A qualitative and quantitative comparison between sustainable and non-sustainable robo advisors

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ABSTRACT,

There are many different robo advisors and several different investment strategies that they can employ. These different strategies and their results can be explored and compared to each other.

The robo advisor market has seen a steady growth since its inception. The global focus on sustainable investment practices has also increased during this time. This makes the combination of robo advisors and sustainable investment an interesting and relevant research topic.

Previously, research has been done to compare robo advisors with each other on a quantitative and qualitative base. However, no research has been done that uses a sustainable investment strategy versus a conventional investment strategy as the basis for a quantitative and qualitative comparison between robo advisors.

This research aims to fill this gap by performing a comparison between a sustainable and a conventional robo advisor, Peaks and Finax respectively. Process, content and results are the three aspects that were identified as the framework for the comparison.

The results indicate that there are differences and similarities between the sustainable and conventional robo advisors. However, whether the differences can be attributed to the different strategies cannot be conclusively stated.

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1. INTRODUCTION

1.1 Situation and argumentation

Robo advisors are a growing market, especially for small private investors. They can be an easy way to get started with investing without needing to have much prior knowledge. Robo advisors will generally create or suggest a portfolio to potential investors, which they will then manage as well. Sustainability has been and is an increasingly popular global issue, so socially responsible investing might be becoming more attractive. Socially responsible or sustainable investments are classified as such by using Environmental, Social and Governance (ESG) factors to assess the sustainability of companies. The combination of robo advisors and sustainable investment could help speed up the global shift towards all things sustainable by giving small investors with little investing knowledge a chance to invest in sustainability.

Investing in ESG stocks has been increasing steadily in popularity over the years. Especially in Europe, where 31 percent surveyed investors said ESG played a central role in their investment approach, according to a 2023 study by Capital Group. Furthermore, 93 percent of European investors confessed to considering ESG issues to some degree in their investment approach. North American investors lack behind a bit with 79 percent of investors saying they consider ESG issues to some degree. (Capital Group, 2022) "In recent years, public awareness of environmental, social, and corporate governance (ESG) concerns has grown, resulting in a shift in societal mindset that has changed asset management market circumstances. People have begun to rethink their environmental impact and consider the ramifications of their behavior on society as a whole. Investors and partners are increasingly demanding products that promote environmental protection, or at the very least do not hurt the environment, recognize working conditions, and practice long-term corporate governance."[1]

Bloomberg Intelligence has found that a significant share of assets under management globally can be classified as ESG assets. Total ESG assets grew from $22.8 trillion in 2016 to $30.6 trillion in 2018 to $35 trillion in 2020. As of 2022 there were still no signs of the growth of ESG assets slowing down. Bloomberg Intelligence predicts global ESG assets may surpass $50 trillion by 2025, which would be over one-third of projected total assets under management worldwide. (Bloomberg, 2023)

This shows that both concepts are gaining in popularity. Therefore, the combination of sustainable investing and robo advisors is an interesting topic to explore and this will be done in this research.

1.2 Academic relevance

Robo advisors have been the subject of a good number of studies, although the literature on robo advisors is far from extensive or conclusive. There are studies that explore the current global view of robo advisors, for example a 2021 study that dives deeper into global awareness and market outlook of robo advisors as well as making a country and company-based comparison regarding assets under management. (Canöz, 2021) The performance of robo advisors has also been studied and analyzed. For instance, robo advisors were found to have a superior risk adjusted performance on average compared to conventional funds. (Tao et al., 2021) Furthermore, prior research shows no significant difference in performance of green funds, other socially responsible funds, and conventional funds. (Climent & Soriano, 2011) Numerous studies looking into investors' behavior regarding sustainability and socially responsible investing have also been conducted. (Brunen & Laubach, 2022)

However, literature on robo advisors that make exclusive use of sustainable investments is scarce, just like overall qualitative comparisons of robo advisors. This study will fill that hole and try to give some insight into the process and effectiveness of robo advisors with portfolios consisting of ESG investments compared to robo advisor portfolios without these types of investments.

1.3 Practical relevance

The practical relevance of this study is to give potential investors an idea of what they can expect of robo advisors. If an investor wants to start using a robo advisors, this study will provide them with insights on practical matters, like what the registration process looks like. It will also provide more clarity on what robo advisors offer to their clients and how it is presented.

Furthermore, it will give details about the financial performance of robo advisor portfolios that are made up of only sustainable investments compared to conventional robo advisor portfolios. If positive or neutral results are found for sustainable investment versus conventional investments, this study could serve as another reminder that sustainable investing should be promoted and more awareness should be spread.

1.4 Research objective

The objective is to determine whether robo advisors with portfolios made up of ESG's perform differently from portfolios that do not include ESG's and how their processes and content differ from each other. It is also interesting to figure out how more conservative or risky strategies influence these results. Whether sustainable robo advisors show differences with conventional ones in other aspects is another objective of this research.

Therefore, the following research question was asked.
To what extent do robo advisors that make use of ESG investments differ from conventional robo advisors?
To get a clear picture of the differences between the two robo advisors, three aspects will be looked at. These aspects are process, content and results.
The process aspect focusses on the registration processes of the different robo advisors and on what actions they take during the time of the experiment.
The content aspect deals with which assets the portfolios consist of and why these assets were selected by the robo advisors.
The results aspect reflects the returns of the portfolios after the set amount of time.

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[1] Aich et al., 2021

2. LITERATURE REVIEW

In 2008, Wealthfront and Betterment launched the first ever robo advisors. Since then, many other robo advisors have reached the market and within ten years of entering the market, robo advisors had $200 billion in assets under management worldwide, with all signs pointing towards a continuation of growth.(Agnew & Mitchell, 2019) According to Vanguard, the largest robo advisor in the world, robo advisors can be defined as an online platform that manages investment automatically and where the financial advice comes from an algorithm instead of people.(Vanguard, n.d.)

2.1 Benefits of robo advisors

Robo advisors have some clear advantages over traditional financial advisors. Firstly, robo advisors are very cost efficient, because the process of portfolio allocation and management is completely automated. This means no time or money spent on either the client's or the platform's side.

Secondly, smaller personal investors can also access financial advice through robo advisors, whereas traditional financial advice in person is only reserved for those with significant amounts to invest. Most robo advisors do have some minimum amount required to invest, however this varies from €0 to thousands of euros.

Lastly, the automated algorithms used by robo advisors can be monitored and thus be improved over time. The rational and hardwired way of decision making also makes reviewing and explaining decisions by the robo advisors easier. Through this reviewing process, tweaks can be made to the algorithms that should positively influence the performance of the robo advisors. (D'Acunto & Rossi, 2021)

These benefits make robo advisors a viable and attractive option for a very broad and large group of potential investors. Especially investors with small budgets or little knowledge about investing can make good use of robo advisors, as they are a relatively cheap and widely available sources of personalized investment advice and portfolio management.

2.2 Theory behind robo advisors

Modern Portfolio Theory (MPT) is a framework for selecting investments and building a portfolio. It is based on maximizing the expected returns of a portfolio while minimizing the risks of the investments. (Mangram, 2013) MPT is the investment framework that is most commonly used among robo advisors. (Beketov et al., 2018) Through this method robo advisors create diverse investment portfolios based on the level of risk the investor is comfortable with. The risk level is gauged through several questions.

