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Robo-advisory as a driving force of the financial market in the light of digitalization?

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Abstract

This article deals with the phenomenon of Robo-advisory used in the provision of investment services. It is appropriate to consider the use of this tool from a regulatory perspective, particularly given the widespread use of digital tools in financial markets and the growing interest of users in the digitization of services. Given the rapid development of digitalization, legislation may not always take into account the use of digital tools. Legislative changes may be delayed. The main objective of this article is to analyze Robo-advisory specifically from the perspective of EU regulation. The aim is to confirm or disprove the hypothesis. Based on the analysis, we are then able to look at using Robo-advisory from different perspectives, both practical and regulatory. The analysis also highlights the similarities and differences between traditional and alternative investment service provision.

Keywords: Robo-Advisory; Investment Advice; FinTech; MiFID; Portfolio Management.

1 Introduction

The impact of new technologies on financial markets is leading to increasing digitalization and a significant change in the basic business models used to provide financial services. The FinTech boom is not only disrupting the market from the perspective of new players but also creating the opportunity to find new solutions to facilitate the competitiveness of established companies. As the term FinTech itself indicates, there is a combination of finance and technology that, with some simplification, facilitates the provision of services by firms and covers many of the technological innovations related to the financial sector. These FinTech innovations fall into several areas, including payments, insurance, investments, securities clearing and settlement, alternative financing platforms, and asset management. Technological innovations include using data analytics, blockchain, and other technological tools (Financial Stability Board, 2017). In the area of investment, some of the key technologies that can be used include Robo-advisory, digital wealth management, and digital investment vehicles (Reiners, 2019).

Robo-advisory is a financial technological innovation. It is classified as a process innovation. According to the economic approach, process innovation is an innovation that allows one to provide a service or produce a product more efficiently than the traditional way of doing so (Fabozzi, Modigliani, 2009). On the basis of this economic approach, Robo-advisory, as a financial process innovation, enables the more efficient provision of investment

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services. It should be noted that Robo-advisory can be used in a wide range of areas, covering both regulated and non-regulated services. But these possibilities are not the subject of this analysis. This article focuses on Robo-advisory used to provide investment services - regulated services.

The focus of this article is a closer examination of the use of Robo-advisory for the provision of investment services in the context of EU legislation. The aim of this article is to link the general view of Robo-advisory with the regulatory framework in the European Union. The extensive regulation of the provision of investment services was one of the reasons for choosing this objective. One of the main contributions of this article is to combine both approaches, i.e., the general view of Robo-advisory and the regulatory view. It should be noted that most of the publications to date have focused only on the general view.

This article will be divided into two main parts. The first part focuses on a general definition of Robo-advisory. This includes a brief history of the phenomenon. This part describes the main opportunities and risks associated with the use of Robo-advisory. The conclusion of the first part is a look at the possible barriers to the development of Robo-advisory services. The regulatory framework for Robo-advisory and the provision of investment advice and portfolio management is then described in the second part. This is followed by an analysis of selected requirements that an investment firm has to comply with in the provision of investment services.

2 Methodology

The aim of this article is to analyze Robo-advisory in more detail and to link the two perspectives on the use of Robo-advisory, both from a general and regulatory perspective. Due to the importance of the regulatory analysis and the achievement of the objectives of this article, the authors use general theoretical methods, especially the method of analysis and synthesis, to explain the phenomena in question. In addition to these methods, the method of analogy will be used. For this purpose, the authors use the method of interpretation of legal regulations. Historical interpretation is used to support teleological interpretation regarding the studied issue and EU regulation.

With regard to the objective of the article, the following hypothesis has been formulated:

The Union's regulation of Robo-advisory for the provision of investment services is identical to the regulation of the provision of investment services regardless of the use of this business model.

3 Robo-advisory – literature review

Robo-advisory is not a new concept. There are many definitions of Robo-advisory in academic publications for different conceptions of the extent of the services used. Robo-advisory is one of the key technologies used in investment, Anshari, Almunawar, and Masri (2022) define it as a digital platform that uses artificial intelligence to automatically generate and manage user portfolios. Reiners (2019) states that Robo-advisory is an online service, which uses algorithms to automatically execute investment orders. Robo-advisory is very similarly defined by Bhattacharyya, S., and Bhattacharyya A. (2022) as an automated investment platform that analyses selected client indicators based on algorithms to provide the required solutions.

