

TOWARDS A TAXONOMY OF ROBO-ADVISORS

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Abstract: *This paper examines the basics of Robo-Advisors, attempts a definition, and lays the necessary groundwork for analyzing both, regulation and contractual relationship between robots-related participants and the attribution of liabilities among them. The objective of this study is to offer a taxonomy of the Robo-Advisory industry and, in order to achieve this aim, we will define a robo-advisor as the algorithm that can provide investment services to an investor. A robo-advisor will involve the participation of following roles, that could be played by the same or different actors: the programmer, the owner, the user and the investor. Considering the relations among these players we will do the taxonomy.*

1. Brief Introduction to Robo-Advisory Market and Trends

In recent years, we have witnessed a revolution in the financial advice field. People do not need to go to a place or concrete location to invest money (stock market, traditional bank offices) anymore, having the option of receiving such services through a virtual financial advisor that can be accessed even with the mobile phone. This revolution is called Robo-Advisory, it has not stopped growing since its inception, and is part of a bigger financial revolution called Fintech.

The development of robo-advisors started in the United States and has been increasing exponentially over the years¹. This country has been pioneering the launch of robo-advisors, which explains why most of them are located there². In fact, the American Robo-Advisory industry is currently expecting to grow exponentially, as reflected in different reports which predict that by 2020 they will manage 2.2 billion dollars in the US³.

Robo-advisors increased their presence after the financial crisis of 2008. The incredibly high number of robo-advisors indicates a tendency towards a major consolidation in the near future. Moreover, there is a clear and disproportionate market dominance by a few companies like Betterment and Wealthfront that have around 7.3 billion USD and 5.1 billion USD of asset under management (AUM), respectively. This, «combined with profitability challenges upon market entry, suggests that smaller players will be absorbed by larger companies, unless they collapse first»⁴.

¹ Tracxn report: robo advisors through BLACKROCK (2016).

² Burnmark through BI INTELLIGENCE (2017).

³ A.T. Kearney estimates that robo-advisors will manage 2.2 billion dollars in the United States by 2020 (ENFINTECH, 2017). Although nowadays robo-advisors represent a small portion of the US market, they are expected to growth till they reach a 15% of all U.S. retail asset under management with 7 trillion USD. This will happen mainly due to the adoption of robo-advisors by banks, including Bank of America and Wells Fargo. This movement will not happen just in the US, but also among banks such as UBS and BBVA, and large investment firms. Even with the impressive growth of the robo-advisors in the US, they are relatively tiny (BROUGHTON, 2016). Vanguard leads the market with 41 billion USD followed not so close by Schwab Intelligence Portfolios, Betterment, Wealthfront and Personal Capital.

⁴ BI INTELLIGENCE (2017).

However, in the recent years, the number of robo-advisors have been growing exponentially and is expected to continue like that, which predict a significant increase in other countries⁵. The situation in Europe is similar but on a much smaller scale. While in the United States there are more than 200 robo-advisors, in Europe they barely exceed 70⁶. That is why we consider that while in the United States the robo-advisors are widely used instruments, as data reflect, in Europe they largely remain as an unknown tool with great potential.

Considering this market situation and current trends, this paper aims to study the basics of robo-advisors in order to clarify the main points that regulators have to take into account to provide an optimal legal framework that allow to promote and control the future developments in the Robo-Advisory industry and its relationship with other financial market players. For this reason, this paper is part of the law policy movement called Regtech which focuses on the legal implications as well as the shortcomings of the features and types of robo-advisors, and the different ways to be regulated, as the new players of the Fintech industry.

2. An Approach to a Basic Concept of Robo-Advisors through its Current Features and Legal Implications

Robo-advisor is a relatively new player in the financial markets. Although there is no single definition of the term, most authors will agree that a robo-advisor can be roughly defined as an algorithm, software or computer program that will help investors somehow ENFINTECH 2017⁷, STATISTA 2016⁸ or VASILEVA 2017⁹).

Regarding how robo-advisors perform their task, there is a wide range of opinions. While some authors just talk about automatized processes, others go far beyond this and talk about Artificial Intelligence (AI). This

⁵ The US is leading the Robo-Advisory field with more than 200 robo-advisors, followed quite a distance from Germany with 31 robo-advisors, being the second largest country by number of robo-advisors. The third place is occupied by China and UK with 20, followed by India with 19 and France with 17. Vanguard, with 30.000 million dollars in assets and investment funds, leads the North American market. However, in the Spanish market they first appeared 3 years ago when FeelCapital was created, with 4 robo-advisors in this market nowadays. Nevertheless, besides the predicted increase in the number of robo-advisors, there is also expected an increasing trend towards vertical integration, finding a clear example in India where a payment company has entered the robo advice space (TECHFLUENCE, 2017).

