Consumer Behavior on Digital Investment Platforms

An investigation into the most important characteristics of digital investment platforms for well-educated, non-sophisticated investors

By Mads Schiøler Tingsgård

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Supervisor: Michael Wessel

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Abstract

Due to our world becoming more and more digitized, all industries and sectors have to keep up and make sure they do not fall behind competition. This is also true for financial institutions and wealth managers. Luckily, new technology does not only create threats, but also opportunities. One of these opportunities lie within the wealth management sector and has resulted in the creation of several types of digital investment platforms. Unlike regular wealth managers, that often require a high net worth to invest with them, digital investment platforms allow more regular people to see their personal finances grow over time. The question is then, what characteristics of such platforms must exist in order to activate more regular people, so they can enjoy better financial returns? This study uses a sequential-qualitative-quantitative approach in order to help digital investment platforms figure this out. Through qualitative interviews with industry experts, barriers to investing are found, built into characteristics of digital investment platforms, and then tested on a population of relative young, well-educated people, with generally little knowledge and little experience within investing. Through conjoint analysis on a population of n = 170, it is shown that the three most important characteristics digital investment platforms have to include in order to attract the population tested, are: the option of letting the platform build the users' portfolio for them, low cost, and the option of investing small amounts of money.

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Introduction

Background

The thesis subject in hand got my attention due to my main interest of figuring out how to improve the Danish investment culture. By ensuring a better investment culture, which in my mind means getting more people to spend a little more of their after-tax income on saving money through investments, rather than spending on material goods or leaving the money on a bank account with no interest rate, an average household would end up with better finances, if we assume that the average market of investments grows at a higher rate than inflation over time.

Relevance for E-Business

The relevance for e-business is vastly high. As internet spending increases and the digital marketplace becomes larger, figuring out how to attract customers to online digital investment platforms is of very large importance for companies working within wealth management. This is true for both wealth management companies focusing on very wealthy customers, but it also opens up opportunities to attract regular people to handle their finances in a better way.

Motivation

The motivation of looking into specifically digital investment platforms comes from the significant innovation of these seen especially in the United States, where several new interesting companies focuses on how to invest in a simple way, for people without former investment experience. There exist several types of digital investment platforms that focus on the non-professional investors, as is my motivation in this project. In the United States, where regulation obviously is different than in the EU and Denmark specifically, and thus not 100 % comparable to Denmark and EU, I will describe a few companies which represent innovation within the sphere of digital investment platforms. Robinhood is a trading platform focusing mostly on the millennial generation as a market group. This means that you, yourself, will buy and sell different financial instruments in real time as you please, to the best of your own knowledge. Robinhood charges no commission on trading, which is their main selling point (Robinhood. (2018)). Being a platform where you have to trade financial instruments yourself, Robinhood and platforms alike might not be optimal for a regular person without a fair share of knowledge of investing, if the goal is optimal returns, as optimal strategic asset allocation requires a large insight. Another type of digital investment platform that has been popularized lately is the robo-advisor, which is seemingly smarter for people without vast knowledge of optimal portfolio building. A famous company in the USA is Betterment. Betterment

is exactly a robo-advisor, which is a digital investment platform that allows you to answer specific questions about your financial status, your risk tolerance, and sometimes financial goals, resulting in the platform calculating which assets to invest in for you. Betterment's entire portfolio strategies are globally diversified by using exchange traded funds, also known as ETF's, which is the same for a large amount of all other robo-advisors (Betterment. (2018)). ETF's are investment funds that aim to follow a specific index, such as the S&P 500, which consists of the average stock price of 500 large and specifically selected American companies (IShares ETFs | Asset management. (2018)). This means that an ETF does not try to outperform the market of a specific index, but instead follow it as close as possible. As we see, innovation within the digital investment platform sphere consists of trading platforms, where you choose your investments yourself, and robo-advisors, where your portfolio is created by the platform, based on certain information of you. In Denmark, in terms of trading platforms, we have Saxo Bank which focuses mainly on highly capable traders, which is a different audience than who I have an interest in (Handelsplatforme og software. Saxo Bank (2018)). Therefor I have not looked into the Saxo Bank platform in this project. But within the last few years, several robo-advisors focusing mainly on an average person with low knowledge of investing have emerged in Denmark.

Objective

As the main goal of the project is to look into how companies in Denmark can attract more investors with zero to relatively little investment experience, knowledge or professional background, there will be covered digital investment platforms in Denmark, and through a sequential-qualitative-quantitative research method, first by using semi-structured interviews, acquire data in terms of what beliefs companies have built their platform on, as well as most importantly, what beliefs they have in terms of barriers to investing from non-sophisticated investors. All relevant Danish robo-advisors have been interviewed with the purpose of figuring out what they perceive as barriers of why some people do not invest. I then test these barriers on a relatively young and relatively inexperienced group of people through an online experiment, using conjoint analysis. The final objective is thus to find out whether the Danish digital investment platforms are correct in their definition of barriers, as well as which of them weighs the most, in terms of the market group this project looks into. When finalized, the project will give other researchers, as well as digital investment platforms, a better look into the psychology of their potential customers.

Problem Formulation

The problem at hand is to find out how to attract new investors with lacking knowledge and experience to digital investment platforms. Current literature within investor behavior focuses more on how people take bad decisions *when* they invest, but not on how digital investment platforms can build optimal characteristics in order of how to *get* them to invest, and how they can help people get rid of the aspects of bad decision making. There also exists literature on definitions of robo-advisors, which will not be used in the theoretical background of this project, for the reason that robo-advisors have only been interviewed in the qualitative part of the data collection and analysis, as it is the author's belief that they are the type of digital investment platform who focuses mostly on the population tested in the project, which enables these industry experts to give the best answers needed to figure out barriers to investing. This is thus not a project on robo-advisors specifically.

Research Question

Main Research Questions

Qualitative:

What are the main barriers to investing for people who do not invest?

Quantitative:

What characteristics, which can be built off of these barriers, of digital investment platforms are most and least desirable for relatively inexperienced Danish investors?

Sub Research Questions

What characteristics, which can be built off of these barriers, of digital investment platforms are most and least desirable for different sub-populations of Danish investors?

What characteristics, which can be built off of these barriers, of digital investment platforms are most desirable in terms of disabling bad decision making by investors?

Delimitations

The delimitations of the projects are most importantly that we do not want to focus on a population mainly built by very experienced, professional investors. It is not a problem to have a small population of these doing the experiment, as it can bring a few insights into differences, which will help answer the sub-research question, but we want to focus mostly on a population that does not

consist of mainly seasoned, professional investors. We also want to keep the population to mainly Danish people, or people living in Denmark.

Theoretical Concepts & Literature Review

One of the main reasons to create this project is that current research within investor behavior is usually built upon how people build non-optimal portfolios, how bad investment decisions are made compared to modern portfolio theory, and so on. The reason this is not what is wanted in this project is of course due to it already being researched tremendously, but also that it focuses on people who already spends a fair amount of time and money on investing. Instead, with this project, it is the goal to figure out how digital investment platforms can be built in such a way, that they attract more customers, especially customers with no investing experience already, and it will also be discussed which of these characteristics might be the best way to help people not fall in the trap of the bad decision making defined in behavioral finance literature. There does not seem to exist any highly regarded research within the barriers to invest your money in the same way as this project is trying to look into. This is especially true when it comes to investing your money through digital investment platforms, and the characteristics of these, probably due to the novelty of the solutions, but also because regular behavioral economics research focuses on different subjects than what is researched in the project at hand. But since no highly regarded research on characteristics of digital investment platforms to attract more customers exists, instead you will get a look into current behavioral finance research within the investment sphere, as it is still interesting to understand from the perspective of this project. If we understand the psychology of investing and how people make bad decisions, it will also be possible to see if the characteristics that were found most important for digital investment platforms can help new investors overcome these bad decision making pitfalls. We thus see that current research focuses more on barriers to investment *success* than barriers to *starting* your investing adventure in general. Such research is still very important for digital investment platforms, especially if they are robo-advisors trying to build optimal portfolio's for their customers, rather than trading platforms, where the customer builds their own portfolio.

The Psychology of Investing

The main research on behavioral finance within investment is collected by Nofsinger in his textbook The Psychology of Investing. This book broadly covers the most important ideas within behavioral finance and investing in current times. The main behavioral finance aspects of investing

is put within the categories of overconfidence, pride and regret, risk perception, decision framing, mental accounting, representativeness and familiarity, social interaction (including media), emotions and self-control (Nofsinger, J. R. (2018)). The last focus is on the difference between men and women in regards of investor behavior (Nofsinger, J. R. (2018)).

Overconfidence

Overconfidence often leads to excessive trading, greater risk taking, and a focus on investing in smaller rather than larger companies, which is due to higher commission costs and underdiversification (Nofsinger, J. R. (2018)). Overconfidence is shown in extensive evidence, for example that groups of people assigned a 98 % confidence interval to events that only happened 60 % of the time (Barberis, N., & Thaler, R. H. (2002); Alpert, M., & Raiffa, H. (1982)). Other literature shows that groups of people are very bad at estimating occurrences of events, for example in a study where people were certain an event would occur, it only occurred about 80 % of the time, and events they thought would never occur, would happen around 20 % of the time (Barberis, N., & Thaler, R. H. (2002); Fischhoff, B. et al. (1977)). Overconfidence could show itself in this report if the data suggests that risk-loving behavior was very high, or if users would prefer building their portfolio themselves although they lacked the proper background and knowledge to do so.

Pride & Regret

Pride and regret in regards of behavioral finance means that people either act or fail to act in order to avoid regret and seek pride, which in investing shows itself in selling to reap profits too early, and selling losing investments too late and thus holding them for too long time (Nofsinger, J. R. (2018)). When it comes to decision making with risky financial assets, people do not always pick what maximizes their expected utility, due to the cognitive demands of consistency to achieve such results (Bell, D. E. (1982)).

Risk Perception

Research suggests that in terms of risk perception, previous events ending in success or failure seems to be a big predictor of risk loving or aversion (Nofsinger, J. R. (2018)). Risk loving tends to increase after big successes and after big losses if there is a perceived high probability of breaking even (Thaler, R. H., & Johnson, E. J. (1990)). If there is not such a chance of breaking even, generally one would become more risk averse (Thaler, R. H., & Johnson, E. J. (1990)).

Decision Framing

Decision framing shows itself in the formulation of a question. Theory suggests that people prefer a low-risk option in the positive frame and the high-risk option in the negative frame (Tversky, A., & Kahneman, D. (1985)).

Mental Accounting

Mental accounting often makes people think about investments singularly instead of in regards of a full, diversified portfolio, resulting in poor strategic asset allocation (Nofsinger, J. R. (2018)). Mental accounting also shows itself in another version of diversification bias, for example in a retirement plan where one stock fund was offered, and one bond fund was offered, the average allocation would be 50 % stocks and 50 % bonds, but if one more stock fund was offered, 2/3 of the portfolio would be chosen as stocks (Thaler, R. H. (1999)).

Representativeness & Familiarity

Representativeness and familiarity causes people to put too much emphasis on the past, such that thinking that good companies necessarily must be good investments, which is called the representativeness bias, and that companies we are familiar with, are good investments compared to companies we are not, which is called the familiarity – or availability - bias (Kahneman, D., & Tversky, A. (1972); Kahneman, D., & Tversky, A. (1971)).

Social Interaction & Media

Social interaction and investing is the idea that people make decisions based on their social circles and news, which investors tend to react too quickly to, resulting in a herd mentality and a short-term focus which can reduce gain and increase losses (Nofsinger, J. R. (2018)).

Emotions

Emotions in investing results in too much optimism, which makes people underestimate risk and overestimate future performance, which sometimes ends in pricing bubbles, which shows itself both in the stock and housing market (Nofsinger, J. R. (2018); Glaeser, E. et al. (2008)).

Self-Control

Self-control exerts itself in investing in regards of the ability to delay gratification, which means more self-control enables you to focus on the long term instead of the short term (Shefrin, H., & Thaler, R. (1977)). It also exerts itself in regards of all other psychological biases, as someone with

more self-control might be more aware of psychological biases and thus able to act on them (Nofsinger, J. R. (2018)).

Physiology

Last but not least, the physiology of humans also determines investing behavior, as women seem to be more risk averse than men, while people with a higher testosterone level has a higher risk tolerance (Nofsinger, J. R. (2018)).

You have now been given a quick tour on literature within behavioral finance in terms of investments, which will be linked back to in the Discussion part of the project.

Concept Matrix

The concept matrix will show how the literature is used in this project mainly, and will not define *all* concepts used in the specific articles or books, but only relevant to the projects literature review.

Article	Overconfidence	Pride & Regret	Risk Perception	Decision Framing	Mental Accounting	Representativeness & Familiarity	Social Interaction	Emotions & Self-Control	Physiology & Investing	Number of Citations
Nofsinger, J. R. (2018)	X	X	X	X	X	X	X	X	X	483
Barberis, N., & Thaler, R. H. (2002)	X									2002
Alpert, M., & Raiffa, H. (1982)	X									1045
Fischhoff, B. et al. (1977)	X									1681
Bell, D. E. (1982)		X								2933

Thaler, R. H., & Johnson, E. J. (1990)			X							2384
Tversky, A., & Kahneman, D. (1985)				X						17978
Thaler, R. H. (1999)					X					3163
Kahneman, D., & Tversky, A. (1972)						X				5025
Kahneman, D., & Tversky, A. (1971)						X				9469
Glaeser, E. et al. (2008)								X		768
Shefrin, H., & Thaler, R. (1977)								X		2694

Methodology, Research Design & Logic

General Approach, Ontology & Epistemology

In general, when looking at research philosophy, we are looking at something grounded in so called ontological and epistemological philosophies in order to build knowledge within certain areas (Saunders, M. et al. (2009)). When talking about ontology, what is meant is what is described as the fundamental nature of a studied phenomenon, while epistemology is described as acceptable knowledge within a specific field (Saunders, M. et al. (2009)). No single philosophy seems to

describe the problem in hand by itself, as this project looks toward a more practical view of consumer behavior, which means concepts and methods that are practical in nature are of utmost importance to answer the given research question. The baseline for the project is thus not only positivist or interpretivist philosophies, but instead pragmatism as a philosophy (Saunders, M. et al. (2009)). Pragmatism is described in a way that multiple ontological approaches are used and that researchers can use whichever procedures, methods and techniques that finds the correct solution to a problem (Saunders, M. et al. (2009)). The justification behind going this way for this project is that, as the literature does not give us a good answer to our research question or help us understand the possible different characteristics of digital investment platforms, we have to first derive these characteristics from industry experts, and thereafter test on a population. But as we are only testing a certain population in a certain time-period, we would not necessarily know if the results given are the exact definition of truth for other cultures. The project does thus not, due to its pragmatic nature, have the purpose of finding the exact definition of what is true, but is instead a so called proxy for the truth, and if the theory fails it is replaced by a new theory, which proves to be more plausible and productive (Haig, B. D. (2005)). This means that if we work within a pragmatic sphere, we are not working with a static observation of truth, but instead a dynamic, as new data might suggest new conclusions in the future (Haig, B. D. (2005)). The final conclusion of the research question has to be looked upon as an explanatory study, as the conclusion will come from quantitative data, using conjoint analysis. This is true as we want to test certain characteristics of digital investment platforms on a significant amount of potential customers. But in order to design this conjoint analysis experiment, we have to explore what the main characteristics of digital investment platforms we want to test are. To explore such a thing could be done by doing case studies, secondary data in terms of literature, and/or qualitative interviews with experts (Saunders, M. et al. (2009)). This means that in order to get to the explanatory part of the research design, one first needs exploratory research to figure out the relevant characteristics. Exploratory research is particularly useful if you wish to clarify your understanding of a problem, such as if you are unsure of the precise nature of the problem, which is exactly true for the current situation, where we are looking into what characteristics of digital investment platforms would be most important to test for (Saunders, M. et al. (2009)). The project thus explores which perceived barriers digital investment platform companies believe to exist through semi-structured interviews. These interviews are thus from an interpretivist point of view, using an inductive approach, as they are subjective to the industry experts, and lay the groundwork of what data to collect afterwards in terms of platform

characteristics and barriers (Saunders, M. et al. (2009)). After a broad collection of data through interviews, the experiment can be created. The experiment will be built upon a deductive approach, as we are basically trying to deduct a hypothesis from the subjective knowledge of our interviewees, where we want to see if we can explain a causal relationship between the variables, i.e. the characteristics of the platform, and an either positive or negative outlook toward a platform with specific characteristics. At last, the project is looking at cross-sectional studies, instead of longitudinal, as we want to find out the reasons people do not invest in current times, as reasons could change over time and be different in different countries. To conclude, the best way to conduct this project seems to be using mixed-methods, with semi-structured interviews as the first part of the research in order to develop the biggest barriers of investment for non-sophisticated investors, to be built into characteristics of digital investment platforms which are then used in an online experiment, using conjoint analysis in order to find a causal relationship between characteristics of digital investment platforms and positive/negative thoughts of these, from a point of view of Danish adults. Following will be given a deeper explanation of the different steps used for mixed-method research in general and for this project as done by Venkatesh et al. (Venkatesh, V. et al. (2016)).

