

THE FINTECH REVOLUTION: A CLOSER LOOK AT ROBO-ADVISORS

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ABSTRACT

The media is calling it the “next big thing in investing”. Robo-advisors, automated online investment services, are already established worldwide and they still seem to be starting up on an almost weekly basis. In this article, we will look at the FinTech revolution that is currently reshaping the financial industry in general and robo-advisors in particular. The first part gives an overview of the current challenges facing the banking industry. The second part gives an introduction to robo-advisors. The third part looks at several aspects of the digital investing experience in more detail. In the last part, we attempt to give an outlook.

JEL codes: G11, G21, G23

Keywords: robo-advisor, robo-advise, FinTech, automated investment solutions

1. INTRODUCTION

“Banking is necessary. Banks are not.”

Bill Gates (1994)

The banking industry is being attacked from all sides. Since the global financial crisis (GFC) in 2007/2008 regulators all over the world are rewriting the rules that banks need to obey in order to do business. The goal is to make banks and the financial system safer (e.g. by making them hold more capital) and to enhance consumer protection. Higher capital requirements and stricter regulations increase banks’ costs.

Furthermore, monetary policy in the major developed markets has pushed interest rates to very low levels; in some countries even into negative territory. This is an unprecedented environment for banks to be in – there is no mention of negative interest rates in *Sidney Homers* and *Richard Sylla’s “A History of Interest Rates”* which covers 5,000 years – and is slowly eroding banks profitability.

Other attacks are coming not from governments but from businesses. “From payments to wealth management, from peer-to-peer lending to crowdfunding, a new generation of start-ups is taking aim at the heart of the [banking]

industry”.¹ New technology and the ubiquitous smartphone or tablet has made it possible for firms to reach retail clients without a physical presence.

Finally, but possibly most importantly, consumer behaviour is changing. The younger generations (Millennials or Generation Y) are used to engage with businesses online; they expect a digital experience from businesses they interact with, i.e. calling an Uber via a smartphone or paying an invoice by scanning it with a mobile phone camera.

The IMF notes in its latest Global Financial Stability Report, that these “are significant challenges that affect large parts of the financial system, and if unaddressed could undermine financial soundness.”²

This perfect storm is threatening the banking industry worldwide. In the next section, we will look at one particular FinTech sector – robo-advisors – that target the wealth management business of traditional banks.

2. A FIRST LOOK AT ROBO-ADVISORS – NOT ALWAYS ROBOTIC, NOT ALWAYS ADVISORS

2.1 What’s in a name?

The term “robo-advisor” seems to have been coined by *Richard J. Koreto* as the title of an article he wrote for the magazine *Financial Planning*.³

The proliferation of robo-advisors is a global phenomenon. The first robo-advisors started in the United States in 2010, with Europe and Asia following a couple of years later (2011 in UK but only in 2013 in Germany).

Investopedia defines robo-advisors as “an online wealth management service that provides automated, algorithm-based portfolio management advice without the use of human financial planners”. According to Wikipedia, robo-advisors are “a class of financial adviser that provides financial advice or portfolio management online with minimal human intervention.”

What is contained in both definitions, is the description of an investment solutions that is automated, digitally delivered and uses algorithms to recommend asset allocations to customers.

However, not all robo-advisors are fully automated (e.g. sometimes human investment committees propose asset allocations or portfolio compositions) nor do they always give advice in the legal sense of the word.

1 *Economist* (2015)

2 IMF (2016)

3 KORETO (2002)

In the United States, robo-advisors are usually registered with the Securities and Exchange Commission (SEC) as registered investment advisors (RIA) but – as the name suggests – they do not advise clients. They usually provide discretionary wealth management services, i.e. they obtain (trading) authority from the client to manage their portfolio according to an investment mandate agreed between the robo-advisor and the customer. Hence, buying and selling decisions are made (discretionary) by the robo-advisor and do not have to be approved by the client.