However, the business models of Robo-advisory are different. This difference leads to different definitions of Robo-advisory. Also, sometimes only the process of automating investment advice is considered as Robo-advisory (ESAs, 2015), or more extensively both investment advisory and portfolio management, or just portfolio management. If we were discussing the narrower focus of the Robo-advisory model, this automated tool would only be used in the case of an investment advisory service. Any automation of the provision of a client wealth management service would be subsumed under the term “automated portfolio management”. Automated portfolio management is then referred to as portfolio management through algorithms or other automated tools, including copy trading (ESAs, 2015). Regardless of the service provided, Robo-advisory falls under the definition of the digital platform, given the neutrality of the term. The Robo-advisory in the form of a digital platform can also stand alone or be developed as an in-house application. In the business model, particularly where the Robo-advisory stands alone and is provided to the investment firm by a third party, many other requirements also fall on investment firms (Financial Stability Board, 2017).

Based on the purpose of this article, the business model of Robo-advisory use is not distinguished. In the following, we work with a broader focus, i.e., the use case of providing investment advice and/or portfolio management. For the sake of simplicity, and with the focus of this article, we conceptualize Robo-advisory as an automated tool for providing specific investment services that function as online services for the customer using data analytics and algorithms. Therefore, Robo-advisory provides an alternative approach to the traditional

provision of investment services (Jung, Glaser, and Köpplin, 2019). It should be mentioned that the classic Robo-advisory is usually primarily intended for retail customers[2] (Torno, Metzler, and Neuss, 2022).

Robo-advisory are extensively conceptualized by e.g., Jung, Glaser, and Köpplin (2019), according to whom Robo-advisory can consist of all the following elements:

1. Configuration:
   a. client profiling;
   b. client evaluation.
2. Pairing (Matching):
   a. defining the investment strategy;
   b. implementation of the defined strategy;
   c. long-term portfolio model;
   d. money management.
3. Management:
   a. portfolio monitoring and rebalancing;
   b. performance and communication.

Sirony (2016) also takes a more extensive view, although slightly different from Jung, Glaser, and Köpplin (2019), according to whom Robo-advisory focuses on profiling, advising, rebalancing, and indexing. It is not appropriate to state which approach is better and not useful to compare them further, as Robo-advisory approaches vary by the extent of the process covered by the automated tool.

Regardless of the different components of the process, the two views intersect in the fundamentals of Robo-advisory. That cornerstone is automatization. This automatization in the form of a tool/platform is leveraged by the end customer (it is intended for user use) from the total, or greatly reduced, elimination of the human factor in service providing. The human factor is therefore replaced by an automated process (e.g., using an algorithm or decision trees) that is used directly by the end customer (ESAs, 2015). The basics include the profiling and pairing process. The profiling process involves providing information about the entire Robo-advisory process and obtaining customer input through remote communication means. This input data is obtained mainly, but not exclusively, through online questionnaire surveys. Both static and hybrid methods are used in the questionnaire surveys to fulfill regulatory obligations and to obtain comprehensive information about the customer, based on which a customer profile (risk profile) is created. The pairing process is then usually based on a pre-designed algorithm according to which the customer profile is matched with the target market of investment products, either on a specific basis for investment advice or by designing a strategy (in the case of portfolio management Robo-advice uses modern portfolio theory) (Torno, A., Metzler, and Torno, V., 2021). Concerning algorithmic data analysis, customers with the same or similar inputs can have identical, or minor nuances, different portfolios, and investment recommendations (Bhattacharyya, S., and Bhattacharyya A., 2022).

3.1 Opportunities and risks of Robo-advisory to customers

Already from such a brief introduction the basic Robo-advisory opportunities and risks for customers can be extracted in combination with the SWOT analysis performed by Jung, Glaser, and Köpplin (2019).

Opportunities certainly include generally lower fees for the provision of services (including lower administrative and fixed costs), which opens the possibility of greater interest in the services in the sector. Lower service charges are not only related to cost reduction. Rather, lower fees have also been found to be driven using a passively managed strategy using publicly traded low-cost index funds (ETFs) (BETTER FINANCE, 2020).

Among the advantages is also the fact that in the case of Robo-advisory, there is equal or higher performance and erudition compared to the classic provision of investment services with a human element. In Robo-advisory, there is also a reduction in cognitive and emotional biases (e.g., elimination of potential feelings of coercion), i.e., various human factor errors. Also, based on algorithms, Robo-advisory can perform more efficient portfolio rebalancing than in the case of traditional service provision (Reiners, 2019).

The undoubted advantage of Robo-advisors is also the expansion of the customer base from the side of new customers for whom the (fully) automated process brings lower time costs for providing the service or from the side of customers (among others regarding the provision of online service and access) who for personal reasons prefer to provide services without physical presence. This facilitates customer access to the services provided. The advantages also include complex data processing, based on which the output is provided to the customer. Similarly, Robo-advisory facilitates record-keeping throughout the process. This is positive for both, the investment firm, and the customers, who have all the information electronically in one place (ESAs, 2015).