In this paper I will take a closer look at two specific robo advisors, Peaks and Finax. Like most other robo advisors, Peaks and Finax make use of the modern portfolio theory as an investment framework. Another similarity between the two is that they almost exclusively deal in Exchange-Traded Funds (ETF), which is also typical for most robo advisors. (Park et al., 2016)

2.3 Reasons for socially responsible investing

The choice for socially responsible investing is based on altruistic values, for example environmental concerns, as well as egoistic values, like economic concerns. Although both sides play a significant role, pro-environmental values were found to be a slightly more significant predictor of behavior towards ESG stocks. (Raut et al., 2023)

Different types of institutions and investors have different attitudes and motives for adopting ESG issues into their investment strategy. Research shows that investment institutions and professional investors adopt socially responsible investments based on financial beliefs in their returns. This contrasts with private investors and the beneficiaries of financial institutes for whom self-transcendent or altruistic values are more significant. (Jansson & Biel, 2011)

The E component of ESG encompasses everything to do with environmental issues. This includes what natural resources a company uses and how it does this and the impact of its operations on the environment. The S component considers social issues. This concerns the management of a company's relationships with its staff, its community and the overall political environment. The G component is regarding governance issues. This encompasses how a company is managed, its corporate policies and the rights and responsibilities of stakeholders. (Ansarada, n.d.)

The number of investors the consider ESG factors in their investment approach has been steadily growing. The environmental element enjoys that most focus worldwide. However, the allocation of focus between the environmental, social a governance element differs slightly between world regions. In Europe for example, the social element receives the second most focus, while the governance element holds second place in North America and Asia-Pacific. (Capital Group, 2022)

2.4 Socially responsible investing versus conventional investing

Many studies looking into the performance of socially responsible investing in ESG assets have been conducted. It has been found that sustainable stocks have beneficial effects on otherwise conventional portfolios due to diversification benefits. (Balcilar et al., 2017) Furthermore, socially responsible investments have been found to be preferable over non-socially responsible investment in time of crisis. During crises sustainable stocks perform better than their conventional counterparts and a significant difference in volatility and liquidity can be seen. (Brodmann et al., 2021) Different types of screening approaches for socially responsible investment were also found to have an effect on the returns of portfolios. (Kempf & Osthoff, 2007))

However, results of studies on whether sustainable stocks outperform conventional stocks are mixed. A case study of ESG energy funds shows that ESG funds tended to have slightly lower returns than non-ESG funds in that sector over a five-year period. Yet the researchers claim that there is no statistically significant difference in performance between ESG and non-ESG. (Kuzmina et

al., 2023) Similarly, a comparative study of ESG indices and MSCI indices finds no statistically significant differences in financial results, but labels sustainable assets as a good substitute for conventional assets for diversification of a portfolio.(Jain et al., 2019) A meta-analysis of 85 studies and 190 experiments shows heterogeneous results between socially responsible investments and conventional investments, and indicates that socially responsible investments are neither a strength nor a weakness in portfolios compared to conventional investments.(Revelli & Viviana, 2014))

Many more examples can be taken to illustrate the conclusion that the performance of ESG investments and conventional investment is mostly heterogeneous.
It is expected that the results from sustainable robo advisors compared to conventional robo advisors will not differ from the results already found regarding sustainable versus conventional investing.

2.5 Conceptual framework robo advisors

Although robo advisors have been publicly available for over ten years, relatively little academic research has been done on the topic. Some publications tackle legal or regulatory issues regarding robo advisors. Examples include Fein (2015) who reviewed in detail the terms of the user agreements of three big robo advisors, and Baker & Dellaert (2018) who identified key questions for regulators and capabilities needed to effectively regulate robo advisors.

More publications focus on other practical aspects of robo advisors, like optimal design patterns, financial performance and investor behavior. Rossi & Utkus (2020) investigate what investors are looking for in terms of financial advice, what drives them to seek advice, and how their wants and needs are fulfilled to differing extents by traditional financial advisors and robo advisors.

Furthermore, some studies have been conducted that aimed to compare specific features of different robo advisors. The way robo advisors establish risk profiles of potential investors and how this affects portfolio composition was analyzed by Tertilt & Scholz (2018).

For a more comprehensive way to classify and compare robo advisors, D'Acunto & Rossi (2021) propose a taxonomy that is based on four distinct dimensions. The dimensions are the degree of personalization of the advice, the investor's involvement in the plans and choices made, the discretion the investor must deviate from the given advice, and the availability of human interaction. Using these dimensions allows for segmentation of different models and methods in robo advisors.

However, literature regarding overall qualitative and quantitative analysis of robo advisors is scarce. Helms et al. (2021) did conduct a comprehensive qualitative and quantitative study on several robo advisors in three different markets. For the qualitative comparison, the authors identified eight criteria on which the robo advisors could be assessed: Regulatory requirements, minimum investment required, pricing scheme, number of risk classes, available asset types, portfolio model, risk measure for risk quantification, and type of rebalancing required to maintain risk level. The authors perform econometric analyses applying the nonparametric method of bootstrapping to provide a foundation for quantitative comparability. Yet qualitative and quantitative comparisons of robo advisors with of focus on what differences exist between a sustainable investment strategy and a conventional strategy.

3. METHODOLOGY

Based on dimensions and criteria outlined in previous literature, three categories were identified on which the comparison of two robo advisors will be based. Firstly, the process category entails everything that the investor must and can do with the robo advisor, the interactive aspect. Secondly, the content category deals with the passive aspect of the robo advisors, what they offer the investor. Lastly, the financial performances of the robo advisors will be looked at for the results category.

The selection of the two robo advisors was based on a few criteria. Firstly, the platforms have to allow for investment from The Netherlands. This requirement exists because both the investing and the further research will be done in The Netherlands. Secondly, the minimum amount of investment needed to access the platform has to be €20 or less. This mark was chosen because €20 fitted the personal budget for this study and anything lower would eliminate too many potential platforms. Thirdly, the platform must allow one user to open several accounts, at least two but preferably more. This allows for more data to be collected and more variation. Lastly, one needs to only use ESG assets, while the other does not make use of these types of investments. This is the baseline for the comparison between the two robo advisors.

Through these criteria, the robo advisors by Finax and Peaks were selected for this study. Firstly, both platforms require a low minimum deposit, €1 for Peaks and €20 for Finax. Most other robo advisors that are available in The Netherlands require significantly more to be invested. Secondly, both platforms allow one person to open several separate accounts, three to six, depending on the pricing tier, accounts on Peaks, while Finax allows unlimited accounts per person. Lastly, the two robo advisors were chosen based on their opposite approaches to sustainable investment. Peaks' portfolios only contain index funds that are considered sustainable investments. Finax' portfolios do not contain these types of index funds.

Three accounts will be opened on each platform. Each platform gets one account that adheres to a conversative strategy, one account that adheres to a balanced strategy, and one account that adheres to a risky strategy. The robo advisors will select a portfolio for each account in line with their risk profile with their own stocks-to-bonds ratios, so one portfolio per account.
All six accounts will have €20 deposited on them, which the robo advisors will invest in stocks and bonds according to the chosen portfolios. The progress of these accounts will be monitored over a certain period, but no action will be taken. The two robo advisors will be compared in the aspects of process, content and results.

3.1 Process

To adequately compare Finax' and Peaks' robo advisors, the first aspect that will be looked at is the process. The process aspect contains all aspects that involve active actions by the investor.

Firstly, the registration processes of both robo advisors will be analyzed to get an idea of how long the process takes and how personalized the advice is.