In Germany, various robo-advisory models exist. The first robo-advisors (e.g. vaamo⁴, ginmon) are doing business as *Finanzanlagevermittler* (investment broker), i.e. they do not give advice in the legal sense, but simply act as an agent for the customer, collecting and forwarding orders to a custodian, where the customer accounts are held. These agents are lightly regulated. They do not need to obtain a license from the financial market supervisory authority (BaFin) but only to register with the local chamber of industry and commerce. With regard to their dealings with retail clients, these robo-advisors only have to conduct a (MiFiD) suitability test. Second-generation robo-advisors (e.g. Whitebox or Scalable Capital) generally do business as *Finanzportfolioverwalter* (discretionary wealth managers) hence resembling their counterparts in the United States. Adjustments to the client's portfolio can be made much quicker without having to obtain approval from clients. *Finanzportfolioverwalter* need to obtain a license from BaFin in order to do business. As wealth managers, these robo-advisors have to conduct both a suitability and an appropriateness test with their (non-professional) clients.

2.2 Business model

Robo-advisors pride themselves on their low, transparent and easily understood fees. Normally they charge a single all-inclusive fee, which includes custody services, securities transaction costs for initial portfolio set-up and recurring portfolio rebalancing. In addition to the all-inclusive fee, the customer needs to pay the management fee of the mutual funds or exchange-traded funds that make up the portfolio. Robo-advisors usually do not charge commissions or get kickbacks from the financial products they sell. Unlike traditional financial advice given by banks, robo-advisors are truly independent and only committed to serving the client.⁵

⁴ See Appendix A for a list of the better known robo-advisors.

⁵ But those robo-advisors who are owned by mutual fund companies or ETF managers (e.g. Vanguard Personal Advisor Services) seem to mainly recommend in-house funds.

It is necessary, however, to differentiate between *pure* robo-advisors and those using a *hybrid* approach. Pure robo-advisors interact with clients mainly through their website or an app and clients cannot discuss their financial situation or goals with a financial advisor. Hybrid advisors on the other hand (examples include Personal Capital or Vanguard Personal Advisor Services) combine the best of both worlds. They offer automated portfolio management but with human interaction; clients are assigned a personal financial advisor, who, during an initial interview, gets to know the client, his/her financial situation, investment goals and ability and willingness to take risks. Usually, there are also scheduled personal review meetings. Because of their higher level of human interaction, hybrid robo-advisors charge higher fees and sometimes require a larger initial investment (e.g. USD 25,000 at Personal Capital).

In the United States, fees are globally the lowest. Betterment currently charges an annual fee between 0.35% and 0.15% depending on account size. Wealthfront charges an annual advisory fee of 0.25%. Personal Capital, as an example of a hybrid robo, charges 0.89% for the first million dollars.

In Germany, robo-advisors use the same all-inclusive fee model but annual charges are higher. Vaamo charges between 0.99% and 0.49% p.a. depending on the size of your account. Whitebox starts with a 0.95% that can be lowered in multiple steps to 0.35% if you invest more than EUR 500,000 with them. Scalable Capital charges an annual service fee of 0.75%. One German robo-advisor, ginmon, has a low fixed annual service fee of 0.39% but charges clients a performance fee of 10%.

Robo-advisors need several financial service providers in order to do business. The client assets are held in an account at a third-party custodian. Depending on their contract with the client (discretionary wealth management or financial advice), they might have the right to issue trading instructions against these account but cannot access the cash. In order to transact in securities, robo-advisors use brokerage services, that are usually also provided by the custodian.

Regarding the business model, another distinction needs to be made in relation to the target group. Some robo-advisors directly target consumers (Business-to-Consumers, B2C), some offer their technology platform also to (smaller) financial advisors (Business-to-Business, B2B) and others still combine both approaches (Business-to-Business-to-Consumers, B2B2C). Business models also change over time. In Germany, for example, vaamo started in 2014 as a B2C robo-advisor but in October 2016 unveiled its cooperation with Bank Santander in Germany and hence moved into B2B2C space. Santander's robo-advisory (called sina) uses a white-labelled version of vaamo's platform. Vaamo also provides client support services for Santander's clients and Santander uses vaamo's custodian (FFB, a subsidiary of Fidelity). Santander has more than 6 million