[2] in EU terminology, non-professional customers

Robo-advisory naturally brings some risks for customers. The main risk is the same for the provision of investment services in both alternative and traditional ways, namely the provision of inappropriate investment advice (both in terms of investment advice and portfolio management). On the Robo-advisory side, the main risk is the provision of unsuitable investment recommendations based on an evaluated client profile, for which any doubts have been identified through the algorithm. In the case of the classical model, this risk can be mitigated by examining the information obtained from more angles than the Robo-advisory algorithm has set up. In the case of Robo-advisory, out-of-date economic predictions may also occur, as Robo-advisory is generally based on the latest information from the updated algorithm. Another major risk is the impossibility of substituting human judgment and psychology, which is required especially in the event of a financial crisis or market downturn (Reiners, 2019).

Also, the customer may not understand the investment recommendation provided or may simply make a mistake in filling in the input data. An error in completing the input data can be assumed, especially in the case of a lack of understanding of the questions or poor interpretation and the impossibility of immediate physical interaction for the explanation. These errors, although unintentional on the part of the customer, will then affect the output provided. Another major risk is the potential error rate or shortcomings of the automated tool, especially errors in the underlying algorithm or the ability of the algorithm to cover the specifics of all customers (BETTER FINANCE, 2020). Related to this is the risk of third parties disrupting the functionality of the tool (ESAs, 2015).

3.2 Barriers to development

In the context of technological developments and the use of digitalization in financial markets, national and supranational authorities are taking a greater interest in this issue. Potential barriers to the use of auto-mathematical tools were also considered in combination with the SWOT analysis performed by Jung, Glaser, and Köpplin (2019).

The use of Robo-advisory is certainly moving the investment landscape and having a positive effect on the financial market. However, there are barriers to the introduction of Robo-advisory which may explain the lower uptake by players in the European market. The barriers to the introduction of Robo-advisory in the market have been analyzed mainly by the European Supervisory Authorities (ESAs) and in academic publications (see Jung, Glaser, and Köpplin, 2019). Barriers to the development of Robo-advisory have been identified as (i) cultural/psychological barriers (which are related, inter alia, to the issue of trust) and (ii) regulatory barriers (ESAs, 2018). Considering the development of Robo-advisory, it is also necessary to look at a factor related to the development, namely competitiveness in terms of the advantages of Robo-advisory considering the motivation to use (BETTER FINANCE, 2020).

In the case of cultural/psychological barriers, these are mainly due to a lack of digital financial literacy, which leads to a preference for face-to-face interaction, reducing the demand for Robo-advisory. They also include mistrust of using robo-advice online and emotional biases when interacting with a Robo-advisor. Regulatory barriers are related to the complexity of current regulations, especially for start-ups, and concerns about further regulation of digitalization. Risks related to AML/CFT obligations have also been identified under regulatory barriers (ESAs, 2018). For regulatory reasons, new players are not entering the market as licensed Robo-advisors but are trying to break out of the regulatory framework by modifying the service offering or by partnering with already licensed entities (Houben, de Muync, and Hendrickx, 2020).

4 Evolution of Robo-advisory

Robo-advisory emerged during the boom of financial innovations launched by fintech companies between 2008 and 2010, especially in the US, because of the global financial crisis in 2008. These fintech companies are generally focused on technology and finance, on the process of digitalization of service delivery in the financial sector. It can be noted that the FinTech ecosystem itself has a broad focus, ranging from peer-to-peer lending, and data digitization, to Big Data analytics. The classification of FinTech can be based on this, namely into lending, payments, Robo-advisory, analytics, and others (Sirony, 2016). Among the factors behind the development of Robo-advisory is the stricter regulatory requirements after the financial crisis in 2008 on banking entities and traditional financial institutions, which opened the way for the development of non-banking entities. Also, the loss of consumer confidence in mainstream financial institutions in the wake of the financial crisis. To try to justify the emergence of Robo-advisory, an approach can be taken that suggests that the development was caused by a combination of price competition, digitalization, and a weakening of trust in traditional financial institutions (BETTER FINANCE, 2020).

The first Robo-advisory platform was launched by Betterment (USA) in 2008 and was first made available to customers in 2010. The Robo-advisory industry has grown consistently since then, with total assets under management (“AUM”) in the US forecast to reach 16 told. USD by 2025 (Reiners, 2019).

Asset management in the Robo-advisory sector is not as widespread in Europe as in the US. In Europe, AUM for Robo-advisory is only 5-6% of that of Robo-advisory AUM in the US (Reiners, 2019). However, Robo-advisory is gaining popularity in Europe. In 2021, the AUM for Robo-advisory was approximately €140 billion, with an estimated annual growth of 21 % over the next four years. Among the Member States, Italy leads in AUM, followed by Germany (ESAs, 2021), Netherlands, and Spain (BETTER FINANCE, 2020). The number of Robo-advisory users was approximately 20 million in 2020 (ESAs, 2021). According to statistical data and analysis carried out in the Czech Republic, among others, the Robo-advisory market had €431 million under management in 2020, which accounts for 0,7 % of the total AUM in the European Robo-advisory market. It was also found that 0,16 million users (i.e., 2 % of the total European market) use the Robo-advisory platform in the Czech Republic (BETTER FINANCE, 2020).

