks can always be connected with first-out on a market. Another potential threat is that market failure might occur if the market is unable to see ad inventory as a tradeable asset like financial assets. As a result, the market might not attract traders outside of the digital advertising market and therefore, the required thickness will be threatened. Re-trading might not attract advertisers because of high alternative costs for wasted media production, causing a risk of lack of ad inventory. Since the value of this asset might be hard to predict (read Michael Jackson case in section 3.3.5), the supply, as well as forecasting, could change in a second. The uncertainty in supply could result in a very volatile market, which might scare traders to trade.

**5.4.2 Recommendations**

Since Schibsted are market leaders in digital advertising on the Swedish market, with a fifty percent reach of the total population, the required brand awareness is already on place, as well as the needed market insights. Important factors that provide a great opportunity for Schibsted to take advantage of their position and act as first movers on this market, with new revenue streams as a potential outcome. A disruptive move in an early stage will put Schibsted in a good position on this market and increase the chances to come out on top, differentiate, and grow their business.

Based on the analysis of our empirical findings, and the SWOT analysis of Schibsted’s position in this new emerging ecosystem, we have identified two potential roles for Schibsted. In the finance trading market these are the roles defined as an **issuer** and a **market maker**. Schibsted could either take both of the roles simultaneously, or one of them separately. Both of the alternatives are analyzed and discussed in the following sections.

The role as an **issuer**, also called **seller** on this market means that Schibsted will be the player on the market issuing their inventory through standardized contracts. Since one of Schibsted’s biggest strengths is their publisher network, the role of a seller of guaranteed ad contracts seems like the obvious choice. Thanks to their wide range of media inventory, Schibsted will be able to
issue contracts that attract traders on the buy side with many different objectives, which will help increase the thickness and liquidity on the market.

However, the role of an issuer requires a third party provider of the actual futures marketplace, i.e. *a secondary platform provider*. Since a transparent advertising futures marketplace in New York was established during this spring, we have reasons to believe that either the same company as in New York or another company will assign themselves this role in a near future. An alternative would be that Schibsted took this role. However, we recommend them not to because of several reasons. For instance, the role as a platform provider would be a very expensive commitment for Schibsted, since the required infrastructure and competence need to be built from scratch. Therefore, we believe there are other players that could do it in a better way than Schibsted could. A player with more experience and other core competences than Schibsted, such as in-house knowledge of the required technology, capable enough to handle this new futures market.

The fact that Schibsted already sell a type of guaranteed contracts through direct sales, equivalent to OTC, also speaks for that they should take the role as an issuer on this new futures market. The reasons to why Schibsted sell a part of their inventory through direct sales are, as stated in previous chapter, to ensure revenue in advance and reduce the risks related to unsold inventory. However, these contracts are negotiated between a Schibsted seller and a buyer, many times with a lot of discounts involved. By issuing standardized contracts through a futures exchange Schibsted would be able to retain the benefits from direct sales, and reduce the disadvantages of today’s way of selling guaranteed contracts. The futures exchange would provide transparency, imply a “fairer” way of trading and pricing.

However, in order to utilize all of the advantages Schibsted will need to forecast the value of their inventory to a greater extent than before. Which could be one of the biggest challenges, since one of the identified weaknesses of Schibsted at this point, is their internal forecasting function. An entrance into this new futures market with the role as an issuer will put a greater pressure on how forecasting is done. An improvement of peak demand tactics will be crucial, to ensure fair prices close to the fundamental value of the inventory. This might have implications on how inventory is priced as well as how the sales organization is structured. The prices of inventory should be based on a more scientific approach, with dynamic pricing derived from supply and demand, rather than relationship building and discounts from sellers. To be able to obtain the trustworthiness needed as an issuer, pricing and selling might need to be disconnected to each other and done by two separate teams, dedicated to each task.

Even though a restructuring of the sales organization will be done or not, the required competence of the sellers will change. The seller’s role will take more of the shape as traders on the finance trading market, with a stronger focus on predicting volatility and risk management. This will be a crucial and challenging step for Schibsted, since a certain resistance against new ways of selling, such as programmatic, have been identified among sellers already.

Taking the role as an issuer on an automated futures exchange will also have implications on the amount of needed workload from Schibsted’s sellers. By selling a part of their inventory through a fully automated futures exchange, a part of their sales force might be uncalled-for. However, a
part of their inventory will always be sold as direct sales through OTC, to ensure that valuable relationships to key clients are nurtured and sustained. In that case, the sellers will pursue their work in the same manner as before.