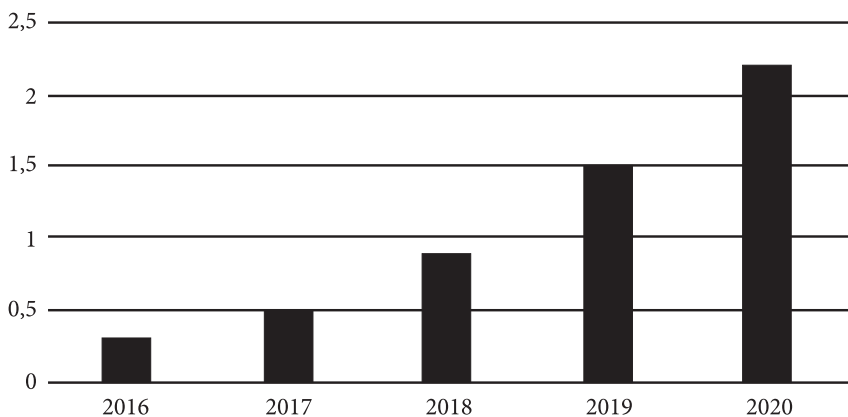
customers in Germany and might lure a significant number of these to sina without spending much on customer acquisition. Customer acquisition costs would surely be much higher for vaamo.

For a bank or an asset manager, who is eager to join the FinTech revolution, two additional options are on the table: make or buy. The bank can build its own robo-advisory business from scratch or acquire a start-up robo-advisor. There are already examples for both strategies. In the United States, the world's biggest asset manager, Blackrock, bought FutureAdvisor in August 2015 and the German private bank Hauck & Aufhäuser acquired easyfolio in May 2016. On the other hand, Charles Schwab launched its own robo-advisory service, called "Intelligent Portfolios" and Vanguard has its Vanguard Personal Advisor Services programme. Both Charles Schwab and Vanguard have been able to get significant assets under management (AuM) for their robo-advisors quickly.

2.3 The market for robo-advice

Collectively, robo-advisors are estimated to manage currently about USD 300 billion in the United States, according *A.T. Kearney*; by 2020 that number will have grown to USD 2.2 trillion.⁶

Figure 1
Estimated U.S. robo-advisors assets under management
(in trillion of dollars)



Source: *A.T. Kearney* (2015)

6 A.T. KEARNEY (2015)

In the United States, Charles Schwab and Vanguard are managing the most assets (USD 10 billion and USD 41 billion respectively), followed by Betterment, Wealthfront and Personal Capital each with around USD 5 billion assets under management.⁷

In Germany, AuM figures are harder to obtain, because of missing legal reporting requirements. Numbers are released at the discretion of the company. According to some sources, German robo-advisors collectively manage around EUR 100 million.⁸ Business Insider reports that Germany/UK-based robo-advisor Scalable Capital attract EUR 2–4 million per week. In September 2016, they had 1,600 customers. Their typical customer is 45 years old, earns EUR 120,000 per year and has a net worth between EUR 250,000 and EUR 1 million.⁹

In the United Kingdom, the biggest robo-advisor seems to be nutmeg with around GBP 400 million assets under management. Another big competitor is money on toast, which manages at least GBP 150 million and serves 5,000 clients.

2.4 The clients of robo-advisors

Initially, robo-advisors targeted clients that were underserved by traditional wealth managers. Due to the increasing (regulatory) cost of wealth management or investment advice, mass market and the affluent clients could simply not obtain wealth management services for a reasonable fee.

Client classification is subjective and differs from country to country, but a common classification (based on household financial assets) is the following:

Table 1
McKinsey Client classification

| Segment | Wealth level |
|-----------------------------|-----------------------|
| Mass market | USD 50,000–200,000 |
| Mass affluent | USD 200,000–1 million |
| Affluent | USD 1–5 million |
| High net worth (HNW) | USD 5–30 million |
| Ultra-high net worth (UHNW) | over USD 30 million |

Source: McKinsey (2014)

⁷ For AuM figures and client numbers for selected robo-advisors worldwide, see the Appendix.

⁸ *Handelsblatt* (2016)

⁹ <http://uk.businessinsider.com/fintech-scalable-capital-attracting-4-million-in-deposits-each-week-2016-9>

The desire to serve the less wealthy (mass market or less affluent) is still present and highly visible in very low minimum depository requirements with nearly all robo-advisors. There is no minimum investment limit for opening an account with Betterment¹⁰ and Wealthfront requires an account value of only USD 500. So even the less wealthy can start saving at an early stage.

However, high-net-worth investors also seem to be attracted by robo-advisors. About 15% of Charles Schwab's robo-clients have a net worth of more than USD 1 million¹¹ and Betterment reported that their largest individual account size was USD 10 million.¹²

3. INSIDE A ROBO-ADVISOR

In order to better understand what being a robo-advisor entails, in this section, we will look into specific aspects in more detail.