5 The use of Robo-advisory in the provision of investment advice and portfolio management

Before examining directly, the use of Robo-advisory in the provision of investment services, it is necessary to analyze the basic legal framework that is relevant to Robo-advisory concerning the regulation of investment services. After the analysis of the basic legal framework, it is sufficient to proceed to the analysis of specific investment services and the comparison of traditional and alternative provisions of investment services.

5.1 Basic EU Legal Framework for Robo-advisory

Regulation at the European Union level about Robo-advisory stems from the principle of technological neutrality. Technological neutrality means that basic uniform rules are set regardless of the form of provision of investment service covered by the Robo-advisory. The use of this platform for the provision of investment services is therefore subject to the same legal regime as for the traditional provision of investment services without the use of digital tools. However, regarding Robo-advisory, it is not always clear how the regulatory rules should apply to Robo-advisory (Houben, de Muync, Hendrickx, 2020).

Regarding the use of Robo-advisory in the provision of investment advice or portfolio management, the main EU legal framework is Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (hereinafter referred to as "MiFID II") and 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 organizational requirements and operating conditions for investment firms and defined terms for that Directive (hereinafter referred to as "CDR MiFID II"). MiFID II is the second framework directive governing investment services. MiFID II aims to enable deeper integration of the internal market through a single and harmonized set of rules for the functioning of the EU financial market (Husták and Smutný, 2016).

Selected relevant requirements set out in MiFID II and the MiFID II Implementing Regulation are discussed later in this article.

This chapter is not intended to be an exhaustive list of the laws and regulations that govern all activities about Robo-advisory and the provision of investment services. The following is a selection of the legislation that is relevant to the Robo-advisory process, and, in the authors' view, it is important to keep this legislation in mind and put it in (at least brief) relation to the Robo-advisory phenomenon in the overall context.

Selected EU legislation includes Regulation (EU) No 1286/2014 of the European Parliament and of the Council of 26 November 2014 on key information documents for packaged retail and insurance-based investment products (PRIIPs) (hereinafter referred to as "R-PRIIPs"). R-PRIIPs lay down uniform rules on the key information for retail investors that a manufacturer or distributor of investment products must disclose for structured retail products and insurance products. Under Article 2 Communication from the Commission - Guidance on the application of Regulation (EU) No 1286/2014 the Key Information Document establishes a common standard governing information on a wide range of products with an investment component for retail investors. This information (in the form of a KID document) enables retail investors to make an informed investment decision, considering the information provided on the main features of the product, its risks, performance, and associated costs. R-PRIIPs apply to investment products with an investment component that is structured retail investment products or insurance products with an investment component. A structured investment product is a retail investment where the resulting pay-out is subject to fluctuations because of exposure to benchmarks or the performance of one or more assets not directly purchased by the retail investor (Article 4(1)(4) Regulation (EU) No 1286/2014). Therefore, R-PRIIPs do not apply to deposits that are exposed only to interest rate risk. Key investor information in the form of a KID must be prepared by the product manufacturer before the start of the product offering and published on the website. If a distributor is used, the distributor must make the KID available to the investor.

The relationship with Robo-advisory may not be obvious at first sight. Kids are commonly encountered with Robo-advisory if the Robo-advisory is focused on providing investment advice. As in the case of MiFID II, there

is technological neutrality and the Robo-advisory must comply with the obligations set out in R-PRIIPs, i.e., to make the KID known to the investor. This relationship can be described as obvious. The relationship may be less obvious in the case of the use of KIDs concerning the algorithm in the matching process. This is because the algorithm must comply with the MiFID II market targeting obligations. The KID will be reflected in this case and part of the process, if the Robo-advisory is provided by a distributor and that distributor, needs information on investment products to set the actual target market. Thus, in a relationship between a manufacturer that is not subject to product governance obligations and a distributor. The primary document for determining the actual target market for investment products not subject to this obligation by the originator should be the Key Information Document (Hobza and Vondráčková, 2019).

In addition, it is worth noting Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC, and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (hereinafter referred to as "D-AML"). D-AML sets out a framework of uniform procedures for the detection of money laundering and terrorist financing, to ensure the stability of financial systems and prevent the economic consequences of money laundering and terrorist financing (Šiková, 2022). Due to the classification of investment firms as obliged entities, the activities of investment firms fall within the scope of D-AML. This means that an investment firm must take appropriate steps to identify and assess the risks of money laundering and terrorist financing, which entails putting in place strategies, controls, and procedures to mitigate and effectively manage these risks, under a risk-based approach.