⁶ There are 73 robo-advisors in Europe, 26 of them in Germany, 19 in the UK followed by 6 in Switzerland (TECHFLUENCE, 2017). There is a trend towards B2C, although most of newly entered in German speaking areas are retail oriented robo-advisors. «The map shows B2C and B2B oriented firms, who either manage assets for clients (B2C) or support this business model (B2B)». There is expected an important increase in the number of robo-advisors in Europe, reaching around 500 in the next five years. These entries will be in all financial services areas, but mostly on «banks, asset managers, wealth managers, insurance providers as well as from the non-financial sector. Partially this will also be part of a beginning vertical integration in FinTech.» (TECHFLUENCE, 2017).

⁷ According to ENFINTECH (2017): «Robo-advisors are computer programs that automate investments by applying modern portfolio management theories, which play with variables related to volatility and expected returns, among many other variables. Robo-advisors profile the client based on questionnaires about their knowledge, experience and investment objectives, then offer a portfolio of assets adapted to the saver. The human factor is no longer relevant when making investment decisions in the short term, but always a human adviser is a vital aid to the investor, both to receive global financial advice (taxes, assets, insurance, inheritance, etc.), As well as to receive a long-term vision that will help the investor to take short decisions, such as using one type of theft advisor or another».

⁸ Definition of robo-advisors according to STATISTA (2016): «The Robo-Advisors segment contains private asset management providers who offer automated online portfolios in which private investors can choose investment volumes depending on their scope and private appetite for risk. Providers such as Wealthfront, Schwab Intelligent Portfolios and Betterment allow private and/or institutional investors to invest their money (starting at very small amounts) in pre-existing portfolios which are automatically managed by individually configured algorithms. The advantage of these services lies in the passive role of the investor, who may not want or cannot afford, ongoing, personal monitoring of their portfolio development. Such automated investment services also allow for the possibility of reaching attractive returns with low starting capital and without specific investment know-how, which contrasts with classic investments offered by traditional banks. In the robo-advisors segment, financial figures show the assets under management of automated online portfolios. Online brokers without automated and recommendation-based advisory functions are not included in this segment».

⁹ VASILEVA (2017) defines robo-advisor as: «Robots that offer the client financial advice. These are developed from artificial intelligence and integrate very complex algorithms through which they get the ability to recommend investment decisions that fit the conditions of the client.»

fascinating debate is not new and has various ramifications that will probably become as controversial for finance as the debate regarding the rationality and behavior of the investors (GARVÍA/SANZ 2017). How smart could machines be, as well as the comparison between human and artificial intelligence is one of the main characteristics that will help us to classify the various categories of robo-advisors.

For our purposes, one of the main features of a robo-advisor is being an algorithm, so it previously had required of a programmer to be created. In our interconnected and globalized world, the role of the programmer is probably the harder concept to define and specify. This figure may range from a person or team that has just downloaded and parametrized an open source code, to an entire group of engineers that have developed software over months or years. In addition, we cannot rule out the possibility of having a robot being programmed by another robot.

The algorithm will also belong to somebody, who will be the owner of the robo-advisor. For its owner, the robo-advisor is an intangible asset whose book value derives from the investigation and research's investment costs. The owner and the programmer could be the same person or not. In case there are different people, there should be a contract between them which will define the relationship.

Once this point is reached, the question to be raised is «Could all investment services based on algorithms be considered robo-advisors?». The answer is no, but the limit is not clearly defined. As a reference, the Financial Industry Regulatory Authority (FINRA, 2016) considers client-facing tools used by financial professionals as robo-advisors when they incorporate at least the following activities: customer profiling, asset allocation, portfolio selection, trade execution, portfolio rebalancing and tax-loss harvesting¹⁰.

The second relevant feature of a robo-advisor is the service provided to the investor. This service is provided by the user of the robo-advisor. Most of the times this service is an internet-based service¹¹. Regarding the type of service given by the robo-advisor, it is important to distinguish between a robo-advisor that just performs advising services, and a robo-advisor that gives a more complete investment service, including for example the purchase and sale of financial assets.