Participation in this new market as an issuer will most likely give Schibsted several opportunities, such as; keeping up with market trends, adoption to new technology, improvement of their forecast function and restructuring of their sales organization. All these opportunities added together might result in a long-term sustainable advantage.

The entry barriers and initial costs related to Schibsted participation as an issuer will be low and therefore, the risks connected to market failure will also be low. On the other hand, the alternative costs related to a non-participation in the exchange would be high. First of all, they might miss out on new potential revenue streams at a very low risk. Secondly, they will continue to fight for the same revenue like their competitors, and they will miss out on first-mover advantages.

Based on our analysis, an entry into this new market could generate many opportunities for Schibsted, such as sustainable growth and force Schibsted as an organization to act more proactively, be more intelligent and actively yield and improve the monetization of their inventory. Adding these together, we recommend Schibsted to participate in this market in an early stage as an issuer and most likely gain long-term sustainable advantage.

5.5 An ethical and sustainable perspective

In this section an analysis of companies’ ethical boundaries due to the large volume of data collected in the digital advertising industry is discussed. Followed by an analysis of how this new potential market will affect the sustainability of the economy.

Ethical boundaries for collection of user data

The large volume of data generated from the digital advertising industry has grown over the last years and customized ads based on user’s online behavior will continue to grow as this industry is growing.

User data is considered to be the new source of competitive advantage. The amount of data collected about users today is almost comparable to spying in the past, even though users often agree to this in different terms and conditions. Since customer data is usually stored in the cloud it might be hard for customers to understand and get a grip of what kind of information that they actually agree to give away to the companies for free. This lead us to question whether consumers actually understand what they agree to give away in terms and conditions and if they actually have control of their own data?

On the one hand, users might want to protect their own data but on the other hand, users might prefer to see ads that are relevant to them even though this explicitly means that their online behavior is being tracked. However, from an ethical perspective, we truly think that companies should consider to be more transparent of their data collection. Transparency and visualization of
the collected data will probably lead to users agreeing to something that they actually understand.

**Sustainability**

This section discusses how the research can affect the sustainability viewed from the three different aspects, economy, society and environment and these aspects are often referred to as the *triple bottom line* (UN, 2016 and Hall, 2011). According to the Brundtland Commissions of the United Nation, sustainability is defined as:

> “Meeting the needs of the present without compromising the ability of future generations to meet their own needs”

*(UN, 1987)*.

The different marketplaces in the financial trading market have a large impact on the economy and the fact that we are moving in this direction - making every asset tradable and develop new types of marketplaces - will probably have large impacts on the development and sustainability of the economy. Therefore, it is of great importance to create markets that deliver greater value to the society, in a sustainable way.

Marketplaces and technical platforms have evolved in recent years, where buyers and sellers are connected through marketplaces or platforms. These technical platforms and marketplaces enable new business relationships where customer-to-customer, company-to-customer or company-to-company are connected. These marketplaces will probably be important drivers for the growth of the economy and a new marketplace. Therefore an ad exchange for guaranteed contracts, will also play a great role in this development.

Moreover, the economy will probably rely even more on money generated from online businesses in the future, where marketplaces and technical platforms most likely will play an important role for achieving a sustainable economic growth.

This study will also impact the environmental perspective. One of the major outcomes of this thesis is a platform working in the cloud and the production and development process for this platform does not require a lot of material to be produced. The actual impact due to the production and maintenance of the platform, will therefore probably be low and not have a major impact from an environmental perspective.

On one hand, the purpose with digital advertising is to increase brands awareness in order to attract and convince customers that a company’s products or services are the best. Successful advertising could therefore lead to increased consumption, why alcohol and tobacco advertising have stricter regulations in some countries. How much the digital advertising industry actually increases the consumption and whether this consumption have a negative impact on the environment is hard to say, especially since consumption is a strong driving force for the economy. Advertising is needed for many other reasons and therefore, players active in this industry might need to consider what kind of advertisements it actually promote and take more responsibility for the effects the advertisements have in a wider ethical, social and environmental perspective.
5.6 Limitation

In this sub-section the limitations are covered, with emphasize on the limitations that decrease the reliability of the study. As a result of the interpretive nature of this study the validity is higher than the reliability.