3.1 Client acquisition

“Build it and they will come.”

Attracting clients is one of the most serious challenges facing robo-advisors. Robo-advisors used to think that being an online offering, marketing should be done online as well – using the usual tools, such as pay-per click, search engine optimisation (SEO) and email marketing. For some robo-advisors this still seems to be the way to attract customers. However, we are also beginning to see traditional offline marketing, e.g. TV advertisement campaigns (Betterment, Wealthfront) a London underground ad campaign (e.g. Scalable Capital UK).

According to some studies, customer acquisition costs are as high as GBP 200 in the UK¹³ and up to USD 1,000 in the US (according to *Michael Wong of Morningstar*).¹⁴

In order to better understand the significance of client acquisition costs (CAC), let us suppose a client invests USD 25,000 with a robo-advisor and is charged an annual all-inclusive fee 0.2%, i.e. USD 50 per year. If the firm achieves a 20%

¹⁰ It is actually USD 10

¹¹ “The Rich Are Already Using Robo-Advisors, and That Scares Banks”, <http://www.bloomberg.com/news/articles/2016-02-05/the-rich-are-already-using-robo-advisors-and-that-scars-banks>

¹² “Robo-Adviser Betterment Hits the \$5 Billion Mark”, <http://www.bloomberg.com/news/articles/2016-07-14/robo-adviser-betterment-hits-the-5-billion-mark>

¹³ “The Robo Revolution”. *Robo-Advice Market Commentary and Analysis*, November 2015, <http://www.ivey.uwo.ca/cmsmedia/3341217/finametrica-2015-robo-advice-report-us.pdf>

¹⁴ <http://www.cnn.com/2016/06/14/is-the-twilight-of-the-robo-advisor-already-at-hand.html>

profit margin, then the anticipated yearly profit will be USD 10. If we further assume a 90% annual client retention rate (i.e. one client per 10 is lost every year), then, on average, a client will remain for 10 years. If we neglect the time value of money, the anticipated lifetime value of this robo-client will be USD 100 (lifetime revenue is USD 500).

In light of this, some analysts have begun to question the robo-advise business model: low lifetime value/revenue and high customer acquisition costs do not go well together.¹⁵

3.2 Client onboarding and risk profiling

“Know your customer.”

Robo-advisors offer their services online and promise total digital customer experience. The process of becoming a customer (“client onboarding”) should be as simple and convenient as possible, otherwise people will abstain from doing it. Most robo-advisors claim that they can onboard a new client in about 10 to 15 minutes – totally online without having to leave the computer or the house.

There is a trade-off between promising quick onboarding and really getting to know your customer. Knowing your customer is not only required from a regulatory point of view but also necessary to offer the prospective client a portfolio or investment strategy that is suitable for him or her. In order to find a suitable portfolio, a robo-advisor needs to obtain information about – among others – the clients’ prior financial experience and knowledge, e.g. experiences in dealing with financial products or services, their financial situation (to assess their capacity to take risk), their goals and their risk tolerance. In a current report, MyPrivateBanking research found that many robo-advisors emphasise fast customer acquisition and hence running the risk of neglecting relevant client information.¹⁶

Anti-money laundering laws usually call for obtaining some form of identification from clients. In the past this was an offline process; the client either had to visit the financial advisor in person or (at least in some countries) see a trustworthy third party (for example the post office in Germany or Austria) to identify them. Nowadays, thanks to updated regulations and the availability of new technology, the customer identification step can also be done online (e.g. via IDnow).

¹⁵ See e.g. <https://www.kitces.com/blog/robo-advisor-growth-rates-and-valuations-crashing-from-high-client-acquisition-costs/>

¹⁶ <http://www.myprivatebanking.com/article/report-robo-advisors-30>

In order to recommend a specific portfolio to a prospective client, most robo-advisors rely on traditional risk tolerance questionnaires. The resulting risk tolerance then maps to an input of the portfolio optimisation model or simply to a model portfolio.

These traditional risk tolerance questionnaires normally neglect research findings in behavioural finance.¹⁷ Instead of asking theoretical questions about e.g. how much risk clients are comfortable with, advisors could ask for historical transactions (“investment history”) or an investment diary to obtain insight into their clients’ investment style.