If the robo-advisor just performs advising services, the user could directly be the investor, while typically, in the second situation, the user will be an Investment Firm, a banking institution or an equivalent agent. One more time, the user and the owner of the robo-advisor could be the same person or not. Also, it is important to consider that in the case where the user is an Investment Firm or an equivalent figure, all cautions and warnings that should be considered between an investor and the Investment Firm are a starting point to define also those between investors and robo-advisors.

The benefits of Robo-Advisory considering the relationship between the user and the investor are several: they can provide better premium and personalized services: mainly, personalized customer service is done to high capital portfolios to provide an integral service to the client¹². The principle governing robo-advisor is that the customer could be anyone who is interested in investing with a minimum of capital, usually affordable for

¹⁰ FINRA, 2016.

¹¹ «Web platforms of the different robots are like each other, it emphasizes its simplicity and the willingness to explain to the client the key aspects of its working method. It can be summarized in 3 blocks, the first one the main page, is used to introduce the customer to the services of the company, explaining to the customer who they are, how it works and introducing the customer to the test; the second would be the profiling part of the client, at this point all are similar, dedicating on average 6 questions of investor profile and 4 questions of risk profile. Finally, we can group in the last block the intended part of the website in which the client is explained in more detail the various aspects of the company's work and its policy, as well as historical returns of the portfolios, FAQ, blog with articles of interest, contact, legal information. And some of them offer a chat service, in which the customer can quickly resolve any questions that may arise» (FINRA, 2016).

¹² Premium services give access in some robo-advisor such as Feel capital or Betterment, offer additional services such as comprehensive risk control, tracking of the portfolio, historical returns of your investment, reduction in rates. For example, Betterment provides a free human advisor for accounts over \$500,000, Wealthsimple provides a free human advisor for accounts over \$100,000, Charles Schwab Intelligent Portfolio enables tax loss harvesting for accounts over \$50,000.

anyone, so it is not intended for a unique customer profile¹³. Regarding the source of income for robo-advisors, it is mainly charged for advice and creation of the client's portfolio as a commission. In this aspect there is no global consensus. Each robo-advisor applies the rates it deems more appropriate by offering exemptions for capital, first month of testing, maintenance free, without commissions up to €10,000 etc¹⁴. In this respect, the implementation at European level of MIFID II will make it possible for clients to know the commissions that are passed on to them, making the investment through robo-advisor more attractive for their low commissions¹⁵. Considering all previous features, we can define a robo-advisor as an algorithm that can provide investment services to an investor. As said above, a robo-advisor will involve taking on the following roles that could be played by the same or different actors: the programmer, the owner, the user and the investor.

3. Final Remarks: Towards a Taxonomy of Robo-advisors regarding its Role in the Financial Market

Once the concept of the robo-advisor is clear, and its main characteristics are defined, we will continue with a deeper analysis comparing different classifications done by different authors with the principal roles just described and the current situation.

If we consider the relation between the user and the investor, and accordingly with Investmet Firms legal requirements, the service must consider investors' profile. Therefore, the advice given by the robo-advisor must be different depending on the final client profile.

This notion leads to a first classification of robo-advisors depending on the step of evolution in terms of features and services between the user and the investor. Each new type or step adds characteristics and service to the previous one, robo-advisor 1.0 being the most basic one and robo-advisor 4.0 the most complete (DELOITTE, 2016)¹⁶.

- Robo-Advisor 1.0. There is no difference between the user and the investor. It offers the most suitable single product or portfolio allocation to the client chosen from a list after answering a test. The portfolio has to be managed by the investor himself as there is no bank or ISC behind, also using their own accounts and managing future adjustments.
- Robo-Advisor 2.0. The robo-advisor is used to know investor's profile through a test that is used to define the risk of the client and match it with the assigned pre-defined portfolio for such risk. The ISC is operated by professional human managers and they are the ones that design pre-defined portfolios.
- Robo-Advisor 3.0. The user is also managed by the robo-advisor, but under the supervision of human managers. The adjustments and rebalancing are automatically done by algorithms according to

¹³ Following the introduction of MIFID II, in Europe, low-capitalization portfolios will not be able to cover the cost of advice, since it must be obtained separately, with the robo-advisor they could have an investment opportunity with affordable advice. In addition, a great growth is predicted by the introduction of this regulation to have to be separated the advice of the distribution of financial assets.