First of all a limitation is that the primary data were conducted through semi-structured interviews and observations. This type of data is highly subjective and can at worst be a reflection of response bias and personal interpretations, which is important to have in mind when conclusions are drawn. Furthermore, the setup with semi-structured interviews makes the replication of the study difficult, which lowers the reliability (Collis & Hussey, 2014). The data gathering in this study has been based on standardized methods and procedures. However, the open-ended questions and the different interview settings are reasons enough for the authenticity of the findings to be questioned.

Another limitation is some of the interviews were held with two respondents. The fact that another person accompanied the interviewee can change the dynamics of the interview and the outcome of the interview (Collis & Hussey 2014). Another limitation due to the interview setup is the choice of interviewees. These were a result of a natural sampling due to the limited time frame of this study.

In addition to the primary sources of data a literature study was conducted. The relatively low number of research done within this field caused a limitation. The available time to make this master thesis was another limitation, playing a great role to the final outcomes of the analysis.
6. Conclusion

The aim of this chapter is to summarize the findings of this thesis and propose suggestions for future research within the field of secondary marketplaces for digital advertising.

6.1 Summary

Up until now, the way advertising space online, also called inventory, is traded has been unquestioned. Few attempts have been made trying to predict the future of how to trade digital advertising, and especially the similarities with other trading markets. One of the major outcomes of this thesis is an analysis of a possible future scenario where a futures exchange for digital advertising will develop. The purpose of the analysis has been to identify which market mechanisms and key factors that will be crucial for a secondary futures market for digital advertising in order for it to be well-functioning and create enough value. The thesis aims to cover the whole ecosystem through the perspective of all involved players. However, emphasize has been put on the role of a publisher.

The most fundamental and important factors for a market are to attract traders and establish incentives to participate in a market. In order to do that some important market mechanisms have been identified, that will be crucial for this future marketplace to cover:

- **Thickness** - There must be enough of potential buyers and sellers in the market in order to satisfy both sides of a trade.

- **Liquidity** - The major part of traders are interested in making profits and liquidity is one of the most important characteristics of market quality to attract traders.

- **Transparency** - For traders to be able to make a profit on a market they need the information about the underlying asset to be transparent enough for them to make an assumption about its value.

- **Congestion** - Although thickness is preferred on a market, thickness can also bring congestion. Meaning that the participants of the market don’t get enough time to make the best choices or means to conduct transactions fast enough. Therefore, it’s important to reduce the congestion on the market.

- **Safety** - An environment that is safe for all participants since the outcome of a market often depends on the participants’ willingness to reveal or act on confidential information they may hold.

- **Simplification and standardization of the contracts** - a standardization and simplification of the contracts will be of great importance when re-trading to establish incentives to participate.
The future scenario is an automated ad exchange with the possibility to trade and re-trade guaranteed contracts with advertising inventory as the underlying asset. The ad exchange will facilitate for long-term media revenue and planning - selling and buying ad inventory in advance. Trading with guaranteed contracts is a way for publishers to hedge themselves towards unsold inventory and for buyers to secure premium inventory in advance. The option to re-trade ad contracts will be possible several times before delivery date and by enabling re-trading a new revenue stream will arise, building liquidity on both the primary and secondary market.

The exchange will be based on a media trading platform working in the cloud with the possibility to connect the exchange to buyers’ media planning tools and sellers’ forecasting tools, which probably will reduce the need of menial tasks. Prices on the exchange will be set by sellers and be based on forecasts made of their reservation of inventory. The design of the guaranteed contracts is the foremost crucial factor to achieve market thickness. Which is why standardization and simplification of the contracts will be of great importance. Therefore, all ad inventory must be transformed into standardized and durable securities on the exchange.

Since the futures market in finance has a well-tested structure with technology that support this kind of secondary market, a similar technology could be applied on the futures market for digital advertising. The finance futures market’s architecture with its market functions simplifying trading, such as clearinghouses, rating agencies and market makers, will be needed in this future scenario. Other required competences are how to manage risk and price in a better way, because of the increasing need of forecasting volatility. In finance futures market, there are normally dedicated teams for these tasks, which might be a necessary next step for publishers to develop.

