ROBO-ADVICE:

BETTER FINANCE TAKES A LOOK UNDER THE HOOD

a BETTER FINANCE research paper

June 2018

BETTER FINANCE

The European Federation of Investors and Financial Services Users

Fédération Européenne des Épargnants et Usagers des Services Financiers

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EUROPEAN INDIVIDUAL INVESTORS TAKE A LOOK UNDER THE HOOD

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A Research report by BETTER FINANCE

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BETTER FINANCE, the European Federation of Investors and Financial Services Users, is the dedicated representative of financial services users at European level. It counts 30 national and international members and sub-member organizations in turn comprising about 4.5 million individual members. Our organization acts as an independent financial expertise centre to the direct benefit of the European financial services users (shareholders, other investors, savers, pension fund participants, life insurance policy holders, borrowers, etc.) and other stakeholders of the European financial services who are independent from the financial industry. As such its activities are supported by the European Union since 2012.

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Executive Summary

For the third year in a row BETTER FINANCE took a closer look at the emerging Robo Advisory business from the perspective of individual investors and savers. Considering that new players are continuously joining the fray, this report focuses solely on selected platforms that set up shop over the last ten years in Europe and North-America, excluding platforms that are directly linked to established financial institutions. 16 platforms found their way into this study: 11 platforms from 7 different EU countries and 5 from North-America (4 US platforms and 1 Canadian).

As already pointed out in our previous reports, BETTER FINANCE continues to believe that Robo-advice could go a long way towards attracting retail investors back into equity markets. Our findings once again illustrate that these automated financial advice services (all duly registered, or in the process of registering, as financial advisers, and in many cases as investment firms) are considerably less expensive than their traditional counterparts and can offer individual investors much better value for their money. Such reduced fees are possible thanks to the fact that all of the platforms covered in this report are “fee-based” and use only or mostly exchange-traded funds (ETFs), unlike their traditional counterparts.

However, since financial literacy and trust in financial services amongst EU citizens as savers and investors are very low, it will take more than just a better alignment with investors’ interests and lower fees to attract them back into equity markets. BETTER FINANCE decided to expand its study and take the algorithms and questionnaires used by the platforms to provide personalised investment advice for a test-drive. More specifically, the study examined Robo-Advice providers for the suitability, transparency, cost-effectiveness and user-friendliness, for retail investors.

In order to recreate the "individual investor experience" as faithfully as possible, BETTER FINANCE decided to use the 'mystery shopping' approach. To this end two individual investor profiles were created - the millennial and the baby-boomer - to take the questionnaires and get adapted investment advice.

Overall the study found that the different platforms provide sufficiently personalised investment recommendations, the way we assume traditional advisors would. Interestingly the European platforms outshone their US counterparts when it came to transparency, whereas, unsurprisingly, the Robo-advisors from the United States continue to be far more competitive (although the difference in terms of fees has somewhat been reduced).

However, mystery shopping reveals a worryingly high dispersion of advertised expected returns and of recommended asset mixes.

The study also compared the results of the algorithms, thereby uncovering important divergences with regards to information on future returns information between the different providers. They provided very different future potential returns for the same profiles and the proposed equity allocations were also very dispersed for the same client and same expressed objectives. What's more is that the proposed equity allocation did not always seem to take the risk profile into account, nor did they seem highly correlated with the expected returns at all. Finally, the mandatory prominent warning on future performance information is often missing or inadequate. These alarming findings put the reliability of the algorithms used into question. They also once again question the validity of using future performance "information" instead of the far more robust and less misleading long-term past performance relative to the providers' objectives (benchmarks).

In as far as **user-friendliness** is concerned, the Robo-Advisors with varying degrees of success engaged in a delicate balancing act between the need to keep the process simple and concise on the one hand and the need to go into a sufficient amount of detail in order to comply with regulations and provide advice that is sufficiently adapted on the other.

Since only a few of the platforms offer the possibility to meaningfully interact with a human advisor (unlike for the 2017 study, BETTER FINANCE did not really find a trend that would confirm an evolution from Robots to Cyborgs) and seeing the poor levels of financial literacy in the general population, many of the platforms have taken it upon themselves to provide financial education in the shape of introductions and definitions, as well as short videos on their respective websites.

Whereas it is crucial to address the lack of financial literacy of potential clients, doing so without independent supervision easily risks turning into a marketing exercise, if not checked by an independent body.

As for **transparency**, the study found important divergences between the different platforms as it analysed the degree to which essential information is clearly disclosed with regards to fees, portfolio allocation, risk and past performance. Unfortunately, providing "fair, clear and non-misleading information", as required by the Markets in Financial Instruments Directive (MiFID II) that lays down the rules for investment services across the EU, is one of the least enforced investor protection rules in the EU[1]. This is also true for the robo-advice sector, with many of the platforms, for instance, presenting future performance estimates more prominently than the accompanying warning of such future estimates` unreliability. The study also found that, although management fees tend to be clearly disclosed somewhere on the websites, half of the platforms included in this study did not present information on fees when presenting final investment advice.

Perhaps even more important than transparency is the **suitability** of the investment advice provided. The very essence of this emerging industry is to provide individual investors with adapted advice based on information gathered through the questionnaires. Whereas most of the platforms under review, as shown throughout the report, provided relatively well-suited advice for the two different profiles, some algorithms seemed to fail to adequately address risk appetite. One of the North-American platforms scored poorly in terms of suitability as it merely provides generic investment advice irrespective of the different information provided by the different investor profiles.

This brings us back to **fees and costs**. The success of robo-advice - their Unique Selling Point - hinges on their capacity to keep costs low. And in this respect the robo-advisors don't disappoint. Most robo providers display a much simplified fee scale, often a single "all-in" fee or consisting of a simple combination of an advice fee and a fund fee.

Some of the platforms though, are putting this simplicity at risk, as they propose a more personalised service with access to human advisors for a higher fee. If robo-advisors are to attract a critical mass of individual investors, they would do good to keep it simple, although "cyborg" advice may be the way forward, given the low level of financial literacy of EU citizens.

[1] "Misselling of Financial Products in the EU" – BETTER FINANCE 2017 Briefing Paper.

INTRODUCTION

BETTER FINANCE believes that the financial system exists to serve the real economy and citizens by ensuring the optimal allocation of capital and providing other financial services in the most effective way. With 67% of their total assets deployed in long-term investments, EU citizens as pension savers and individual investors are, by their very nature, long-term oriented with long-term saving goals such as retirement, housing, children's studies, transmission of wealth, dictating their investment strategies.

The European Commission has, to some extent, recognised this and has put EU citizens as savers and individual investors at the heart of its flagship initiative, the Capital Markets Union (CMU), with the aim of strengthening the link between investors` savings and the real assets into which their funds are deployed, as well as providing better returns.

Given the overall persistently poor value of long-term investment services offered to EU citizens - as measured by the Commission's Consumer Markets Scoreboard[2] - it is crucial to rehabilitate equities and low-cost index equity funds as the simplest, most effective and most liquid long-term investment products for the majority of EU citizens, thereby ensuring better returns and regain the trust of individual investors. Currently, the playing field is heavily tilted against equities, non-financial bonds and low-cost Exchange-traded funds (ETFs) in favour of more packaged and fee-laden investment products. This is especially the case in Europe since the dominant commission-based distribution model keeps fees high and does not incite retail distributors to promote low-cost index funds such as ETFs and direct investments in equities and bonds.

Robo-Advisors seem to form an exception to the rule. Whereas, in general, low-cost ETFs are rarely proposed by "human" advisors[3], they are actually predominant among robo-advisors. For BETTER FINANCE, this fact alone warranted a closer look under the hood.

EXPANSION OF INDEX INVESTING

Since the 2008 financial crisis the investing world has witnessed the meteoric rise of indexed Exchange Traded Funds, multiplying the number of different ETFs available on the market. A large majority of them are also index funds: they seek to track the performance of a benchmark index, and hold assets that help them to do just that. Being index-based, they give you a way to buy and sell a basket of assets without having to buy all the components individually. The ETF replicates the

[2] European Commission - Consumer scoreboards

[3] It has also been confirmed by the recent European Commission's Study on the distribution systems of retail investment products: please see table on page 21

performance of its underlying assets, thereby providing the diversification benefits of mutual funds but with significantly lower fees.

Irrespective of the current financial environment, there is also a growing realisation that paying high fees for active management may not be the best strategy, since few actively managed portfolios succeed in beating the capital markets in the mid- to long-term.

The ETF success story is actually part of a wider trend that has seen a significant shift towards passive management, with investors putting money into passive funds rather than actively managed ones. In the current low-interest environment investors are increasingly opting for lower fees, thereby ensuring better net returns on investment in the long-run.

However, up to now, ETFs have rarely been promoted to retail investors in Europe. Whereas in the US the market is shared equally between institutional and retail investors, in the EU the market is still for 90% in the hands of institutional investors. This is largely due to the predominantly commission-based and closed-architecture business model of retail financial distribution in Europe.

The fact that all the emerging robo-investors researched by BETTER FINANCE are predominantly offering ETFs represents a great opportunity for European retail investors. Furthermore, this emerging trend could be helped by those Member States who have taken steps towards abandoning commission-based distribution model in favour of a fee-based one, like the UK and the Netherlands. But again, the low level of financial literacy constitutes a major hurdle hampering the expansion of this model beyond the investment savvy customers. To start, most EU savers wouldn't know what "fee-based advice" could mean, or even "ETFs".

ROBOTS TO THE RESCUE

As pointed out by BETTER FINANCE in its earlier research report (2016 and 2017), automated financial advice services have the advantage of being considerably less expensive than their traditional counterparts[4]. Fee-based, as opposed to commission-based, advice also helps preventing conflicts of interests from arising between the advisor and the client, as well fostering more transparency. All in all, they constitute an interesting alternative for those investors who do not require custom-made solutions. This is potentially great news for savers and individual investors, since, within the ongoing environment of low capital market returns, these new players could make a real difference on the actual performance of financial advice, safeguarding the purchasing power (the real value) of people's savings rather than obliterating it due to excessive fees.