To Robo-advisory, an investment firm must consider the distribution of the investment service through this automated tool in its risk assessment in terms of potential AML/CFT risks. This means that, based on the assessment of the use of the tool, the resulting procedures for establishing a business relationship with a client/executing a trade may be affected, even during that business relationship. In other respects, the establishment of a business relationship through Robo-advisory can be equated with the traditional use of online platforms.

With the growing interest in Robo-advisory, national, and multinational authorities are particularly concerned with the risks that Robo-advisory poses to customers. These risks include, among others, concerns about cybersecurity and data protection. As part of these concerns, there is increasing analysis and discussion around complementary regulations on the use of digital technologies (Abraham, Schmukler, and Tessada, 2019). With a view to the efficient delivery of financial services and maintaining consumer and market confidence, there has been much consultation on how to increase the cyber resilience of the financial sector in the face of technological innovation and risks (European Commission, 2019). These consultations and analyses led to the adoption of the Digital Finance Package, including the Digital Finance Strategy, on 24 September 2020. This strategy sets out key priorities and objectives for digital finance. Key priorities and objectives include enabling the interoperable use of digital identities across the EU, open finance (promoting data sharing between businesses in the EU financial sector and beyond), clear and comprehensive EU rules for the crypto-asset market, mitigating the risks of digital transformation through digital operational resilience rules, ensuring the application of the "same activity, same risk, same rules" principle (European Commission, 2020).

As part of this package, legislative proposals have been put forward which build on the strategy. Based on the above legislative proposals, Regulation (EU) 2022/2554 of the European Parliament and of the Council of 14 December 2022 on digital operational resilience for the financial sector and amending Regulations (EC) No 1060/2009, (EU) No 648/2012, (EU) No 600/2014, (EU) No 909/2014 and (EU) 2016/1011 (hereinafter referred to as "R-DORA") was adopted, which concerns, inter alia, Robo-advisory from a digitalization perspective. R-DORA is effective from 17 January 2025.

R-DORA addresses information and communication technology (ICT) risks in the financial services value chain and should strengthen and harmonize cybersecurity rules across the EU and ensure that digital operational risks are effectively addressed. ESAs (2022) states, that it also introduces new supervisory powers about critical third-party ICT service providers, recognizing the integral role that technology providers increasingly play in the financial system. Particularly in the use of Robo-advisory, where R-DORA applies to investment firms, investment firms will need to adopt a proper ICT risk management strategy, especially considering Robo-advisory as the critical function. Thus, with the use of this technology, it will be necessary to assess any risks arising more fully from its use, manage the risks, put in place protective and preventive measures, implement business continuity strategies, conduct business testing, and much more (Explanatory memorandum to Proposal, R-DORA). Any obligations introduced will therefore be reflected not only in practical implementation but also in the need for a complex adjustment of the management and control system, including the investment firm's information security policy.

Regarding the investment service provided through Robo-advisory, it is also necessary to mention soft law, namely standards and recommendations. Soft law includes global standards, EU standards and standards and recommendations of national authorities and professional organizations. According to Husták and Smutný (2016), soft law in addition to EU and domestic legislation completes the system of legal standards and helps it to function

effectively, such as various recommended standards of conduct or methodological and interpretative documents or market codes. In particular, the guidelines and recommendations of the European Securities and Markets Authority (hereafter referred to as "ESMA"), which are issued based on Regulation (EU) No 1095/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC.

5.2 Investment advice and portfolio management

As mentioned above, Robo-advisory can be used to provide investment advisory services or portfolio management. In EU terminology, investment services subject to MiFID II are divided into investment services and activities and ancillary investment services. Both investment advice and portfolio management are classified as investment services and activities under Annex I, Section A of MiFID II. The individual investment services will be discussed below in their basic features.

According to Article 4(4), MiFID II investment advice is the provision of personal recommendations to a client, either at the client's request or the initiative of the investment firm, on one or more transactions relating to financial instruments. Investment advice consists of an individualized assessment of the customer's conditions and, following the consideration of these conditions and the analysis of opportunities relating to investment instruments, the provision of a personalized recommendation to the customer about a specific investment instrument (Husták and Smutný, 2016). Investment advice is usually aimed at taking the next active action (Article 9, CDR MiFID II) as an investment decision action that is initiated by that client. Hobza (2017) states, that the basic conceptual features of investment advice include the provision of recommendations, about transactions in a particular investment instrument or instruments, to a customer or his representative, personalized, not disseminated exclusively through distribution channels or intended exclusively for the public. Given the thin line between the provision of investment advice and ordinary advice that does not fall within the definition of investment service, an approach has been defined to determine whether it is investment advice. This approach is based on five key tests. A service will be considered as a provision of investment advice if all the specified tests are met cumulatively. The conceptual features of investment advice set out above reflect the issues set out in the five key tests. The five key tests are based on the answers to the specified questions relating to the service provided. If the assessment is positive, the service meets the characteristics of investment advice, and it is necessary to meet the requirements of the relevant legal provisions for this service (CESR, 2010). The test according to CESR (2010), also agreed by ESMA (2023), consists of the following questions: "(1) Is the service offered a recommendation or simply information? (2) Does the recommendation relate to a transaction/disposition of one or more investment instruments? (3) Is the recommendation presented as appropriate or does it consider the customer's circumstances? (4) Is the recommendation made other than through distribution channels or published? (5) Is the recommendation directed to the customer or potential customer or his representative?