Secondly, the degree to which the investor is and can be involved in the decision-making process of the creation and maintenance of a portfolio.

3.2 Content

The content aspect is the second aspect that will be discussed. This aspect deals with everything that Finax and Peaks offer to all investors.

Firstly, the selection of ETFs that the robo advisors made will be looked at as well as what their reasoning behind the selection was. How they fill out their portfolios with these ETFs is another question that will be answered.

Secondly, all the features and information that Finax and Peaks offer to investors and potential investors will be discussed and compared.

Thirdly, an analysis and comparison between the pricing schemes that the two different robo advisors employ will be made.

3.3 Results

The results aspect is that last aspect of the comparison between Finax and Peaks. This aspect deals with the financial performance of the accounts as well as to what extent the portfolios are actively managed by the robo advisors.

Firstly, the simple returns of all accounts over a period of fifteen weeks will be monitored and noted. Then the weekly average daily returns will be analyzed in terms of measurables like mean performance and standard deviation. Furthermore, two-tailed independent t-tests will be performed to ascertain whether the accounts perform statistically significantly differently. The hypotheses for examining the performances of the Finax and Peaks accounts:
Null hypothesis: There is no significant difference in performance between the two accounts.
Alternative hypothesis: There is a significant difference in performance between the two accounts.

F-tests were performed to determine whether the t-tests were homoscedastic or heteroscedastic. If the null hypothesis is rejected, the t-test must be heteroscedastic. The t-test must be homoscedastic if the null hypothesis is not rejected. The hypotheses for examining the variance of the performances of the accounts:
Null hypothesis: There is no significant difference in the variance of the performances between the two accounts.
Alternative hypothesis: There is a significant difference in the variance of the performances between the two accounts.

How actively the robo advisors manage the portfolios is also part of the results aspect. This will be done by monitoring the asset allocation of each account and noting this weekly. The two robo advisors will be compared on activity and how much the portfolios deviate from the target ratios.

4. RESULTS

Finax was founded in 2017 in Slovakia. The founders were dissatisfied with the Slovak financial sector and the limited range of investment instruments available to ordinary investors. Finax was created to allow anyone to have access to investment tools with a very low barrier of entry and to increase enhance financial literacy. Eastern Europe is the target market as evidenced by the assortment of Eastern European languages in which the website is available as well as by the option to invest with Eastern European currencies. (Finax, n.d.)

Peaks was established in The Netherlands in 2016. It was created to challenge the idea that investing is only for the select few with extensive financial knowledge and large available funds. Peaks is aimed at people in The Netherlands and Germany that want to get started with investing in a simple way with small amounts of money. (Peaks, n.d.)

4.1 Process
4.1.1 opening account

Through differing processes, robo advisors create or link one investment portfolio to one account. Before opening an account on the robo advisor platforms, potential investors must choose what type of account to open.

Finax provides potential investors with ten different account types, separated into four categories. The first category is for standard appreciation of money. It has only one account type, 'Wealth building', which is also the most standard account type and the one used during this research. The second category is for saving up for a specific goal and it includes four account types: 'Emergency fund', 'Buying an expensive item', 'Property' and 'Saving for children'. The third category is for investors that want to increase their pension or live on annuity. 'European Pension Plan (PEPP', 'Pension on your own terms', 'Annuity (payout portfolio)' are the three account types that fall under the third category. The last category is for short term investments with 'Smart Deposit (even up to 1 year)' and 'Wallet (for 1-3 years)' as its two options.

Peaks provides potential investors with four different account types as well as the option to create your own portfolio. These four types are: 'Standard investment account', 'Interest account', 'Children's account' and 'Pension account'. The 'Standard investment account' is the most basic account type, used for standard appreciation of money. The 'Interest account' offers and tries to stick to an attractive variable interest rate. A 'Children's account' can be set up for a child by a legal representative. When the child turns eighteen, all investments will be sold and they receive the money. A 'Pension account' is used to invest towards retirement and will pay out periodically after the investor has retired.

For this study, all Finax accounts chose 'Wealth building' as account type and all Peaks accounts chose 'Standard investment account' as account type. Appendix one contains all the introductory questions that Finax and Peaks pose to create an account and match an investment strategy to a new investor.

Finax asks new investors thirteen separate questions before opening an account, one of which has four sub questions. These questions can be divided into a few categories: Goal and input, personal finance, risk profile, and investing experience. The questions in the categories of goal and input, personal finance, and investing experience were all answered identically by the three accounts. Only the questions in the risk profile category, that ask that user directly about their attitude towards the risks of investing, differ between the accounts.

The first six questions fall into the goal and input category. They deal with how much the investor wants to invest, over what period of time the investment will be made, and what purpose the investment serves. The question of the timeframe of the investment is the only question in this category that impacts on the proposed portfolio. Shorter investments will get a lower stocks-to-bonds ratio than longer term investments with the same risk profile.

Through the next three questions Finax tries to gain insight into where the money that the potential investor plans to invest will come from. Accounts with more risky profiles in terms of money sources and time it took and will take to gather financial resources will be recommended more bond heavy portfolios. Whereas accounts with less risky profiles in those terms are recommended more risk-heavy strategies with higher stocks-to-bonds ratios.

Next, there are three direct questions about the risk profile of the investor. As expected, answering these questions in a conversative manner will result in the suggested portfolio having a lower stocks-to-bonds ratio while answering the question in a financially risky manner will result in a more stocks heavy portfolio suggestion. The last question of this category has four sub-questions with the goal of gauging the experience and knowledge of the potential investor regarding different financial instruments. Investors with more prior experience with investing can be recommended a portfolio with a higher stocks-to-bonds ratio, however it seems to have a less significant impact on the portfolio than the previous questions. Some more conversative and risky profiles will not be affected by prior experience and knowledge.

The last question Finax poses does not fit in any of the categories. It asks whether the investor is interested in ESG investments. If, however, the investor expresses interest in such investments, they are informed that Finax' portfolios do not contain indexes that meet the ESG requirements.

Peaks, on the other hand, has a much shorter and simpler registration process. Potential investors are asked seven questions before opening an account. After answering the first question by selecting 'Standard investment account' and giving the account a name, there is only one direct

question to determine the investor's risk profile. This question is directly linked to one of the four preset portfolios Peaks works with. The remaining four questions are to determine the sum and the frequency of investments that will be made and whether potential investors want to invest their change. This will round up all purchases made with the connected bank account to whole euros and invest the spared change once a week. However, to even start registration, the user must download the Peaks app.

It is clear that the two platforms take a vastly different approach to creating an account and linking investors with profiles and portfolios. The similarities start and end with how much the investor wishes to deposit to start off with and how much they wish to invest monthly. Peaks is very concise and direct with one choice determining which of the four portfolios best suits the investor. Contrarily, Finax uses a much larger and more varied set of questions. Finax does not only take the investor's mindset on risk into account, but also the financial situation of the investor. Furthermore, it allows for differentiation regarding the investment period and it tries to shield less experienced investors from riskier strategies. Overall, Finax takes a much more personal approach in tailoring investment plans to the wants and needs of investors. One last notable difference is that Peaks shows the exact allocation of assets of their proposed portfolio before anything has been accepted. Finax only shows the stocks-to-bonds ratio of the proposed portfolio before a choice has been made. The exact allocation of assets becomes clear after the portfolio has been chosen and money has been deposited.