In Germany, the typical robo-advisor asks about 10 questions. The majority of questions is asked because of regulatory requirements. Under European law (the soon-to-be-updated MiFID), financial advice to non-professional clients must pass the suitability and the appropriateness tests. Under this test, the financial advisor has to inquire, for example, about the client’s financial situation, his/her past experiences, and goals. The risk tolerance is typically “measured” by asking the client about his reaction to a hypothetical scenario, e.g. how he would react to a 20% drop in asset prices or – taking into account the relationship between expected return and risk – about his favourite among several return distributions (with different expected return and risk levels).

3.3 Investment universe

Academic research has found that the asset allocation decision is the most important decision an investor can make. According to *Brinson et. al. (1986)*, it explains about 90% of the variation in returns. Consequently, it is much more important to select suitable asset classes and combine them in a sensible way, than to select the best investments within a given asset class.

Current robo-advice offerings focus on doing just that: they propose a suitable (strategic) asset allocation to their clients. In a second step, they select suitable indices as a proxies for these asset classes, and select (usually) passive exchange-traded funds (ETF) that aim to replicate these indices. In essence, each client gets a suitable portfolio of ETFs. The majority of robo-advisors hence subscribes to the passive approach to investing, at least within each asset class. There are robo-advisors who use active (but quantitatively driven) investment funds for each asset class (e.g. vaamo).

Robo-advisors differ in the specific investment universe they offer: from around 5 asset classes (e.g. vaamo, ginmon) up to 28 (Charles Schwab Intelligent Port

17 <http://www.myprivatebanking.com/article/report-robo-advisors-30>

folios). Most robo-advisors provide access to equity markets, government bond markets (USD denominated or local debt), corporate bond markets (investment grade or high yield) and inflation-protected securities. Depending on the offering, clients may also invest in real estate (REITs), commodities (mutual funds or ETFs) or precious metals (usually via ETFs).

3.4 Portfolio construction

“Algorithms work their magic.”

When it comes to selecting the best portfolio for the client’s goals, robo-advisors usually rely on ideas from modern portfolio theory, which started with the seminal 1952 paper of Nobel Prize winner *Harry Markowitz*.¹⁸ According to this (mean-variance) model, the investor cares only about the mean and the variance of terminal wealth. In order to be compatible with normative decision theory under uncertainty (expected utility maximisation), one has either to assume that asset returns are jointly normally distributed or that investor preferences can be modelled by a quadratic utility function.

Inputs to the portfolio optimisation problem are the expected returns of the assets and their covariance matrix. Furthermore, the risk tolerance of the investor is needed (or a volatility of terminal wealth that is acceptable for him). The resulting portfolio can contain negative weights (assets that need to be sold short) hence in practice asset weights are restricted to be non-negative.

An important practical problem arising from the application of the model is the extreme sensitivity of the output weights to even small changes in inputs. Since the true joint distribution of the asset returns is unknown and must be estimated, this is a severe shortcoming. It has been shown that changes in expected returns have 10 times as much effect on the weights as changes in covariances.¹⁹ A practical approach taken to restrict the impact of estimation risk and to obtain “sensible” portfolios is to restrict the weights to a specific range. This approach is for example taken by Wealthfront.²⁰

More theoretical solutions are (i) the inclusion of the estimation risk in the objective function (called “robust estimation”) or (ii) Bayesian approaches, where an initial prior from some theoretical financial model (usually CAPM implied expected returns) is updated with an estimate from historical data. In the Black Litterman model,²¹ the CAPM implied expected returns are combined with so-

18 MARKOWITZ (1952)

19 CHOPRA – ZIEMBA (1993)

20 <https://research.wealthfront.com/whitepapers/investment-methodology/>

21 BLACK – LITTERMAN (1991)

called views which tilt the portfolio weights away from the CAPM weights towards asset classes which are expected to perform better.

Some robo-advisors employ full-scale optimisation. In a full-scale optimisation, asset returns do not need to be normally distributed and investors do not have to have a quadratic utility function.²² It is computationally more expensive but – at least in theory – should give the true optimal portfolio instead a just an approximately optimal one. Unfortunately, full-scale optimisation also suffers from estimation risk.