¹⁴ At European level commissions are higher, around 0.25% and 2% commissions, but we must also note that there are robo-advisors that charge 10% and 20% of total profits. In the other hand, in the United States, commissions are lower and in addition they only charge for capital management. Advice, rebalancing, maintenance and other associated expenses are free in all robo-advisors. These management fees range from 0.25% to 1%. In addition, there is the possibility in robo-advisor in Europe and the United States that only a single monthly payment is paid, in Europe Feel Capital establishes to its clients the monthly fee of 15 €, in the United States we find Bloom with a fee of 10 \$ a month for any type of account and MarketRiders with \$ 14.95 per month managing your investments autonomously.

¹⁵ BI INTELLIGENCE (2017) warns about the fact that some of this robo-advisors have additional fees. «AssetBuilder, FutureAdvisor, and Rebalance IRA all charge trade fees. AssetBuilder's range from \$20 to \$50 per trade, FutureAdvisor's from \$8 to \$24, and Rebalance IRA's from \$50 to \$70 for each portfolio rebalance. The company also charges a \$250 account opening fee. Both TradeKing Advisors have fees for add-on services and a \$50 IRA account closing fee, while WiseBanyan has add-on service fees.» (MEOLA, 2017).

¹⁶ DELOITTE (2016).

pre-established investment strategies. Professional fund managers oversee the final control, in some occasions allowing the client to slightly modify their portfolios to individualize them¹⁷.

- Robo-Advisor 4.0 The user is full-time operated by the robo-advisor, which could offer a sophisticated risk profiling of the client that leads to direct investments via self-learning artificial intelligence (AI) investment algorithms. Robo-advisors could shift between different asset classes based on changing market conditions and individual investment needs such as profit, risk appetite, and liquidity aspects, monitor and adjust single client portfolios in real time to keep on track with their selected investment strategy.

In addition to the different types of robo-advisors depending on the relation between the user and the investor, we can find other classifications depending on the rest of roles, for example attending to the degree of independence between the owner and the user, we can separate them into three groups that will require of distribution agreements (Independent robo-advisor, Segregated robo-advisor and Integrated robo-advisor) and a fourth in which robo-advisor will be used only as a tool for other users:

- Stand-alone robo-advisor: The robo-advisor plays the role of an independent advisor. A deposit is made at a bank or ISC chosen by the client or by the advisor, who will be the custodian of the client's assets. This robo-advisor will oversee the elaboration of customer profiles, the construction of the portfolios and the monitoring of the investments. This is the only type of robo-advisor that can provide independent advice according to MIFID II.
- Segregated robo-advisor: in a banking group but not integrated. It differs from the previous one in the level of independence. Here we can distinguish two scenarios, with or without incentives on the part of the asset distributors, but in either case it is not integrated at the bank.
- Integrated robo-advisor: part of a wider service range. It is part of the bank's services, who is the depository. It is not an independent advisor unless the bank takes this option, and is fully integrated into the bank's business model.
- Robo for advice: digital advice for human advisors (users). It is only used as a tool. The consultant, ISCs or banks evaluates the investments and he is who takes the investment decisions on behalf of final investors. The robo-advisor chooses between different portfolios that finally can be accepted or not by the user. This type of robo-advisor does not have to be connected to the services of a bank or ISCs being the owner of the robo-advisor the one who charges the fees.

With the implementation of MIFID II at European level, advice and asset management must be separated. Advice must be made independent with the creation of partnerships with financial asset distributors without incentives, with the Independent robo-advisor having a great opportunity for expansion¹⁸.

This leads to a huge increase in competition in a market that was only relatively recently born and had considerably less competition. The coming years are going to be important in the robo-advisory field when new competitors enter the game and mergers and acquisitions gain ground.

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¹⁷ The statistics shows that 80% of robo-advisors have the 3.0 features and characterized towards increasing the service offering, the automation – including the automation of portfolio's rebalancing – and the technology used (DELOITTE, 2016).

¹⁸ According to the forecast, in less than a decade, digital-advisory services will be 50 times larger when compared with the small part of the wealth management market they were in 2015. In 2015 there were 32 Trillion USD assets under management, of which less than 100B USD belonged to robo-advice. See BROUGHTON, 2016. .

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