Portfolio management is then defined in Article 4(8) of MiFID II as the management of portfolios by mandates from clients with discretion to individual clients, where those portfolios include one or more financial instruments. Portfolio management is focused on the formulation of a personalized investment strategy for the client and its subsequent practical implementation. This practical implementation then lies on the side of the service provider. In this case, the customer does not enter a specific order for an investment instrument. The customer is passive in the implementation of the investment decision (Husták and Smutný, 2016). Hobza (2017) states, that the client thus in fact leaves, in whole or in part, the decision-making activity, i.e., the formulation of investment decisions and their subsequent implementation, to the investment service provider. It should be noted that in the case of portfolio management and the related portfolio management agreement, the specific investment instruments on which transactions will be made in the future are not defined in advance. The portfolio management agreement, within the framework of which the investment service provider must subsequently act, although at the discretion of the provider, does not contain any instruction in the sense of investment service - reception and transmission of orders. In the context of the portfolio management service provided, an investment strategy may be defined (Hobza, 2019). In the case of Robo-advisory, these would primarily be standardized portfolios with a broadly defined category of investment instruments. In this case, it would be necessary to carry out a more in-depth analysis of whether the level of detail provided goes beyond the service provided and would fall under other types of investment services.

5.3 Obligations arising from the provision of investment services through Robo-advisory to clients

The provision of these investment services is also linked to the obligations that are imposed on the investment firm. Regarding technology neutrality, the investment firm is required to comply with any obligations imposed on the provision of investment advice or portfolio management. The responsibility of the investment firm is not reduced by the provision of investment services through automated/semi-automated instruments (Article 54(1), CDR MiFID II). Therefore, the level of customer protection is the same as in the case of traditional provision of

investment services (Houben, de Muync, and Hendrickx, 2020). However, as noted above, the use of Robo-advisory brings with it some confusion as to how the regulatory rules will apply to Robo-advisory. For this reason, ESMA has also issued general guidance on certain aspects of the MiFID II suitability requirements (ESMA, ESMA 35-43-1163, 2018). This additional information will be provided below for each selected rule/obligation.

Investment firms providing investment services through Robo-advisory must comply with the prudent investment services rules and conduct of business rules. The next section of the article will discuss selected obligations of investment firms that could be modified due to the use of Robo-advisory for the provision of services.

The main duties, regardless of the service provided, include the rules of professional care in dealing with customers. That is, the investment firm acts honestly, fairly, and professionally following the best interests of its customers (Article 24(1)(3), MiFID II). The investment firm must also comply with the rules of communication with customers and promotion of investment services.

The basic information that an investment firm must provide to the client includes relevant information about the investment firm, the services provided, the financial instruments, the proposed strategies, the execution venues, and the costs of providing the services, including fees. This information base is expanded in the case of investment advice to include whether the advice is provided independently; what analysis the advice is based on whether the investment instruments are limited to entities with close links or other legal or economic relationships; and whether the investment firm will periodically evaluate the investment instruments for suitability for that client. Details of the investment instruments and proposed strategies must also always be provided, together with an indication of the risks involved in the investment and for which customers it is intended (Article 24, MiFID II).

When using Robo-advisory, it is essential to focus on the information provided in such a form that customers understand the information provided through Robo-advisory (Houben, de Muync, and Hendrickx, 2020). The basic rules of communication are maintained with the difference that the investment firm using Robo-advisory is obliged to take into account this way of providing investment services and, if necessary, to modify the information provided to maintain the basic principles of the rules of dealing with clients.

An investment firm using Robo-advisory must also comply with suitability assessment requirements (applicable to both investment advice and portfolio management), i.e., that the assessment of the investment instrument or strategy proposal is suitable for the client. Suitability assessment under ESMA (ESMA35-43-1163, 2018) means the entire process of gathering information about a potential client and then assessing by the investment firm whether the investment product is suitable for the client, i.e., whether it can recommend it to the client or execute an order based on the contractual framework of portfolio management.