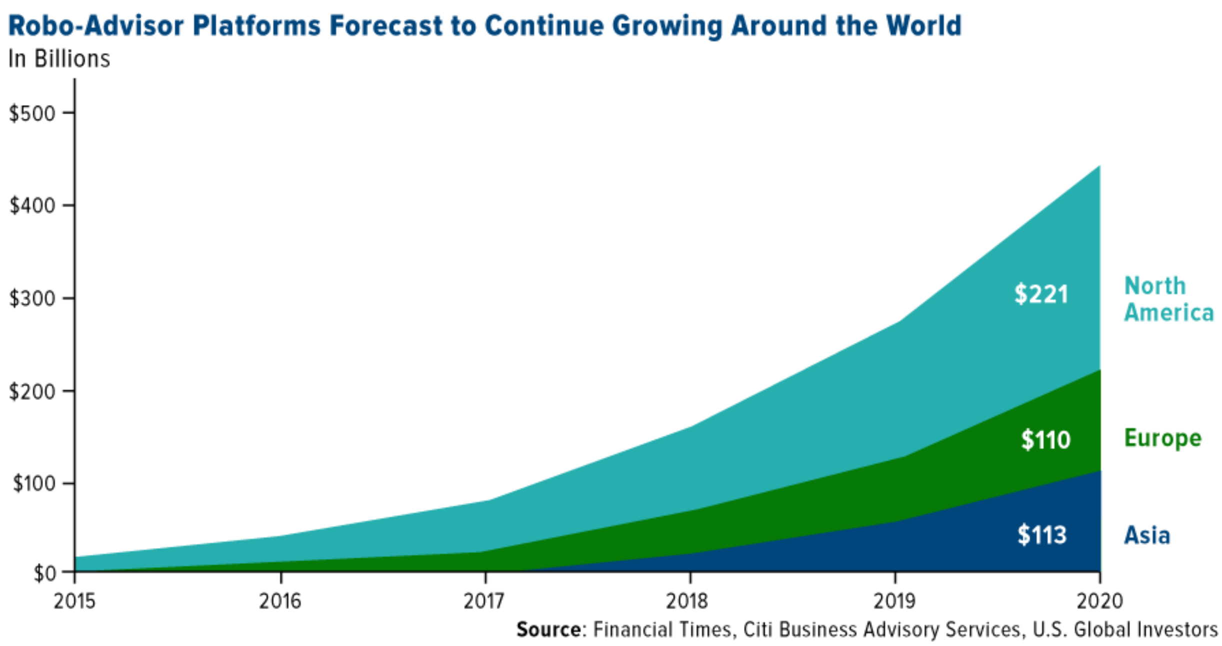
[4] It has also been confirmed by the recent European Commission's Study on the distribution systems of retail investment products: please see page 136

EVERYONE WANTS A SLICE OF THE PIE

Over the last few years, the emerging robo-advisory sector has picked up speed- forecasted to take over an increasingly important part of the global investment market. This trend was not lost on the traditional players of the investment industry who were quick to join the fray and capitalise on the new opportunities presented by the concept of digital investment management.

With the launch of their own robo-advice platforms these traditional players actually very quickly exceeded the start-ups in terms of Assets under Management (AuM), thereby contributing exponentially to the growth of this sector.

The strong growth of the sector over the last years is forecasted to continue:



Although traditional players by now represent the largest part of the sector's AuM, this report focuses on the independent players and start-ups that set up shop over the last 10 years.

THE INVESTOR PERSPECTIVE

This research report looks at robo-advisory services from the perspective of investors. It is aimed at establishing general trends in the industry and inspiring practices as well as identifying issues and areas that we feel can be improved upon. More specifically, the goal of this research is to examine Robo-Investment providers for their reliability, user-friendliness, transparency, costs and suitability for retail investors.

As such, only information that could realistically be acquired by an individual investor - without having to go through great lengths to obtain it - has been considered.

Rather than constituting a comprehensive review and ranking of the robo-advisory landscape, this study aims to establish to what extent automated investment advice can deliver for individual investors.

The Business Model

Misnomer: "Robo-Advice" looks more like "Robo-Investing"

The European MiFID II Directive (Article 4, 1.4) defines Investment Advice as "*the provision of personal recommendations to a client, either upon its request or at the initiative of the investment firm, in respect of one or more transactions relating to financial instruments*". The providers included in this study provide investment advice under this definition, although the degree of personalisation is debatable and varies between the different platforms. Most providers ask prospective clients to fill out a questionnaire regarding needs, tolerance to risk or risk appetite and on their existing financial situation. Based on their answers, customers are directed either to a rather limited number of predefined investment strategies or portfolios, whereas others tend towards a more personal approach.

That being said, the majority of the platforms under review also provide asset management services, since they typically implement the personal recommendations provided to their clients. In addition to executing the proposed investments, several of the platforms included in this study rebalance investments periodically to stick to the agreed asset allocation. In fact, several of the providers are registered as asset management companies with their National Competent Authority, or partner with an asset management company.

Therefore, terms such as "robot investing" or "robot investment management" would designate this emerging business more appropriately than robo-advice[5].

[5] The conclusions of the EC study go even further mentioning that *"robo-advisors only provide digital asset management, in contrast to advice"* on page 157. However, BETTER FINANCE is of the opinion that all EU-based robots included in this study provide investment advice based on the requirements under the MiFID II legislative framework (Level 1 and Level 2 instruments). We believe the robo-advisors studied comply with the implementing provisions for Article 4.1(4) and Article 25.2 of MiFID II.

SIMPLER, LOWER AND MORE TRANSPARENT FEES

Most "robo" providers display a simplified fee scale compared to traditional providers, often a single "all-in" fee or fees consisting of a simple combination of advice- and fund fees. Typically, fees such as entry fees, custody fees, transaction / trading fees, performance fees, wrapper fees, etc, frequently found in standard "human" financial advice and private banking services, are not present. Although fund fees are not always disclosed in the presentation of the platform services, their existence on top of the management fee is usually mentioned.

Whereas fees for robo-investing services are generally far simpler and more transparent than those for traditional investment advisors, information provided on underlying fees could be significantly improved for most platforms included in this research.

The fees are also much lower than for traditional services, especially since most platforms use only or mostly exchange-traded funds (ETFs). The basis for charging fees, however, remains, in most cases, traditional: it is asset-based, not performance based. This constitutes a limit to a better alignment of interests between providers and clients. There is one notable exception: the French robot adviser "Marie Quantier"[6] has developed a very innovative and investor-friendly fee model: from € 79,60 fixed per year for administration plus 5% of annual gains.

TAKING A LOOK UNDER THE HOOD

While the first two editions of BETTER FINANCE`s Robo-advice report had a detailed look on the emerging sector in terms of information provided on the respective websites regarding costs and underlying investments, a new development in this year`s report is comprehensive algorithm testing of the included platforms.

To get a more complete and accurate picture, for the 2018 edition we decided to create two different profiles that we used to take the questionnaires and sign up to the different platforms.

This allowed us to analyse the different providers in terms of suitability, user-friendliness, transparency and fees.

MYSTERY SHOPPING

Automated investment advice services carry real promises for savers and investors. By providing simple, understandable and affordable products and by addressing the lack of

[6] Not covered in this report as the platform requires a subscription and an up-front payment in order to take the questionnaire.

financial literacy and information, robo-advisory services may very well allow households to gain trust and find their way back to equity investments. That being said, it is important not to sell the bearskin before killing the bear. Whereas the robo-advice business model seems to go a long way towards improving the situation for individual investors looking to access the equity markets, BETTER FINANCE wanted to verify if these platforms do as they promise. If retail investors are to invest in equity, it is key for these financial products to be suitable, accessible and affordable.

BETTER FINANCE decided to put the platforms to the test and, as the representative of EU Citizens as Savers and Investors at the European level, get into the skin of average non-professional investors looking to put money aside for the future. To this end two mock profiles were created (see below) in order to engage in some 'mystery shopping' on the 16 selected robo-advice platforms. This allowed BETTER FINANCE to collect data and put the different algorithms to the test.

Our approach was to replicate the actual consumer experience and did not involve any research that could or would not be done by an individual investor, in order to establish user-friendliness and transparency levels.

Two Investor Profiles

In choosing and designing the profiles, we aimed for the average characteristics of two investor categories: (i) **millennial**s, with a shorter investment horizon but a higher risk appetite, and (ii) **baby-boomers**, with a long-term goal, more savings to invest but also a more conservative approach to the risks they are willing to take. For simplicity and comparability reasons, we chose the initial investment sum of 10,000€ for the millennial and 100,000€ for the baby-boomer.[7] In choosing the millennial and the baby-boomer's age, we considered how many years the average employed EU citizen would have to save in order to accumulate the aforementioned amounts to be invested.[8] Thus, with a modest savings ratio of 1:9 of the income (10% per month), a millennial would roughly accumulate 10,000€ by the age of 30, while

MILLENNIAL

Age: 30 years
Personal situation: unmarried, no children;
Education: M.A. in banking and economics;
Investment goal: Buy a house
Investment horizon: 5 years
Risk tolerance (own assessment): High
Investment amount: 10 000

[7] Net of liabilities

[8] Based on Eurostat data, the average monthly net income in the EU is 1,500€ – see here. In addition, we use an annual income increase rate of 2% based on an assumption used in the Bocconi study – see A. Berardi, C. Tebaldi, F. Trojani, 'Consumer Protection and the Design of The Default Investment Option of a Pan-European Pension Product' (2018) SDA Bocconi School of Management.

Age: 50 years
Personal situation: married, has children
Education: engineering
Investment goal: save for retirement
Investment horizon: 20 years
Risk tolerance (self assessment): Low
Investment sum: 100 000

BABY BOOMER

the baby-boomer would have saved about 100,000€ by the age of 50.

The millennial is unmarried, has no children, holds a Master's degree in banking and economics, and is therefore financially literate, although without any real practical experience with investments. His investment goal is to raise money towards a real estate property over 5 years. Considering his more specialised knowledge of capital markets, he is willing to take higher risks for higher returns in short-term markets.

The baby-boomer on the other hand has a family, a degree in engineering, has some experience dabbling in investments (pension savings, life insurances), and is planning for retirement. She read BETTER FINANCE's Pension Savings Report and she knows she must complement the low replacement income from her state pension and the poor returns on her occupational pension plans with additional savings, although she does not have specialised financial knowledge. With an investment horizon of 20 years, her profile is more conservative and her risk tolerance is lower. Given the choice, she would prefer her savings to go into more stable, reliable funds or securities, accepting a lower expected return on his investment.

For complex questionnaires also focusing on, for instance, personal situation and financial status, the team calculated the net monthly and annual income and the expenses-to-savings ratio.

Selection Criteria

BETTER FINANCE limited the selection to the largest robo-advice firms with an AuM (assets under management) value of at least 30 million €, in order to include the players that have been able to establish themselves with some degree of success and a certain level of experience.

The other criterion was the possibility to access the platforms' main functionalities without having to register or pay, since we believe that another positive characteristic of automated financial advice services is the possibility to receive investment advice (including disclosure of fees and other important features) before actually having to commit and sign up to any sort of contract. This provides transparency and increased choice for investors as well as ensuring a higher degree of competition in the market.

WHAT DID BETTER FINANCE CHECK?

Unlike their human counterparts, robo-advisors first of all just provide potential investors with a questionnaire to be completed online,[9] aimed at establishing a profile of the potential investor and determining risk appetite, investment capacity, investment horizon and target.[10] Based on the answers from the questionnaire, the robo-advisor goes on to propose what should be a tailor-made portfolio composition and investment plan for each potential client. So, besides consulting the more generic information available on most platforms, the report focused primarily on an analysis of the robo-advice algorithm (the link between the questionnaire and the resulting investment advice) as well as the information disclosed to the user.

ALGORITHM TESTING AND EVALUATION CRITERIA

As mentioned, earlier, it is not so much the aim of this report to single out the best robo-advice platforms as it is to establish whether robo-advice lives up to its promise to individual investors. The criteria used to put the algorithms to the test are specifically designed to determine to what extent these automated advisors deliver the four elements that European retail investors need: user-friendly and transparent investment services that provide suitable advice and portfolio planning for a competitive fee. Even if the central approach to this research – i.e. to carry out the research from the perspective of the layman investor - is necessarily subjective, the research uses objective criteria to lay down an impartial overview of the market.

However, since it is impossible to study a particular market in a vacuum, the individual robo-advisors that make up the market ultimately had to be compared. Therefore, our team used evaluation criteria only to establish what, in our view, are the best practices in this emerging market.

[9] See Line Bjerknes, Ana Vukovic, 'Automated Advice: A Portfolio Management Perspective on Robo-Advisors' (June 2017) Norwegian University of Science and Technology, 33.
[10] Ibid, 12-13.