Appropriateness of a Mixed-methods Approach

As our research question entices us to build a holistic view of characteristics of digital investment platform characteristics and investment barriers, especially since we concluded that the area of interest lacks a vast amount of research and is thus very fragmental, a mixed-methods approach seems very appropriate. Since the literature does not provide us with a thorough understanding of barriers to investments and how characteristics of digital investment platforms can help overcome these, we have to derive this knowledge from industry experts before moving on to test these characteristics. A mixed-methods research question is unlike a qualitative or quantitative research question something that include both a quantitative research question and qualitative research question within the same question (Venkatesh, V. et al. (2016); Onwuegbuzie, A. J., & Leech, N. L. (2006)). Such questions also determine which kind of research design should be created and whether data should be collected and analyzed sequentially, iteratively or concurrently (Creswell, J. W., & Tashakkori, A. (2007)). It is possible in mixed-methodology research, especially sequential, to write qualitative and quantitative research questions in such a way that the quantitative research question can be based on the qualitative, and vice-versa (Creswell, J. W. (2009)). The research questions in the given project are created in such a way that the quantitative research questions depend on the results we get from the analyzation of the qualitative research question, collected

through the semi-structured interviews. The main quality of the semi-structured interviews is basically to ensure we will get rid of possible weaknesses, so we don't assume wrong barriers and characteristics in the quantitative part of the study, which is the compensation purpose of a mixed-methods study (Venkatesh, V. et al. (2016)).

Strategies for the Mixed-Method Research Design

Now there has been argued for the appropriateness of the choice of research methodology. Now we have to build the strategy for the research design. In mixed-methodology, it is possible to use either mono-strand or multi-strand design, used from three stages (Venkatesh, V. et al. (2016)):

- Conceptualization (theoretical foundations, purpose and methods)
- Experiential (data collection and analysis)
- Inferential (data interpretation and application)

As we first want to explore the barriers from the industry experts point of view and afterwards test on the population, we have to use a multi-strand design, where we use all of the above three stages. It is thus smartest to build this study using a sequential-qualitative-quantitative research design, as we first want to after a qualitative research question through qualitative interviews, analyze that data and build the quantitative part through the barriers obtained, changed to the characteristics we want to test, and then used in the experiment.

Strategies for Collecting and Analyzing Mixed-Methods Data

The chosen participants in the study were purposively chosen to be Danish digital investment platforms in regard of the qualitative interviews, with mainly robo-advisors, as these platforms often look into how to get non-investors started within investing, compared to more sophisticated trading platforms. We therefor collect the best possible data in terms of industry expert knowledge from our interviews in order to design our quantitative study in the best way possible. In regards of the quantitative data, Danish adults with generally no or a short period of investing experience were chosen/contacted, in order to get the best results in regard of the research question and the population of interest. The data collection strategy for the quantitative study has been chosen to be an experiment in survey form, giving a deep description of the subject at hand and then combining the found characteristics we want to test within different profiles, described in the Measurement parts of the project. The data analysis is based on conjoint analysis, as we can then find importance

of the different characteristics based on the experiment. As mentioned before, there will thus be used a sequential qualitative-quantitative data analysis strategy.

Meta-Inferences from Mixed-Methods Results

In this project, we are looking towards using both inductive and deductive reasoning as we follow the pragmatic approach, described earlier. We first use inductive reasoning to gather the information from the interviewees in the qualitative research, and then deductive reasoning to test the importance of these characteristics through the quantitative research. We then make a generalization from our specific sample of a theoretical population, as done in deductive research (Tashakkori, A., & Teddlie, C. (1998)).

Quality of Meta-Inferences:

To assess the inference quality, we have to examine the design quality first. In Appendix B of Venkatesh, V. et al. (2016) we see different criteria for design quality being:

- Design suitability/appropriateness

The design suitability and appropriateness determines to which degree the methods selected including the research design, are appropriate for answering the research question (Venkatesh, V. et al. (2016)). As we are working with non-conclusive research and want a holistic view as an answer to the research question, using sequential-qualitative-quantitative research seems appropriate.

- Design adequacy

The adequacy for qualitative and quantitative research is determined by the level of quality and rigor to the quantitative part of the study (Venkatesh, V. et al. (2016)). With a sample size of 7 interviews of industry experts and a sample size of 170 respondents with on average little experience within investing, the samples, measures and data collection procedures seems to be of high enough quality.

- Analytic adequacy

In order to answer the research question, a conjoint analysis has been chosen to analyze the quantitative data, which is a thoroughly used measure in marketing studies and in terms of the quality of platforms, which thus enables us to answer the research question at a high level of

certainty, given the population tested. Following the above, we have to assess the explanation quality, which is made up of three areas (Venkatesh, V. et al. (2016)):

- Quantitative and qualitative inferences

Here we have to look at the degree to which interpretations from the two studies follow the relevant findings and are consistent with theory, the state of knowledge in the field and whether they are generalizable (Venkatesh, V. et al. (2016)). This can first be done in the Discussion part of the project.

- Integrative inference/meta-inference

This part consists of three different parts, integrative efficacy, which is the degree which we effectively integrate inferences of the research inquiry into a meta-inference, secondly transferability, to check whether the meta-inferences are generalizable or transferable to other contexts, as well as integrative correspondence, where we see if the meta-inferences satisfy our initial purposes for using the mixed-methodology approach (Venkatesh, V. et al. (2016)). This can also first be done in the Discussion part, but it seems this will hold true as long as the data collection is properly conducted, as is argued for already.

Delimitations

In this project we are trying to figure out the importance of 5 different characteristics for digital investment platforms, in the Danish market. In terms of credibility of research findings, through testing this scenario, would we then be completely sure that this would be the whole truth of the situation? According to research methodology, it is definitely not possible to be 100 % certain that a result is the certain truth, but we can reduce the possibility of getting the answer wrong, by creating our research design in the best way possible (Raimond, P. (1994)). To do this, we must pay deep attention to reliability and validity of the research design and data collection.

Reliability

Reliability means that, to which extent will your data collection and/or analysis procedures ensure that your results are consistent, i.e. can they be replicated (Saunders, M. et al. (2009))? The above can be described using three questions (Easterby-Smith, M. et al. (2008)):

1. Will the measures yield the same results on other occasions?
2. Will similar observations be reached by other observers?

3. Is there a transparency in how sense was made from the raw data?

To answer these questions, we must first understand what is considered threats to reliability in such research. In some literature, there are defined 4 threats in terms of reliability (Robson, C. (2002)).

The first threat is called subject or participant error (Robson, C. (2002)). An example could be if one was studying enthusiasm of employees in regards of their work or employer, they might give different answers Monday rather than Friday, why it might be better to ask them at a more neutral time than the beginning or end of the week (Saunders, M. et al. (2009)). In the case of this survey of characteristics of digital investment platforms, one could regard that people might have different looks on investments dependent on the business cycle, meaning that during a recession it might seem logical that most people might have a more negative outlook on digital investment platforms than during a bull market, if they are not educated in the area. As of the time of this survey, mid-October to end October 2018, the global stock market generally fell a lot for the first time in many years, but not close to the same as during the financial crisis of 2008. I would argue that the markets did not fall enough for the regular person to be more afraid of investments than regularly, although this is merely a guess.

The next and thus second threat to reliability is subject or participant bias (Robson, C. (2002)). An example of this could be in the case of a qualitative interview that interviewees might say what is in the best interest of their company, instead of what might actually be true. This could be seen as a bias in terms of the interviews to collect data for the barriers and characteristics, but as all answers were very alike, as seen in the Results part of the project despite different models of digital investment platforms, it does not seem to be a problem in the interview part. It could possibly had been a problem if questions in regard of the market of digital investment platforms were to be considered for the research question, as one might believe the interviewees would be biased towards their ideas of the size of the market and the positive uses of their platforms. Secondly, a way of getting around this threat is to use anonymized data in a questionnaire, which has been done. The vast amount of participants in the experiment did not work in the investment sector either, as seen in the Results part. But an example of possible issues could be that if many high level consultants would take the questionnaire, they would be biased in terms of their answers as they are not allowed to invest in companies they consult, meaning they would probably be biased towards blind funds. The same could be said for high level executives etc., but to do this, there was a focus on acquiring data from people who generally did not have such high rankings, but to get around this problem, the

participants were given a thorough introduction to the subject, and told to put themselves in a specific situation that makes sense for the project, as written in the first part of the survey, the description of the scenario.

The next two and thus third & fourth threat to reliability is observer error and observer bias (Robson, C. (2002)). An example of observer error could be different people having different ways of asking questions in order to get answers from interviewers. In terms of the interviews, they were all asked the same questions in a semi-structured way by the same person, which should remove this possibility. In regards of the survey, observer bias could be if I formulated the definitions of the characteristics in a way that deemed decisively subjective to my own thoughts, as well as if the description of the survey to respondents was either too positive or too negative. An example would be if I had sent out the survey with a text that investing always has a positive importance on your personal finances, which is why you should take this test, or similar. Then respondents would be biased in a regard that investing was a good thing, instead of a neutral thing. Instead, the survey was sent out with no bias in terms of whether investing is good or bad, the characteristics are described as seen in the experiment description neutrally, without a statement that either a Low or High choice is good or bad, and so on, which ensures unbiasedness. Now we can answer the 3 questions written above:

1. Will the measures yield the same results on other occasions?

I firmly believe the results would be close to the same, if a similar study would be created with the same type of socio-demographic answering the questions. But in my opinion there is no proof that they will be the same if the socio-demographics were vastly different. Since the survey was sent to mostly friends, colleagues, friends of friends, co-students etc., the socio-demographics of the population studied are relatively highly educated and relatively young, as well as relatively male-dominant, see Results. It could be very interesting to see if the same answers would be given by adults with no education, but it was not possible in time of this project deadline to get enough answers of an uneducated population, to find great answers to this question.

2. Will similar observations be reached by other observers?

I believe similar observations would be reached by other observers, if the socio-demographic of the population tested would be the same, but I would also tend to believe that the answers has potential to differ, if respondents were from another country than Denmark, with a different investment

culture, level of wealth and so on. But as this project focuses on the Danish population, it seems the data has a high possibility of being valid as long as the population does not differ too much in terms of the control variables. One must also consider the timing of the research. If other observers would try to find results within the same area during a big recession like the financial crisis of 2008, or in general another part of the business cycle, one would logically think that there might be a possibility of different answers than the conclusion in this study, my guess would be mostly in terms of high risk and time to access savings.

3. Is there a transparency in how sense was made from the raw data?

In the results and discussion part there is full transparency on how there has been made sense from the raw data.

Another question that might arise is, since we have a big interest in getting answers from both a population with or without knowledge of investments, we cannot be completely sure that all respondents had a full understanding of the experiment, as it is somewhat complex. An example could be if a respondent had never heard of a digital investment platform before, did not know anything about investments, there would be a somewhat decent probability that this person might not fully grasp the profiles of the platforms to a full extent. The study was designed in such a way that it was as easy to understand as possible, with definitions and examples of everything, but when working with respondents without expertise within the area, the answers from this population has a possibility of being somewhat skewed. To conclude, the data is only reliable for a socio-economic group close to the population tested in this project, and only as long as we are looking at the Danish market. One cannot be completely sure the answers would be the same given another period within the business cycle of growth or recession. At last, people with no experience or knowledge of investments must be assumed to understand the definitions in the survey at a decent level in order to be able to have reliable data of this population.

Validity

Validity of a study means whether your findings are about what they seem to be, or what you expect them to be (Saunders, M. et al. (2009)). The most important factor is probably whether or not there is a causal relationship between variables tested. Validity often has a big probability of being compromised in qualitative studies due to the reason that researchers have to build interpretations based on their own subjective judgements of the interviewees. As in the article also referred to

before, we see 5 different threats to validity (Robson, C. (2002)): The first is history, in this study it could mean that the perceived quality of the digital investment platforms could be skewed due to recent negative media on such platforms, or a recession as before. If the idea of the study was to collect findings in such a situation, it would make sense, but for a general opinion times would have to be relatively 'normal' to get the best answers. I believe the research design and timing of the project does not create validity issues in terms of history.

The next threat is testing, which could mean if a study was designed together with a company, they might not be happy to design a project that could result in something that could disadvantage them in any way. This project was not built together with any company, although many companies were interviewed, there is no bias in terms of the data collection in this regard.

The next and third threat is instrumentation, which means that a change occurred during the study in a way that the dependent variable was measured (Robson, C. (2002)). This could be in terms of the survey being conducted over too long a time period and thus the business cycle could change or the media could have different focuses that might create a bias in opinion of the respondents. As the survey was only out for 2 weeks, and most answers were within 1 week, it does not seem to be an issue in this particular project.

The next and fourth threat is mortality, which means differential loss of participants across groups (Robson, C. (2002)). As seen in results, most people who opened the survey completed it, and only completed data will be used in the results part, whereas mortality will not be an issue in this project.

The fifth threat is maturation, which means if there were changes in the dependent variable due to normal development processes operating within the subject as a function of time (Robson, C. (2002)). An example in management research could be that events happening during the year could have an effect on management style, meaning answers might be different dependent on the timing (Saunders, M. et al. (2009)). In this study, due to the relatively time-consuming survey, compared to regular surveys with simple answers and less thoughtfulness required, there could be a probability of respondents not answering as seriously at the time of profile 8 compared to profile 1. But using the required conjoint analysis framework to build as few profiles as possible to gain as much information as possible, this is also taken care of in the best way possible.

The sixth and last threat to validity is ambiguity about causal direction. Finding causal relationships is arguably the most important part of research. Thus, if you conduct an experiment or similar, you

have to be sure there is a causal relationship between the variables and that they are significant. In this project, we are looking at importance of characteristics through a conjoint analysis system, which we by the framework of statistical analysis will consider whether are causal or not, which can be seen in the Results part.

Another part of validity is external validity, meaning whether the research is generalizable, i.e. is the research generalizable to all populations (Saunders, M. et al. (2009)). This project is obviously not generalizable to all populations, but only gives a view of the socio-demographic who answered the survey at the current time of the business cycle. Several follow up studies would be required to find out the robustness of the project in hand.

Study 1 – Qualitative Research

Measurement, Data Sources & Collection

Semi Structured Interviews

To explore barriers to investing which have potential to be overcome through characteristics of digital investment platforms, a qualitative approach has been used through interviews with 7 selected interviewees from relevant companies. This has been done to acquire data in regards of determining what challenges the companies themselves perceived as barriers of acquiring new customers with low to no investment experience. According to Saunders, semi-structured interviews allow us to find new insights and meanings, especially within an exploratory stage of a research project, which is exactly what is needed for this paper (Saunders, M. et al. (2009)). The interviews were conducted with a length between 20-40 minutes. The interview with June and Nordnet were conducted in July 2018, and the rest of the interviews were conducted in the beginning of September 2018. Only relevant parts have been transcribed in order to answer the qualitative research question in hand. The reason for this is that the interviewees were asked several questions on their platform in general, marketing possibilities, design, business models and much more, in order to also make sure that there platforms had been built in such a way, that these interviewees of their respective companies, were the most relevant in order to bring us the needed data. Many interviewees considered some information confidential, and as that information is not relevant to our research question, instead of making the thesis confidential, these parts will simply not be transcribed or analyzed. The questions answered could be relevant if the paper was looking to do

case studies of different robo-advisors, but this is not the purpose. Findings from the interview will be coded in order to find out which barriers to investing the interviewees perceive as most relevant, and then find out which were most prevalent and then used in the quantitative study, by being translated into characteristics of digital investment platforms. Following will be given short descriptions of the interviewees and the platforms they have been a part of building.

Jakob Beck Thomsen, SVP Global Head of Customer Engagement, Wealth Management & Head of June, Danske Bank

June is a digital investment platform defined as a robo-advisor built by Danske Bank's innovation department MobileLife. Using June you will be asked different questions in terms of risk profile, financial status etc. in order to be recommended one of their five portfolios, which you can't change unless you deactivate your account and create a new one (June (2018)). The platform allows you to invest for only DKK 100, you can deposit and withdraw your money at any time, although it will take a few days before you receive what you withdraw, unlike a trading platform, where you would be able to sell your investments in real time (June (2018)). Costs are low compared to regular Danish funds and the yearly price is around 0.7-0.74 % (June (2018)). June works with what is called an active overlay, meaning that, although they invest in passive funds, a wealth manager will optimize the portfolio in terms of how you are exposed in regards of geography, asset classes and currencies (June (2018)). Jakob has been Head of June since the idea of the platform emerged and it it thus obvious to use him as an interviewee.