The suitability assessment has three dimensions: (1) the customer's investment objectives, (2) financial loss-bearing capacity, and (3) knowledge and experience (Brenncke, 2017). For this suitability assessment, it is necessary to collect all information from these dimensions (BETTER FINANCE, 2020). Linked to the suitability assessment process is the obligation to inform the client of the reason for the assessment so that it is clear to the client why they are required to provide certain information. Following the suitability assessment, investment firms use internal product classification models to assign risks to each product (Colaert, 2017).

In the case of the use of Robo-advisory, the investment firm should in accordance ESMA (ESMA35-43-1163, 2018) informs the customer of the suitability process beyond the traditional information obligation:

1. the extent of human involvement in the process and an indication of whether and how the customer may request human interaction;
2. the fact that the information provided by the client will have a direct impact on the suitability of the investment recommendation (investment advice) or the realization of the investment decision on behalf of the client (portfolio management);
3. any sources of information used to make investment recommendations or provide portfolio management; this includes indicating whether direct input from the customer is the only source of information for evaluation through the Robo-advisory or whether the Robo-advisory has access to additional information about the customer;
4. an explanation of how and when the customer information will be updated.

Questionnaires are generally used to gather all the necessary information for the suitability assessment. In the case of Robo-advisory, these are online questionnaires. For questionnaire surveys, Robo-advisory must comply with the basic obligations of customer communication, namely, to pay attention to the clarity, completeness, and comprehensibility of the information requested in the questionnaires. All questions should not be aimed at self-assessment. Where such questions are used, they should be balanced against objective criteria to ensure consistency of responses from the customer. As part of the assessment, it is considered important that the questions also focus on understanding basic financial concepts. In this respect, the use of example scenarios is also recommended (ESMA, ESMA35-43-1163, 2018).

For Robo-advisory, it is then necessary to take into account other factors, namely whether the information requested through online questionnaires is sufficient to meet the suitability assessment requirement, whether the

questions in the online questionnaire are sufficiently clear or should be supplemented with more detailed explanations or examples to bridge the physical interaction in the case of supplementary questions, or whether to include a human element in this part of the process, e.g. via email, chat box, etc., assessing the user-friendliness of the questionnaire (ESMA, ESMA35-43-1163, 2018), also whether steps have been taken to address inconsistent client responses (e.g. various forms of alerts, pop-up banners, etc.) (Houben, de Muync, and Hendrickx, 2020). Therefore, when using Robo-advisory, investment firms should focus more on the structure of the questionnaire so that it provides a suitable and effective tool to find out all the necessary information.

Investment firms must have the necessary knowledge of the investment products provided to provide investment services. This includes the analysis of the investment firm for product governance obligations.

The requirement for product governance is set out in Article 16(3) of MiFID II, with some differences for both product manufacturers and distributors. However, there are no different requirements for Robo-advisory. Hobza and Vondráčková (2019) state, that the purpose of the measures included in the product governance framework is to ensure that investment instruments that are inappropriate for them are not offered to customer groups defined by common characteristics. Part of the product governance process includes targeting markets for investment products. Although a target market is not a legal definition, it can be by Hobza and Vondráčková (2019) presented as the intended range of end customers of a particular investment instrument within a relevant customer category, further defined by common customer type characteristics. In determining the potential target market, the investment firm considers five categories: the type of customer for whom the product is intended; knowledge and experience; financial situation with a focus on loss-bearing capacity; risk tolerance and compatibility of the product's risk/return profile with the target market; and customer objectives and needs (ESMA, ESMA35-43-620, 2018). To Robo-advisory, it is necessary to assess whether they are the manufacturer of the product or the distributor. From the distributors' point of view, it is necessary to identify the target market, the so-called real target market, which should consider direct contact with a specific customer base, practical knowledge, and experience (Hobza and Vondráčková, 2019). Product governance, therefore, involves the assessment of each investment instrument and the determination of the target market (including the assessment of the potential and real market). The obligation to target markets also entails an assessment of the suitability and appropriateness of financial instruments to be distributed in the designated target market and to the relevant category of customers. Product governance is inextricably linked to the process of matching customers with appropriate products. Hobza and Vondráčková (2019) mention that target market identification does not therefore automatically involve or predetermine the suitability or appropriateness assessment and vice versa.

In the pairing process (matching the client profile with suitable products), it is essential, regardless of the use of Robo-advisory, to consider all information obtained from the client and all relevant characteristics of the investments considered in the suitability assessment (based on product governance). Where model portfolios or other algorithms are used to model investment recommendations or investments, appropriate systems and mechanisms must be in place to ensure that the outputs are relevant to the investor's inputs consider all the specificities of the investor and the investment product and provide appropriate risk diversification.