4.1.2 Investor involvement

During the process of opening an account, Finax allows potential investors to change the stocks-to-bonds ratios of the proposed portfolios. Investors can adjust the ratio with increments of ten, however Finax only allows conservative adjustments. Finax will not allow investors to increase the proportion of stocks above the level that they initially provide with the risk profile of the investor taken into account. There is no way for the investor to influence what specific assets the portfolio is made up of. The only way investors can exercise influence over their investment after accepting and investing in a portfolio is by changing the overall strategy of the portfolio.

Peaks does not grant potential investors permission to alter the stocks-to-bonds ratios of their portfolio. If none of the four proposed portfolios are satisfactory to potential investors, Peaks allows investors to construct their own portfolio. Investors are given full freedom to use the ETFs and Exchange Traded Products (ETP) that Peaks has selected to make a portfolio to their liking.

Peaks allows the investor to rebalance their accounts manually. Through rebalancing the portfolio can be returned towards the intended allocation per fund. Finax does not allow for any input by the investor in the specifics of the portfolio.

Finax and Peaks take completely different approaches when it comes to investor involvement. Finax allows investors to make their proposed portfolio more conservative through adjustments in the stocks-to-bonds ratios towards more bonds. Peaks gives investors either

no influence at all or all the responsibility of creating the portfolio. After the initial investment, Peaks does allow the investor to make small, non-specific changes to the portfolio through rebalancing, while Finax does not allow these types of changes.

4.2 Content
4.2.1 Assets and Portfolios
Finax has selected ten different ETF funds with which they create effective portfolios. Six are stock ETFs and four are bond ETFs. Several factors played a role in the selection of the ETFs. Ten ETFs were chosen, because those funds cover most economic sectors and key world regions, keeping the portfolios well diversified. More different ETFs would only increase administrative and investment costs, thus decreasing returns. Finax selected only ETFs that reinvest the dividends instead of paying it out for tax reasons. Investing is only done through and in funds of reputable administrators for increased security. A key factor in the selection of the ETFs was its ability to copy the index performance, as well. (Finax, n.d.)

Peaks, on the other hand, has selected sixteen ETFs to make up the portfolios, as well as two ETPs in the form of cryptocurrencies. The platform does not consider reinvestment of dividends a selection criterium and it reinvests the dividends automatically for its investors. Some of the ETFs cover key world regions, while other ETFs cover specific market sectors like healthcare innovation or digitalization to allow potential investors to diversify their portfolios.
Notably, Peaks' portfolios only consist of ETFs that are qualified as sustainable according to the characteristics that are specified in article eight of the EU's Sustainable Financial Disclosure Regulation (SFDR). (EU Regulation, 2019) Peaks has exclusively chosen ETFs that exclude companies that are involved in controversial businesses like weapons trade. Through a best-in-class approach the top 25 percent most sustainable companies are selected. To pinpoint this top 25 percent, ESG-scores by reputable rating agency MSCI are used. ESG-scores measure how well companies address risks and responsibilities regarding environmental, social, and governance issues. Peaks only invests in ETFs that score an A or higher. The crypto ETPs, however, are not regarded as sustainable investments. (Peaks, 2023)

Appendix two contains the portfolio suggestions made for all six accounts. Finax' portfolio suggestions range between 0:100 and 100:0 stocks-to-bonds ratios.
The conversative Finax portfolio (Finax C) uses seven different ETFs to get a 20:80 stocks-to-bonds ratio. Global government bonds are the biggest contributor with almost 50 percent of the portfolio.
The balanced Finax portfolio (Finax B) contains all ten ETFs used by Finax and suggests a 70:30 stocks-to-bonds ratio. US large cap stocks make up the biggest part of this portfolio with almost 30 percent.
The risky Finax portfolio (Finax R) contains all ten ETFs and aims for an 80:20 stocks-to-bonds ratio. With over 30 percent of the portfolio, US large cap stocks are again the biggest contributor.

Finax uses all the selected ETFs in two of the three portfolios. Global government bonds and US large cap stocks are the most popular ETFs for Finax by far. These two ETFs represent almost 25 percent of the total investments respectively.

Peaks' portfolio suggestions range between 30:70 and 90:10 stocks-to-bonds ratios.
The conversative Peaks portfolio (Peaks C) has a 30:70 stocks-to-bonds ratio and uses six ETFs. Almost 50 percent of the portfolio is made up of European government bonds.
The balanced Peaks portfolio (Peaks B) has a 70:30 stocks-to-bonds ratio and also uses six ETFs. With almost 40 percent, North American stocks represent the biggest part of this portfolio.
The risky Peaks portfolio (Peaks R) has a stocks-to-bonds ratio of 90:10 and uses the same six ETFs as the other two Peaks portfolios. Almost half of the portfolio consist of North American stocks, making those the biggest contributor.

Remarkably, all three Peaks portfolios contain only the same six ETFs. Four are region bound stock ETFs and two European bond ETFs. North American stocks clearly are Peaks' preferred stock ETF as they account for one third of the total investment. A quarter of the total investments went towards European government bonds, making it the preferred bond ETF.

The two platforms took mostly different approaches to the selection of ETFs. Peaks selection process focused on finding the most sustainable ETFs through a best-in-class approach, while Finax based the choice on multiple other factors, like the ETF's ability to copy index performance. Both can agree on the importance of covering different global regions and different economic sectors for diversification reasons. Finax selected a smaller pool of ETFs than Peaks. However, Peaks only uses six of the selected ETFs for their portfolio, whereas Finax uses all the selected ETFs in two out of three portfolios.

4.2.2 Features and Information
Information about Finax' portfolios can be accessed and monitored on desktop as well as in the Finax app. The desktop version can be accessed through email address and password, while the app requires a pin code to enter. Both versions' home screens provide information on total account values, like total value and overall simple return or time-weighted return, as well as providing this type of information on the individual accounts. When clicking on an account, both versions provide a graph of its performance and more detailed information on the individual assets. For each asset in the portfolio the current weight, the target weight, the value, and the performance are given in addition to some more general information regarding the holding. Interestingly, Finax chooses to present the account values in whole euros, not showing the precise value of the account after the comma.

Finax puts out articles and videos every one or two weeks. These provide information about numerous topics, including changes made by Finax, developments with impact on the portfolios, and financial and investment tips.
The Finax website and app are both available in seven languages which include English and Eastern European languages.

Apart from some differing terminology, the only noticeable difference between the two versions is that the app provides an up-to-date stocks-to-bonds ratio for the portfolio whereas the desktop version only shows the target ratio.

When opening an account, Finax provides a prediction of the performance of the portfolio over the chosen investment period. Optimistic, pessimistic and average expected results are given based on the performance over the past 30 years.

Peaks also has a website as well as a mobile application. However, Peaks' portfolios can only be opened, accessed and monitored through the Peaks app. The app requires a pin code to enter, while the website has no login option as it only provides general information about Peaks. The website is available in Dutch, German and English. However, the app is only available in Dutch and English. The home screen of the Peaks app provides information on value and performance of individual accounts. When clicking on an account, the app presents a few different tabs. The first tab is about the balance and includes specific information about the performance of the portfolio with a graph. The graph can express performance in both percentages and absolute values. The second tab gives in-depth information about the make-up of the portfolio. Weight, value and performance for each individual asset is given as well as more general information, like ESG score. The third tab shows everything that has been put into the account, everything that has been taken out, and all the transactions. The other two tabs are about daily input and inviting friends to join Peaks.
On its website, Peaks publishes blogs with market updates every month. Other blogs with differing subjects like investing and saving are published sporadically as well.
Peaks provides potential investment with expected gross returns per year for each portfolio. These figures are based on Peaks' return forecasts and cover a horizon of ten to fifteen years. Peaks also gives suggestions on the most suitable investment horizon for each portfolio. Peaks gives an expected gross return per year for all four preset portfolios and how this would look with the intended investments when opening an account. Furthermore, a cost calculator can be found on their website, which provides in-depth information about what expenses can be expected when investing with Peaks.