WHAT WE FOUND

***<u>Disclaimer</u>**: All the results and associated grading or rankings are subject to the Research's methodology and aim to reflect the research team's experience from the individual investor point of view. This Research does not claim to constitute a review or comparison of individual platforms or models but rather aims to establish if and how Robo-Investing can deliver for individual investors. The rankings below only reflect the situation of the robo-advice firms in the sample and do not take into account the market and other players, thus the former must only be considered within the sample of automated investment platforms, limitations and caveats of the methodology. These are qualitative assessments which, by essence, are highly subjective and may differ from person to person and market to market. All references to EU secondary legislation are for information purposes only and do not constitute a legal assessment of the robo-advisors in subject, nor have they been taken into account when proposing, establishing or assigning points, grades or ranking for the robo-advisors.*

USER-FRIENDLINESS

The robo-advice business model implies a more accessible and easier way for individuals to invest. Keeping in mind the significant differences in terms of digital and financial literacy between investors, the continuing low levels of trust in providers of financial services[11], and the fact that financial matters can be very complex and difficult to understand, this study takes a deeper look at the extent to which the 16 robo-advisors included in this study are user-friendly and can easily be understood by the average layperson.

In order to be attractive and stimulate retail investor participation in capital markets, robo-platforms must be easy to use and understand, without misleading or omitting essential information. An independent study shows that the average user loses interest and focus after 100 seconds when completing an online questionnaire.[12] For these reasons, robo-advisors face the difficult challenge of balancing the need for a questionnaire that has enough questions to establish a sufficiently detailed profile and customised investment advice with the need to keep the questionnaire short and simple in order not to put off the potential investor.

Furthermore, robo-advisors need to comply with legal requirements and professional ethics, for which certain financial concepts need to be referred to. Since those concepts may not necessarily form part of the knowledge base of the average investor, robo-advisors must also to some extent test the financial literacy of their potential clients. In short, providers of digital investment tools

[11] As evidenced by the European Commission's Consumer Scoreboards

[12] Michael Tertilt, Peter Scholz, 'To Advise, or Not to Advise — How Robo-Advisors Evaluate the Risk Preferences of Private Investors' (June 2017) 8.

should consider it to be their responsibility to address shortcomings in financial literacy through investor education on their platforms.

With these considerations in mind BETTER FINANCE looked at the simplicity and accessibility of the platforms as well as whether the platform provides some degree of financial/investor education.

SIMPLICITY & ACCESSIBILITY

- whether the process is self-explanatory;
- whether the questionnaire is easy to use;
- whether the website is multilingual;
- whether there are tutorials/guidelines on how to use it;
- whether the user needs to register first;[13]

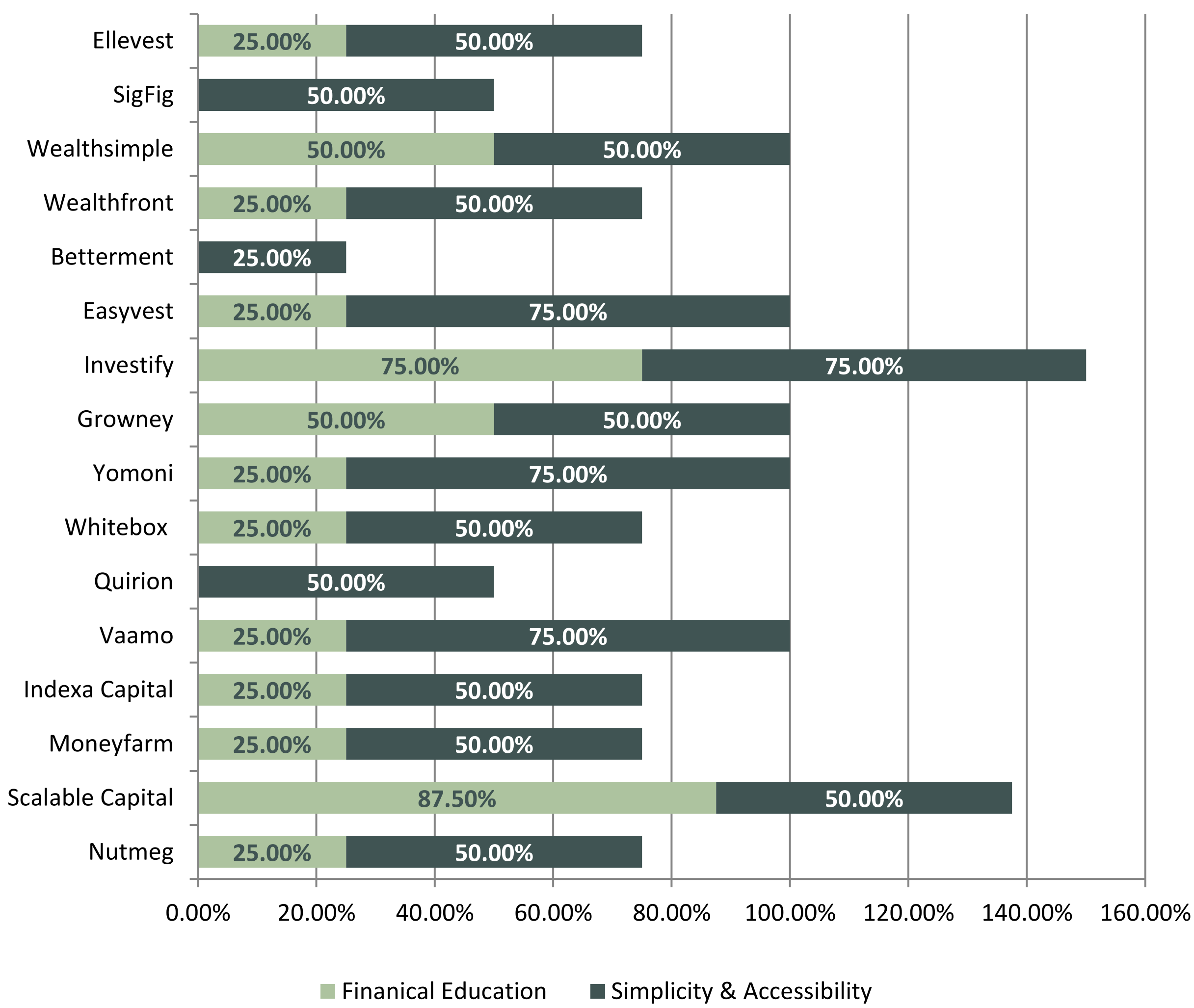
FINANCIAL/ INVESTOR EDUCATION

- whether there are easily accessible definitions of terms and explanations for layman investors;
- whether definitions are provided during the questionnaire process;
- whether the platform proposes webinars or videos;
- and whether there is a human advisor available for help and questions (IM or chat boxes).

Based on our scoring (listed in graph below) Investify and Scalable Capital stand out. Out of the 16 platforms included in this study, 25% offer easily accessible online material such as videos and webinars informing about potential investments and increasing their financial literacy. It is important to point out though that investor is not a full-time job and that, rather than providing lengthy videos and explanations, it is preferable for a provider to stay as simple as possible.

[13] We refer to 'registration' in the sense that the user must provide an e-mail account address in order to continue. Where further information was required (address; national identification number; bank account), the adviser was excluded from the study.

User-friendliness



That being said, most of the questionnaires were easy to find and easy to complete and the process was self-explanatory. Two of the platforms, Scalable Capital and Investify, include detailed information with definitions of financial terminology and concepts and explanations for layman investors, giving both platforms a higher score, and hence the two top spots within this category. Unfortunately most of the platforms do not provide multi-lingual content.

Only 5 of the robo-advisors provided the possibility to get in touch with human advisors at this pre-contractual stage.

TRANSPARENCY

BETTER FINANCE believes that transparency is the cornerstone of a sound financial industry, particularly with regards to charges and past performance. This report analyses the degree of essential information disclosure in the questionnaire and in the results (investment advice): i.e. fees, portfolio composition, past/future performance and risk.

TRANSPARENCY OF FEES

As mentioned in the introduction, one of advantages robo-advisors have over more traditional advisors is the simplified and reduced fee structure for the services provided. When analyzing the extent to which fees are clearly disclosed by the 16 robo-advisors:

- We first looked at whether the online platforms informed the user about the fees during the completion of the questionnaire and whether the results contained a breakdown of fees and their allocation (i.e. what the different fees are for: custodian fees, ETF fees, management fees etc.).
- Then we checked whether future performance scenarios were presented net of the total fees charged by the investment firm.[14]
- Lastly, we analysed whether the website provided an easily accessible overview of fees and charges and whether there were any inconsistencies between what the investor is presented with during the questionnaire.

A lack of transparency in terms of costs and fees is a concern that has been voiced by others, including in the EC's study on retail investment products. Although management fees tend to be disclosed somewhere on the platforms' websites, the ease with which this information can be found and the level of comprehensive and detailed information presented varies. Half of the platforms included in this study did not present information on fees when presenting final investment advice (4 out of 5 in the US and 4 out of 11 in Europe), and only 31% explicitly state that final returns include fees. This is not to say that the remaining 69% platforms limited themselves to presenting gross returns, but simply did not specify whether fees were included in the calculation of future performance.

The information on fees disclosed on the websites is often confusing or even misleading and often

[14] As per Article 50.10 MiFID II DR.

accessible only after some digging into the more obscure corners of the website.

However, this is not the case for all robo-advisors, since detailed information on fee allocation, can easily be found on platforms such as Nutmeg, Yomoni, Growney and Investify.

PORTFOLIO COMPOSITION TRANSPARENCY

The majority of elements the Report looks at when it comes to the proposed portfolio or funds are grouped under the *Suitability* sub-heading, but we have also checked the degree of disclosure on investment advice in line with the following criteria:

- whether the portfolio composition in terms of asset classes and percentages is presented;
- whether the asset classes are further detailed in terms of sectors/geographic focus;
- and, finally, whether there is a breakdown of the underlying funds that will compose the portfolio.

PAST/ FUTURE PERFORMANCE TRANSPARENCY

Central to the investment advice presented to potential investors is a prediction of how the initial investment sum will evolve over time, often referred to as "future performance scenarios".[15] The reliance on past performance data in the estimate of future performance scenarios is unfortunate. In addition to being inherently misleading, MiFID II clearly states that: *"...such forecasts are not a reliable indicator of future performance*[16]". For this reason, a clear warning of this unreliability is required by EU Secondary Legislation to accompany future performance forecasts. Such warnings are unfortunately missing from a majority of the robo-advice platforms included in this study.

BETTER FINANCE strongly disagrees with the usage of future performance scenarios[17], and finds the inclusion of the past performance of a proposed portfolio, or of a comparable fund, to be far more useful, enabling the potential investor to take informed decisions.

When looking at the robo-advisors' transparency in terms of historical and performance data, this study focused on the extent to which:

[15] MiFID II Delegated Regulation, Article 44.

[16] Article 44.4(d) of the Commission Delegated Regulation (EU) 2017/565 of 25 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council as regards organisational requirements and operating conditions for investment firms and defined terms for the purposes of that Directive, OJ L 87/1 (MiFID II DR).

[17] For a simple overview of how misleading future performance forecasts are, see the computations made by MEP Sven Giegold using the PRIIPs Key Information Document's methodology to calculate the three performance scenarios in comparison with the actual performance: https://www.sven-giegold.de/wp-content/uploads/2016/09/PRIIPS-performance-scenario-shortcoming-graph-and-explanation.pdf; for more detail, see https://sven-giegold.de/priips-abstimmung/.

- The performance forecast is presented alongside the forecast of a benchmark;
- The performance forecast is accompanied by the historical data of the fund, a comparable fund, or that of a referential index.