Katie Nordenbøl, Head of Sales & Marketing, Nordnet Bank

Nordnet is a regular brokerage and bank, which means they are not a robo-advisor as the other companies interviewed (Nordnet (2018)). If you use Nordnet you have to build a portfolio yourself and thus requiring more interest and knowledge than a robo-advisor. The reason for interviewing Nordnet is due to their general reputation as a place to start investing, although you will have to acquire more knowledge than you would have to if you used a robo-advisor.

Nikolaj Bomann Mertz, Head of Marketing, NORD.Investments

NORD.Investments is a robo-advisor start-up launched in December 2016, and thus the first robo-advisor in Denmark (NORD.Investments (2018)). They focus specifically on passive investment, without an active overlay which June, one of their main competitors, has (NORD.Investments

(2018)). By answering specific questions, you will be recommended one of their 20 risk profiles with a yearly price of 0.6-0.96 % (NORD.Investments (2018)). They have a minimum first investment of DKK 30.000 and afterwards DKK 10.000, which would seem to make them less desirable for people without a significant income (NORD.Investments (2018)). NORD.investments are to my knowledge the only launched start-up robo-advisor in Denmark per November 2018, while all their competitors are big financial institutions who have implemented such a digital investment platform strategy.

David Frederiksen, Executive Advisor, Business Development, Lead Darwinist, BankInvest

BankInvest has created the digital investment platform Darwin, which is also a robo-advisor, with 4 risk profiles at a price of 0.75-0.9% yearly, and a minimum investment of DKK 1,000 (Darwin (2018)). Darwin works with an active overlay, like June, and can be used if you are a customer at any of the 11 banks and financial institutions using Darwin (Darwin (2018)).

Hanne Birgitte Møller, Director, Jyske Bank

Jyske Bank has implemented a British digital investment platform called MunnyPot, in which you can invest for minimum DKK 2,000 (Jyske Munnypot (2018)). Currently, you have to be a customer at Jyske Bank to use the platform and it works a little differently than the regular robo-advisors described above, as they allow you to set a specific goal for your investments, when you want to hit the goal, risk profile, and then invest in terms of that (Jyske Munnypot (2018)). They have a 5 % commission on positive returns, which none of the other platforms have (Jyske Munnypot (2018)). This is more in comparison with a regular investment or hedge fund, but unlike the other robo-advisors who charge a flat fee.

Mette Harbo Bossow, Director of Indexed Investments, Sparinvest/SparIndex

SparInvest has built SparIndex, which is their robo-advisor, investing in SparInvest's own index funds (SparInvestIndex (2018)). Total yearly cost is 0.63-0.82% and they have only 3 risk profiles if you want to be recommended portfolios, but more if you want to invest in the indexes yourself (SparInvestIndex (2018)). There is a minimum investment of DKK 200 if you want the recommended portfolios, while only investing in passive funds and thus do not have active overlay (SparInvestIndex (2018)).

Daniel Rytz, Product Manager, Nora, Nordea Sweden

Nordea has built the robo-advisor Nora, which will soon be launched in Denmark, and works in the same way as the other robo-advisors, with an active overlay, minimum cost of DKK 100, 5 risk profiles and cost of 0.74-1.02 % yearly (Nordea (2018)). They have been launched in Sweden since 2017 which is the reason for interviewing their Swedish product manager, after a discussion with several Danish Nordea representatives.

Interview Guide

Although all interviews were semi-structured, all companies were asked at minimum the same, following questions:

- How does your platform work?
- Who is your target group?
- How do you currently try to persuade your target group in terms of marketing?
- What have you done in terms of marketing that worked?
- What have you done in terms of marketing that didn't work?
- How do you build your platform to persuade your target group to invest?
- What have you done in terms of platform interface that worked?
- What have you done in terms of platform interface that didn't work?
- How do you educate customers on investing?
- Is it worth educating customers on investing from an earnings perspective?
- What is your perception of why people do not invest?

The reasoning behind the first many of these questions are in order to figure out if the assumption that these companies focus on the right customer group in terms of this project is correct, as well as understanding their perspective of building such a platform. We then dive into marketing and design issues that were deemed confidential by many interviewees and also not necessary to understand to answer the research questions we want to answer. In the end we get to the question in terms of perception of why people do not invest, which relates to the literature review in regards of what behavioral aspects could make them move away from investing. Examples could be, lacking knowledge and thus having a higher probability of facing some of the bad decision making attributes that behavioral finance research has concluded. It is also reasoned that the answers possibly tells us if some of these barriers the interviewees perceive, relate to some of the literature

within the psychology of investing. Only the part of perception of why people do not invest will be transcribed, due to research question relevance.

Results, Analysis & Findings

This section will derive the barriers to investing that the interviewees perceive as being most important to break, in order to get more people involved in investing more of their disposable income, rather than consuming. As written in the measurement part of the project, the interviews are not fully transcribed or coded, but only in terms of relevancy to the qualitative research question. The interviews focused on reasoning behind their platforms, marketing, design and most importantly perceived barriers to overcome for new investors. These barriers will then be turned into characteristics of digital investment platforms we want to test with our experiment, to see which barriers have the largest impact and importance on the choice of using a digital investment platform. Results of the interviews are given below.

Barriers to Investing

Jakob Beck Thomsen, SVP Global Head of Customer Engagement, Wealth Management & Head of June, Danske Bank

The interview which gave the most results was with Head of June, Jakob Thomsen, from Danske Bank. June specifically focuses on how to activate people who have never invested before, "…I spent two years building June and I have been Venture Lead on June which is our first initiative within robo-advisory with the intend to activate people with a savings account who believes it is difficult to begin investing today." Through qualitative interviews with several different types of consumers, June found five barriers to investments. "One, people found it **inflexible** to invest, so people thought if they put in money, they wouldn't be able to get them back before 10-15 years…", "…second, people found it **complex**, they simply didn't know how they should get started with investing…", "…third, people found it **expensive**, which means people didn't believe there was transparency in regard of prices, so it **required a large fortune** to start.", "…fourth, people believed it was **only for rich people**, this might be t**he most important of them all**…", "…the last thing was that people associated investing with **high risk**, something gambling related…". We have thus discovered five barriers from the June interview which were: **Inflexibility, complexity, expensive, only for the wealthy and high risk.**

Katie Nordenbøl, Head of Sales & Marketing, Nordnet Bank

Nordnet differs a lot from the other platforms as they are not giving advisory and thus leaving people to invest for themselves. They therefor focus more on investors who are self-motivated and are eager to learn, which is a different target group than the one described in the June case. They do still discuss the area of why people do not invest: "…but I think the main reason is that people are afraid. **People are afraid to lose money**, you believe you're **not competent enough**, and then you just don't start. I think that's the primary reason.", "…and then people believe they **need a whole lot of money** to invest". From here we see three barriers: The first is that people are afraid to lose money, which is equivalent to the barrier of **high risk**. The second is lack of competency, which is equivalent to the barrier of **complexity**. The third is that people think they need a whole lot of money, which is equivalent to the barrier of investing being **only for the wealthy**.

Nikolaj Bomann Mertz, Head of Marketing, NORD.Investments

NORD.Investments is the first robo-advisor in Denmark, and they focus on more well-educated, rational investors, and thus not complete newcomers, mainly due to the entry cost to use the platform: "we have a high minimum investing both due to branding to be more exclusive, and we are currently not thinking of changing that, but also for practical reasons, as the ETF portfolio we buy can't be bought for less than 30.000 DKK, so first time you invest with us it is 30.000 DKK, and afterwards it is 10.000 DKK." Due to this high entry cost, they perceive their own biggest barrier to be exactly that "M: What are the most typical barriers to investments you hear?", "N: For us specifically it is our **minimum investment**…" Other barriers were also described, "One of the barriers is lack of understanding of investments, a lot of people are afraid of it, they think it's **dangerous**, a lot of people also think it's too **complex**." From the NORD.Investments interview we thus find three barriers: They consider their own high minimum investment a barrier for newcomers, which is equivalent to the barrier of investing being **only for the wealthy**. The second barrier is that people believe investing is dangerous, which is equivalent to the barrier of being **risky**. The third barrier is **complexity**.

David Frederiksen, Executive Advisor, Business Development, Lead Darwinist, BankInvest

The main target group of BankInvest is the younger crowd who is interested in investing for the first time, "the main thought was to attract a younger crowd who wanted to invest, and where there have been barriers in terms of how you even start or **do you have enough money to invest**…"

Outside of that, two barriers were described, “I think there are several things, for some people it can seem very **complex**…” “Then there are those who think they do not have enough money to start and that **investing is only for the wealthy**.” We thus find two barriers which are: Do you have enough money to invest, which is equivalent to investing being **only for the wealthy** and **complexity**.

Hanne Birgitte Møller, Director, Jyske Bank

Hanne Møller mentioned several barriers, “I think it is a lot about **feeling safe and secure** in regards of what you’re doing. Especially when we’re talking stocks, people think there’s a **very high risk**, partly due to the crisis 10 years ago, so **being more liquid** and having things in order in terms of your assets is important.” It is my interpretation that feeling safe and secure is equivalent to being afraid of **high risk**, while being more liquid means the same as **flexibility** in the June case, as liquidity means you are able to sell and buy your assets as often as you want, instead of them being locked in for several years.

Mette Harbo Bossow, Director of Indexed Investments, SparInvest/SparIndex

Mette from SparInvest gave very thorough insights into the history of index funds in Denmark, and in regards of barriers she revealed the following, “…the dialogue we have with our customers is that they want **flexibility**, they **don’t want to think about markets** and so on, they just want to start investing.”, “…as we have seen in our focus group interviews and other things we have done, and some of it is that people sees investing as difficult and **complex**, they think it’s difficult to begin investing, a lot of people also view it as speculation and thus a **high risk** activity.” “…you have to talk into the insecurities and the fear the individual customer has, they think it’s **difficult, risky, complex** and talk towards these areas in order to educate people…“ The first barrier thus seems to be **inflexibility**. The second is “they don’t want to think about markets”, which I interpret as not wanting to dive into the complexity of investing, which is also described in the later quote as simply **complex**. We see the barrier of **high risk** activity, and at last difficulty, which is equivalent to complex.

Daniel Rytz, Product Manager, Nora, Nordea Sweden

Daniel Rytz from Nordea is Swedish and thus mostly looks into the Swedish market, but although it is generally thought that the Swedish and Danish investing cultures are different, he mentions some

of the same barriers as the others, "…the perception of the threshold, when it comes to **how much you need in order to start investing,** and of course it is cumbersome to start investing when you don't know how…", "…people who don't have **large amounts of money** lying around don't think it's for them.", "The perception that it's **complicated** and difficult, might be the biggest hurdles for people to overcome." We thus find two barriers, which are that it is **only for the wealthy** and that it is **complex**.

The barriers have been set up in the following table:

Barrier	Jakob, Danske Bank, June	Katie, Nordnet	Nikolaj, NORD.Investments	David, BankInvest, Darwin	Hanne, Jyske Bank, Jyske Munnypot	Mette, SparInvest, SparIndex	Daniel, Nordea, Nora
Inflexible	X				X	X	
Complex	X	X	X	X		X	X
Expensive	X						
Wealthy Only	X	X	X	X			X
Risky	X	X	X		X	X	

The table shows us that the most mentioned barriers seem to be complexity, followed by risky and wealthy only. I would wonder why cost is only mentioned by Jakob from June, as it seems that robo-advisors tend to focus a lot on lowering the cost compared to other types of investment funds, but they were not mentioned as a barrier so often, while the low cost of the products were though mentioned in non-transcribed parts of the interview, as a competitive advantage when comparing robo-advisors and other types of investment funds.

Characteristics of Digital Investment Platforms

These five barriers will now be emerged into five characteristics of digital investment platforms, in order to test these characteristics in terms of their perceived importance of digital investment platform quality, for the population tested in this project.

Time to Access Savings

As inflexible in the case of the interviews is described such that it means people would like to have the possibility to access their investments in cash, instead of locking the investment up for several years or decades, this characteristic will be called ***Time to access savings***. It is thus hypothesized that if time to access savings is low, the barrier would be broken in terms of attracting people with no investing experience.

Self-Chosen Investments

The second barrier is the complexity, it is interpreted that people do not want to think about what assets to buy as they feel this process is too complex. This barrier will be translated into the characteristic of ***Self-chosen investments***. It is thus hypothesized that if you have a very low amount of self-chosen investments, meaning the platform chooses for you, this barrier will be overcome.

Cost

The third barrier is expensive, which is simply translated into the characteristic of ***Cost***, meaning that a low cost will break this barrier.

Least Amount to Invest

The fourth barrier is described as only for the wealthy. This barrier is translated into the characteristic of ***Least amount to invest***, meaning that if the least amount to invest is low, the barrier will be broken.

High Risk/High Return

The last barrier is high risk, which is simply determined as the characteristic of ***High Risk/High Return***. The high return part of the characteristic is necessary due to framing of the question. If we only used high risk as a characteristic, instead of also considering the higher possible return, we would not be realistic. It is though still hypothesized that a low risk will break the barrier in terms of non-investors, but due to the framing of the characteristic to include high return, there might be a possibility of people being overoptimistic as described in the literature. It is interesting to find out whether this overoptimism will show itself for either people with no investing experience, a lot of experience, both groups, or none at all.

We have now found the five characteristics of investment platforms we want to test in the quantitative part of the research:

- Time to access savings
- Self-chosen investments
- Cost
- Least amount to invest
- High risk/high return.

Study 2 – Quantitative Research

Measurement, Data Sources & Collection

Experiment & Conjoint Analysis Reasoning

After conducting the interviews, the necessary characteristics of digital investment platforms have been found and an experiment is now built as an online survey using SurveyXact, to be analyzed using conjoint analysis, using R. The overall idea of the conjoint analysis experiment is to figure out which of the derived characteristics of platforms evaluates to the highest perception of quality in the eyes of the users who could be described as relatively non-sophisticated investors. Conjoint analysis was first used in 1971 and is often used in terms of consumer preferences for multi-attribute options (Green, P. E., & Rao, V. R. (1971); Green, P. E., & Srinivasan, V. (1978)). It works in such a way that different characteristics are combined in different ways, in order to create a full profile of, in this case, a digital investment platform, meaning that users evaluate the full profile, having a specific combination of characteristics, instead of evaluating single characteristics by themselves. After having evaluated a specific number of profiles, we can calculate the specific weights and preferences based on the answers given by the population tested. By giving the respondents the possibility of evaluating a profile of a digital investment profile, this approach is very outside-in and user-centric, meaning that we can evaluate and build a product in regards of what users tell us they like, as is very used in e-business in general, instead of building something we like and thus believe users might enjoy. This is true as the decision process is close to the assessment of a real product, as the attributes we build would likely be the same as if we were building a real product and having users read about it on the website, or in marketing, of the platform. As mentioned several times, to design a conjoint analysis experiment, first we must find

the characteristics that are most relevant in order to test barriers of investment, which has been done through the industry expert interviews. These characteristics will not only have to describe the most relevant barriers, but will define the whole product in the best way possible, to give users the best impression and understanding of what they are rating. Through the interviews, five main barriers and thus digital investment platform characteristics were developed, which have been used in the conjoint analysis experiment to be tested in terms of their significance of customer interest. As done in several other conjoint analysis studies, binary options were chosen for participants to choose between levels of variables, i.e. high and low options for each characteristic, due to the reason that *"a high state of knowledge is required to receive differentiated results when using a greater number of levels. Besides, using different levels for a variety of attributes can lead to biased results in form of the "number of levels effect"* (Benlian, A., & Hess, T. (2010); Park, C. W., & Lessig, V. P. (1981); Steenkamp, J. E., & Wittink, D. R. (1994); (Verlegh, P.W. et al. (2002); Siegfried, N. et al. (2015)). We thus ensure a simplified decision process and a lot of bias will in this way avoided (Siegfried, N. et al. (2015)). In this project the conjoint analysis has been done in the same way as other studies, using a fractional factorial, orthogonal design (Siegfried, N. et al. (2015); Wittink, D. R., & Louviere, J. J. (1989)). Using a script for conjoint analysis using the aforementioned fractional factorial, orthogonal design, in the statistics program R, which builds the least amount of profiles needed to create the most information possible, 8 different profiles of the combination of the 5 characteristics were created. The experiment for the conjoint study design was conducted through an online survey which was accessible online for 2 weeks. It was shared through mostly Facebook but also LinkedIn, and Copenhagen FinTech's newsletter and received 170 full responses. Only the full responses will be analyzed in the Results section.

Experiment Description

Users were first introduced to the project and afterwards given a description of the scenario:

"Put yourself in the following situation: You are wondering if you should start saving parts of your after-tax income instead of either spending it or saving it through your bank account. You decide to research different digital investment platforms, and thus check out the websites and mobile applications of different such platforms. To evaluate whether you want to start invest savings through specific digital platforms, you will be presented five different characteristics of the platforms. On each of the following pages you will find different combinations of these

characteristics called "profiles", each profile representing an individual platform. On the next pages you will get the explanations of the 5 characteristics."