To sum up, Finax and Peaks contain some similar features, while displaying some unique characteristics. Both platforms offer similar information when it comes to the portfolios, like information about returns, assets and their allocation. They also both offer prediction tools to give the investor an idea of what to expect of their investments. The use of scheduled and one-off short blogs and videos to inform clients about market movement and other topics is another similarity between the two.
Differences between Finax and Peaks include the fact that Finax accounts are accessible through both an app and a desktop version, whereas Peaks accounts can only be accessed through the app. Lastly, Peaks provides a cost calculation tool, while Finax has no such feature.

4.2.3 Pricing
The pricing scheme of the two robo advisors is another important element for comparison. Finax and Peaks have different types and tiers of pricing and services, which are important for potential investors to be aware of. Appendix three contains information on the pricing schemes employed by Finax and Peaks.

Finax has different fee structures for the different services they provide. Standard portfolio management, portfolio management with Finax Elite, and management of Intelligent Wallet and Smart Deposit are the three tiers they distinguish. Finax charges their clients a percentage of total assets under management. This is an annual fee that is calculated on a monthly basis. Payments are made through the portfolio, so no charges are made to the client's bank account. Standard portfolio management was used for this study. Although it has the highest assets under management fee, it does not have high investment requirements like the Finax Elite plan. Finax does not charge investors anything for standard actions, like opening or terminating accounts, deposits and withdrawals, and it does not impose performance fees. There are different fees for other, less standard, actions. For example, accounts can change strategy free of charge once every calendar year, but an additional strategy change will cost the investor 200 euros plus VAT.

Peaks works with three tiers of pricing: Start, Complete and Premium. They have a subscription business model as well as an asset under management fee. The Start package offers all the services that Peaks provides in exchange for the lowest monthly subscription cost and the highest asset under management fee. The other packages offer the ability to open more accounts against a higher monthly subscription cost, but a lower management fee. Subscription costs are subtracted from the customer's bank account every month. Peaks does not work with transaction fees for deposits and withdrawals and there are no fees for opening or terminating accounts. The investor does incur some additional costs that are associated with index investments, like fee funds and spreads.

So, both robo advising platforms charge their clients a fee that is a percentage of the total assets under management. However, the most obvious difference between Finax and Peaks in regard to pricing is the subscription model that Peaks employs. Both platforms also have some differing additional costs and fees.
In all pricing tiers, Finax' asset under management fee is a higher percentage than Peaks' asset under management fee. This makes Finax more attractive for the smaller investor as Peaks' monthly subscription costs can be relatively much compared to the management fee for small amounts. Peaks becomes more attractive when the investment is bigger as all their pricing tiers have lower management fees and the subscription costs have less of an impact on larger investments.

4.3 Results
Appendix four shows the average simple daily return of all six accounts and two benchmark indices after every week during the testing period, as well as some other interesting measurables.

Firstly, looking at the three Finax portfolios, we can see that Finax C has the best mean performance during the testing period, followed by Finax B and then Finax R. As can be expected, the higher stocks-to-bonds ratio of the portfolio, the higher standard deviation and variance. The Peaks portfolios follow the same trends as the Finax portfolios.

Secondly, Finax and Peaks will be compared per risk profile in terms of means, maximums, minimums and standard deviations of the weekly results.
Finax C has a higher mean performance during the testing period than Peaks C. Finax C is also less volatile as evidenced by the lower standard deviation. This volatility can also be seen in the higher maximum and lower minimum of Peaks C compared to Finax C.
Finax B and Peaks B follow the exact same trend. Finax B has a higher mean performance and a lower standard deviation than Peaks B.
Finax R and Peaks R also follow the same trend when it comes to mean, standard deviation and minimum. However, Finax R has the highest maximum of the two risky portfolios.

Next, the S&P 500 and Nasdaq Composite were chosen as benchmark indices to compare the Finax and Peaks accounts with. It seems all six accounts outperform the benchmark indices in mean performance during the testing period. The benchmark indices are also more volatile with higher standard deviations, higher maximums, and lower minimums than all Finax and Peaks accounts.

Statistical tests can be performed to further compare the performance of the accounts among each other and with the benchmarks. Appendix five contains the results from all the F-tests and T-tests that were performed.

The results from the T-test between Finax and Peaks and their respective risk profiles show that only the risky profiles perform significantly different from each other. The conservative and balanced profiles of Finax and Peaks show no statistically significant difference.

When comparing the Finax accounts against each other, the results show that Finax C performs significantly different from Finax B and Finax R. While Finax B and Finax R do not differ significantly statistically. The Peaks accounts follow the exact same trend.

S&P 500 and Nasdaq Composite are frequently used benchmark indices to measure the performance of portfolios against. The results of statistical tests between S&P 500 and Nasdaq Composite and the Finax and Peaks accounts show that Peaks B and Peaks R do not perform significantly different from the benchmark indices. All Finax accounts and Peaks C do perform significantly different from the benchmarks.

Appendix six shows the stocks-to-bonds ratios of all accounts during the testing period. It is obvious that Finax and Peaks make few changes to the portfolio that alter the stocks-to-bonds ratios on a week-to-week basis. Finax balanced is the only Finax account that has its ratio changed during the testing period, which happens twice.

The ratio of Peaks Balanced is altered twice, Peaks Conversative gets altered once and the ratio of Peaks Risky stays the same during the testing period.
All changes in stocks-to-bonds ratios are by one point. Looking at the deviation from the target ratios as proposed to the investor when opening the account, there are some clear differences between Finax and Peaks. Finax immediately diverts two of the three accounts away from the target ratios, whereas Peaks starts on target and mostly stays on target.

Overall, Finax accounts have a better mean performance and lower standard deviation than their corresponding Peaks counterparts. Although, there was only a significant difference in the performance of the risky profiles, according to the statistical tests. All accounts outperformed the benchmark indices in terms of mean performance and standard deviation. The difference in performances were only statistically insignificant for Peaks B and Peaks R.
Furthermore, neither Finax nor Peaks make frequent or large changes in the composition of their portfolios as evidenced by the few instances of changed stocks-to-bonds ratios.

5. DISCUSSION
5.1 Limitations
There are a few limitations that impact the validity of this research. Most of these limitations are in relation to the results aspect of this comparison.

Firstly, there is a two-week difference in the testing period of Finax and Peaks. This is the results of verification issues with the Finax accounts. The impression was given that depositing money into the accounts would verify the bank information. However, it was also required to send evidence of ownership of the bank account in the form of something with your name, address and bank number. It took a few tries and two weeks to finally provide ample evidence.

Secondly, more tests and measures could have been used to compare Finax and Peaks with each other. The Sharp ratio, for example, measures the performance of an investment compared to a risk-free asset, after adjusting it for risks. Other possible risk-adjusted measures include the Treynor ratio and Jensens alpha. The results of these measures would make the results from this research more meaningful. More t-tests to measure the standard deviations of the accounts against each other would have also given slightly more insight into how the performances of the portfolios compare.