In as far as disclosure on past performance is concerned, only Indexa Capital shows past performance compared to a benchmark (over the last 5 years) and presents the historical data over the last 15 years, while Quirion shows the past performance of the investment strategy compared to an equity and bonds portfolio. On the same topic, Nutmeg presents the simulated past performance of a comparable portfolio over the last 22 years, and Moneyfarm shows how the portfolio has performed as of 2016. Taking into consideration the dire need for EU citizens to have access to appropriate and comparable information on past performance, this is seen as an area where there is room for improvement.

RISK TRANSPARENCY

In order to ensure that the risk-levels of the proposed investments by the robo-advisors are clearly disclosed to the investor - all the more important taking into consideration the DIY[18] nature of most robo-advisors included - this study researches the risk transparency of the different robo-advisors. The financial literacy of the investor, crucial to the investor`s ability to process and analyse the information provided, plays a key role here and is discussed under the section on user-friendliness above.

In estimating risk transparency, disclosure of said risk on the different platforms has been researched based on the following criteria:

- Clear disclosure of risk-levels either estimated by the robo-advisor based on input provided by the investor, or determined directly by the investor.
- If presented, estimated future performance includes best- and worse-case scenarios.
- Whether a warning on the potential loss of value is clearly disclosed with the results.
- Whether a warning on the unreliability of future performance scenarios is clearly disclosed with the results[19].

As discussed above, a clear warning on the unreliability of future performance scenarios is required by law[20] (BETTER FINANCE`s view on this issue was already clearly expounded), as is a clear warning on potential loss of value[21]. This study thus researches to what extent such warnings are

[18] Do-It-Yourself
[19] In accordance with the principle set out in Article 44.2(b) MiFID II DR.
[20] See Annex 2, tick box 2 and 5.
[21] See Annex 2 tickbox 5.

presented with the results, and whether they are as prominent[22] as the future performance scenarios and estimated end-returns presented. In estimating the riskiness of the investment, the inclusion of best- and worst-case scenarios when presenting future performance scenarios as well as past performance has been analysed[23], as well as to what extent the risk-level is clearly presented.

Although it is the responsibility of the potential investor to go over the information provided on the website in order to make an informed investment decision, BETTER FINANCE believes that the responsibility to provide clear and non-misleading information falls squarely on the suppliers of financial services[24]. For this reason it is not sufficient for the platform to limit itself to providing information somewhere on the website. Consequently, essential information should also be provided as part of the results of the questionnaire after the potential investor has filled it out.

While investor education is crucial, it should clearly not relieve suppliers of financial services of their duty to provide individuals and businesses with effective, clear and comprehensible information before contracts are concluded. It is useful to keep the MiFID II formulation on the issue in mind:

- *"Information must be fair, clear and not misleading."*
- *"it shall be accurate and in particular shall not emphasise any potential benefits of an investment service or financial instrument without also giving a fair and prominent indication of any relevant risks."*
- *"it shall be sufficient for, and presented in a way that is likely to be understood by, the average member of the group to whom it is directed, or by whom it is likely to be received."*
- *"it shall not disguise, diminish or obscure important items, statements or warnings."*

(EU MiFID II Directives)

As evidenced by the disparate scores of the 16 robo-advisors, the extent to which this responsibility of fair, clear and not misleading information is taken seriously varies greatly between different platforms. This is in line with the overall trend identified by BETTER FINANCE: fair, clear and non-misleading information remains one of the least enforced investor protection rules in EU. The detailed ranking can be found below:

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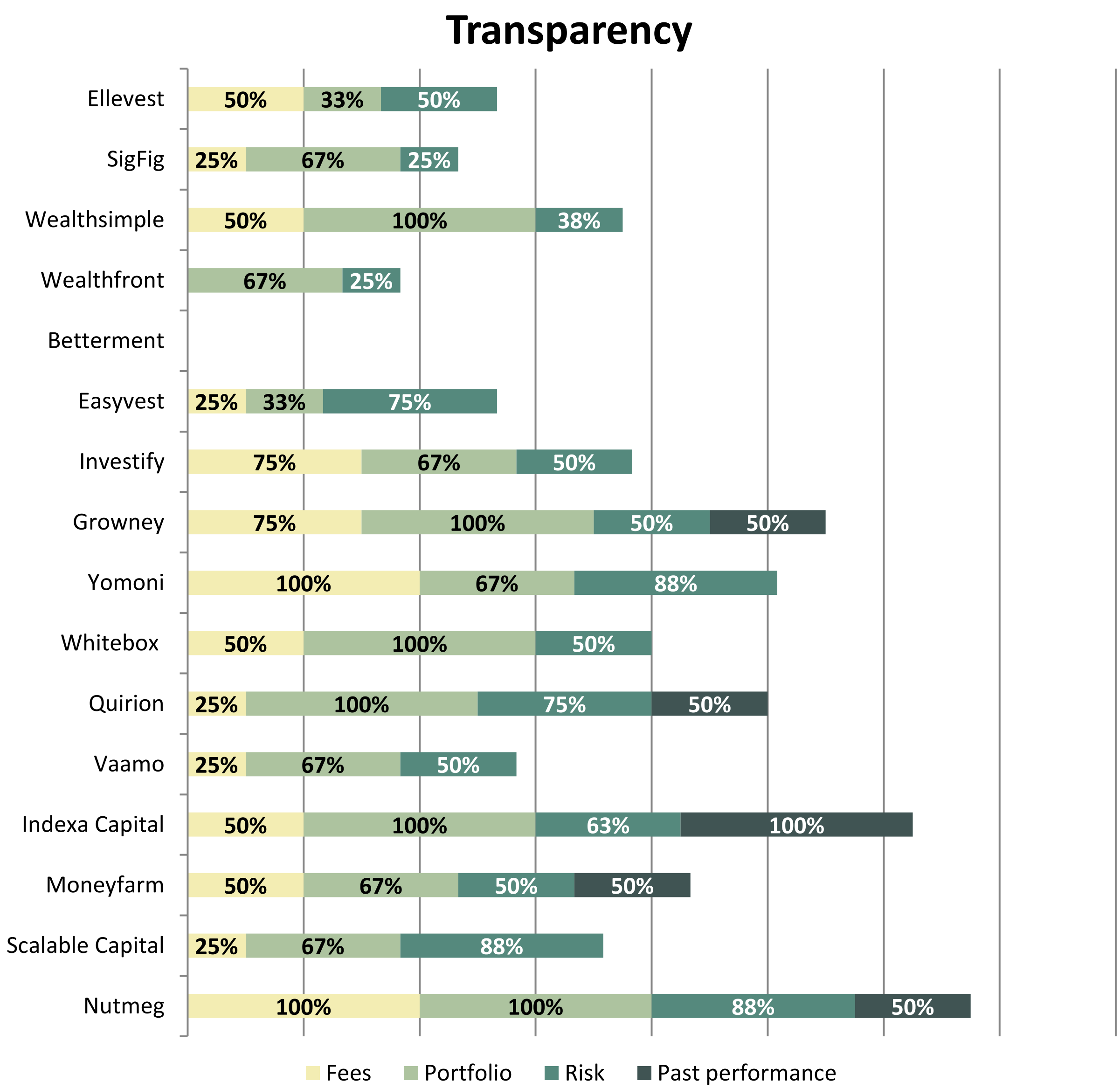
[22] See Annex 2 tickbox 5.
[23] For legal basis please see Annex 2 Tick box 3.
[24] Article 24.1 of MiFID II



Nutmeg achieves a top score for both transparency on fees and portfolio allocation. However, while Nutmeg does well on risk transparency, a clear warning on the unreliability of estimated future projections is not present. BETTER FINANCE`s stance on the unreliability of future performance estimates[25] is well known and, although 10 of the 16 platforms covered by this study show the estimated future performance for both best- and worst-case scenarios, an equal

[25] Article: New PRIIPS KID rules violate MiFID II Provisions at the Detriment of Investors

share does not warn investors of the potential loss of the value of their investments. Worse, 43% do not warn against the unreliability of future performance estimates.

There is also a tendency to present **future performance** estimates more prominently than the accompanying warning of their unreliability. This can be misleading to investors, especially considering current low levels of financial literacy.

Surprisingly, Betterment, the very well-established North American robo-advisor, scores a very disappointing 0%. This is in large part due to the generic nature of the investment advice presented as well as poor information disclosure on underlying fund fees. Like the other platforms, Betterment invites potential investors to fill out its questionnaire in order to get personalised investment advice. However, with a total of four questions, it does not take much to figure out that personalisation of advice will be limited at best. Worse than that, our findings show that after filling out the questionnaire, investors are presented with a "one size fits all" page with very little information dissimulated as personalised advice.

SUITABILITY

One of the Report's objectives was to determine whether automated investment advice can deliver suitable advice, i.e. propose a portfolio that is adjusted to the risk tolerance and target (sum, time and value) of the investor. In other words, can robo-advisors judge investor's needs appropriately and provide adapted advice accordingly?

In assessing this feature, we first evaluated whether the proposed portfolio compositions differ between the two profiles. A human financial advisor would be likely to propose a more conservative portfolio for the baby-boomer, who has a lower risk tolerance than the millennial, than the millennial who is keen on taking more risk and therefore better suited to a more aggressive portfolio.

The study further takes into account the asset class quota: based on several assumptions[26] and on previous robo-reports,[27] we defined equity-quota ranges that would match the risk profile, as follows:

- for the millennial, with an above-average risk appetite but a short-term investment horizon, an allocation between 20%-40% of the invested sum in equity-ETFs; the rest (majority) in bonds and a small remainder in cash/ money-market instruments;

[26] See Footnote 11.
[27] Tertilt, Scholz, 'To Advise, or Not to Advise — How Robo-Advisors Evaluate the Risk Preferences of Private Investors' (n 7) 2.

- for the baby-boomer, with a conservative-defensive risk approach, an allocation between 40% and 60% in equities, the rest of the money invested in bonds. The equity allocation range is slightly higher for the baby-boomer investor since the long-term investment horizon allows more holdings in stocks with reduced risk.

The following criteria were tested in relation to the questionnaire:

- Does the questionnaire ask about the investor`s financial situation?
- Does the questionnaire ask about the investor`s risk appetite?
- Does the questionnaire ask about the investor`s personal situation?
- Does the questionnaire ask about the investor`s investment goal?
- Does the questionnaire ask about the investor`s investment horizon?
- Does the questionnaire test basic financial literacy levels?
- Does the questionnaire adapt to input, is it interactive?