In Table 8 identified key players from the finance trading industry are listed with their description based on a digital advertising context.
Table 8. Key players from finance in a digital advertising context

<table>
<thead>
<tr>
<th>Players</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td>• Inventory or Inventory/data bundles</td>
</tr>
<tr>
<td></td>
<td>• Needs standardization to simplify trading and rating</td>
</tr>
<tr>
<td>Issuer</td>
<td>• Issues contracts that attract traders on the buy side with many different objectives</td>
</tr>
<tr>
<td>Rating Agency</td>
<td>• Rates inventory assets according to quantifiable standards, due to differences in risk and quality</td>
</tr>
<tr>
<td>Market Maker</td>
<td>• With the ability to manage risk, and knowing the market, guarantees liquidity in a specific instrument</td>
</tr>
<tr>
<td>Clearing House</td>
<td>• Ensures buyer and seller fulfills obligations of delivery</td>
</tr>
<tr>
<td>Secondary Market Platform</td>
<td>• Platform facilitating the futures market trading and re-trading</td>
</tr>
</tbody>
</table>

Based on the analysis of our empirical findings, and the SWOT analysis of Schibsted’s position in this new emerging ecosystem, we have identified two potential roles for a publisher. In the finance trading market these are the roles defined as an *issuer* and a *market maker*. The role as an *issuer*, also called *seller* on this new marketplace means that the publisher will be the player on the market issuing their inventory through standardized contracts. Thanks to their wide range of media inventory, publishers will be able to issue contracts that attract traders on the buy side with many different objectives, which will help increase the thickness and liquidity on the market. By issuing standardized contracts through a futures exchange publishers will be able to retain the benefits from direct sales, and reduce the disadvantages of today’s way of selling guaranteed contracts. The futures exchange would provide transparency and imply a “fairer” way of trading and pricing.

However, in order to utilize all of the advantages publishers will need to forecast the value of their inventory to a greater extent than before. An improvement of peak demand tactics will be crucial, to ensure fair prices close to the fundamental value of the inventory. This might have implications on how inventory is priced as well as how the sales organization is structured. The prices of inventory should be based on a more scientific approach, with dynamic pricing derived from supply and demand, rather than relationship building and discounts from sellers. To be able to obtain the trustworthiness needed as an issuer, pricing and selling might need to be disconnected to each other and done by two separate teams, dedicated to each task.

Furthermore, this development requires a third party provider of the actual futures marketplace, i.e. a *secondary platform provider*. Since a transparent advertising futures marketplace in New
York was established during this spring, we have reasons to believe that either the same company as in New York or another company will assign themselves this role in a near future.

6.2 Future research
The fields of digital advertising trading and the finance trading are both large areas to cover in one thesis and could be researched further in many ways. In this study, limited interviews with key people within the two industries have been done in combination with a literature review that covers the two chosen fields. These have provided an indication of the current situation, based on the thoughts and expertise of the chosen people and the chosen literature, and for that reason probably not the whole picture. In order to cover the research field to its full extent and to increase the generalizability of the study, a wider range of interviews could be held. Preferably in a structured manner, to ensure all aspects and opinions are covered, and to provide a more nuanced picture of the two industries.

This thesis does not investigate further which type of technology that should be used on this marketplace. As a secondary platform provider of the exchange, the technology used by AF1 and AF2 is assumed to be the best alternative. However, in order to achieve the most efficient marketplace with the best matchmaking-function research should be done within this field. Neither does this thesis more than touch upon the subject of how to value and design the specific contracts that will be traded on this futures exchange for digital advertising. Therefore, future research on how these contracts should be packaged and standardized should also be done.

In order to give Schibsted a recommendation based on a scenario that reflects the reality and a plausible path for this industry to take, future research on different scenarios should be done. Where each scenario should be evaluated and analyzed based on its pros and cons through a publisher’s perspective as well as its plausibility through an industry perspective. Further research on Schibsted’s behalf could be; analysis of other possible roles to take, a possible go to market-plan - including a more in depth analysis of the competitive landscape, which companies to cooperate with, and pilot project to partner with.
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Appendix

Appendix A - Overview of all the interviews

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Profession</th>
<th>Date and duration</th>
<th>Form</th>
<th>City and Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Vice President of Product Management</td>
<td>04/01/17, 60 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>A2</td>
<td>International Account Manager</td>
<td>02/27/17, 60 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>A3</td>
<td>Senior Account Manager</td>
<td>13/02/17, 60 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>A4</td>
<td>Vice President of Advertising</td>
<td>14/03/17, 90 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>A5</td>
<td>Yield Manager</td>
<td>20/04/17, 30 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>F1</td>
<td>Price Management Senior Analyst</td>
<td>07/02/17, 70 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>F2</td>
<td>Head of Trading</td>
<td>16/02/17, 90 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>F3</td>
<td>Market Maker</td>
<td>02/03/17, 60 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>F4</td>
<td>Senior Vice President Market Technology</td>
<td>06/04/17, 90 min</td>
<td>Live interview</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>AF1</td>
<td>Chief Executive Officer</td>
<td>26/04/17, 45 min</td>
<td>Skype interview</td>
<td>New York, US</td>
</tr>
<tr>
<td>AF2</td>
<td>Chief Technology Officer</td>
<td>18/04/17, 90 min</td>
<td>Skype interview</td>
<td>New York, US</td>
</tr>
</tbody>
</table>
Appendix B - Interview questions within the topic of digital advertising