As written in the description of the scenario, the next parts of the survey were descriptions of the 5 different characteristics, which will now be explained.

Characteristic 1 – High-Risk/High-Return Investments:

When this characteristic is "*High*" it means your investments through this platform will be in products with a high risk of loss of money, but a high probability of a high return of money. *Example:* There is a high probability of earning more than 10 % on your investments per year, but also a high risk of losing the same amount.

When it is "*Low*" it means your investments through this platform will be in products with a low risk of loss of money, but a low probability of a high return of money.

Example: There is a low probability or earning more than 10 % on your investments per year, but also a low risk of losing the same amount.

Note: The reasoning for a high return being more than 10 % is that this is somewhat higher than the average increase in stock price over long periods of time, as an example, the S&P 500 index has grown from $17 in 1928 to currently $2740, which is just about a 6 % annual increase: $17.36 * x^{90} = 2738.31 \Leftrightarrow x = 1.058 \Leftrightarrow x = 5.8\ \%$. Where 17.36 is the price of S&P 500 January 1st 1928, and 2738.31 is the price of S&P 500 November 6th 2018 (S&P 500 Index - 90 Year Historical Chart. (2018)). The above price increase makes 10 % seem relatively high, but not so high that a high risk will always be worth it.

Characteristic 2 – Self-Chosen Investments

When this characteristic is "*High*" it means you will have to choose your investments in financial products such as stocks, bonds, exchange traded funds, and so on, yourself.

Example: You buy products based on your own understanding of whether or not the product will rise in value in the future.

When it is "*Low*" it means that the digital investment platform itself will invest in financial products for you, and thus you do not choose which products to buy

Example: The platform chooses what products to buy, based on general information of your economic situation and other factors.

Characteristic 3 – Least Amount to Invest

When this characteristic is "*High*" it means you need a significant amount of money to invest through the platform.

Example: You can only use the platform if your first investment is 1½ times your monthly after-tax salary, thereafter 15 % of your after-tax salary.

When it is "*Low*" it means you can invest through the platform with a very small amount of money.

Example: You can begin using the platform for only DKK 100, or 13 euro.

Note: Here, high is estimated to be around the same price as NORD.Investments, which is the most expensive Danish robo-advisor, while low is the price as the lowest entry-cost robo-advisors in Denmark. Instead of choosing DKK 30.000 as NORD.Investments use, the price is set to monthly after tax income instead, so there is no bias in terms of income.

Characteristic 4 – Time to Access Savings

When this characteristic is "*High*" it means a long time will have to pass before you can get access to your money, after investing through the platform.

Example: You can first access the money on the platform 5 years after the first investment.

When it is "*Low*" it means you have access to your money in a short period of time, after investing through the platform.

Example: You can always get the money on the platform on two day's notice.

Characteristic 5 - Cost

When this characteristic is "*High*" it means the cost of investing through this digital platform is high.

Example: The cost of the platform is 3 % of your investments, yearly.

When it is "*Low*" it means the cost is low.

Example: The cost of the platform is 0.5 % of your investments, yearly.

Note: A price of 3 % yearly is significantly higher than all of the Danish robo-advisors, which all costs between 0.5-1.5 % yearly, which is the reasoning for the low cost being 0.5 %.

All of the characteristics are defined in such a way, that the High option of all of the characteristics, refers to what the qualitative data has determined to be a barrier of investment for non-investors, which is determined in the results part of the qualitative study. This means that a Low version would, according to the hypothesis built through the qualitative interviews, be the opposite of a barrier of investment for non-investors. Although this is true, it does not mean that a High version by definition is undesirable in general in regards of optimal long term investing, it only means that the subjective opinion of the interviewees were that people who do not invest, would probably perceive a High option of any of these five characteristics as undesirable. High risk/high return might be desirable for people with high risk tolerance. High self-chosen investments might be desirable for people with more knowledge of financial instruments in general, especially those with education, personal interest and work experience within the area of investments. High least amount to invest might not rationally look like it is a more desirable option than a low amount, although a guess would be it could be a desirable option for reasons of feeling exclusive, which is also stated in the NORD.Investments interview, and probably a higher feeling of commitment towards investing. High time to access savings might not seem desirable for people who are afraid of investing, but could seem more desirable for those having a long time view on their personal investments and finances, and also has the ability of helping people who lack self-control with investing properly over a long time period, as they would not be able to take out their investments at a bad time of either a business cycle or their life. High cost seems to be the only characteristic that is not desirable for anyone, if all else is equal. But it is still important to evaluate how high importance cost has, as it would not be a bad hypothesis to believe that some investors might actually find a platform with high risk/return and high cost more desirable than low risk/return and low cost, but obviously not high risk/return and low cost, all else equal. High cost often comes with the selling point that a fund has a higher cost due to the belief they will perform better than the market, but this is not included in the experiment. The importance of cost is thus still very relevant, although all else equal, low cost seems more desirable for anyone.

Conjoint Profiles & Intention to Use

After having read the description of the characteristics, the participants were shown the 8 profiles, one profile at a time, with the different combination of characteristics.

The profiles were defined as such through the conjoint analysis script in R:

Conjoint Profile	1	2	3	4	5	6	7	8
High-risk/High-return investments	Low	High	High	Low	High	Low	High	Low
Self-chosen investments	High	High	High	High	Low	Low	Low	Low
Least amount to invest	High	Low	High	Low	High	Low	Low	High
Time to access savings	Low	Low	High	High	Low	Low	High	High
Cost	High	High	Low	Low	Low	Low	High	High

On each profile, answers to two formulations had to be given a rating:

- *Assuming I have the option to use the platform, I intend to use it*
- *Given that I have the option to use the platform, I predict to use it*

With possible answers being on a scale from 1-7, where 1 = Very unlikely, 2 = Unlikely, …, up until 7 = Very likely:

Very unlikely, Unlikely, A little unlikely, Moderate, A little likely, Likely, Very likely

The formulations of these options are based on theory on intention to use a certain system or platform, as described in former research. In the Technology Acceptance Model, intention to use is defined to be determined by two different factors (Venkatesh, V., & Davis, F. D. (2000)). The first factor is perceived usefulness, which has been defined to mean the extent in which a person believes that using the system (in this case the digital investment platform) will enhance his job performance (in this case personal finances & investments, instead of job performance) (Venkatesh,

V., & Davis, F. D. (2000)). The second factor is perceived ease of use, which has been defined to mean the extent in which a person believes that using the system will be free of effort (Venkatesh, V., & Davis, F. D. (2000)). It is seen in research that perceived usefulness is a dependent variable of perceived ease of use, due to the fact that certain technology will seem easier to use if it is more useful (Venkatesh, V., & Davis, F. D. (2000)). It is shown empirically that in regards of usage intentions, perceived usefulness is a very strong determinant and is thus a great predictor of user acceptance (Venkatesh, V., & Davis, F. D. (2000)). But it seems that the other determinant factor of intention to use, which is ease of use, is not as strong a factor in regards of prediction, as it has not shown as consistent results as perceived usefulness (Venkatesh, V., & Davis, F. D. (2000)). This seems somewhat logical, as a system or platform might be easy to use, but if it is not particularly useful, there would be no reason to use it. The two formulations of Intention to Use in this paper are thus the same as in the referred relevant research and are thus defined as given (Venkatesh, V., & Davis, F. D. (2000)):

- *Assuming I have the option to use the system, I intend to use it*
- *Given that I have the option to use the system, I predict to use it*

Where the word "system" in this project is changed to "platform", as we are not giving users a specific system to use, but instead a digital investment platform. There will not be tested more than these two formulations in regards of the intention to use the platform, the perceived usefulness and the perceived ease of use, due to the intention being the main factor we want to determine. After letting respondents choosing how much they intend to use the different profiles of different combinations of characteristics, a number of control variables were collected in order to explain the behavior of different market groups.

Variables in Experiment

The control variables were:

- *Age, gender, country.*
- *Highest level of education:*
    - *Elementary school, high school, BSc, MSc, PhD or above*
- *Knowledge of investment (possible to choose several options):*
    - *No knowledge, self-taught theoretical knowledge, self-taught practical knowledge, educational theoretical knowledge, professional work experience*

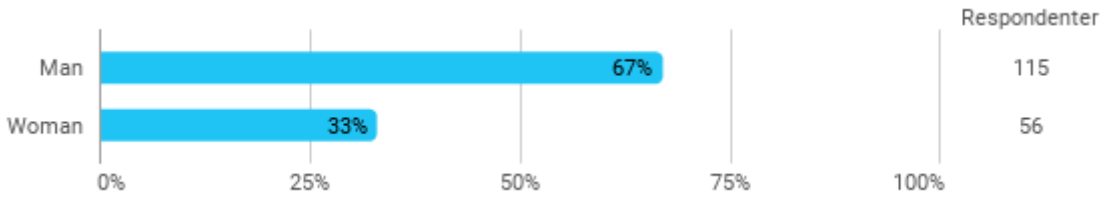
- *How many years of investing experience?*
    - *0 years, 1-5 years, 6-10 years, more than 10 years*
- *Do you work within the investment sector?*
- *Overall, would using a digital investment platform interest you?*

Answers to these variables were collected to ensure analysis possibilities within different market groups in terms of socio-demographics, as well as experience related factors and self-assessments in terms of knowledge of investments. The full theoretical background and thoughts behind the quantitative data collection has now been accounted for, while the full design of the conjoint analysis experiment has been described.

Results, Analysis & Findings

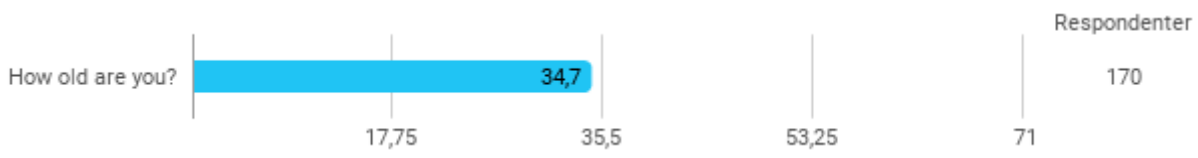
Socio-Demographics of Population

First a short introduction of the demographics of the participants will be described. A total of 170 people fully finished the survey, and only these fully finished attempts will be analyzed. 67 %, equaling 114 respondents were men, while 33 %, equaling 56 respondents were women, as seen in the following graph. For some reason the graph from SurveyXact shows 115 men, which is untrue. The Excel data file uploaded shows 114 respondents were men, when variable s_18 equals 1.



Gender distribution

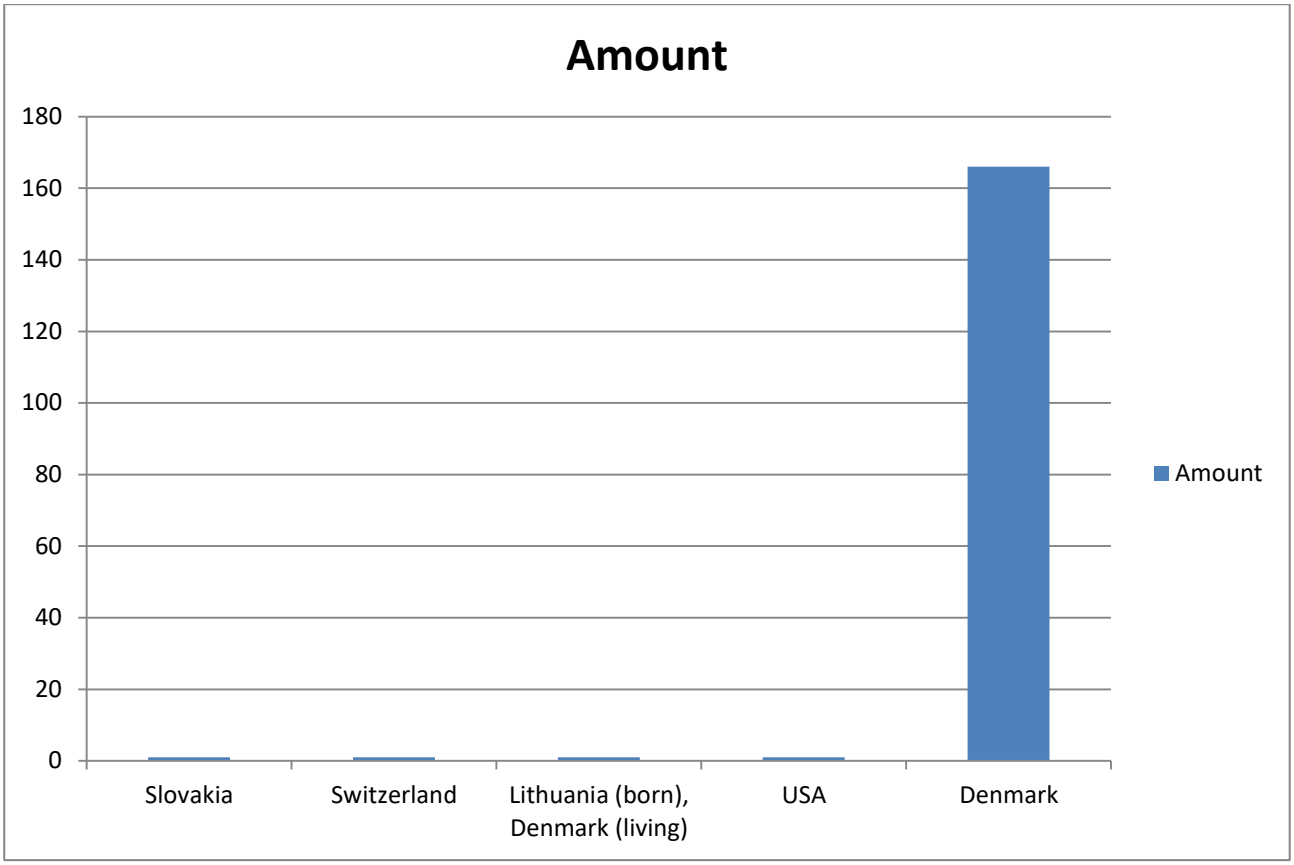
There was an average age in years of 34.7.



Average Age

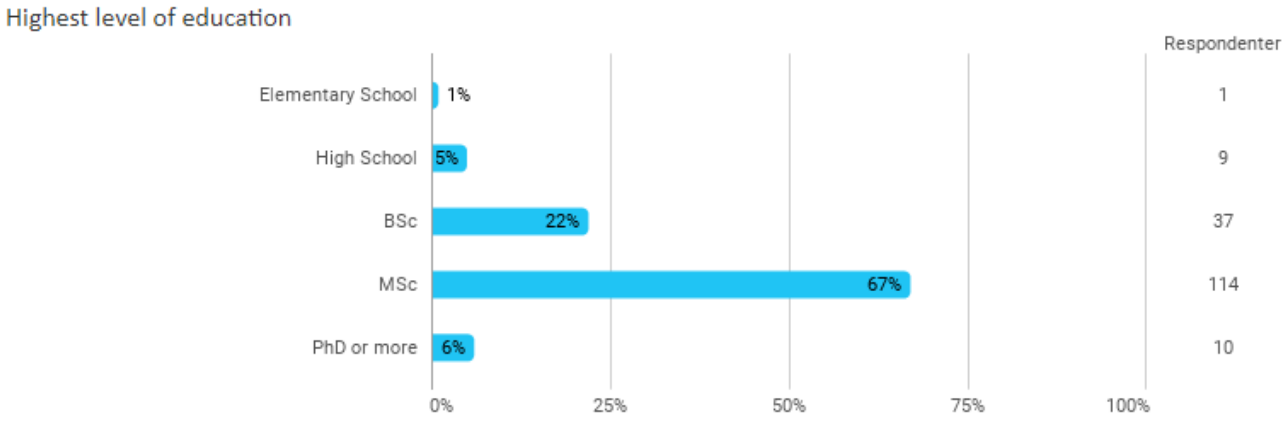
Country of origin included one from Switzerland, one from Lithuania living in Denmark, one from USA, one from Slovakia and 166 from Denmark. It is not known whether the American, Slovakian

and Swiss live in Denmark. Respondents had to write their country in text instead of a list of choices, which is why these data were coded into Excel and built into histogram, with all spellings of Denmark changed to a single version.