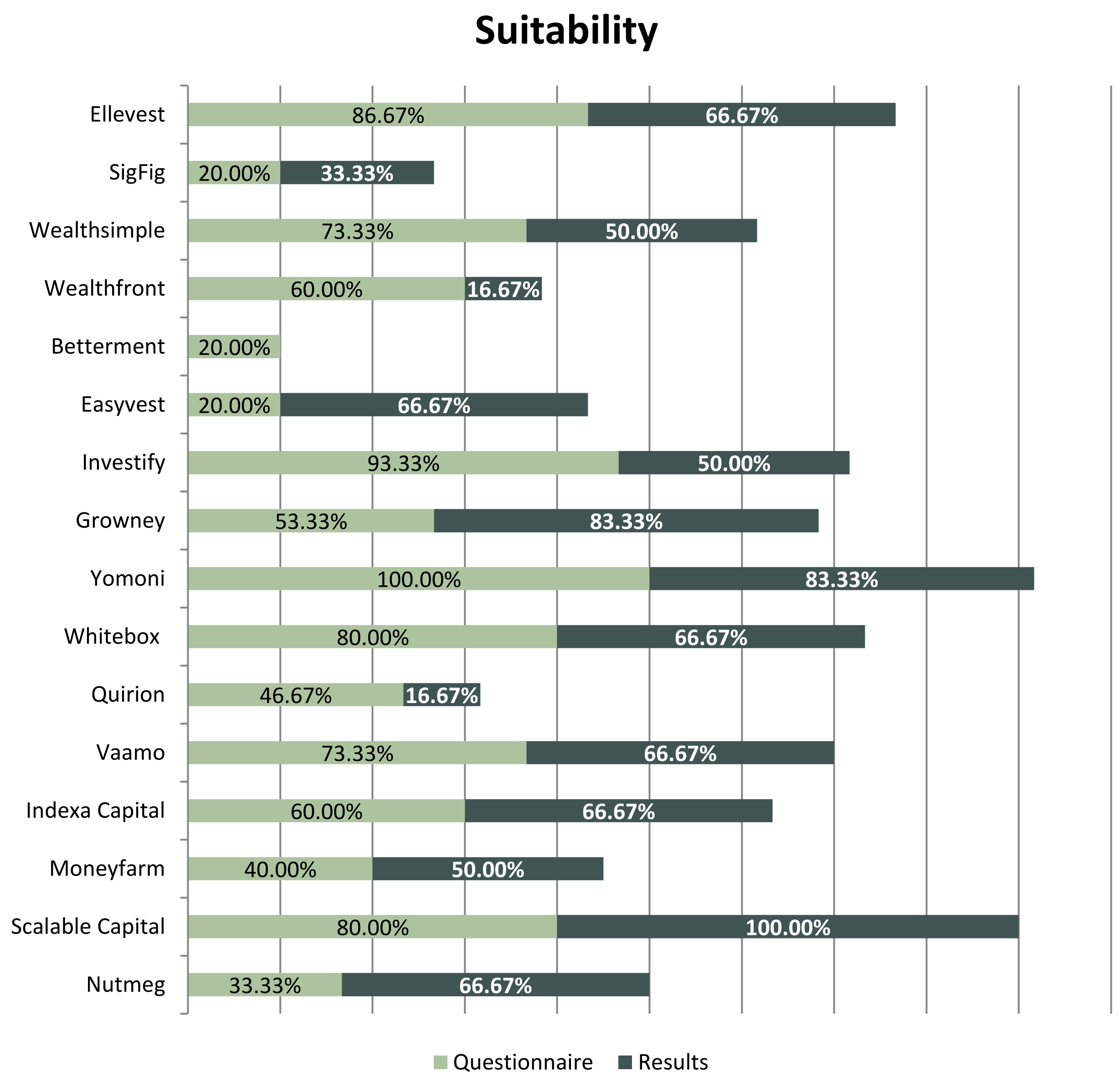
The following criteria were tested in relation to the questionnaire results:

- Are indicated annual returns realistic?
- What is the level of personalisation of the results?
- Can results and input be tweaked or adapted?

In testing the 'suitability' of the different platforms, the study takes a deeper look at the extent to which the algorithms used by the robo-advisors take into account different investor profiles, different risk appetites, personal preferences and situations when providing investment advice.

Although there is no automatic correlation between a higher number of questions asked and the quality of the information gathered, with 23 questions Investify is the platform with the highest number of questions tested in this study. Its thorough questionnaire results in a comprehensive overview of the investor`s ability and willingness to invest. Investify suitably adapts the suggested portfolio composition to both profiles, reflected in the personalised investment advice. Its advice was also deemed realistic by BETTER FINANCE.

Investify deserves a special mention for its neat feature providing the investor with the option to choose "investment themes", including ethical investing. However, its questionnaire does not adjust to the answers from investors in real time (a feature we only found in the questionnaires of Indexa Capital, Whitebox, Vaamo and Yomoni), nor does it provide the opportunity to tweak or change results based on investors' preferences once they have been given their final results.



Investify is in good company, with the top 5 platforms all scoring over 80% with regards to the suitability of the questionnaire

The final results presented by Wealthsimple are based on the premise that the investor makes an additional monthly payment to be added to the initial sum, which obviously boosts results and cannot be changed. Luckily this is quite clearly shown in the results. Wealthsimple also has a feature allowing the investor to choose to invest socially and responsibly, and it changes the portfolio allocation accordingly when this option is ticked. This allows investors to personalize their investments.

An additional remark is to be made for Easyvest, which implements a “de-risking” strategy, similar to life-cycle funds: the portfolio composition proposal includes a gradual reduction of the riskier asset classes as the maturity (target) date gets closer. While for the baby-boomer the portfolio allocation of 80% equity is reduced over 20 years to 48%, the millennial’s portfolio allocation in stocks is reduced to 0% by the end of his 5 year investment period.

FEES

Reduced costs resulting from automated investment advice are at the forefront of the debate about the benefits and risks of “the rise of the robo-advisors”, hailed as the revolutionary-nail-in-the-coffin for traditional investment business models. Akin to Henry Ford`s assembly lines, and the subsequent symbolic transformation of cars from a sign of abundant wealth to a symbol of personal freedom and the ideals of the American dream, the question is to what extent robo-advisors can lead to a similar paradigm-shift in the way we access, manage and view investment services.

The success of robo-advice - their Unique Selling Point if you will - hinges on their capacity to keep costs low. And in this respect the robo-advisors don’t disappoint. Most robo providers display a much simplified fee scale, often a single “all-in” fee or consisting of a simple combination of an advice fee and a fund fee.

When looking at fees, the research team only considered the fees disclosed by the robo-advisor together with the proposed investment advice as well as the more generic fee information provided on the website. No other source of information was considered for the purpose of this section.

The research team first looked for the total *ongoing charges*, i.e. the total amount of fees taken from the investment on an annual basis. Second, the research team looked for a breakdown of fees and whether all fees are taken into account (management fees, ETF or underlying funds’ fees, custodian fees, etc.).

A closer look at the fees allowed this study to identify the players with the most competitive fee structure. Since future returns on investment are unknown and not predictable, it is important to look at fees as they are a key driver of the performance of retail investment products.[28]

[28] Please see BETTER FINANCE’s Report on the real return of long-term savings in Europe.

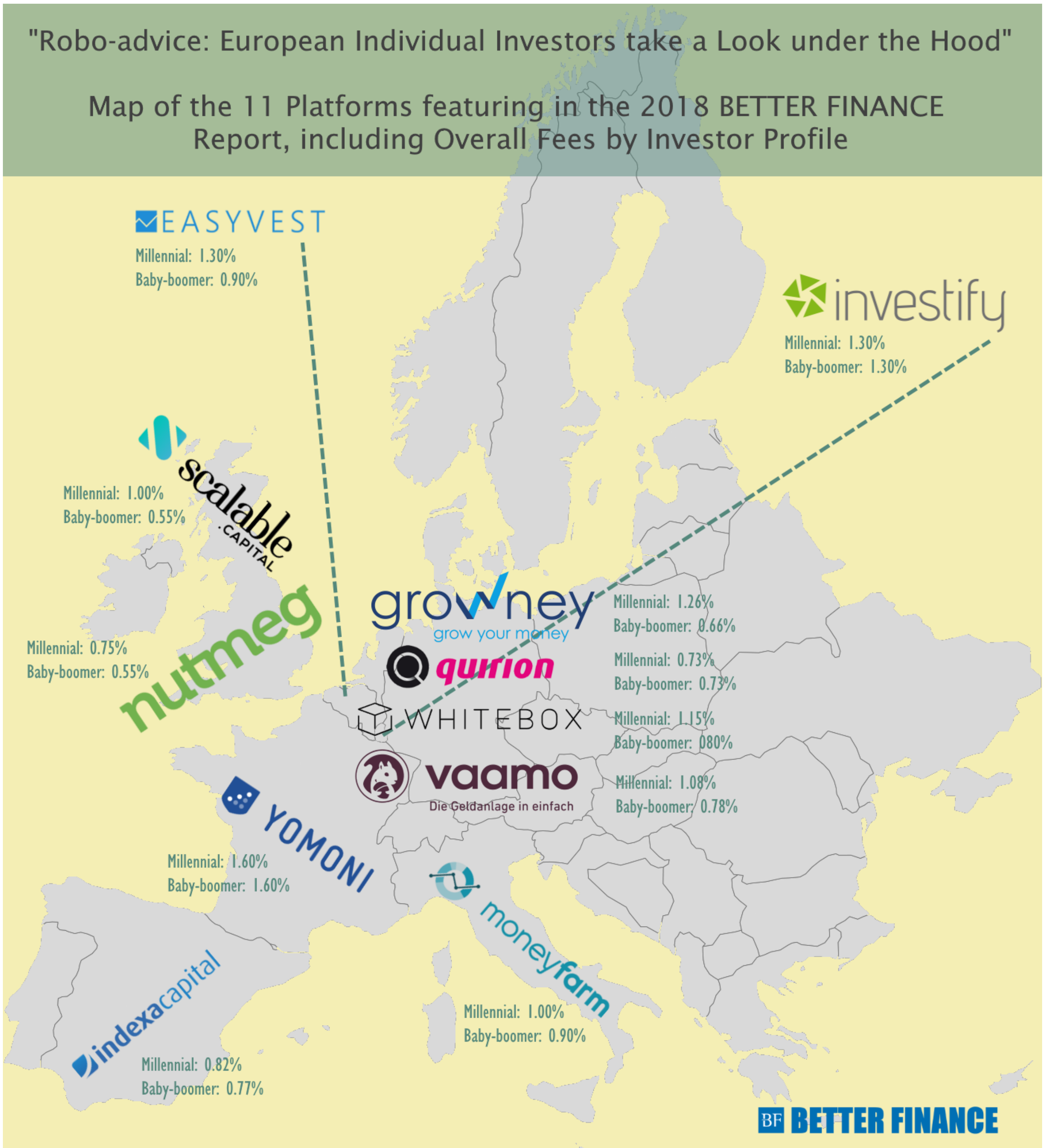
Whereas we already covered transparency of costs and fees in the section on transparency, it is worth mentioning that the above table could be much simpler if the platforms disclosed their fees together with the results and investment advice. As shown in the table, most platforms do, but others limit themselves to simply mentioning fees on their website as more generic, non-adapted, information.

We have chosen to present the fees as shown on the website alongside the fees as disclosed with the questionnaire outcome. Whereas there are a few divergences, overall fee disclosure is consistent between website and questionnaire results, especially in Europe. In the United States we had to look at the generic website information in order to get an overview of the fees charged (not provided with results).

Although the gap is closing somewhat compared to last year's results, robo-advice fees remain significantly higher in Europe than they are in the US, indicating that investment–related fees are overall much higher in Europe. This can be attributed to the fragmentation of the European capital markets and to a lack of product standardisation as well as insufficient competition. In addition, in some countries, the use of an additional wrapper around the selected funds for tax optimization purposes contributes significantly towards higher fees.

FEE DIFFERENCES BETWEEN INVESTOR PROFILES

Differences in fees between the different investor profiles on the same robo-advice platform can most of the time be explained by the business model that reduces the management fee proportionally to the amount of invested capital. Most platforms reduce the management fee significantly as the amount invested goes up, although some exceptions, such as Quirion and SigFig, take the opposite approach and allow for individual investors with less disposable capital to access their services for a reduced fee. Other platforms, such as Scalable Capital, Yomoni and Wealthfront, apply a flat fee irrespective of the initial capital invested.