Thirdly, both benchmark indices used, S&P 500 and Nasdaq Composite, are indices that are designed to track the performance of the American market. A European benchmark index, like STOXX Europe Total Market, together with an American benchmark index would have made for a more well-rounded comparison.

The last limitation of the results aspect has to do with the monitoring of how actively the robo advisors manage their portfolios. The specific changes in the portfolios could have been monitored, noted and analyzed in much more detail. However, collecting this data would have been tedious and not very interesting for the broad

comparison between sustainable and conventional robo advisors.

Furthermore, the use of more different robo advisors could have made the results and conclusion more conclusive. However, the requirement for the selection of robo advisors did not leave many options. The need for a minimum investment requirement below €20 and for purely sustainable or conventional portfolios were especially restricting.

Further research should be done to validate and improve on these findings. More robo advisors with either sustainable or conventional strategies should be analyzed to get a clearer picture of the impact a sustainable strategy has on the way the robo advisor' functions overall. This research should include more statistical tests and measures, like the Sharpe ratio, to get a more in-depth comparison of the performances.

5.2 Conclusion

The aim of this thesis was to find out the extent to which a robo advisor that exclusively invests in sustainable assets differs from a robo advisor with conventional investment options. As parameters for the comparison, three aspects were identified.

Firstly, the process aspect, which contains all the actions investors can and must take. In terms of registration process, Finax takes a much more extensive approach to linking potential investors to risk profiles and portfolios than Peaks. Finax asks more questions and considers the answers to come up with a portfolio suggestion, whereas Peaks does not make such personalized suggestions.

Finax minimizes investor involvement by allowing very little freedom to change proposed portfolios and by giving no options to influence asset allocation after the initial investment. Peaks give potential investors complete freedom to create their own portfolios out of the selected ETFs and ETPs and it allows for rebalancing after the initial investment.
The differences between the two robo advisors might be explained by their target clientele. Finax and Peaks both aim to make investing accessible for people with smaller budgets as evidenced by statements on their websites and their low minimum investment requirement. However, the sustainable investing philosophy of Peaks should be attractive to more conscientious investors. Where Finax' processes seem set up to protect investors from taking risks they might not understand, Peaks' assumably more conscientious investors do not need this protection and are given more freedom to involve themselves. Thus, Peaks' philosophy could be used as an explanation for the differences in the process aspect.

Secondly, the content aspect, dealing with everything that the robo advisors offer their clients. There are some similarities in the selection processes of the assets used by Finax and Peaks. Namely, both platforms place great importance on diversification and show this by representing different world regions and economic sectors with their ETFs. Peaks' focus and Finax' lack of focus on sustainability is a key difference in the selection process. The fact that Peaks uses only six ETFs to fill out

their portfolios is a notable difference with Finax that makes use of most if not all of its selected ETFs.

Finax and Peaks provide their clients with mostly similar features and information, like scheduled reports and prediction tools. However, Peaks only provides account-specific information through their app, while Finax allows investors access to their accounts through both their app and their website.

Both platforms have different pricing tiers and schemes and they both charge their clients a fee that is a percentage of the total assets under management. However, Peaks supplements their income by also charging a set monthly subscription fee.

Peaks' sustainable investment strategy plays a clear and definite role in the selection process of the assets. This sustainable strategy cannot reasonably be used to explain the differences between the robo advisors in available features and pricing, however.

Thirdly, the results aspect, that deals with the performance of the portfolios, as well as the changes in ratios. The mean performances of the Finax accounts were higher than their respective Peaks accounts and their standard deviation lower. However, there was only a significant difference in the performance between the risky profiles.
All accounts performed better in terms of mean performance and standard deviation than the benchmark indices. There was a significant difference in performance with four out of six accounts.
Neither robo advisor platform made many changes to the portfolio composition, in terms of stocks-to-bonds ratio. These results suggest that Finax would be the preferable robo advisor when it comes to financial performance. Whether this can be attributed to their conventional investment strategy versus Peaks' sustainable strategy cannot be concluded from this study. Better diversification could be a factor that played a role in these results, as the Peaks portfolios contained fewer different ETFs than Finax' portfolios. The difference in testing period is also a reason for cautiousness when interpreting the numbers.

Overall, to answer the research question, Finax and Peaks share many similarities and some obvious differences. The main differences are the registration process and the asset selection process. The latter can be directly attributed to Peaks' sustainable philosophy towards investing. The former, however, cannot be conclusively linked to that philosophy through this study.
The financial performances only show a statistically insignificant difference between the risky profiles. However, drawing conclusions from this regarding conventional versus sustainable investing would be premature without further research.

After conducting this research, I would generally recommend Finax over Peaks. Even though there were some troubles starting the account, the ability to access account on both app and desktop really gives Finax an edge over Peaks. Especially since the graphs in the Peaks app did not work properly for a large portion of this study. The Finax portfolio also slightly, if insignificantly,

outperformed the Peaks portfolios during this testing period.

Finax would be especially attractive to new investors that have a relatively small investment budget and little knowledge about investing. This is because Finax protects investors from strategies that Finax deems too risky for the investor, based on the questions asked during the registration. The pricing scheme that Finax employs is also better suited for smaller investors than Peaks' pricing scheme.

Peaks would be a better recommendation for investors with more experience, a higher budget and more affinity for sustainable initiatives. This is because Peaks allows investors more freedom in the process and their pricing scheme is more suitable for higher investments.

6. APPENDICES

(1) Introductory Questions

During the creation of an account, Finax asks the following questions to come up with a risk profile:
1. What is the purpose of the investment?
The seven options Finax provides are: A. Intelligent wallet B. Emergency funds C. Retirement D. Saving for children E. Wealth building F. Intelligent annuity G. European pension.
All accounts chose option E, Wealth building.

2. How many years do you plan to invest?
On a spectrum from 1 to 50 years, all accounts chose 10 years.

3. In what currency do you wish to deposit funds?
All accounts chose the Euro.

4. What is your target amount you would like your investment to reach?
All accounts chose no specific target.

5. How much do you wish to invest one-off?
All accounts chose €20.

6. How much do you wish to invest regularly every month?
All accounts chose €0.

7. Source of income?
Finax provides the following options: Salary, Entrepreneurship, Investment, Inheritance, Rent, Pension, Other.
All accounts chose Salary.

8. What part of your net worth do you intend to invest?
Net worth consists of an apartment, a car, savings, a stake in a company, etc.
Options provided: A. I invest only a small part of my net worth. B. I invest about half of my net worth. C. I invest a significant part of my assets.
All accounts chose option A.

9. How long would you have saved for the intended investment? Take into account not only your income, but also your expenses and liabilities (mortgages, loans).
Options provided: A. I invest regularly, or in smaller amounts as allowed by my financial conditions. B. I would save the money I invest in about a year or two. C.

It would take an eternity for me to save up for the intended deposit again.
All accounts chose option A.

10. What type of investment do you prefer?
Options provided: A. Rather less to gain than to lose anything. B. I would like to earn 4-7% per year. I am willing to tolerate the years with losses from time to time. C. I wish to have higher returns. I know that even if the stock market falls significantly, the markets will bounce back in the following years.
The conservative account chose option A. The balanced account chose option B. The risky account chose option C.

11. What would you do if the investment dropped by 20% of its value?
Options provided: A. I would sell a part or all of my investment. B. I will not do anything, I do invest long-term. Short-term fluctuations do not interest me. C. I would continue with the regular deposits, or I might even increase my investment. It's an opportunity to buy cheaply.
The conservative account chose option A. The balanced account chose option B. the risky account chose option C.