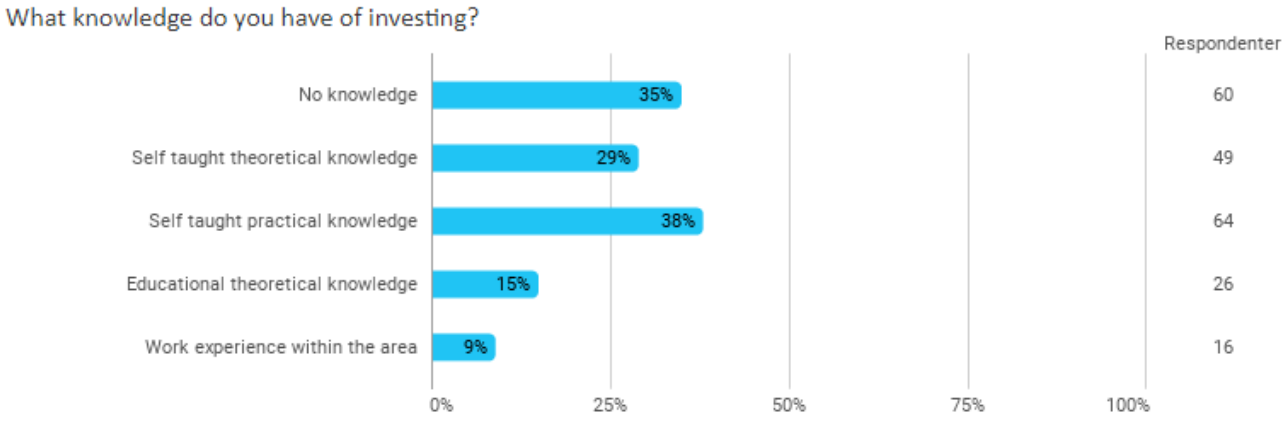
Country of Origin

The level of education was mainly very high, probably due to the survey mostly being sent to people within the network of the researchers' job, friends and co-students, with 1 only finishing elementary school, 9 high school (5 %), 37 BSc (22 %), 114 MSc (67 %), and 10 PhD (6 %). This of course makes us unable to understand answers from an uneducated population, which might give different results.



Educational Level Distribution

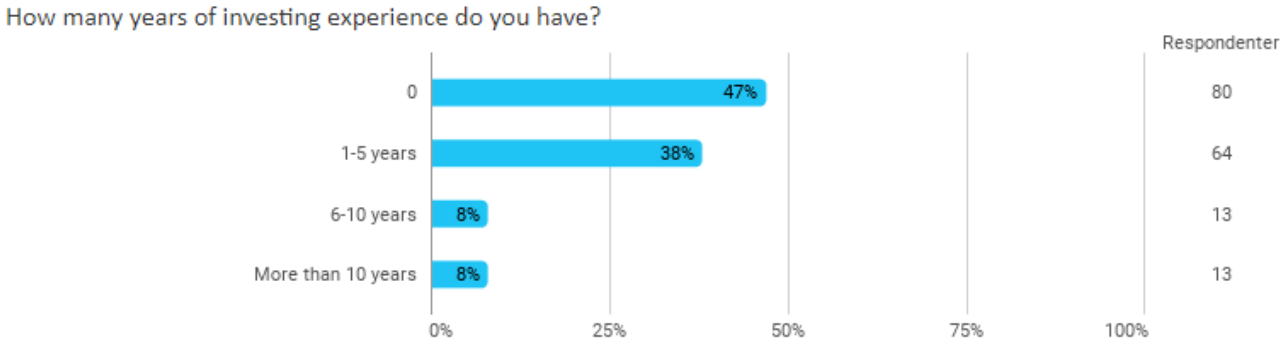
In terms of knowledge of investing, 60 people (35 %) considered themselves to have no knowledge at all, 49 people (29 %) considered themselves to have self-taught theoretical knowledge, 64 people (38 %) self-taught practical knowledge, 26 people (15 %) educational theoretical knowledge, but only 16 people (9 %) had work experience within the area of investing.



Knowledge of Investing

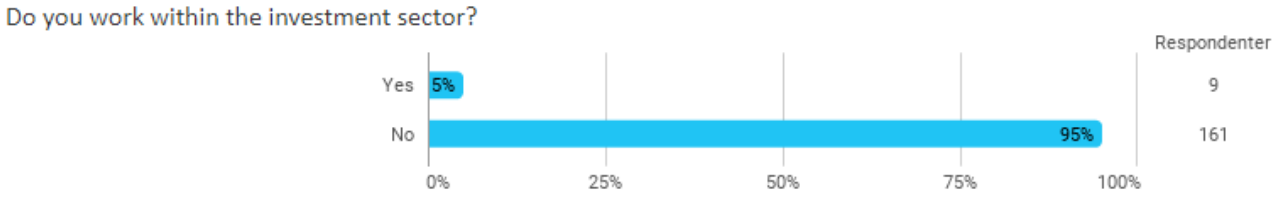
Although we got the above results, we see something interesting in the next responses. Only 35 % deemed to have no knowledge of investing, but a full 47 %, 80 people, have 0 years of investing experience. This leads us to think that even though one might have some knowledge of investing, it does not mean they have actually started investing their own money. 64 people (38 %) had 1-5 years of investing experience, while 13 people (8 %) had between 6-10 years, as well as 13 people (8 %) with more than 10 years of experience. We thus see that the survey respondents consists of 144 people (85 %) with less than 5 years of investing experience, which seems like a very good

subject group to analyze people with no or little investing experience and how to build platforms in order to help them overcome barriers of investing.



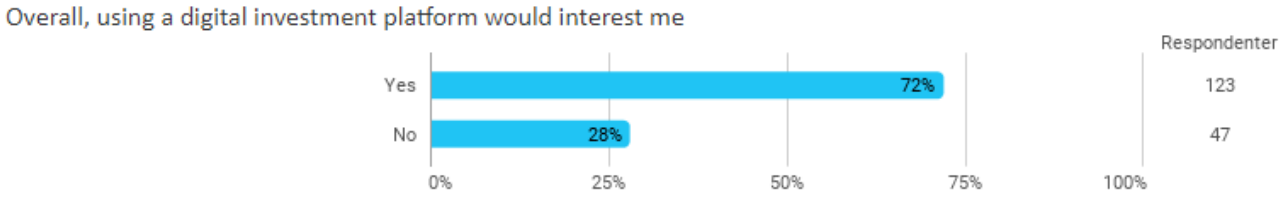
Investing Experience

Only 9 people (5 %) of respondents worked within the investment sector, while the rest, 161 people, did not.



Current Job

Last but not least, 123 respondents (72 %) found using a digital investment platform interesting, while 47 respondents (28 %) did not.



Interested in Platform

Now we have taken the demographics into account, and following will be the conjoint analysis of relevant groups of respondents. The groups of respondents to be analyzed are:

- The full population
- Women/men
- No knowledge/knowledge

- No experience/experience
- Age >34.5/age <34.5
- Not interested in digital investment platform/interested in digital investment platform

Analysis of different levels of education could also be interesting, but since less than 6 % of the respondents (10 respondents) do not hold at least a bachelor degree, this sample size is simply too small to get decent results from. All conjoint analysis are calculated in R, using the conjoint function as described in Measurement, and the code used for all the data can be found in the Appendix.

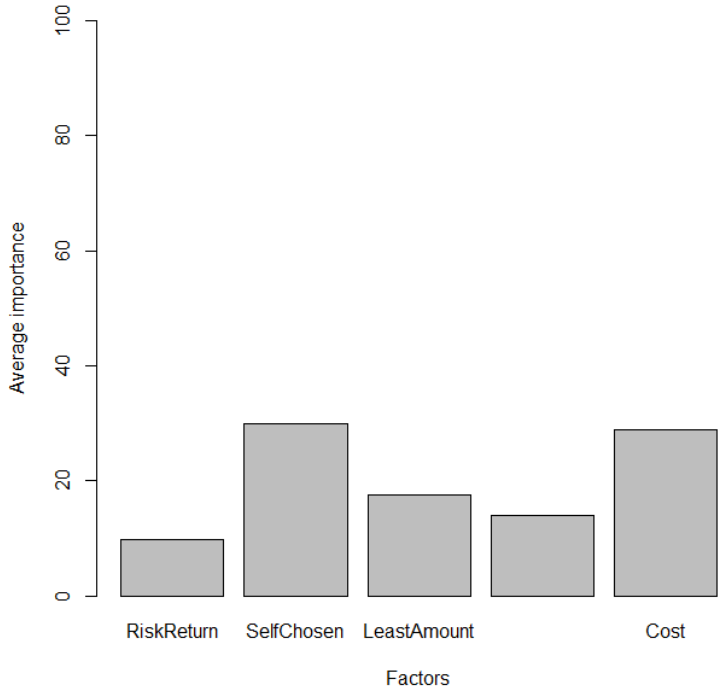
Conjoint Analysis - Full population

First we look into the most important part of the results, namely the full population of the respondents. Let's take a look at the conjoint analysis from R:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,8926 -1,4812 -0,1247  1,4012  4,5188

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)            3,0008824  0,0345108  86,955  < 2e-16 ***
factor(x$RiskReturn)1 -0,0777941  0,0345108  -2,254   0,0243 *
factor(x$SelfChosen)1  0,2638235  0,0345108   7,645 2,95e-14 ***
factor(x$LeastAmount)1 0,2439706  0,0345108   7,069 2,00e-12 ***
factor(x$AccessTime)1  0,0008824  0,0345108   0,026   0,9796
factor(x$Cost)1        0,4608824  0,0345108  13,355  < 2e-16 ***
---
Signif. codes:  0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1

Residual standard error: 1,716 on 2544 degrees of freedom
Multiple R-squared:  0,09069,  Adjusted R-squared:  0,0889
F-statistic: 50,74 on 5 and 2544 DF,  p-value: < 2,2e-16

[1] "Average importance of factors (attributes):"
[1]  9,82 29,86 17,58 13,91 28,83
```

Under coefficients, we see high significance for the characteristics SelfChosen, LeastAmount and Cost while RiskReturn is significant, but with a lower p-value than the former mentioned. AccessTime is insignificant for the full population. The estimates of the coefficients determines whether the population values a high or low version of the characteristics the most, with a positive outcome being the low value as the most popular, and a negative outcome being the high value as the most popular. In the case of the full population, RiskReturn is the only significant value where the respondents tend to prefer a high value, meaning that high risk/return is slightly favored

compared to a low risk/return. SelfChosen, LeastAmount and Cost all have the low value decently favored, while a low cost seems to be chosen more often than the other two characteristics, due to its higher estimate. Last but not least, we get to the most important part, which is the average importance of the characteristics, which are graphed below:



Full Population Importance

For the full population, we conclude that the majority tend to favor that the digital platform chooses the portfolio for you as the most important characteristic, with low cost being almost just as important. Having the option of investing small amounts is the third most important factor, but with average importance of only 17.58 % compared to nearly 30 % for the two more important characteristics, while a high risk/return has the lowest significant importance of 9.82 %. Flexibility in terms of access time is as mentioned insignificant for the full population.

Conjoint Analysis – Gender

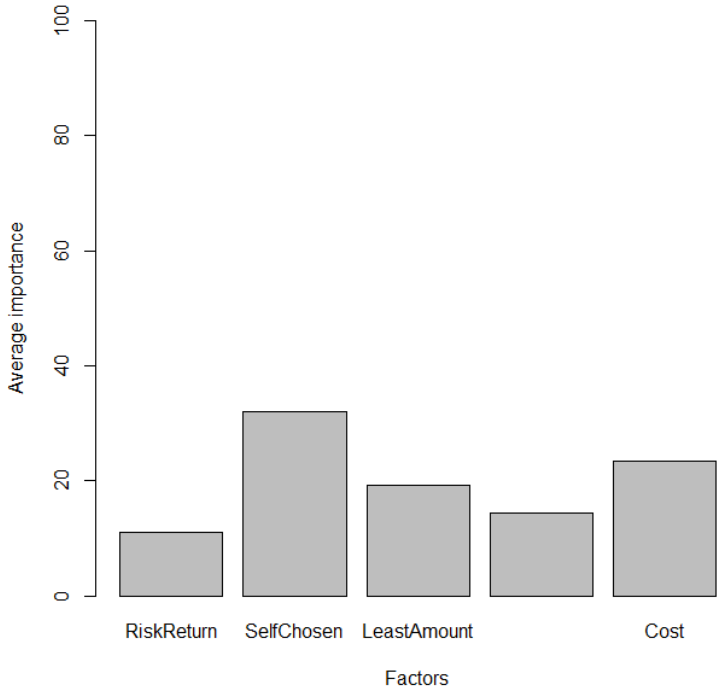
Women

Now let's have a look at the data of only respondents who are women:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,8259 -1,2634 -0,2634  1,1741  4,4054
```

```
Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)              3,10089    0,05962  52,011  < 2e-16 ***
factor(x$RiskReturn)1   -0,09330    0,05962  -1,565 0,117968
factor(x$SelfChosen)1    0,20268    0,05962   3,400 0,000707 ***
factor(x$LeastAmount)1   0,22277    0,05962   3,736 0,000199 ***
factor(x$AccessTime)1    0,07857    0,05962   1,318 0,187907
factor(x$Cost)1          0,31429    0,05962   5,272 1,72e-07 ***
---
Signif. codes:  0 ‘***’ 0,001 ‘**’ 0,01 ‘*’ 0,05 ‘.’ 0,1 ‘ ’ 1

Residual standard error: 1,702 on 834 degrees of freedom
Multiple R-squared:  0,05816,  Adjusted R-squared:  0,05251
F-statistic:  10,3 on 5 and 834 DF,  p-value: 1,347e-09

[1] "Average importance of factors (attributes):"
[1] 11,08 31,97 19,17 14,37 23,42
```

As seen here, it seems RiskReturn and AccessTime are both insignificant for the data of female respondents due to the p-value being too high, which sadly removes the possibility of comparing risky behavior between women and men, which would’ve enabled us to compare these data to the literature. SelfChosen, LeastAmount and Cost are again highly significant with low values being the preferred option for all three. The estimates tell us that low cost has a higher estimate than the rest of the characteristics, but this does not mean it is the most important factor. Let’s have a look at the graph of average importance:



Women Population Importance

Women favor the digital investment platform choosing the portfolio for them at a very high level, at 31.97 %, while cost and least amount to invest are somewhat close on 2nd and 3rd place, with 23.42 % and 19.17 % average importance respectively. RiskReturn and TimeToAccess were both insignificant.

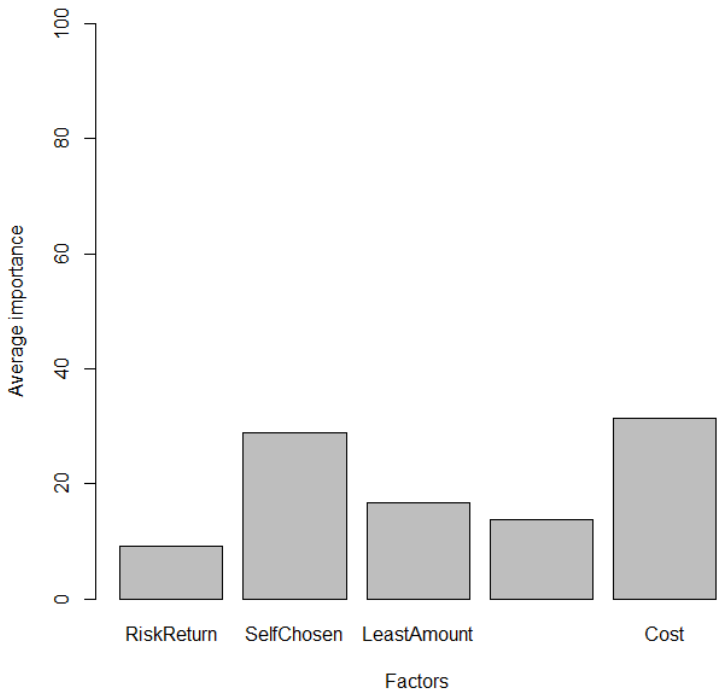
Men

Now let's have a look at the data of only respondents who are men:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,9254 -1,4123 -0,0746  1,4430  4,5877

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)              2,95175    0,04221  69,931  < 2e-16 ***
factor(x$RiskReturn)1   -0,07018    0,04221  -1,663   0,0966 .
factor(x$SelfChosen)1    0,29386    0,04221   6,962 4,77e-12 ***
factor(x$LeastAmount)1   0,25439    0,04221   6,027 2,05e-09 ***
factor(x$AccessTime)1   -0,03728    0,04221  -0,883   0,3772
factor(x$Cost)1          0,53289    0,04221  12,625  < 2e-16 ***
---
Signif. codes:  0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1

Residual standard error: 1,719 on 1704 degrees of freedom
Multiple R-squared:  0,1117,   Adjusted R-squared:  0,1091
F-statistic: 42,87 on 5 and 1704 DF,  p-value: < 2,2e-16
```