"Robo-advice: European Individual Investors take a Look under the Hood"
Map of the 11 Platforms featuring in the 2018 BETTER FINANCE Report, including Overall Fees by Investor Profile
EASYVEST
Millennial: 1.30%
Baby-boomer: 0.90%
investify
Millennial: 1.30%
Baby-boomer: 1.30%
scalable CAPITAL
Millennial: 1.00%
Baby-boomer: 0.55%
nutmeg
Millennial: 0.75%
Baby-boomer: 0.55%
growney
grow your money
Millennial: 1.26%
Baby-boomer: 0.66%
quirion
Millennial: 0.73%
Baby-boomer: 0.73%
WHITEBOX
Millennial: 1.15%
Baby-boomer: 080%
vaamo
Die Geldanlage in einfach
Millennial: 1.08%
Baby-boomer: 0.78%
YOMONI
Millennial: 1.60%
Baby-boomer: 1.60%
moneyfarm
Millennial: 1.00%
Baby-boomer: 0.90%
indexacapital
Millennial: 0.82%
Baby-boomer: 0.77%
BETTER FINANCE

ROBO ADVICE - TOTAL FEES PER PROFILE - FEES ON WEBSITE VS FEES PROVIDED IN QUESTIONNAIRE RESULTS

	Fully managed portfolios - Management Fee - €10,000	Fixed allocation portfolios - Management Fee - €10,000	Fully managed portfolios - Management Fee - €100,000	Fixed allocation portfolios - Management Fee - €100,000	Trading fees & effect of market spread (average)	Investment Fund Costs - ETF Fees	Setup and exit fees & Transaction fees	Wrapper Fees	Total Fee - Millennial - Fully managed (from website)	Total Fee - Millennial (from website)	Total Fee - Baby Boomer - Fully managed (from website)	Total Fee - Baby Boomer (from website)
EUROPE												
Nutmeg - website	0,75%	0,45%	0,35%	0,25%	0,09%	0,21%	na	na	1,05%	0,75%	0,65%	0,55%
Nutmeg - results	0,75%		0,35%		na	0,21%	na	na	0,96%		0,56%	
Scalable Capital - website	0,75%				na	0,25%	na	na	na	1,00%	na	1,00%
Scalable Capital - results	na				na	na	na	na	na		na	
Moneyfarm - website	0,70%		0,60%		na	0,30%	na	na	na	1,00%	na	0,90%
Moneyfarm - results	0,70%		0,62%		na	0,30%	na	na	1,00%		0,92%	
Indexa Capital - website	0,45%		0,40%		0,18%	0,19%	na	na	na	0,82%	na	0,77%
Indexa Capital - results	0,45%		0,40%		na	0,37%	na	na	0,82%		0,77%	
Vaamo - website	0,79%		0,49%		na	0,29%	na	na	na	1,08%	na	0,78%
Vaamo - results	na		na		na	na	na	na	na		na	
Quirion - website	0,88%	0,48%	0,88%	0,48%	0,25%		na	na	1,13%	0,73%	1,13%	0,73%
Quirion - results	0,00%		0,48%		0,28%		na	na	0,28%		0,76%	
Whitebox - website	0,95%		0,60%		na	0,20%	na	na	na	1,15%	na	0,80%
Whitebox - results	0.95% - 0.35%				na	na	na	na	na		na	
Yomoni - website	0,70%				na	0,30%	na	0,60%	na	1,60%	na	1,60%
Yomoni - results	0,70%				na	0,30%	na	na	1,00%		1,00%	
Growney - website	0,99%		0,39%		na	0,27%	na	na	na	1,26%	na	0,66%
Growney - results	0,69%		0,39%		na	0,27%	na	na	0,96%		0,66%	
Investify - website	1,00%				na	0,30%	na	na	na	1,30%	na	1,30%
Investify - results	1,00%				na	M = 0,24% - BB = 0,22%	na	na	1,24%		1,22%	
Easyvest - website	1,00%		0,60%		na	0,30%	na	na	na	1,30%	na	0,90%
Easyvest - results	na		na		na	0,30%	na	na	na		na	
NORTH AMERICA												
Betterment - website	0,25%		0,40%	0,25%	na	0,13%	na	na	na	0,38%	0,53%	0,38%
Betterment - results	na		na		na	na	na	na	na		na	
Wealthfront - website	0,25%				na	na	na	na	na	na	na	na
Wealthfront - results	na				na	na	na	na	na		na	
Wealthsimple - website	0,70%				na	0,20%	na	na	na	0,90%	na	0,90%
Wealthsimple - results	0,70%		0,50%		na	na	na	na	na		na	
SigFig - website	0,00%		0,25%		na	0,11%	na	na	na	0,11%	na	0,36%
SigFig - results	0,00%		0,25%		na	na	na	na	na		na	
Ellevest - website	0,25%		0,50%	na	na	0,11%	na	na	na	0,36%	0,61%	0,61%
Ellevest - results	0,25%				na	0,16%	na	na	0,41%		0,41%	

DIVERGENCES IN PERFORMANCE FORECASTS AND RECOMMENDED ASSET MIXES

As mentioned earlier, a robo-advisor should propose tailor-made, suitable recommendations for potential investors. The research highlights a significant divergence between the investment advice provided to the two different investor profiles created for this study. Considering that exactly the same investor profiles were used to test each platform, it would be reasonable to expect that each profile would be given the same risk/reward assessment and investment horizon on each platform. It is therefore interesting to look at the differences between the ***expected***[29] outcomes presented by each different robo-advisor.[30]

This section focuses on three fundamental elements concerning the investment advice for the ***millennial*** and ***baby-boomer*** investors: (**a**) expected returns on investment; (**b**) proposed equity (ETF) allocation; and (**c**) correlation between the first two.

Before expanding on these, it is important to point out the following:

First, not all robo-advisors present results for the indicated investment horizon for the baby-boomer. For those who calculated performance forecasts on less than 20 years, the research team had to estimate and calculate the cumulative results with regards to the target date (2038).

Second, many robo-advisors by default include a certain amount of monthly contributions to be added to the initial investment amount in their questionnaires, something the average investor might not always be aware of and which would result in a higher final lump sum. While the research team could, in most cases, tweak the settings in order to obtain forecasts without monthly/annual contributions, for one advisor the results had to be re-computed without monthly contributions. Furthermore, two robo-advisors did not present any performance forecasts at all (nor past performance).

Last, some robo-advisors focus on fees and annual growth rates, which is highly misleading since they do not take investment horizons into account. In some cases a net return per year is shown, solely based on the risk profile of the potential investor (putting particular emphasis on the low level of fees), which remains the same irrespective of whether the target date is 5 or 20 years in the future.

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[29] That is the forecast which presents the highest probability of occurrence.

[30] The Research team acknowledges that differences may result from ongoing fees, ETF-picking skills and risk approaches. Nevertheless, it also agrees that these should have a limited effect. In particular, since the portfolio composition – from an asset class distribution and geographic focus –is not very divergent, the same investor should have received more or less the same: (i) portfolio allocation and (ii) expected result over the 5 or 20 years investment horizon from the robo-advisors.

MILLENNIAL DIVERGENCES

Considering the short investment horizon, the research team expected fewer differences in terms of investment advice for this profile. This was not the case:

Investment gain: The differences in terms of returns on investment between the different platforms (or how much the investor would make on top of his initial 10.000€/$/£) are significant, starting **from 880€[31] (Ellevest) and reaching up to 8.300€[32] (Wealthsimple)**. Considering that most robo-advisors propose portfolios composed of ETFs – which generally are index-trackers – investing in traditional asset classes (equity; bonds; money-market instruments),[33] the research team could find no explanation as to how such huge differences (almost 1000%) in expected outcomes could exist. As shown in the table below, the same important divergences can be found for the other parameters (annual growth rate, % increase).

Equity allocation: The equity allocation in the proposed portfolio, considering that the investor profile is the same for all platforms, is also inexplicably different. It is our view that the equity allocation in the proposed portfolio should reflect the risk and reward profile of each investor. Nevertheless, for a short-term investment, the millennial investor received "personal recommendations" ranging from **32% to 89% in equity ETFs**. Besides the fact that, as shown above, 89% equity allocation for a 5-year holding period does not match the millennial's risk profile, it also shows that robo-advisors may, in some cases, provide generic advice, instead of tailor-made recommendations. Either this or the risk tolerance assessment algorithm is based on discretionary rules for some advisors.

An additional observation is needed: in line with the criteria described in the *Suitability* section, seven robo-advisors proposed a portfolio allocation that would equate to a very aggressive risk profile (over 50% equity), and the average on all advice was 59%.

Correlation: The most important element the research team observed is that there is a clear disassociation between the equity allocation in the portfolio and the expected investment gain for the investor. This stands as clear proof that not only are future performance scenarios based on the discretionary assumptions of financial advisors, but that performance forecasts have the potential of being highly misleading for investors.

[31] According to the currency exchange rate announced by the European Central Bank of 11/06/2018, i.e. USD/EUR = 1.1754, see here.
[32] Ibid
[33] In the absence of extremely speculative, high-yielding financial instruments (derivatives) or use of financial operations (such as leveraging).

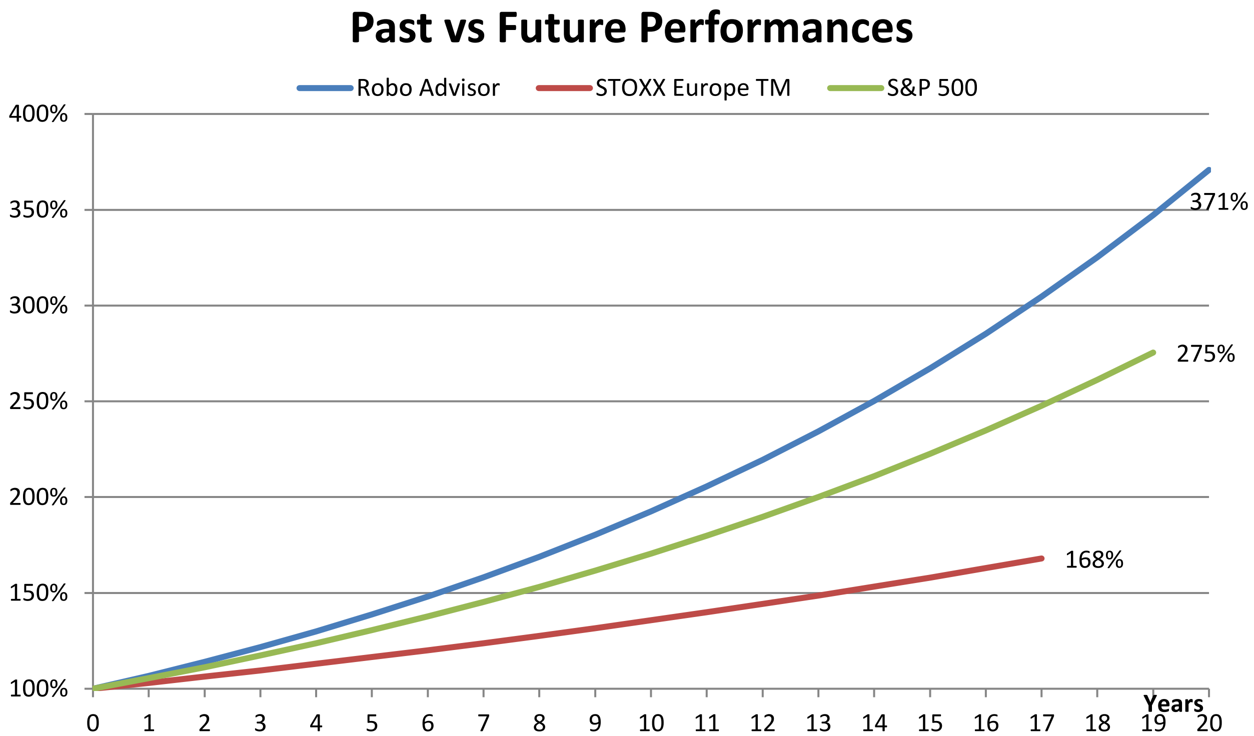
MILLENNIAL FUTURE PERFORMANCE SCENARIOS of 10,000 €/$/£				
Investment Horizon: 5y	Annual Growth Rate*	Investment Gain	% increase	Equity Allocation
EUROPE				
Nutmeg	5,22%	£ 2.897	129%	87%
Scalable Capital	3,58%	€ 1.924	119%	32%
Moneyfarm	2,35%	£ 1.236	112%	66%
Indexa Capital	2,40%	€ 1.259	113%	46%
Vaamo	4,37%	€ 2.385	124%	36%
Yomoni	2,11%	€ 1.100	111%	36%
Whitebox	4,80%	€ 2.641	127%	66%
Quirion	6,20%	€ 3.509	135%	60%
Growney	4,86%	€ 2.678	127%	50%
Investify	5,65%	€ 3.163	132%	75%
Easyvest	4,90%	€ 2.702	127%	48%
NORTH AMERICA				
Betterment	N/A	N/A	N/A	N/A
Wealthfront	N/A	N/A	N/A	89%
Wealthsimple	14,59%	$ 9.756	198%	50%
SigFig	N/A	N/A	N/A	87%
Ellevest	1,99%	$ 1.035	110%	69%
**Source: BETTER FINANCE own computations*				