Based on the interviews with managers A1, A4 and A5 as presented in Table 1, chapter

**Background & Career**
- Can you tell us shortly about your background in digital advertising?
- What is your experience when working with digital advertising at Schibsted?

**Schibsted’s role in the ecosystem**
- What do you think about Schibsted’s current business model for digital advertising?
- What are the pros and cons with the business model?
- How do you differentiate yourself from other publishers?

**Current ecosystem**
- What challenges does the digital advertising ecosystem face today?
- Do you see any trends for the future of digital advertising?
- How will the trends affect Schibsted as a publisher?
- Which are the biggest challenges for Schibsted as a publisher?

**Futures market for digital advertising**
- What do you think about the future of the sales process?
- What do you think will be the biggest challenges with increased automatization?
- How will the role of sellers change?
- We are investigating a possible future scenario with a futures market for digital advertising. What challenges and opportunities can you see with this development?
Interview questions within the topic of digital advertising

Based on the interviews with key account managers A2 - A3 as presented in Table 1, chapter

Background & Career
- Can you tell us shortly about your background in digital advertising?
- What is your experience when working with sale in digital advertising at Schibsted?

Distribution between sales channel
- Which sales channels do you work with?
- How do you work with the two different sales channels?
- Do you prefer working with any of the sales channels? Why?
- Which sales channel have you been most educated within?

Products
- What are the different products?
- What are included in the contracts?
- How are the products prized?

Forecasting and under-delivery
- How do you know how much available ad inventory you can sell?
- What happens if the campaigns under-deliver or over-deliver?

Bonus system
- How does your bonus system work?
- Are you allowed to give any discounts?
- What are the internal rules for discounts?

Future of digital advertising
- What do you think about the future of the sales process?
- What do you think will be the biggest challenges with increased automatization?
- How will the role of sellers change?
Appendix C - Interview questions within the topic of finance

Based on the interviews F1-F4 as presented in Table 2, chapter

**Background & Career**
- Can you tell us shortly about your background in finance?
- What is your experience when working in the financial trading market?

**Essential market mechanisms**
- What are the essential market mechanism for a well-functioning and efficient trading market?

**Futures market in finance**
- How does the futures market work?
- How are the futures contracts sold in finance?
- How do you value the underlying asset?
- What actors are involved in pricing of the underlying asset?
- How do you forecast the risk and volatility of the underlying asset?

**Key players**
- What are the key players in the futures market?
- What are their role in the futures market?

**Ad-tech meets fin-tech**
- Do you see any trends for the future of finance?
- We are investigating a possible future scenario with a futures market for digital advertising. What challenges and opportunities can you see with this development?
- Do you have any thought on how the underlying asset (ad inventory) could be packaged and valued?
Appendix D - Interview questions within the topic of ad-tech and fin-tech

Based on the interviews AF1 and AF2 as presented in Table 3.

Background & Career
- Can you tell us shortly about your background in the industry of digital advertising and finance?

Technology
- The platform is based on blockchain technology, why did you decide to use this technology?

Product
- How will you package the products? Will data be included or will the underlying asset just be the placement in the publisher’s site?
- How will you manage to decide the value of the underlying asset?
- When will the assets be paid according to the agreement?
- How do you decide the lock date? How long time between lock date and time of delivery?

New market positions
- You are working on the translation between the adtech world and the financial concept you’re coming with. How are you doing this translation? How do you know it gets “right”?
- Do you believe there will be a need of new positions? If yes, describe the different positions.
- How does your collaboration/agreement with other players involved look like? Publishers?
- How will you guarantee that the publisher retains the quality control such as advertising blockers, creative review of ads (what kind of advertiser who will show their ad?)
- How will you tackle the fact that the agencies and advertisers are lacking behind when it comes to adaptability? Do you have a plan for how to educate them about the new system and technology?
- Which institute will you use for rating?

Challenges
- What challenges and opportunities can you see with this new market?