```
[1] "Average importance of factors (attributes):"
[1]  9,20 28,82 16,80 13,68 31,49
```

Again, SelfChosen, LeastAmount and Cost are highly significant, with RiskReturn being only significant at the smallest allowed level. AccessTime is yet again insignificant. As seen by the estimates, men very often prefer low cost. Let's see the graph of average importance:



Men Population Importance

As seen, low cost is the highest valued characteristic by men with average importance of 31.49 %, just about equal to the value women put on a low amount self-chosen assets. A low amount of self-chosen assets is though still very important to men, almost as important as cost, with an average importance of 28.82 %. Being able to invest small amounts comes in at 3rd place at 16.8 % while a high risk/return is the least important significant factor for men at 9.2 %.

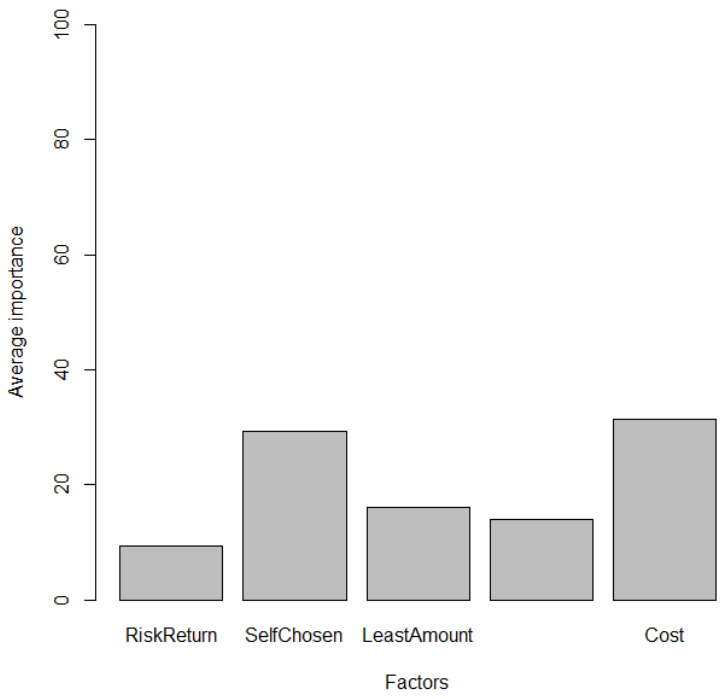
Conjoint Analysis – Knowledge Levels

Knowledge

Let's look at the numbers for the respondents who answered that they had either self-taught, educational or professional knowledge within investments. Note that this is not by definition the same as practical experience.

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,9114 -1,4082 -0,2341  1,3568  4,5918

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3,02682    0,04334  69,845  < 2e-16 ***
factor(x$RiskReturn)1 -0,08227    0,04334  -1,898   0,0578 .
factor(x$SelfChosen)1  0,21523    0,04334   4,966 7,53e-07 ***
factor(x$LeastAmount)1 0,21636    0,04334   4,993 6,59e-07 ***
factor(x$AccessTime)1 -0,01068    0,04334  -0,246   0,8053
factor(x$Cost)1        0,54591    0,04334  12,597  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0,001 ‘**’ 0,01 ‘*’ 0,05 ‘.’ 0,1 ‘ ’ 1

Residual standard error: 1,733 on 1644 degrees of freedom
Multiple R-squared:  0,1028,   Adjusted R-squared:  0,1001
F-statistic: 37,68 on 5 and 1644 DF,  p-value: < 2,2e-16

[1] "Average importance of factors (attributes):"
[1]  9,33 29,23 16,05 14,05 31,34
```

Here, low values of SelfChosen, LeastAmount and Cost are highly significant, with high RiskReturn being somewhat significant. Low cost proves to have the highest estimate but also to be the most important characteristic of digital investment platforms according to the group of self-perceived knowledgeable respondents, which is also seen in the graph of average importance:



Knowledgeable Population Importance

As seen, low cost and low self-chosen assets have the highest importance, of respectively 31.34 % and 29.23 %, with the possibility of investing small amounts being 16.05 % and high risk being the least significant characteristic with 9.33 % average importance.

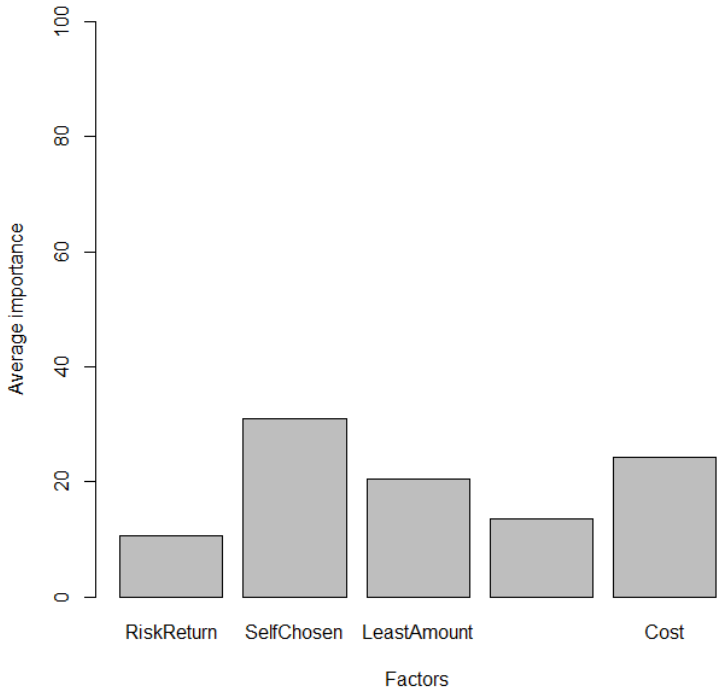
No Knowledge

Let's look at respondents with no knowledge of investing:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,8583 -1,6150 -0,3433  1,3183  4,3850

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)           2,95333    0,05656  52,212  < 2e-16 ***
factor(x$RiskReturn)1 -0,06958    0,05656  -1,230    0,219
factor(x$SelfChosen)1  0,35292    0,05656   6,239 6,78e-10 ***
factor(x$LeastAmount)1 0,29458    0,05656   5,208 2,37e-07 ***
factor(x$AccessTime)1  0,02208    0,05656   0,390    0,696
factor(x$Cost)1        0,30500    0,05656   5,392 8,92e-08 ***
---
Signif. codes:  0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1

Residual standard error: 1,671 on 894 degrees of freedom
Multiple R-squared:  0,08547,  Adjusted R-squared:  0,08035
F-statistic: 16,71 on 5 and 894 DF,  p-value: 8,37e-16
```

```
[1] "Average importance of factors (attributes):"
[1] 10,72 31,00 20,40 13,65 24,22
```

We here see a somewhat different output than we saw for knowledgeable respondents. SelfChosen, LeastAmount and Cost are again the only highly significant factors, while RiskReturn and AccessTime are not, but we see the value of cost being decisively lower than the other groups, although it is still the second most important factor:



No-Knowledge Population Importance

Having the platform choose your portfolio for you is the most important characteristic for respondents with no knowledge of investments with 31 %, and they also have a higher preference of being able to invest small amounts with 20.4 % importance. Low cost is still important, but not as much as for other groups, as it is only 24.22 % for this group.

Conjoint Analysis – Experience Levels

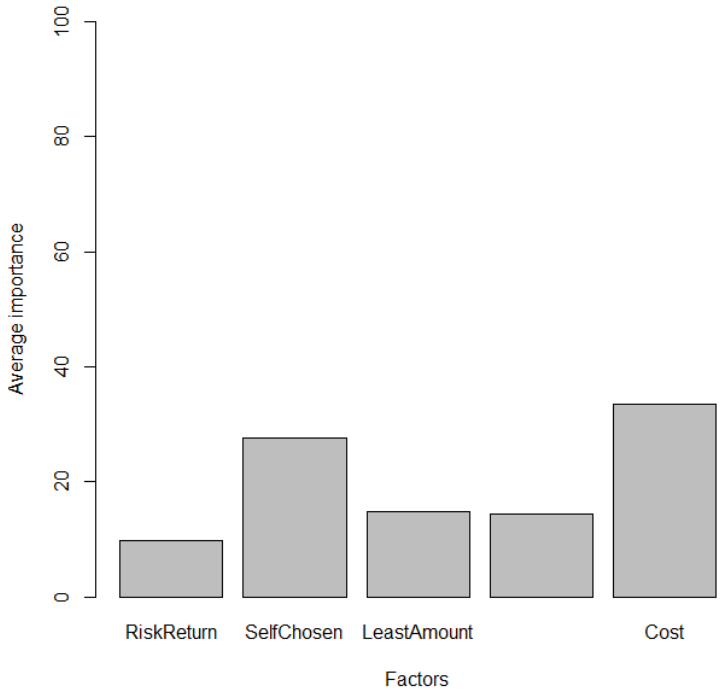
Experience

Now we take a look at the respondents with experience of at least 1 year within investing.

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,8972 -1,3389  0,0333  1,3194  4,6611
```

```
Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3,04861    0,04688  65,027  < 2e-16 ***
factor(x$RiskReturn)1 -0,09861    0,04688  -2,103  0,03562 *
factor(x$SelfChosen)1  0,16806    0,04688   3,585  0,00035 ***
factor(x$LeastAmount)1 0,20694    0,04688   4,414  1,1e-05 ***
factor(x$AccessTime)1 -0,01806    0,04688  -0,385  0,70021
factor(x$Cost)1        0,59028    0,04688  12,591  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0,001 ‘**’ 0,01 ‘*’ 0,05 ‘.’ 0,1 ‘ ’ 1

Residual standard error: 1,696 on 1344 degrees of freedom
Multiple R-squared:  0,1157,   Adjusted R-squared:  0,1125
F-statistic: 35,18 on 5 and 1344 DF,  p-value: < 2,2e-16

[1] "Average importance of factors (attributes):"
[1]  9,68 27,65 14,87 14,32 33,48
```

For experienced investors, the highly significant characteristics are low SelfChosen, LeastAmount and Cost, while high RiskReturn again is more significant than the previous groups. Low cost is decisively the most important factor for the experienced investor:



Experienced Population Importance

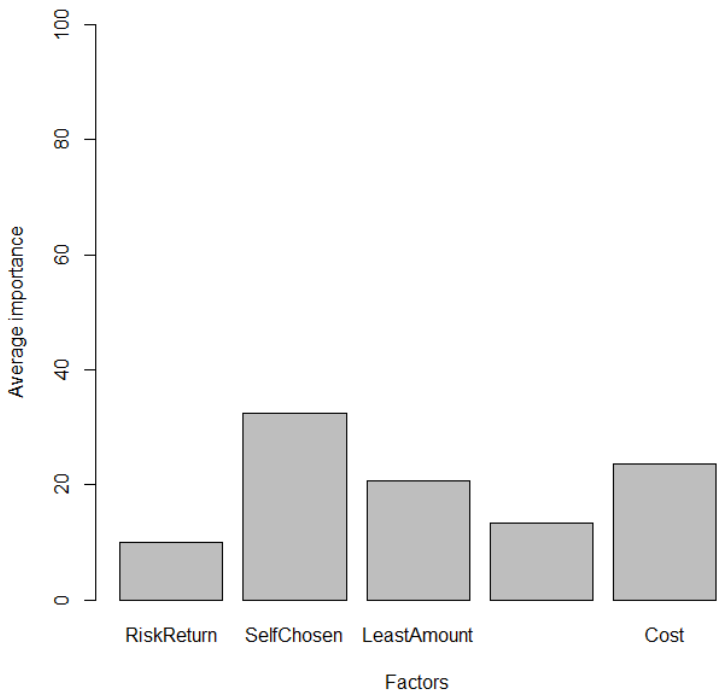
As we see, low cost is as high as 33.48 % of average importance, with low self-chosen investments being in 2nd place with 27.65 % average importance. Being able to invest small amounts is 14.87 % and a high risk/return is 9.68 %.

No Experience

Now we look at the respondents who have no experience at all investing:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,8875 -1,6225 -0,3212  1,3587  4,3775

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)             2,94719    0,05042  58,453  < 2e-16 ***
factor(x$RiskReturn)1  -0,05437    0,05042  -1,078    0,281
factor(x$SelfChosen)1   0,37156    0,05042   7,369 3,19e-13 ***
factor(x$LeastAmount)1  0,28563    0,05042   5,665 1,84e-08 ***
factor(x$AccessTime)1   0,02219    0,05042   0,440    0,660
factor(x$Cost)1         0,31531    0,05042   6,254 5,57e-10 ***
---
Signif. codes:  0 ‘***’ 0,001 ‘**’ 0,01 ‘*’ 0,05 ‘.’ 0,1 ‘ ’ 1

Residual standard error: 1,72 on 1194 degrees of freedom
Multiple R-squared:  0,08466,  Adjusted R-squared:  0,08083
F-statistic: 22,09 on 5 and 1194 DF,  p-value: < 2,2e-16

[1] "Average importance of factors (attributes):"
[1]  9,98 32,35 20,64 13,44 23,60
```

Only low SelfChosen, LeastAmount and Cost are significant for respondents with no experience, having low SelfChosen as the most important factor:



Non-Experienced Population Importance

Letting the digital platform choose the portfolio is of very high importance to respondents without experience, with importance of 32.35 %, being able to invest small amounts is almost as important as cost, as they are respectively 20.64 % and 23.6 %.

Conjoint Analysis – Age

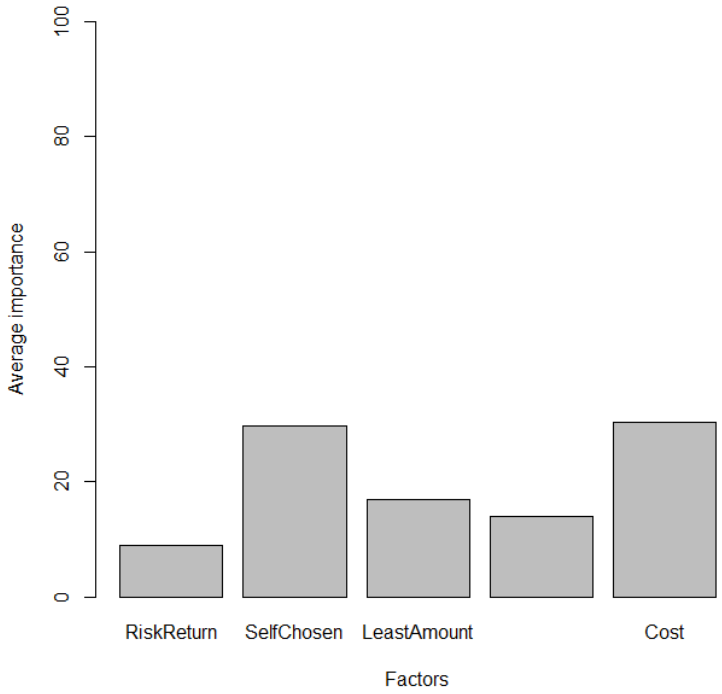
Age younger than 34.5 years

Let's now look at respondents with age less than 34.5 years old:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,9901 -1,4789 -0,1307  1,4200  4,5211

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            3,00866    0,04247  70,849  < 2e-16 ***
factor(x$RiskReturn)1 -0,06042    0,04247  -1,423    0,155
factor(x$SelfChosen)1  0,28629    0,04247   6,742 2,14e-11 ***
factor(x$LeastAmount)1 0,26546    0,04247   6,251 5,14e-10 ***
factor(x$AccessTime)1 -0,01985    0,04247  -0,467    0,640
factor(x$Cost)1        0,50998    0,04247  12,009  < 2e-16 ***
---
Signif. codes:  0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1

Residual standard error: 1,729 on 1704 degrees of freedom
```

```
Multiple R-squared:  0,1055,   Adjusted R-squared:  0,1029
F-statistic: 40,21 on 5 and 1704 DF,  p-value: < 2,2e-16

[1] "Average importance of factors (attributes):"
[1]  8,97 29,81 16,94 13,95 30,33
```

The younger crowd finds low SelfChosen, LeastAmount and Cost highly significant, with Cost having the highest estimate, but AccessTime and RiskReturn insignificant. In terms of importance:



Age < 34.5 Years Population Importance

We see that low cost and having the platform choose assets for you are basically equal in importance, at close to 30 % each, while the ability to invest small amounts is the least important significant factor at 16.94 %.