BABY-BOOMER DIVERGENCES

In long-term investments, even small differences in portfolio allocations and annual growth rates would lead to higher differences in investment gains after 20 years. Nevertheless, the discrepancies between what the baby-boomer was presented with in terms of investment gains, equity allocation and correlation are, again, significant.

Investment gains: Some advisors predicted an expected return on investment of almost 34.000€ (Indexa Capital), while one robo-advisor presented an expected return of 270.000€ on top of the initial 100.000€ invested. Simple arithmetic shows an 8-fold difference in what the investor is "offered" from one advisor to another.

More worrying is that, while the investment horizon of 20 years will surely comprise a market correction (downturn at some point), some expected results show a cumulative return of 371%, which is 202 percentage points above what the STOXX Europe Total Market (NR) returned since the beginning of this century[34], and the S&P 500 also returned 96 percentage points less over 20 years.



Equity allocation: Contrary to all expectations, the lower and upper limits for the equity allocation in the proposed portfolios are lower than those of the millennial investor, although the investment horizon is 4 times longer. The smallest equity quota was proposed by Indexa Capital – 20% (which, in turn, could explain the smallest investment gain) - and the highest was presented by Easyvest – 80%.

Correlation: Once more, the correlation between the annual growth rate, investment gain (or compound return at maturity date) and equity quota (or portfolio risk profile) seems surprisingly low in most cases. One of the robo-advisors projects an expected investment gain of 94.000€ over 20 years with 47% of its portfolio invested in equity-ETFs, while another expected a gain of 142.800€ with 32% equity share in the portfolio holdings.

[34] BETTER FINANCE, *Pension Savings: The Real Return* (2017), page 20, available here.

BABY-BOOMER FUTURE PERFORMANCE SCENARIOS of 100,000 €/$/£				
Investment Horizon: 20y	Annual Growth Rate**	Profit	% increase	Equity Quota
EUROPE				
Nutmeg	2,87%	£ 76.003	176%	64%
Scalable Capital	3,59%	€ 102.377	202%	30%
Moneyfarm	4,54%	£ 142.800	243%	32%
Indexa Capital	1,47%	€ 33.892	134%	20%
Vaamo	1,53%	€ 35.612	136%	24%
Yomoni*	3,95%	€ 116.997	217%	45%
Whitebox	2,05%	€ 50.097	150%	48%
Quirion*	6,77%	€ 270.825	371%	60%
Growney	6,14%	€ 229.942	330%	70%
Investify	3,37%	€ 94.000	194%	27%
Easyvest	4,77%	€ 153.785	254%	80%
NORTH AMERICA				
Betterment	N/A	N/A	N/A	N/A
Wealthfront	N/A	N/A	N/A	72%
Wealthsimple*	4,81%	$ 155.702	256%	50%
SigFig	N/A	N/A	N/A	67%
Ellevest*	2,46%	$ 62.635	163%	64%
** BETTER FINANCE estimates* *** Source: BETTER FINANCE own computations*				

INVESTOR PROFILES DIVERGENCES

The strongest case against future performance scenarios can be made by presenting the divergences between the three elements presented above (investment gain, equity allocation and correlation) of the two opposing investor profiles side-by-side.

Investment gain: Analysing both tables presented above first leads to a warning: there are cases where the baby-boomer would gain less in absolute terms (%) than the millennial over a period four times longer (Wealthsimple – 198% in 5 years with 50% equity; Whitebox – 150% in 20 years with 48% equity).

Equity allocation: Naturally, the millennial should have a portfolio composition that reflects the more risky approach he has to investments. Considering the different investment horizons, an excessively large equity allocation for the millennial would go over his risk tolerance while an equity allocation that is too low for the baby-boomer would overestimate his risk aversion. Results are, again, inconsistent. Some robo-advisors proposed a 75% equity allocation for a 5 year holding period for the millennial while proposing a 47% allocation in stocks on a 20 year horizon for the baby-boomer, when it should have been the other way around.

Correlation: No rule could be deduced on the same platform for both profiles. We would have expected a slightly higher equity allocation, coupled with a lower absolute gain, for the millennial and the opposite for the baby-boomer. The results, however, show that some platforms do follow this pattern, some have a reversed approach, and others do not specify it at all.

Portfolio composition: An additional observation is the allocation, in some cases, of the investment amount into rather unusual asset classes. In this case the Report refers to money-market instruments and commodities. While money-market instruments are unstable securities that also have a low rate of return over the long-term (lower than bonds), commodities have proven to be even more unstable and highly risky. For instance, one of the robo-advisors presents a portfolio allocation of nearly 30% in natural resources, which in our view would make for a very interesting discussion on the synthetic risk and reward indicators of those portfolios in question.

RECOMMENDATIONS

REGULATION & SUPERVISION

Robo-advisors must follow the same rules under the MiFID II legislative framework[35] as traditional advisors. Indeed, all providers researched were duly registered (or in the process of registering) as financial advisors in their respective jurisdictions like traditional, non-automated financial advisors are. In addition, many are logically also registered as asset managers or have a contractual relationship with a registered investment company. It follows logically therefore that these newcomers are regulated as such and need to comply with rules governing investments and advice, and in particular MiFID.

INVESTMENT ADVICE

However, an issue that BETTER FINANCE wishes to highlight is the unclear definition of "investment advice", in particular the undefined "personal recommendations"[36] term. This is a major concern both for investment services providers and retail investors as falling under or

[35] This counts MiFID II, MiFIR, and the delegated or implementing regulations (Level 2 instruments).
[36] Article 4.1(4) MiFID II.

escaping the definition of investment advice contained in Article 4.1(4) MiFID II creates legal uncertainty concerning a series of regulatory obligations (for the advisor) and guarantees (for the client) – such as the rules on inducements and non-independent advice. Therefore, since the lack of consistency as regards terminology is contributing to the investors' confusion, BETTER FINANCE would like to invite regulators and other interested stakeholders to agree on a standardised terminology, in particular on how to define concepts such as "investment advice", "personal recommendations", "product selling", "guidance", "planning", "fee-based" and "commission-based".

BETTER FINANCE welcomed[37] the European Securities and Markets Authority's (ESMA) final guidelines on suitability[38] (applying to all firms offering the service of investment advice and portfolio management, irrespective of the format used for the provision of these services) as the assessment of suitability is one of the most important requirements for investor protection in the MiFID framework and a cornerstone of this study. The Guidelines take into consideration technological developments of the advisory market and the increasing use of automated or semi-automated systems for the provision of investment advice or portfolio management (robo-advice). BETTER FINANCE supports the Guidelines' definition of robo-advice as "the provision of investment advice or portfolio management services, in whole or in part, through automated or semi-automated system". In particular, BETTER FINANCE welcomes ESMA recommendation for robo-advice firms to provide clients, in addition to other required information, with a clear explanation that the answers clients provide will have a direct impact in determining the suitability of the investment decisions recommended or undertaken on their behalf. We agree that this would help address potential gaps in clients' understanding of the services provided through robo-advice.

Moreover, we regret that contrary to what was planned in the 2015 CMU Action Plan the recently published EC study on the retail investment product distribution has not examined "*how the policy framework should evolve to benefit from the new possibilities offered by online based services and fintech*". However, since the study suggest that the fact that on average, distributors in the Netherlands and the UK seem to display the lowest ongoing fees for all types of funds (except for money market funds) may be related to the ban on inducements in those countries, BETTER FINANCE recommends that research is undertaken by the EC on the quality of investment advice in countries with and without ban on inducements.

[37] Please see BETTER FINANCE's response to the consultation on the ESMA's *Guidelines on certain aspects of the MiFID II Suitability Requirements* http://betterfinance.eu/fileadmin/user_upload/documents/Position_Papers/Securities_Market/en/BETTER_FINANCE_s_answer-_Consultation_Paper_on_MiFID_II_Suitability_requirements_FINAL.pdf.

[38] ESMA's *Guidelines on certain aspects of the MiFID II Suitability Requirements* https://www.esma.europa.eu/press-news/esma-news/esma-publishes-final-guidelines-mifid-ii-suitability-requirements.

Relative Past Performance Disclosure

In light of the significant divergences BETTER FINANCE has observed during the mystery shopping exercise, it cannot be stressed enough how important the disclosure of standardised relative (past) performance is for investors. Our findings demonstrate that the same investor profile (in both cases: millennial and baby-boomer), i.e. with the same investment amount and horizon, personal and financial situation, as well as level of financial literacy, received widely diverging: (i) risk profile assessments (where applicable), (ii) portfolio composition and (iii) expected outcomes of his investment. As a consequence, this leaves the potential retail investor with few (if any) comparable elements between the different robo-advisors, meaning that it will be difficult for them to take an informed decision and it shows the unreliability of the advice provided on that basis.
For these reasons, BETTER FINANCE recommends that EU regulators:

- impose on investment advisors at least the obligation to always present relative past performance of the proposed portfolio or fund alongside the performance forecasts,
- eliminate entirely future performance scenarios and
- make requirements for a presentation of the risk/reward profile, ongoing charges and performance graphs similar to the current UCITS KIID.

Complexity

The recent EC study on retail investment products confirmed BETTER FINANCE's findings, i.e. that investment products are not bought but sold, and that an average individual investor is not able to differentiate between the benefits and risks of different types of advice, often believing that advice provided by non-independent advisors via banks and insurers is "free" (unaware of incentive schemes and potential conflicts of interests). Therefore, the potential for new distribution models based on FinTech is promising but still needs to be monitored carefully. In fact, the emerging sector is charging significantly lower and more transparent fees with few or no commissions from providers. However, these platforms still deal with products and services that require clients to be relatively financially literate to really understand the value of their offers.