Other portfolio optimisation methods in actual use, include Mean-VaR or Mean-CVaR optimisations. In both cases, risk is not measured by the volatility of the terminal wealth but either by the Value-at-Risk or the Conditional Value-at-Risk (expected shortfall). Conditional Value-at-Risk is superior from a theoretical point of view, because the “normal” Value-at-Risk has been shown to be sub-additive, which means that the VaR of a portfolio of assets can be higher than the sum of the VaR of each individual asset.²³

In the United States, Betterment relies heavily on the Black Litterman model; Wealthfront uses mean-variance analysis; and Charles Schwab Intelligent Portfolio uses full-scale optimisation. In Germany, Scalable Capital employs Mean-VaR optimisation, and Whitebox uses a Mean-CVaR optimiser.

Apart from portfolio optimisation, some robo-advisors seem to construct “sensible” model portfolios, which must not be the output of a portfolio optimiser. Vaamo for example offers only three portfolios, which differ in their allocations to equities and bonds. Their low-risk portfolio contains 40% equities, their medium risk portfolio 60% equities and their higher risk portfolio 80% equities. It seems that these weights can at best have been influenced by an optimiser but are surely not the output of one. This approach is also favoured by ginmon which offers 10 portfolios with an equity allocation ranging from 10% to 100% (in 10% steps).

If the investor is saving for retirement, many robo-advisors will deterministically change the asset allocation as the retirement age is approached. By making use of this so-called “glide path” (in the mutual fund world these constructs are known as target-date funds) it is ensured that the portfolio gets less risky over time in order to prevent large losses shortly before retirement. However, since there is normally “no free lunch” in the financial markets, the investor is therefore also forfeiting the potential of large gains (near the retirement date) due to the lower equity allocation.

22 ADLER – KRITZMAN (2007)

23 ARTZNER et al. (1999)

3.5 Risk management

Robo-advise is much more than recommending an initial investment portfolio. Clients also expect some kind of risk management. The majority of robo-advisors offers their clients a portfolio rebalancing (to constant weights), where the current asset allocation is reset to the initial weights of the strategy. Due to market fluctuations, the current asset allocation may differ severely from the initial one. Rebalancing in essence entails buying asset that have lost value and selling assets that have gained. It is usually implemented using one of the following three strategies: (i) rebalance the portfolio on a scheduled basis (e.g. yearly), (ii) rebalance the portfolio based on some event (e.g. when there is a “large” deviation between the current and the target weights) or (iii) rebalance the portfolio on a scheduled basis but only when there is a large deviation between the current and the initial asset allocation. Rebalancing is in essence a risk management technique but has been shown to have a positive effect on expected returns (by earning the so-called “diversification return”).²⁴

Scalable Capital, which does business in both Germany and the United Kingdom, tries to differentiate itself via its risk management capabilities. Scalable Capital – at each point in time – offers 23 portfolios which are labelled according to their (annual 95%) Value-at-Risk, ranging from 2% to 25%. Because of changing input parameters, the current 10% VaR portfolio can have a different composition than the 10% VaR portfolio a month before. What Scalable Capital promises is in effect that your portfolio stays in the risk bucket, e.g. always has a 10% VaR. Scalable Capital potentially adjusts portfolio weights (after taking into account the ETF bid-ask spread) daily, hence portfolios can swing quite a bit when market conditions change.²⁵

Hedgeable, one of the newer robo-advisors offers portfolio downside protection via Constant Proportion Portfolio Insurance (CPPI).²⁶ CPPI is a dynamic hedging strategy that adjusts the portfolio allocation between risky and riskless assets in a way that allows an investor to retain the upside potential of holding risky assets while providing a capital guarantee (floor) – hence it is similar to a long call option.²⁷ The advantages of a CPPI strategy include its transparency, since no use of derivatives is needed. However, since it is a dynamic strategy, the floor can be breached, if there is a sharp drop in market prices and the portfolio cannot be rebalanced adequately.