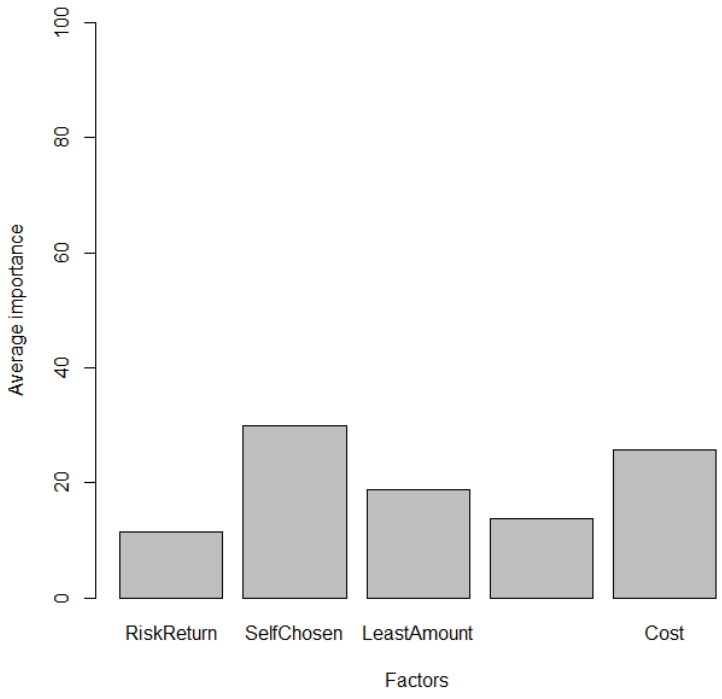
Age older than 34.5 years

Let's look at the respondents older than 34.5 years:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,6942 -1,4857 -0,1357  1,2375  4,5143

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)          2,98504    0,05914  50,472  < 2e-16 ***
```

```
factor(x$RiskReturn)1  -0,11317    0,05914  -1,913 0,056027 .
factor(x$SelfChosen)1   0,21808    0,05914   3,687 0,000241 ***
factor(x$LeastAmount)1  0,20022    0,05914   3,385 0,000744 ***
factor(x$AccessTime)1   0,04308    0,05914   0,728 0,466568
factor(x$Cost)1         0,36094    0,05914   6,103  1,6e-09 ***
---
Signif. codes:  0 ‘***’ 0,001 ‘**’ 0,01 ‘*’ 0,05 ‘.’ 0,1 ‘ ’ 1

Residual standard error: 1,688 on 834 degrees of freedom
Multiple R-squared:  0,06504,  Adjusted R-squared:  0,05944
F-statistic:  11,6 on 5 and 834 DF,  p-value: 7,424e-11

[1] "Average importance of factors (attributes):"
[1] 11,54 29,95 18,89 13,83 25,79
```

High RiskReturn is again significant at a very small level, while our regulars in low SelfChosen, LeastAmount and Cost are highly significant. Cost has the highest estimate but is seemingly not of highest average importance:



Age > 34.5 Years Population Importance

Having the platform build your portfolio has the highest importance of 29.95 %, while low cost comes at an importance of 25.79 %. The ability to invest small amounts has an average importance of 18.89 %, while high risk/return is the least important at 11.54 %.

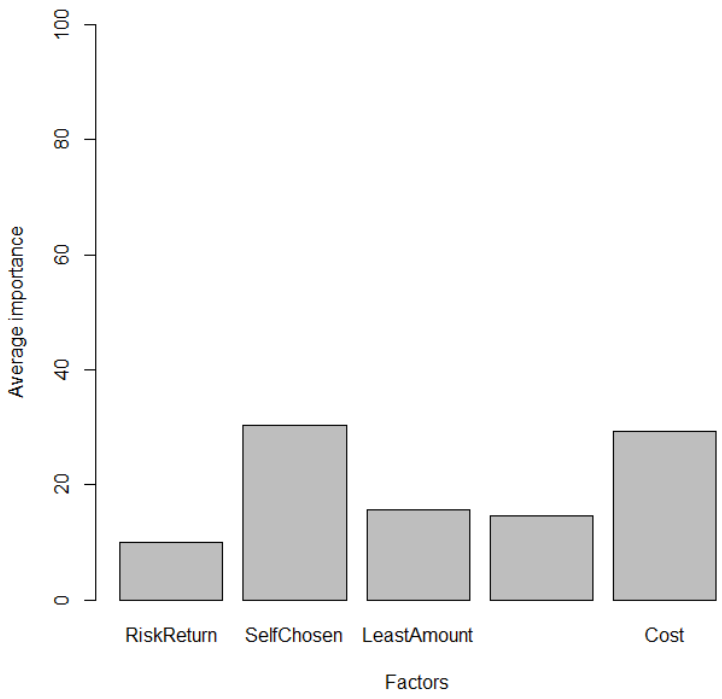
Conjoint Analysis – Digital Investment Platform Interest

Interested in Platform

Looking into the data of those who are interested in a digital investment platform, we get the following numbers:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,9980 -1,5756 -0,1886  1,2862  4,4244

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)              3,12419    0,04145  75,381  < 2e-16 ***
factor(x$RiskReturn)1   -0,08618    0,04145  -2,079   0,0377 *
factor(x$SelfChosen)1    0,24878    0,04145   6,003 2,33e-09 ***
factor(x$LeastAmount)1   0,22033    0,04145   5,316 1,19e-07 ***
factor(x$AccessTime)1    0,01138    0,04145   0,275   0,7836
factor(x$Cost)1          0,47947    0,04145  11,569  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0,001 ‘**’ 0,01 ‘*’ 0,05 ‘.’ 0,1 ‘ ’ 1

Residual standard error: 1,753 on 1839 degrees of freedom
Multiple R-squared:  0,08828,  Adjusted R-squared:  0,0858
F-statistic: 35,61 on 5 and 1839 DF,  p-value: < 2,2e-16

[1] "Average importance of factors (attributes):"
[1]  9,94 30,35 15,72 14,62 29,37
```

High RiskReturn is now somewhat significant, while our regulars in low SelfChosen, low LeastAmount and low Cost are highly significant, with low cost having the highest estimate, and an almost shared first place in terms of importance:



Interested in Platform Population Importance

Low cost and low amount of self-chosen assets are about equal in importance, at close to 30 % each. Being able to invest small amounts has an average importance of 15.72 %, while high risk/return is at 9.94 %.

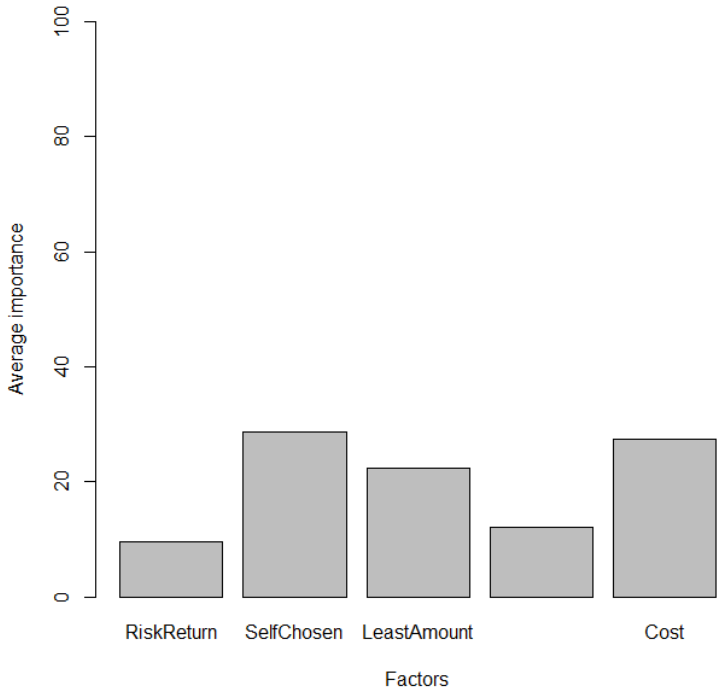
Not Interested in Platform

Last, but not least, we analyze the data of respondents who were not interested in a digital investment platform:

```
Residuals:
    Min      1Q  Median      3Q     Max
-2,6170 -1,2340 -0,2340  0,9362  4,7660

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)            2,67819    0,06021  44,479  < 2e-16 ***
factor(x$RiskReturn)1 -0,05585    0,06021  -0,928    0,354
factor(x$SelfChosen)1  0,30319    0,06021   5,035 6,07e-07 ***
factor(x$LeastAmount)1 0,30585    0,06021   5,080 4,86e-07 ***
factor(x$AccessTime)1 -0,02660    0,06021  -0,442    0,659
factor(x$Cost)1        0,41223    0,06021   6,846 1,66e-11 ***
---
Signif. codes:  0 ‘***’ 0,001 ‘**’ 0,01 ‘*’ 0,05 ‘.’ 0,1 ‘ ’ 1

Residual standard error: 1,574 on 699 degrees of freedom
Multiple R-squared:  0,1077,   Adjusted R-squared:  0,1013
```

```
F-statistic: 16,87 on 5 and 699 DF,  p-value: 9,205e-16

[1] "Average importance of factors (attributes):"
[1]  9,51 28,57 22,46 12,04 27,42
```

We only have the three regulars as significant, low SelfChosen, LeastAmount and Cost, where Cost has the highest estimate. There is some obvious difference between non-interested and interested respondents in terms of importance as seen in the graph:



Not Interested in Platform Population Importance

The respondents who were not interested in a platform had relatively close average importances in terms of the three characteristics, at 28.57 % for small amounts of self-chosen assets, 22.46 % for the option of investing small amounts, and 27.42 % for low cost.

Full Results Analysis

In this section, you can see the full results in the following table:

			Full Population	Women	Men	Knowledge	No Knowledge	Experience	No Experience	Age < 34.5	Age > 34.5	Platform Interest	No Platform Interest
RiskReturn	Estimated Utility	High	0.08	Insign.	0.07	0.08	Insign.	0.10	Insign.	Insign.	0.11	0.09	Insign.
		Low	-0.08	Insign.	-0.07	-0.08	Insign.	-0.10	Insign.	Insign.	-0.11	-0.09	Insign.
	Importance		9.8%	Insign.	9.2%	9.3%	Insign.	9.7%	Insign.	Insign.	11.5%	9.9%	Insign.
SelfChosen	Estimated Utility	High	-0.26	-0.20	-0.29	-0.22	-0.35	-0.17	-0.37	-0.29	-0.22	-0.25	-0.30
		Low	0.26	0.20	0.29	0.22	0.35	0.17	0.37	0.29	0.22	0.25	0.30
	Importance		29.9%	32.0%	28.8%	29.2%	31.0%	27.7%	32.4%	29.8%	30.0%	30.4%	28.6%
LeastAmount	Estimated Utility	High	-0.24	-0.22	-0.25	-0.22	-0.29	-0.21	-0.29	-0.27	-0.20	-0.22	-0.31
		Low	0.24	0.22	0.25	0.22	0.29	0.21	0.29	0.27	0.20	0.22	0.31
	Importance		17.6%	19.2%	16.8%	16.1%	20.4%	14.9%	20.6%	16.9%	18.9%	15.7%	22.5%
AccessTime	Estimated Utility	High	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.
		Low	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.
	Importance		Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.	Insign.
Cost	Estimated Utility	High	-0.46	-0.31	-0.53	-0.55	-0.31	-0.59	-0.32	-0.51	-0.36	-0.48	-0.41
		Low	0.46	0.31	0.53	0.55	0.31	0.59	0.32	0.51	0.36	0.48	0.41
	Importance		28.8%	23.4%	31.5%	31.3%	24.2%	33.5%	23.6%	30.3%	25.8%	29.4%	27.4%

We see no significance of AccessTime in any of the populations. RiskReturn is significant for the full population, although not significant for about half the different populations individually. When significant, a high RiskReturn is preferred compared to a low. For the full population, low SelfChosen and low Cost are most important, with high RiskReturn being the least important significant characteristic. For the genders, men seem to care a lot more about low Cost than women, who care somewhat more about low SelfChosen and low LeastAmount. In terms of knowledge, the respondents with no knowledge found highest importance in low SelfChosen, but not a lot more important than the knowledgeable. They did find the option of investing small amounts more

important than the knowledgeable did, while the knowledgeable cared a lot more about low cost, than those without knowledge. The same results hold true for experienced and non-experienced investors, although the difference spread in importance between experienced and non-experienced investors is somewhat larger than that of knowledgeable and non-knowledgeable. The younger group of age 34 or younger found low Cost more important than the older group, while the older group found the option of small investments a little bit more important than the younger group, although not by a lot. They were about equal in terms of the importance of low SelfChosen, which still had a high importance rate. Those with or without platform interest mainly differed in the importance rate of LeastAmount, where the non-interested cared more about the option of investing small amounts, than the interested group did.

Discussion

Interpretation

The results of the experiment are very interesting, due to them showing differences between different populations, but also as they tell a few unexpected stories. Several interviewees mentioned that they thought the most important barrier to break probably was the one that made people think investing was only for the wealthy, although it was only the second most mentioned barrier. Now, in this study, we do not test the barrier in a way that you need a very high net worth in order to invest, but instead with a minimum investment of 1½ times monthly after tax income, and afterwards 15 % of monthly after tax income. I believe this is pretty high for anyone without a significant net worth, especially when looking at a young population that probably doesn't have a big savings account already. The most mentioned barrier was complexity, which seems to fit the results very well. Complexity was changed into the characteristic of letting the digital investment platform choose your portfolio for you, i.e. if you have a low self-chosen portfolio, your need to understand the complexity of investing is significantly reduced. This was turned into the factor SelfChosen, which for the full population was the most important characteristic at 29.9 % average importance, when having the low value. Outside of the full population, a low level of self-chosen portfolios was the most important factor for women, respondents without knowledge of investing, no investing experience, age 35 or older, and both of the groups that were either interested or not interested in the platform, respectively. My interpretation of the aforementioned results are that in order to attract people who have not invested before, or have low knowledge, the platforms have to

build the portfolio for their users, as is done by the robo-advisor companies, instead of letting the users decide how to build their own portfolio, as is done by the trading platforms. When we look at the other groups than those mentioned before, which are men, people with knowledge of investing, with investing experience and people 34 years old or younger, we see that these groups seem to put the most importance on low cost, quickly followed by a low amount of self-chosen assets. Cost was not mentioned by many interviewees, but it is my perception that the robo-advisor and digital investment platform business was built due to a new focus on low commission, as seen by the introduction of Robinhood, Betterment, and many other American companies that focuses on investing for the younger generation that are new to investing. The focus on cost and commission definitely shows in these results, especially to the groups of men, people with knowledge, experience, and the younger crowd. The interpretation is thus that although the groups of men, experienced and knowledgeable investors care the most about the cost of investing, they still want the digital investment platform to invest for them in most cases, at a level almost as high as the other groups, and close to the same importance level of cost for anyone, but with the largest spread for experienced investors, with 27.7 % importance for low self-chosen, and 33.5 % low cost. This makes sense as you would think experienced investors would be more driven towards choosing investments themselves, than other populations. In general letting the platform choose assets for you is highly important for all groups, with experienced investors giving it the lowest importance at 27.7 % and non-experienced giving it the highest importance of 32.4 %, while all other groups are in between. Again, it would be logical that people with knowledge of investing and experienced investors would rate lowest in terms of low self-chosen portfolios, but instead we see the two groups with lowest (low) self-chosen importance are experienced and men, and not experienced and knowledgeable. Men and the group of knowledgeable respondents are though very close, at 28.8 % and 29.2 %, so the difference is not significant. Cost spans a lot more, from 23.4 % for women to 33.5 % for experienced investors. Although this is true, there is no suggestion that cost is not still very important for all groups, meaning that focusing on low cost will still attract all populations tested in this study. In my opinion, some of the most interesting parts of the results are that there was no suggestion that high risk was considered bad by any groups, on the other hand, for the groups where this factor was significant, a high risk/return was slightly preferred to low risk/return. Some of the reasoning behind this would obviously be the framing of the characteristic risk/return, as it is framed in such a way that you have the possibility of getting a high return if you choose high risk. If the characteristic was formulated in a way that it only considered high risk, but not high

return, we might have seen a different outcome, although this was not tested for and is thus a guess. But it also reveals that the population tested in this survey is not as risk-averse as one might have thought after the interviews and before the quantitative study was conducted. The lesson for the digital investment platforms could be, in terms of removing the barrier of risk, mention high risk together with the possibility of a higher return, when this is not unethical, and based in research. An example of unethical ways to do the above would be overleveraged products that were not very well understood by the seller or buyer, meaning taking big loans to invest in high risk products. At last the barrier of inflexibility, made into the characteristic of low or high access to savings (low/high liquidity), was deemed insignificant in all groups tested, which means according to this study, this factor did not seem like an important barrier to overcome.

In terms of generalizability of the population tested, it must be noted that all groups tested were relatively highly educated, and can thus not be compared to populations with low education levels. For digital investment platforms wanting to use the results of this project, it must be ensured that future research within low educated populations must be done in order to see if the results are relatively equal, or vastly different. But the population tested in this project does give a decent look into highly educated, relatively inexperienced young investors in Denmark, due to the demographics and sample size of n=170, at a confidence level of 95 % and a margin of error of 7.5 % (SurveyMonkey (2018)).