Therefore, BETTER FINANCE again calls on EU Authorities to fulfil their legal duty to promote simplicity and transparency of investment products as well as to follow up on their "Consumer Financial Services Action Plan"[39] released in 2017 and go beyond the non-binding "Key Principles for Comparison Tools". In light of our findings on very diverging results for one and the same investor profile on different providers, it is clear that EU citizens are in dire need of comparable information on investment products, including past performances relative to the

[39] The EC's Financial Services Action Plan https://ec.europa.eu/info/publications/consumer-financial-services-action-plan_en

objectives of the providers (their "benchmarks"), and on costs. It should be accessible via independent web-based comparison tools for retail investments. BETTER FINANCE is ready to contribute to this process, since this constitutes a major challenge for EU citizens as long-term savers, for the Capital Markets Union initiative, for the EU economy and for the adequacy of our pensions.

PUBLIC ENFORCEMENT

Last but not least, even though a clear warning of future performance forecasts' unreliability is required by EU Legislation to accompany such estimates, it was unfortunately missing from a majority of the robo-advice platforms included in this study. Moreover, many of the providers tested were found to present future performance estimates more prominently than the accompanying warning of such forecasts` unreliability. Therefore, BETTER FINANCE calls on national supervisors in charge of protection of retail financial users to use their powers and investigate potential breaches of the EU law.

ANNEX 1: COMPARISON TABLES OF ROBO-ADVISORS IN EUROPE AND NORTH-AMERICA:

BETTER FINANCE	Italy	Luxembourg	France	Spain	Belgium
	MONDEYFARM	INVESTIFY	YOMONI	INDEXA CAPITAL	EASYVEST
ASSETS UNDER MANAGEMENT	€ 375 million	€ 35 million	€60 million	€89 million	€30 million
LAUNCH YEAR	2011	2015	2014	2015	2016
PRODUCTS AVAILABLE	4-3 investment accounts + investment advice	4	2	6	3
TOTAL FEES MILLENIAL	1,00%	1,30%	1,60%	0,82%	1,30%
TOTAL FEES BABY BOOMER	0,90%	1,30%	1,60%	0,77%	0,90%
LEGAL STATUS	Money Farm is Authorised and regulated by the UK Financial Conduct Authority as an Investment Advisor and Investment Management Company - Authorisation no. 629539	Authorised by CSSF Lum lisens number: 461	YOMONI is auhtorised and regulated by French Regulator AMF as an asset management company, no. GP-15000014 and registered insurance broker (ORIAS 15003517).	Yomoni is a portfolio management company approved by the AMF under number GP-15000014 and as insurance broker ORIAs 15003517.	Easyvest is a brand of Easyvest SPRL, authorized and regulated by the Belgian Financial Services and Markets Authority, no. FSMA 114522 cA-cB, as an agent in banking and investment services for Leleux Associated Brokers, and as a subagent in insurances for Securex
SOURCES	www.moneyfarm.com	www.investify.com	www.yomoni.fr	https://indexacapital.com/	www.easyvest.be

	EUROPE					
	UK		Germany			
	NUTMEG	SCALABLE CAPITAL	QUIRION	GROWNEY	WHITEBOX	VAAMO
ASSETS UNDER MANAGEMENT	€ 1.1 billion	€ 600 million	€ 75 million	€50 million	€60 million	€85 million
LAUNCH YEAR	2012	2014	2013	2014	2016	2013
PRODUCTS AVAILABLE	5 investment accounts and 2 types of management (flexible, fixed)+investment advice on all 10	4-3 investment accounts + investment advice	3-2 inv. + inv. Adv	4	2	2-inv. + inv. Adv
TOTAL FEES MILLENIAL	0,75%	1,00%	0,73%	1,26%	1,15%	1,08%
TOTAL FEES BABY BOOMER	0,55%	1,00%	0,73%	0,66%	0,80%	0,78%
LEGAL STATUS	Nutmeg® is authorised and regulated by the UK Financial Conduct Authority, no. 552016.	Scalable Capital Limited is authorised and regulated by the UK Financial Conduct Authority (Firm Ref No 672532).	Product offered by Quirin Privatbank AG, BaFin ID-Number: 148587	Growney's status as a financial investment broker is no longer sufficient , the company requires the license as asset manager pursuant to section 32 KWG with which it would be subject to BaFin supervision, has applied for licence as financial services provider to BaFin	Authorised by Bafin As, Id Number: 139603	Sciuridae Vermögensverwaltungs GmbH (trade mark vamoo) is licensed by BaFin for investment advice, investment brokerage, financial portfolio management and financial intermediation (BaFin ID 147708)
SOURCES	www.nutmeg.com	uk.scalable.capital	www.quirion.de	www.growney.de	www.whitebox.eu	www.vaamo.de

	NORTH AMERICA				
	BETTERMENT	SIGFIG	ELLEVEST	WEALTHSIMPLE	WEALTHFRONT
ASSETS UNDER MANAGEMENT	$13.5 billion	$211 million	$91 million	$1,4 billion	$10.2 billion
LAUNCH YEAR	2008	2012	2016	2014	2008
PRODUCTS AVAILABLE	7	4	4	2	3
TOTAL FEES MILLENIAL	0,38%	0,11%	0,36%	0,90%	na
TOTAL FEES BABY BOOMER	0,38%	0,36%	0,61%	0,90%	na
LEGAL STATUS	Registered as investment adviser with SEC (file number: 801-70171) and broker with FINRA (CRD: 149117).	Registered as investment adviser with SEC (file number: 801-72762) and Broker with FINRA (CRD: 158823)	Registered with the SEC as an investment adviser (SEC File number: 801-106683) and broker with FINRA (CRD: 175476)	Registered with the CSA, NRD 47940	Registered with SEC as an investment adviser (SEC file number: 801-69766) and broker with FINRA (CRD: 148456)
SOURCES	www.betterment.com	www.sigfig.com	www.ellevest.com	www.wealthsimple.com	www.wealthfront.com

Annex 2: Calculation of Divergences

With the aim of observing whether the expected outcomes of the investment are more or less in the same range for different platforms, this study takes into account the different results put forward by the robo-advisors for each investor profile.

In order to observe divergences, the cumulative return (CR) of the investment (in %) was calculated, based on the following formula:

$$CR = \frac{expected\ results}{initial\ investment} \text{ x } 100$$

Then, annualized rate of return (ARR) of the investment, i.e. the mean growth rate of the investment until the maturity date was calculated, based on the following formula:

$$ARR = \sqrt[n]{CR} - 1$$

- where n is the number of years (5 and 20);

For the robo-advisors that did not forecast the portfolio's performance for the entire investment horizon, the annualized rate of return computed for the forecasted investment horizon was used, which was then computed to obtain the compound return over the same investment horizon as other platforms, based on the following formula:

$$Estimated\ CR = CR_f \text{ x } (1 + ARR_f^{n-y})$$

- n is the number of years of the investment horizon; CR_f is the forecasted cumulative return; ARR_f is the annualized rate of return of the forecast; y is the number of years on which the forecast is made;

While this study has generally included questionnaires with a lump sum investment, where platforms had a default input of an investment plus additional monthly contributions, the the cumulative return net of periodical contributions has been computed, based on the following formula:

$$Estimated\ CR_f = \prod_{k=1}^{n} \{\{[I_{n-1} \text{x} \left(1 + ARR_f\right)] - (I_{n-1} + MC)]\}/[I_{n-1} \text{x} \left(1 + ARR_f\right)]\} + 1$$

- where n is the year number; I_{n-1} is the previous year accumulated sum; MC is the monthly contribution and where n=1, I_{n-1} is the initial investment sum;

Computations were carried out to compare the degree of divergence of future performance as compared to past performance scenarios. The robo-advisor was randomly selected among the platforms, and the calculations are based on the information obtained after conducting the questionnaire, i.e.:

- portfolio composition (name of the ETFs and weight);
- expected outcome (for the millennial profile);
- charges;
- historical data (past performance) of a comparable fund.

The computation sought to put side-by-side the graph with the expected outcome presented by the robo-advisor and the actual outcome (2012-2017) of the:

- proposed portfolio;
- comparable fund;
- proposed portfolio's indexes (composite);
- major indexes (based on major asset classes of the portfolio).

The computation of the comparative past performances:

- for the underlying ETFs of the portfolio, it takes into account the cumulative return on the period of 31.12.2011 – 31.12.2017, based on data obtained from the respective fund's website;
- based on the cumulative return of the fund, the annualized rate of return was calculated (using the same methodology as described above);
- the annualized rate of return then was weighted according to the weighting assigned by the robo platform:

$$WARR_{ETF} = PW_{ETF} \text{ x } ARR_{ETF}$$

- $WARR_{ETF}$ is the weighted annualized rate of return of an ETF; PW_{ETF} is the ETF's weighting in the portfolio composition; ARR_{ETF} is the annualized rate of retun of the ETF in subject;

- the annual growth rate of the portfolio was computed by adding the weighted annualized rates of returns of the ETFs that compose the portfolio and subtracting the disclosed management fees, as follows:

$$PAGR = \left(\sum WARR_{ETFn}\right) - annual\ fees$$

- n is the number of the ETF. Where the ETFs have an inception date later than 31.12.2011, the ARR_{ETF} was replaced by the annualized rate of return of the index it tracks;

- the performance of the comparable fund was calculated using the data (annualized rate of return) presented on the website;
- the performance of the *composite index* was calculated using the same methodology as for the past performance of the proposed portfolio, but replacing ETF data with the coresponding indexes' data;
- the performance of the major indexes are calculated using data available on the corresponding websites, but represent gross returns.

Annex 3: Requirements – Future Performance Scenarios

Investor tick boxes: a list of basic requirements financial advisors must comply with when presenting future performance scenarios.

Tick box 1

Calculation of performance forecasts must not use simulated past performance figures. In other words, it shall not be based or refer to the actual returns of other financial instruments or indices than the ones in subject.[40] While this prerequisite may seem complicated, it translates that future performance scenarios of a fund or of an entire portfolio of funds may use only the historical returns of the fund or of the portfolio itself, if they had one. In absence of such – e.g. where the funds are newly issued – the scenarios must be based only on '*reasonable assumptions supported by objective data*'.[41]

Tick box 2

The presentation of the performance forecast of the recommended portfolio must be accompanied by a **'prominent warning that such forecasts are not a reliable indicator of future performance'**.[42]

Tick box 3

Future performance scenarios must reflect 'the nature and risks'[43] of the instruments used or of the portfolio composition, in particular by **showing both positive and negative scenarios** in the corresponding markets.

Tick box 4

Performance forecasts, as well as past performance scenarios, must be net of charges. In other words, these graphs must show the effects fees and charges will have on the investment.[44]

[40] Paragraph 6(a) read in conjunction with paragraph 5(a) of Article 44 MiFID II DR.
[41] Article 44.6(b) MiFID II DR.
[42] Article 44.6(e) MiFID II DR, emphasis added.
[43] Article 44.6(d) MiFID II DR.
[44] Article 50.10(a) MiFID II DR.

Tick box 5

Pursuant to the overarching principle of '*fair, clear, and not misleading*' information disclosure,[45] investment advisors (whether cyborgs or humans) must not lay down this positive side of the investment advice in a manner that would '*disguise, diminish or obscure important items, statements or warnings*',[46] such as the warnings reminded earlier:

- that the investment is uncertain and may also lose value;
- that past performance is not a reliable indicator of future performance;
- that a performance forecast is not a reliable indicator of the actual future performance.

[45] Article 24.3 MiFID II, further detailed by Articles 44.2(e) MiFID II DR.
[46] Article 44.2(b) MiFID II DR.

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