12. Which financial instruments do you have experience with and what kind of?

	Doesn't ring the bell	I know what it is	Less than three year	More than three year
Bonds		X		
Mutual funds, retirement funds and ETFs		X		
Equities		X		
Derivatives (such as options, CFD)		X		

All accounts answered these questions as shown above.

13. Are you interested in socially and environmentally responsible investments (ESG)?
Options provided: A. I am interested. B. Not interested.
All accounts chose option A. It should be noted that if option be is chosen, the user is informed that Finax' portfolios do not contain index funds that meet ESG requirements.

Recommended strategy
Conservative — Dynamic

Average expected result ⓘ ● **28 €**

Total deposit ● **20 €**

Conservative
20:80
Stock : Bond
ETFs ETFs

Account name
Wealth building

Amount of the one-off investment
20 €

Amount of the regular investment
0 €

Investment horizon in years
10

32 €
30 €
28 €
26 €
24 €
22 €
20 €
2024   2026   2028

The value of your investment may fluctuate and you may not ac
we created this forecasting model here.

The figure above is an example of the conversative account.

Peaks on the other hand asks many fewer questions during the creation of an account:
1. What kind of account would you like to open?
Peaks provides the following options: A. Normal account (under your own name) B. Retirement account. C. Children's account (under name of a (grand)child).

All accounts chose option A.

2. Give your account a name?
The conversative account will be called 'conversative'. The balanced account will be called 'balanced'. The risky account will be called 'risky'.

3. What is your risk profile?
Options provided: A. Careful. B. Balanced. C. Enterprising. D. Adventurous.
The conservative account chose option A. the Balanced account chose option C. The risky account chose option D.

4. How much do you wish to deposit one-off?
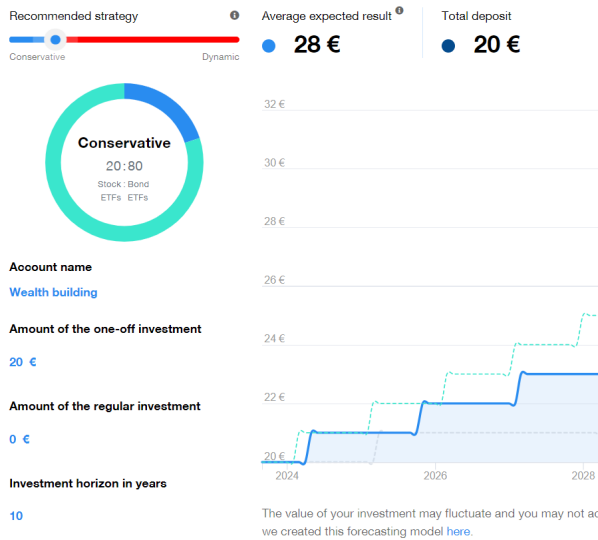All accounts chose €20.

5. How much do you wish to deposit monthly?
All accounts chose €0.

6. How much do you wish to deposit daily?
All accounts chose €0.

7. Would you like to invest your change?
All accounts chose No.

Peaks provides the user with expected returns for the portfolio they have chosen with both pessimistic and optimistic scenarios.

(2) Portfolio Contents

	Stocks-to bonds ratio	Stock ETFs	Bond ETFs	Target weights (%)
Finax C	20:80	-EU large cap: Stoxx Europe 600 UCITS ETF (DR) 1C -Emerging markets: ISHR CORE EM IMI -US large cap: Core S&P 500 UCITS ETF	-EUR corporate bonds: DBX EUR CORP 1C -EUR high-yield bonds: DBX HY BOND EUR -Emerging markets bonds: UBS EM SVRGN EUR -Global governments bonds: DBX G GOV EUR 1C	-EU large cap: 5.1 -EUR corporate bonds: 21.0 -EUR high-yield bonds: 4.0 -Emerging markets: 5.1 -Emerging markets bonds: 4.0 -Global government bonds: 49.5 -US large cap: 9.8
Finax B	70:30	-EU large cap: Stoxx Europe 600 UCITS ETF (DR) 1C -EU small cap: DBX EU SMALL 1C -Emerging markets: ISHR CORE EM IMI -US large cap: Core S&P 500 UCITS ETF -US mid cap: SPDR S&P 400 MID -US small cap: Russell 2000 US Small Cap UCITS ETH	-EUR corporate bonds: DBX EUR CORP 1C -EUR high-yield bonds: DBX HY BOND EUR -Emerging markets bonds: UBS EM SVRGN EUR -Global governments bonds: DBX G GOV EUR 1C	-EU large cap: 14.0 -EU small cap: 4.2 -EUR corporate bonds: 6.5 -EUR high-yield bonds: 4.5 -Emerging markets: 14.0 -Emerging markets bonds: 4.5 -Global government bonds: 13.0 -US large cap: 27.3 -US mid cap: 6.3 US small cap: 4.2
Finax R	80:20	- EU large cap: Stoxx Europe 600 UCITS ETF (DR) 1C -EU small cap: DBX EU SMALL 1C -Emerging markets: ISHR CORE EM IMI -US large cap: Core S&P 500 UCITS ETF	- EUR corporate bonds: DBX EUR CORP 1C -EUR high-yield bonds: DBX HY BOND EUR -Emerging markets bonds: UBS EM SVRGN EUR -Global governments bonds:	-EU large cap: 16.0 -EU small cap: 4.8 -EUR corporate bonds: 5.0 -EUR high-yield bonds: 3.0 -Emerging markets: 16.0 -Emerging markets bonds: 3.0 -Global government bonds: 7.5 -US large cap: 31.2 -US mid cap: 7.2

		-US mid cap: SPDR S&P 400 MID -US small cap: Russell 2000 US Small Cap UCITS ETH	DBX G GOV EUR 1C	-US small cap: 4.8
Peaks C	30:70	-North America: UBS LFS-MSCI USA Socially Responsible UETF (USD) Ad -Europe: iShares MSCI Europe SRI UCITS ETF EUR (Acc) -Asia Pacific: UBS LFS MSCI Pacific Socially Resp UCITS (USD) Ad -Emerging markets: iShares MSCI EM SRI UCITS ETF USD (Acc)	-European government bonds: iShares Core € Govt Bond UCITS ETF EUR D -European corporate bonds: Xtrackers II EUR Corp Bond SRI PAB UCITS ETF 1D	-North America: 16.0 -Europe: 7.0 -Asia Pacific: 4.0 -Emerging markets: 3.0 -European government bonds: 49.0 -European corporate bonds: 21.0
Peaks B	70:30	-North America: UBS LFS-MSCI USA Socially Responsible UETF (USD) Ad -Europe: iShares MSCI Europe SRI UCITS ETF EUR (Acc) -Asia Pacific: UBS LFS MSCI Pacific Socially Resp UCITS (USD) Ad -Emerging markets: iShares MSCI EM SRI UCITS ETF USD (Acc)	-European government bonds: iShares Core € Govt Bond UCITS ETF EUR D -European corporate bonds: Xtrackers II EUR Corp Bond SRI PAB UCITS ETF 1D	-North America: 38.0 -Europe: 16.0 -Asia Pacific: 8.0 -Emerging markets: 8.0 -European government bonds: 21.0 -European corporate bonds: 9.0
Peaks R	80:20	-North America: UBS LFS-MSCI USA Socially Responsible UETF (USD) Ad -Europe: iShares MSCI Europe SRI UCITS ETF EUR (Acc) -Asia Pacific: UBS LFS MSCI Pacific Socially Resp UCITS (USD) Ad -Emerging markets: iShares MSCI EM SRI UCITS ETF USD (Acc)	-European government bonds: iShares Core € Govt Bond UCITS ETF EUR D -European corporate bonds: Xtrackers II EUR Corp Bond SRI PAB UCITS ETF 1D	-North America: 49.0 -Europe: 20.0 -Asia Pacific: 11.0 -Emerging markets: 10.0 -European government bonds: 7.0 -European corporate bonds: 3.0