Link to Theory

As mentioned earlier in the project, through the time of the project it has not been possible to find research theory within characteristics of digital investment platforms that enables users with no background in investing to overcome their barriers of beginning to invest. It was though possible to find a significant amount of research within the psychology of investing and behavioral finance, as shown in the literature review. In the theory of psychology of investing and behavioral finance, we looked into the definitions of nine different aspects:

- Overconfidence
- Pride & Regret
- Risk Perception
- Decision Framing
- Mental Accounting

- Representativeness & Familiarity
- Social Interaction
- Emotions & Self-Control
- Physiology & Investing

The question would thus be how do we connect these aspects with the results of the project, and how can digital investment platform use this information to build a better platform in order to attract more customers, but also remove the negative aspects of behavioral finance for ethical reasons and optimal long term investing. Overconfidence would probably show itself best in the factors of RiskReturn and SelfChosen, as overconfidence is correlated with higher risk, as well as overconfidence showing itself when thinking one knows more about the future of specific assets than one actually does, as explained in the literature review (Nofsinger, J. R. (2018)). When looking into RiskReturn, we wouldn't necessarily conclude that people are overconfident, but the data at least suggests that no one group tested is afraid of risk, when it is framed in a way of high risk giving the possibility of high return. We do see a minor difference in the importance of self-chosen assets between most two negating groups (men/women, no knowledge/knowledge etc). In the literature we see that men tend to have greater risk tolerance than women, and the data in this project suggests that men at least show more confidence than women in terms of self-chosen assets, as men have a higher tendency to build their own portfolio than women, although not by a large amount (Nofsinger, J. R. (2018)). Risk was insignificant for women, so we cannot tell the differences between the genders here. Pride & regret is in literature determined by selling profits too quickly and not selling losses fast enough (Bell, D. E. (1982)). Through this data and in terms of digital investment platforms, a way for them to ensure this would not happen, they could increase the time until users will be able to access their money. One might interpret that if users required a very high flexibility, i.e. a low time to access, they would have a higher probability of getting into the situation of pride & regret, but as the data suggests, we do not find significant results in terms of access time and flexibility, outside of interviews. With risk perception we see that risk tolerance increases after big, positive results, while risk aversity increases after big, negative results (Thaler, R. H., & Johnson, E. J. (1990)). In this project one could interpret the reason for low risk not being preferred, could be due to the high market increase the last 10 years, but this is not an obvious causal relation, and is somewhat speculative. But it is indeed very interesting to see high risk being slightly preferred for all populations within the study, making risk seem like a smaller barrier to pass than expected. Decision framing is in regards of the formulation of a question (Tversky, A., &

Kahneman, D. (1985)). In this study it is attempted to define the characteristics in a neutral way where neither the low or high version by definition was good or bad, for anything but cost, as it is difficult to see high cost as a positive unless you are guaranteed better outcome, which we do not have data or literature to suggest is true. This ensures that respondents are as unbiased as possible in terms of their choices. No questions during the experiment tested differences in decision framing, but it could definitely be possible for digital investment platforms to frame questions in different ways, in order to get their users to either invest in the risky or risk-less portfolios. This could be done in an ethical way if they were encountering users with gambling related problems, then the options of investing could be framed in a way that they would tend to take more risk averse decisions. Mental accounting shows itself in diversification bias and poor strategic asset allocation (Nofsinger, J. R. (2018); (Thaler, R. H. (1999)). This would mean in order to get rid of the issue of mental accounting, the digital investment platform in my opinion has to build the portfolio for the users, instead of allowing them to do it themselves. The data from the quantitative conjoint analysis suggests that all groups find this characteristic highly important as well, which is a good reason to implement such a strategy, as is done in the robo-advisory business already. Representativeness & familiarity biases shows themselves when putting too much emphasis on the past and only thinking of investments in terms of familiar companies, which can lead to too little diversification and bad strategic asset allocation (Kahneman, D., & Tversky, A. (1972); Kahneman, D., & Tversky, A. (1971)). These biases can again be taken care off by letting the platform build the portfolio for the investors, which all groups as mentioned found severely important. One might interpret that the reason most people found it important that they did not build their own portfolios, could be that the population tested in this study generally had less than 5 years of investing experience and only perceived themselves to have a small amount of knowledge. If a study was to be done on investors who perceived themselves as very knowledgeable and with a lot of experience, one might have gotten different results. Social interaction in investing means investing in regards of your social group and “heresay”, and is not accounted for in the quantitative data, but can be removed in a digital investment platform by ensuring people do not build their portfolios themselves in regards of assets, which is seen as an important characteristic already by all groups tested (Nofsinger, J. R. (2018)). The same can be said about emotions and self-control, although the time to access savings seems a logical factor to consider in order to remove this mental barrier to rational investing, as a low access time could facilitate people taking out their savings from the investment platform at a time not optimal. Again, time to access was though not found significant in any group, but since

flexibility still seemed to be an important issue for several interviewees, the flexibility might actually put people in a situation of behaving poorly in regards of optimal, long term investing. The literature within physiology and investing tells us that women are more risk averse than men, and that people with higher testosterone have a higher risk tolerance than people with low testosterone (Nofsinger, J. R. (2018)). In terms of gender, risk/return was not found significant for the female population, but we do see differences in terms of a self-chosen portfolio, where men tend to find it less important than women that the digital investment platform builds the portfolio for them, which seems to correlate with the literature. Different outcomes for different testosterone levels are not tested. All in all, we interpret the results as it being most important for digital investment platforms to build their platform solution in such a way that the users do not choose the assets for their portfolio themselves, both in terms of the main and sub-research questions for the quantitative study. A low cost/commission is also of very high importance generally, while all groups also tend to like the option of being able to invest small amounts. At last, there should be implemented different options in terms of risk, such that investors can get portfolios that have either low, medium or high risk, and platforms must remember to frame risk in regard of possibility of high return. Flexibility was insignificant according to the quantitative data, and too much flexibility might hurt the option of optimal returns in the long-run, as I believe it gives a higher probability of users falling into the negative sides of the psychology of investing.

Contribution to Knowledge & Implication to Practice

The study at hand contributes in a way that it can help digital investment platforms realize what characteristics have the highest importance in regards of a user base that is well educated, young (less than 40) and with no- to a small amount of experience within investments, as the vast majority of respondents had 0-5 years of investing experience. Current research within psychology of investing focuses on the situation where people invest and build portfolio's themselves and what pitfalls they might fall into if they do this. Respondents in this study seem to be aware of their lack of understanding of the complex area of optimal portfolio choice, as the most important characteristic of a digital investment platform for the full population, and most sub-groups, is that the digital investment platform chooses the portfolio for the user. From the discussion we interpret the results and literature in such a way that by allowing platforms to build user-portfolios, there is less chance of the users making the mental investment mistakes described. The study as well does not show that high risk is a barrier for the population at hand, as high risk was slightly preferred to low risk, when framed in a way that it gave a higher probability of a higher return as well.

Conclusion

Summary

This study looked into what characteristics of digital investment platforms were of highest importance to a population generally of well-educated people with no or only a small amount of experience or knowledge within investing. Through semi-structured interviews with 6 Danish and 1 Swedish (launched in Denmark shortly after the interview, but interview with a Swede), 5 barriers to investing for non-investors were defined, and built into 5 characteristics of digital investment platforms. These 5 characteristics were tested through a conjoint analysis experiment on 170 respondents. The results suggest that the most important characteristic is that the digital investment platform chooses the portfolio for the users, in the project called "low self-chosen assets", at 29.9 % average importance. The second most important characteristic was low cost at 28.8 % average importance. The third most important characteristic was the ability to invest small amounts of money, in the project called "low least amount to invest", at 17.6 % importance. A high risk/return was the least important significant characteristic, with an importance rate of 9.8 % for the full population. Liquidity/flexibility, either high or low, was seen as an insignificant characteristic through the full, and all sub-populations. Through a literature review of the psychology of investing and the results from the interviews and conjoint analysis, it is concluded that the most important focus of digital investment platforms, in order to relieve users of bad investment choices and living up to the users thoughts of important characteristics, have to focus on the option of building the portfolio for the users, at a low cost and the option of being able to invest small amounts of money.

Future Research & Challenges

In future research it would be interesting to see if focus-group or 1-1 interviews with users would give the same results, as a challenge in the study was the relative complexity of the experiment, especially for people without knowledge of the area. As the interviews were conducted in regards of not only the barriers of investments, but also marketing, design and thoughts behind the platforms (not transcribed due to irrelevancy), the interviews don't go as deep into every single one of the barriers as one could have done, in order to see what everyone thought of every single barrier mentioned were the most important to break, as to then have a better comparison of what the data from the conjoint analysis resulted in, and the interviewees said. In future research, it could also be interesting to get data directly from the different investment platforms, and compare the answers towards the different attributes of the different platforms. This study focused on a population

mainly of highly educated respondents, and future research would have to look into populations of respondents with no or low levels of education, in order to see differences and similarities. Future research could also focus on digital platform characteristics in general, and thus compare to see if these characteristics were possible to attach a digital investment platform in order to attract and maintain a large user base.

Appendix

Interviews

Interview with Jakob Beck Thomsen (J), Danske Bank

By Mads Tingsgård (M), CBS

M: You can start by introducing yourself.

J: My name is Jakob, I am Head of Customer Engagement in Danske Bank, Wealth Management, which means marketing, digital sales and digital platforms, including June. Before that I spend two years building June and I have been Venture Lead on June which I sour first initiative within robo-advisory with the intend to activate people with a savings account who believes it is difficult to begin investing today.

… skip irrelevant parts…

M: Who is your target group?

J: June is first of all a test-platform for us to learn from, a new technology , but also test and see how we can use a full digital platform and how we can learn from users. But what we have tried to do with June is first of all to activate this segment of people with savings that are not invested today, which is a relatively large audience in Denmark currently, on average the danes have around 160.000 DKK on their accounts, which is more than 200 billion DKK, a very significant figure, so what we started with, with June, was first to interview a lot of people, both people with wealth, people without wealth, people with no experience, people with some experience, people with interest in investments, people without interest in investments, to find out which barriers people connect to investing.

From there we found 5 barriers.

One, people found it inflexible to invest, so people thought if they put in money, they wouldn't be able to get them back before 10-15 years, and as they didn't think they would have access to it, it would'nt work as a savings account.

Second, people found it complex, they simply didn't know how they should get started with investing, a lot of people thought you could go down in a kiosk to buy stocks and wouldn't feel comfortable by entering that world at all.

Third, people found it expensive, which means people didn't believe there was transparency in regard of prices, so it required a large fortune and insight to start.

Fourth, people believed it was only for rich people, this might be the most important of them all, people didn't see the relevance for themselves, that even though you didn't have a million DKK on your account, then investing is still relevant for you, as long as you just continuously save money through investments.

So people didn't want to invest at they thought I'm not a millionaire, I don't have CBS education so I shouldn't spend my time doing that.

The last thing was that people associated investing with high risk, something gambling related, which they didn't dare doing, in the sense that they thought there was black and red and you risked your full savings by investing, so they didn't have the diversified thoughts in terms of investing.

Interview with Katie Nordenbøl (K), Nordnet

By Mads Tingsgård (M), CBS

M: First I would like to know who you are and what your occupation at Nordnet is

K: My name is Katie and I am Head of Sales and Marketing. I have been at Nordnet for almost 7 years and started ad responsible of our customer service and around a year ago I was put in sales and marketing.

…skip irrelevant parts…

M: What do you think the reason is that people don't invest, do you talk about that internally?

K: Absolutely, because even though we don't focus on in directly in our marketing communication, then we are interested in doing a difference in making people invest, now it's very hyped and we see more in the media, but I think **the main reason is that people are afraid**. People are afraid to lose money, **you believe you're not competent enough**, and then you just don't start. I think that's the primary reason.

And then **people believe they need a whole lot of money** to invest. When we have events and so on and I discussed with different people, then they say yeah, but I don't have 10.000 DKK I can throw in, but no and you don't need that, you could also start by putting 500 aside every month and then you have a few thousand or 5 you can put them in and invest them, so it's don't think it's because people don't want to, but that they are afraid, that there are some barriers.

Interview with David Frederiksen (D), BankInvest

By Mads Tingsgård (M), CBS

M: Who are you and what is your role at BankInvest?

D: I am responsible for our business development, which means I am developing new products and concepts for our financial institutions and that's why I have also built Darwin which I have been project manager for, where we currently have made the project with 11 financial institutions and 3 data centrals, where it is integrated. My role has been to make it into an app.

…skip irrelevant parts…

M: Who is your target group?

D: the main thought was to attract a younger crowd who wanted to invest, and where there have been barriers in terms of **how you even start or do you have enough money to invest**…

… skip irrelevant parts…

M: What is your perception of why some people don't invest?

D: I think there are several things, for some people it can seem very **complex**, and some might not want to talk with an investment advisor in the bank and thus showing their lack of knowledge within the area. Of course some people are plainly not interested.

Then there are those who think they do not have enough money to start and that **investing is only for the wealthy**.

Interview with Hanne Møller (H), Jyske Bank

By Mads Tingsgård (M), CBS

M: Who are you and what is your role at Jyske Bank?

H: I am director for private at Jyske Bank.

… skip irrelevant parts…

M: What is your perception of why people don't invest and how do you think you can overcome these barriers?

H: There are many people who invest, but also many people who don't. I think it is a lot about **feeling safe and secure** in regards of what you're doing. Especially when we're talking stocks, people think there's a **very high risk**, partly due to the crisis 10 years ago, so **being more liquid** and having things in order in terms of your assets is important. On the other hand it's impossible to get a good return without a little risk, so customers have to weigh these against each other.

Interview with Nikolaj Bomann Mertz (N), NORD.Investments

By Mads Tingsgård (M), CBS

M: Could you please tell who you are and what your role is at NORD.Investments?

N: My name is Nikolaj and I am Head of Marketing at NORD.Investments which I have been for 6 months. I am responsible for growth on our platform.

… skip irrelevant parts…

M: What are the most typical barriers to investments you hear?

N: For us specifically it is our minimum investment, because a lot of people want to start investing. But we have a high minimum investing both due to branding to be more exclusive, and we are currently not thinking of changing that, but also for practical reasons, as the ETF portfolio we buy can't be bought for less than 30.000 DKK, so first time you invest with us it is 30.000 DKK, and afterwards it is 10.000 DKK.

M: What is in your eyes the reasons that some people don't invest?

N: There are those that just aren't in the market of investing, but also in general I don't think Danish people invest a lot, we probably look more towards saving our money on a bank account and then have our pension, and in the old days you could make money off your bank account holdings, but you can't do that today. One of the barriers is lack of understanding of investments, a lot of people are afraid of it, they think it's **dangerous**, a lot of people also think it's too **complex**.

Interview with Daniel Rytz (DR), Nordea

By Mads Tingsgård (M), CBS

M: Who are you and what is your role at Nordea and in terms of Nora?

DR: My Name is Daniel Rytz and I've been part of the product management group and the Nora application since it started 1,5 years ago. My role is sort of co-product manager.

… skip irrelevant parts…

M: What is your perception of why people do not invest and what is your perception of how to change this?
DR: I think basically what we think, our idea is that the threshold is too idea, well the perception of the threshold, when it comes to **how much you need in order to start investing,** and of course it is cumbersome to start investing when you don't know how. So the threshold of going to a branch and sit down with an advisor is taunting, people who don't have **large amounts of money** lying around don't think it's for them.

The perception that it's **complicated** and difficult, might be the biggest hurdles for people to overcome.

Interview with Mette Harbo Bossow (MB), SparInvest

By Mads Tingsgård (M), CBS

M: Who are you and what is your role at SparInvest?

MB: You know my name already, and I am working for SparInvest and SparIndex, which is a part of the SparInvest organization, not a daughter company, but a brand and product within the organization.

My role is to be responsible for sales, advisory and everything in regards of our index-products branded under SparInde, including the launch of the platform sparindex.dk, which is a digital investment platform and robo-advisor.

…skip irrelevant parts…

MB: (during monologue about SparIndex) … the dialogue we have with our customers is that they want **flexibility**, they **don't want to think about markets** and so on, they just want to start investing. But there is also another segment that knows what they want and want to build their own portfolio…

…skip irrelevant parts…

M: Outside of flexibility what is your perception or barriers for people in terms of investing?

MB: Well there are several barriers to why people don't invest, as we have seen in our focus group interviews and other things we have done, and some of it is that people sees investing as difficult and **complex**, they think it's difficult to begin investing, a lot of people also view it as speculation and thus a **high risk** activity. So they think more in regards of risk and less in regards of return, and then I think people feel safe by having their money on their bank account, even though it will be worth less over time due to inflation and the very low interest rate on your bank account holdings.

… skip irrelevant parts…

MB: (monologue on marketing and communication)… you have to talk into the insecurities and the fear the individual customer has, they think it's **difficult, risky, complex** and talk towards these areas in order to educate people…

Code

Following is the code used in R to perform the conjoint analysis:

```
# Multi level full profile conjoint analysis
# Read in file
library(conjoint)
library(xlsx)
data <- read.xlsx(file.choose(), 1)
```

```
conj <- read.xlsx(file.choose(), 2)
lev <- c("LowRiskRet","HighRiskRet","LowSelfC","HighSelfC",
        "LowAmount","HighAmount", "LowAccessTime",
        "HighAccessTime","LowCost","HighCost")
lev.df <- data.frame(lev)
# Get utilities of each attributes for the full model
Conjoint(data[,2:17],conj[2:17,6:10],z=lev.df)
#Get importance of factors
caImportance(data[,2:17],conj[2:17,6:10])
```

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