In algorithm-based pairing, algorithms should be tested and monitored regularly. When algorithms are used, appropriate documentation on the operation of the algorithm should be provided, including the purpose, scope of the algorithm, and even basic decision rules. Policies and procedures for managing changes to the algorithm, and for dealing with faults, should also be included. When using the algorithm, it is then necessary to set sufficient security measures, in particular, to prevent unauthorized changes, control access to the algorithm, update, etc. (ESMA, ESMA35-43-1163, 2018). Algorithms should also be developed considering the nature and characteristics of the clients (Houben, de Muync, Hendrickx, 2020). For the use of Robo-advisory, there are no additional requirements for the development and administration of the algorithm beyond those imposed on the use of the algorithm as a standard automated matching tool within the internal processes of an investment firm. This would require an assessment of whether and how the development and management procedures for the Robo-advisory algorithm differ from those for internal use only, i.e., whether the strategy set for the internal use algorithm is appropriate and sufficient for the Robo-advisory algorithm. Purely from the point of view of the functionality of the matching algorithm, it can be assumed that the basic security procedures will be similar for both types.

Other obligations of an investment firm in providing investment services include the provision of professional personnel. "In general, where individuals provide investment advice or information on financial instruments and investment services on behalf of an investment firm, they are required to have the necessary knowledge and skill (Article 25, MiFID II).

The level and extent of knowledge and skills must then be appropriate to the duties assigned and the services provided (Article 21 (1)(d) CDR MiFID II). Achievement of this knowledge and skills is assessed according to the achievement of qualification[3] and experience[4] in service provision. This applies to personnel with direct contact

[3] appropriate qualification such as a qualification or other examination or vocational training course, as determined by the national supervisory authority in meeting the requirements set out in the guidelines ESMA/2015/1886, 22/3/2016

[4] relevant experience in the form of full-time work experience for at least 6 months, or extended work experience requirements by the

with customers (ESMA, ESMA/2015/1886, 2016). Personnel who are not in direct contact with the customer have limited duties. In the case of the human element in the process, this is an adequate requirement.

But what happens when Robo-advisory is used? In this situation, the procedure would be the same as for staff not in direct contact with the client. However, for the personnel involved in the Robo-advisory process, it is necessary to add appropriate technical knowledge, knowledge of the risks and rules on which the algorithms are based, as well as knowledge of the implementation of the controls of the implemented algorithm (ESMA, ESMA35-43-1163, 2018). The use of Robo-advisory would remove the obligation to ensure that personnel are appropriately qualified and experienced, based on the above interpretation.

6 Conclusions

Robo-advisory is a very interesting tool. It has great potential for the provision of investment services. This is due, among other things, to the increasing interest in digitalization and the maintenance of competitiveness in the provision of services. There have been two levels of analysis of the Robo-advisory phenomenon. From a general and regulatory perspective, the main interest was to identify the links between these levels and to assess the practical applicability and feasibility of providing investment services. Robo-advisory was subject to a fundamental view of this digital tool and the context of EU legislation.

The basic conditions for the provision of investment services are the same for all investment firms, irrespective of the use of digital and automated tools. This is in line with the technology-neutral approach of EU legislation. It has been recognized that the core MiFID II legislation is not fully adapted to Robo-advisory, following a more detailed assessment of the requirements for the provision of investment services. ESMA is in the process of trying to fill in these gaps in the hard law in the form of guidelines. However, not all areas covered by Robo-advisory are currently covered by guidelines. Within the current regulatory framework, there are a large number of concerns about the risks that arise from digitalization. In response to issues of application and interpretation, new legislation is currently going through the legislative process, addressing these concerns and seeking to adapt to the rapidly changing structure of financial services provision.

It is also important to note the limitation of this article, which is a more general focus on the use of Robo-advisors regardless of the business model. That is, whether the automated tool is in-house or provided as a service by a third party. A further and deeper interest in specific parts of the process for business models would certainly be of significant value to legal research and practice, particularly in light of further legislation on outsourcing of regulated services and tighter regulation of cybersecurity and cloud computing. However, it would be a pleasant satisfaction for the authors of this article if this article serves as a starting point for further research into the use of Robo-advisory in the provision of investment services based on the business model.

The authors of this paper have formulated a hypothesis as to whether the regulation of Robo-advisory for the provision of investment services in the Union is identical to the regulation of the provision of investment services regardless of the use of this business model. The hypothesis is only partially confirmed. The technological neutrality of EU legislation is certainly crucial for this validation. To bridge the gap between the traditional and alternative provision of investment services and the related issuance of soft law, additional or modified rules for Robo-advisory are already in place and must be complied with. However, these additional rules do not represent a significant regulatory burden, but rather reflect the duty of proportionality for the established business model. However, a significant regulatory burden will need to be discussed in the event of N-DORA, which will impose many obligations on Robo-advisory beyond the traditional provision of investment services.

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