(3) Pricing schemes

Finax	Monthly subscription	Asset-under- management fee	Perks	Requirements
Standard	€0	1% + VAT	Standard services	none
Finax Elite	€0	0.85% + VAT	Standard services + extras, like private wealth manager	Minimum investment of €100.000
Intelligent Wallet and Smart Deposit	€0	0.5%	Standard services	none
Peaks				
Start	€1,99	0.5%	Standard services, 3 accounts	None

Complete	€2,99	0.4%	Standard services, 4 accounts	None
Premium	€4,99	0.25%	Standard services, 6 accounts	none

(4) Performance results (in percentages)

	Finax C	Finax B	Finax R	Peaks C	Peaks B	Peaks R	S&P 500	Nasdaq Composite
Week 36				-0.25	-0.39	-0.40	-1,06	-1,29
Week 37				-0.27	-0.16	-0.25	-0,92	-1,45
Week 38	-0.26	-0.34	-0.48	-1.05	-1.33	-1.58	-2,78	-4,08
Week 39	-0.49	-1.35	-1.51	-1.95	-2.44	-2.77	-4,89	-6,14
Week 40	-2.03	-2.48	-2.66	-2.51	-3.14	-3.56	-5,45	-5,57
Week 41	-1.02	-1.31	-1.44	-1.52	-1.91	-2.26	-3,68	-3,52
Week 42	-1.79	-2.16	-2.30	-2.51	-3.33	-3.88	-4,50	-5,09
Week 43	-2.25	-4.13	-4.59	-3.10	-5.19	-6.36	-7,41	-8,47
Week 44	-1.44	-3.23	-3.69	-2.13	-3.94	-5.00	-5,78	-6,68
Week 45	-0.54	-1.71	-2.05	-1.21	-2.39	-3.19	-3,05	-2,90
Week 46	0.06	-0.63	-0.87	-0.35	-1.12	-1.73	-0,65	0,07
Week 47	0.50	0.00	-0.24	0.07	-0.48	-0.98	0,79	1,58
Week 48	1.10	0.42	0.13	0.88	0.09	-0.55	1,06	1,65
Week 49	2.15	1.93	1.71	2.44	1.73	1.12	1,32	1,64
Week 50	2.87	3.02	2.85	3.46	3.13	2.70	3,69	4,44

Average daily return per week
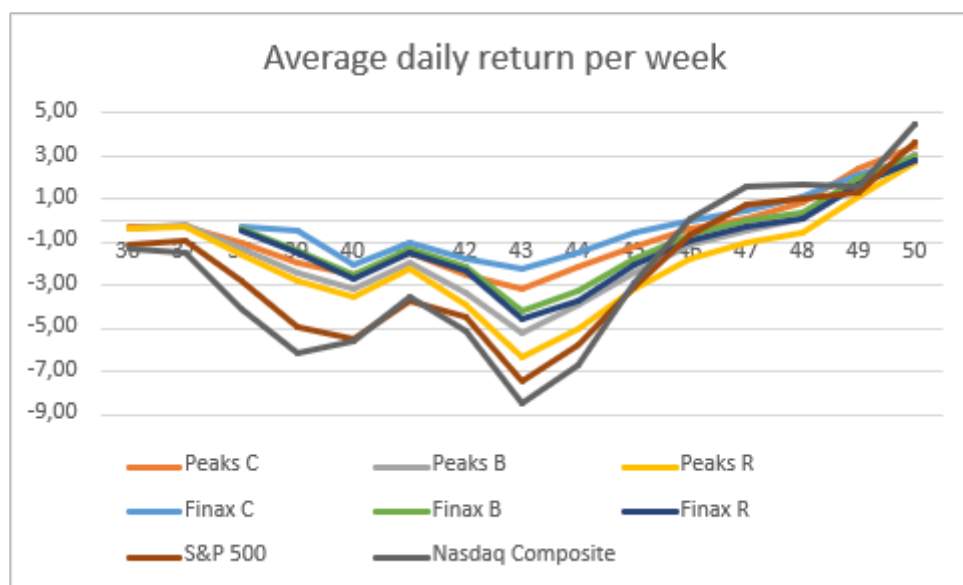
	Finax C	Finax B	Finax R	Peaks C	Peaks B	Peaks R	S&P 500	Nasdaq Composite
Mean	-0.24	-0.92	-1.17	-0.67	-1.39	-1,91	-2.22	-2.39
Max	2.87	3.02	2.85	3.46	3.13	2.70	3.69	4.44
Min	-2.25	-4.13	-4.59	-3.10	-5.19	-6.36	-7.41	-8.47
Standard deviation	1.51	1.91	1.96	1.78	2.09	2.26	3.04	3.60

(5) Statistical tests results

	P-value F-test	F-test null hypothesis rejected?	P-value T-test	T-test null hypothesis rejected?
Finax C-Peaks C	0.213	No	0.146	No
Finax B-Peaks B	0.439	No	0.180	No
Finax R-Peaks R	0.233	No	0.047	Yes
Finax C-Finax B	0.065	No	0.034	Yes
Finax C-Finax R	0.037	Yes	0.005	Yes
Finax B-Finax R	0.803	No	0.493	No
Peaks C-Peaks B	0.138	No	0.030	Yes
Peaks C-Peaks R	0.029	Yes	4.63E-4	Yes
Peaks B-Peaks R	0.480	No	0.164	No

S&P 500	P-value F-test	F-test null hypothesis rejected?	P-value T-test	T-test null hypothesis rejected?
Finax C	5.29E-8	Yes	5.94E-6	Yes
Finax B	2.07E-4	Yes	0.004	Yes
Finax R	5.23E-4	Yes	0.019	Yes
Peaks C	6.15E-6	Yes	3.86E-4	Yes
Peaks B	0.002	Yes	0.067	No
Peaks R	0.016	Yes	0.513	No

Nasdaq Composite	P-value F-test	F-test null hypothesis rejected?	P-value T-test	T-test null hypothesis rejected?
Finax C	2.67E-11	Yes	1.98E-5	Yes
Finax B	5.19E-7	Yes	0.004	Yes
Finax R	1.68E-6	Yes	0.017	Yes
Peaks C	4.16E-9	Yes	6.13E-4	Yes
Peaks B	6.18E-6	Yes	0.052	No
Peaks R	1.16E-4	Yes	0.368	No

(6) Weekly stocks-to-bonds ratios

	Finax C	Finax B	Finax R	Peaks C	Peaks B	Peaks R
Week 36				30:70	70:30	90:10

Week 37				30:70	70:30	90:10
Week 38	19:81	70:30	82:18	30:70	70:30	90:10
Week 39	19:81	71:29	82:18	30:70	70:300	90:10
Week 40	19:81	70:30	82:18	30:70	69:31	90:10
Week 41	19:81	71:29	82:18	30:70	70:30	90:10
Week 42	19:81	70:30	82.18	29:71	69:31	90:10

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