24 ILMANEN (2011)

25 Scalable Capital, The Scalable Capital Investment Process, https://uk.scalable.capital/wp-content/static/Whitepaper_ScalableCapital_UK.pdf

26 <https://www.hedgeable.com/hedgeable-investment-philosophy-white-paper>

27 BLACK – PEROLD (1992)

3.6 Tax-optimised investing

Many robo-advisors in the United States offer customers tax-optimised portfolio management by using so-called “tax-loss harvesting”. According to Betterment, tax loss harvesting entails selling a security that has experienced a loss. By “harvesting” this loss, investors are able to offset taxes on gains and income.²⁸ The sold security is quickly replaced by a similar one – e.g. an ETF that is highly correlated to the old one but tracks a different index – thus the asset allocation is maintained.²⁹ Care has to be taken that the replacing security is not *substantially identical*. According to the so-called “wash sale rule”³⁰ the loss cannot be “harvested” if it results from the sale of a security that is replaced with a *substantially identical* security 30 days before or after the sale.

We currently see no tax-optimised investment offerings in Europe.

3.7 Financial account aggregation

Another feature that many U.S.-based robo-advisors provide is account aggregation.³¹ Since many investors hold securities and cash accounts with different financial institutions, these robo-advisors offer to incorporate (“sync”) these accounts not held with them in order to provide the client with an accurate overview of the households’ entire wealth – presumably not in the unselfish hope that some of the other accounts will someday be migrated.

In Europe there seems to be no such offering currently.

4. OUTLOOK

During the last couple of years, robo-advisors have become ubiquitous, with several established players in the major markets. They are currently managing only a very small percentage of the total world wealth but are quickly adding assets. They are targeting customers that seek independent financial advice, are cost-sensitive and like having a convenient – 365/24/7 – access to their financial advisor, wherever they are.

Incumbents need to have a plan of how to deal with this new reality. Ignoring the trend might not be very dangerous in the short-run, since many of these

28 <https://www.betterment.com/tax-loss-harvesting/>

29 <https://www.betterment.com/resources/research/tax-loss-harvesting-white-paper/>

30 U.S. Code “26 USC § 1091 - Loss from wash sales of stock or securities.”

31 E.g. Betterment and Personal Capital.

target customers are not wealthy yet. In the longer run, the new generation will eventually inherit the wealth of the older generation and will choose someone to manage this wealth whom they are already familiar with, probably a digital one.

In my opinion, robo-advisors are here to stay. They offer a superior product that customers are already willing to pay for. On the other hand, I doubt that there is currently a robo-advisor that is already profitable.³² It is reported that nutmeg has burned through GBP 10.7 million from launch³³, Scalable Capital had two financing rounds and obtained EUR 11 million venture capital in total. Betterment has recently secured USD 100 million in new funding from Swedish investment firm Investment AB Kinnevik seeing its valuation rise to USD 700 million.³⁴ Currently, the financing climate seems to be good, but there surely will come a time when capital will be harder to obtain. This will be the time when the fate of robo-advisors will be decided.

In Hungary there are some promising FinTech initiatives but currently no active robo-advisor. It will be interesting to see how the FinTech revolution in general and the robo-advisory model in particular will change the Hungarian banking market.

32 However, one cannot be sure; this financial information is difficult to obtain.

33 <http://citywire.co.uk/wealth-manager/news/revealed-how-much-money-nutmeg-has-under-management/a941662>

34 <https://www.bloomberg.com/news/articles/2016-03-29/robo-adviser-betterment-sees-700-million-valuation-after-new-round-of-funding>

APPENDIX

The following table contains data on selected robo-advisors worldwide.

| Country | Name | Founded | AuM | Clients | Employees |
|----------------|--|----------------|-------------|----------------|------------------|
| US | Betterment | 2010 | USD 6B | 188,000 | 136 |
| US | Wealthfront | 2011 | USD 4B | 90,000 | 138 |
| US | Personal Capital | 2011 | USD 3B | 19,000 | 123 |
| US | Charles Schwab Intelligent Portfolios | 2015 | USD 10B | n/a | n/a |
| US | Vanguard Personal Advisor Services | 2015 | USD 41B | n/a | n/a |
| DE / UK | Scalable Capital | 2015 | n/a | 1,600 | n/a |
| DE | Vaamo | 2014 | n/a | n/a | n/a |
| DE | Quirion | 2013 | EUR 37m | 1,200 | n/a |
| DE | Whitebox | 2015 | n/a | n/a | n/a |
| IT / UK | Moneyfarm | 2011 | n/a | n/a | n/a |
| UK | Nutmeg | 2011 | GBP 400m | n/a | n/a |
| UK | Money on toast | 2012 | GBP 150m | n/a | n/a |

Sources: For US latest FORM ADV reports. For other countries company website.

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