Research Focus

Volume 1, Issue 1, 2019, p. 26-33

ISSN: 2668-4675

www.researchfocus.org

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Digitization in Finance: Fintech and Automated Investment Tool

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Abstract

In recent years, the importance of fintech phenomenon has grown relatively fast, due mainly to the Internet, computers and disruptive or sustaining innovations. Today, the traditional financial paradigm has shown its inefficiencies. Considering the world we are living in, there is almost no reason to still keep it alive, but transforming it. The 2007-2009 economic crisis can be seen as a natural consequence of the global revolution which is taking place in almost every sector of the economy. The purpose of this article is to give a brief definition of FinTech, which is ground zero for a large number of innovations. The paper will also analyze an automated investment tool.

Keywords: fintech, robo-advisory, financial advisory, automated investment tool

Introduction

FinTech is about cryptocurrency, blockchain, mobile payments, crowdfunding, peer to peer lending, trading system, artificial intelligence (AI) and machine learning, digital advisory and even more. The word “fintech” has a large application in different fields, but in order to clarify its meaning, it is possible to define it as a new financial industry that applies technology to improve financial activities (Schueffel, 2016). Investments in Fintech firms have grown by 75% in 2015 with respect to 2014, an amount of 22.3 USD billion (Skan J., Dickerson J., Gagliardi L., 2016). Since 2010, a total amount of 50 USD billion has been invested in fintech firms all over the world (Skan J., Dickerson J., Gagliardi L., 2016).

Robo-Advisory: a FinTech innovation

“Robo-Advisory” consists of digital (online) investment guidance and portfolio management services that are based on algorithms and models (Kaya, 2017). Figure 1 presents the main building blocks of Robo-Advisory.

Asset universe selection	Investor profile identification	Asset allocation/portfolio optimization	Monitoring and rebalancing	Performance review and reporting
All systems use ETFs with minor exceptions including: Mutual/ Actively Managed Funds, Sustainable Funds, ETCs, and Index Funds. Different selection criteria include: expense ratio, total costs, liquidity, replication method, and correlation among the ETFs	Online questionnaires focused on identifying clients' risk tolerance as well as investment objectives and horizon. Typically, the questions are compiled to understand the objective risk tolerance through information on age, income, savings, previous investment experience, and investment goals	Most of the systems apply the Modern Portfolio Theory approach, supplemented and modified by various methods (e.g., Black–Litterman, VaR and CVaR optimization*). Notable exceptions include Risk Parity, Full-Scale Optimization and Constant Proportion Portfolio Insurance. A few systems apply constant portfolio weights	Most systems use event/ threshold-based rebalancing based on the daily rebalancing check. The triggers are defined as portfolio structure (i.e., weights), returns (drift), and VaR Some systems use calendar-driven rebalancing. Some also use optimized dividend and cash-flow (re)investment for the rebalancing	Half of the systems provide control and monitoring possibilities through the website only. The half also provide a smartphone app. Some systems send the monthly statements and quarterly reports automatically by e-mail

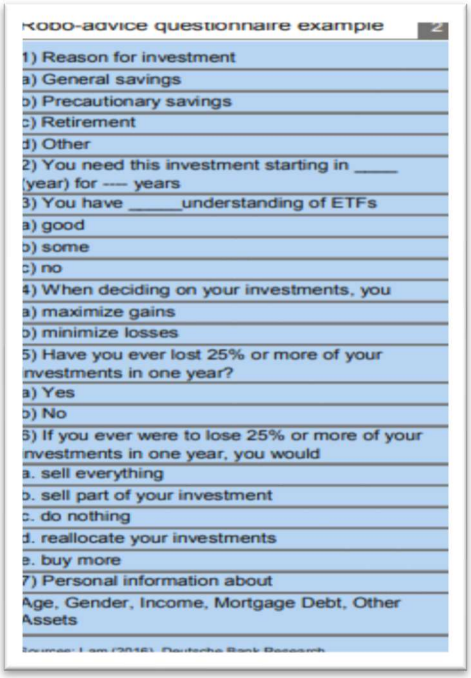
Figure 1. Robo-Advisory main components

(Source: (Beketov M., Lehman, K., Wittke M., 2018))

Another expression to name Robo-Advisory is “Automated Investment Tool”, given by the Security and Exchange Commission (SEC) in the US. In a document provided by the SEC and

the Financial Industry Regulatory Authority (FINRA), there are 5 tips for the investors related to Robo-Advisory (US Securities and Exchange Commission, 2015): “Understand any terms and conditions; Consider the tool’s limitations, including any key assumptions; Recognize that the automated tool’s output directly depends on what information it seeks from you and what information you provide; Be aware that an automated tool’s output may not be right for your financial needs or goals; Safeguard your personal information”.

At the basis of these tips, there is the main concept that Robo-Advisory may rely on assumptions that are incorrect or inapplicable to an individual’s financial situation (Fein, 2015). In other words, Robo-Advisory typically rely upon traditional Modern Portfolio Theory, in which the expected return on a portfolio of assets is maximized for a given level of risk and nevertheless just a few data are collected in order to determine the correct risk profile of the customer (age, net income, risk preferences, time horizons, etc.) (Figure 2). This is a very poor approach, especially for long term or multi-horizon investments (IBM Analytics, 2016).


Robo-advice questionnaire example

1) Reason for investment
a) General savings
b) Precautionary savings
c) Retirement
d) Other
2) You need this investment starting in ____ (year) for ---- years
3) You have _____understanding of ETFs
a) good
b) some
c) no
4) When deciding on your investments, you
a) maximize gains
b) minimize losses
5) Have you ever lost 25% or more of your investments in one year?
a) Yes
b) No
6) If you ever were to lose 25% or more of your investments in one year, you would
a. sell everything
b. sell part of your investment
c. do nothing
d. reallocate your investments
e. buy more
7) Personal information about
Age, Gender, Income, Mortgage Debt, Other Assets

Figure 2. Example of Robo-Advice questionnaire

(Source: (IBM Analytics, 2016))

Figure 3 shows different models used by Robo-Advisory in asset management. As we can see, “modern portfolio theory” is frequently used.

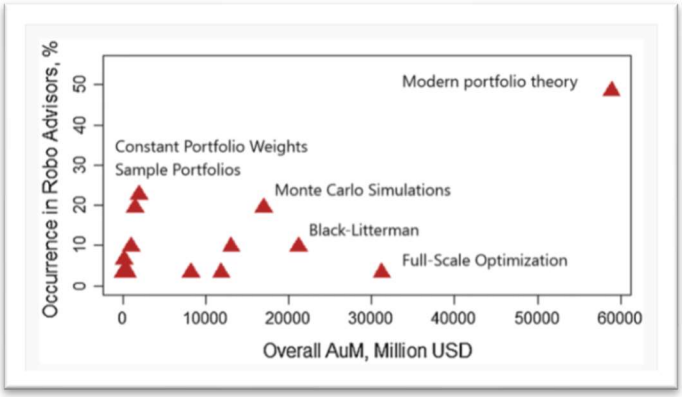


Figure 3. Models used by Robo-Advisory in asset management

(Source: (Beketov M., Lehman, K., Wittke M., 2018))

Robo-Advisory strengths

There are some key advantages provided by Robo-Advisory. It is worth to emphasize that the development of this new way of thinking in financial advisory is allowed by client's ability to access the Internet, their willingness to directly manage their own assets as well as the growing trust in digital systems (Figure 4).

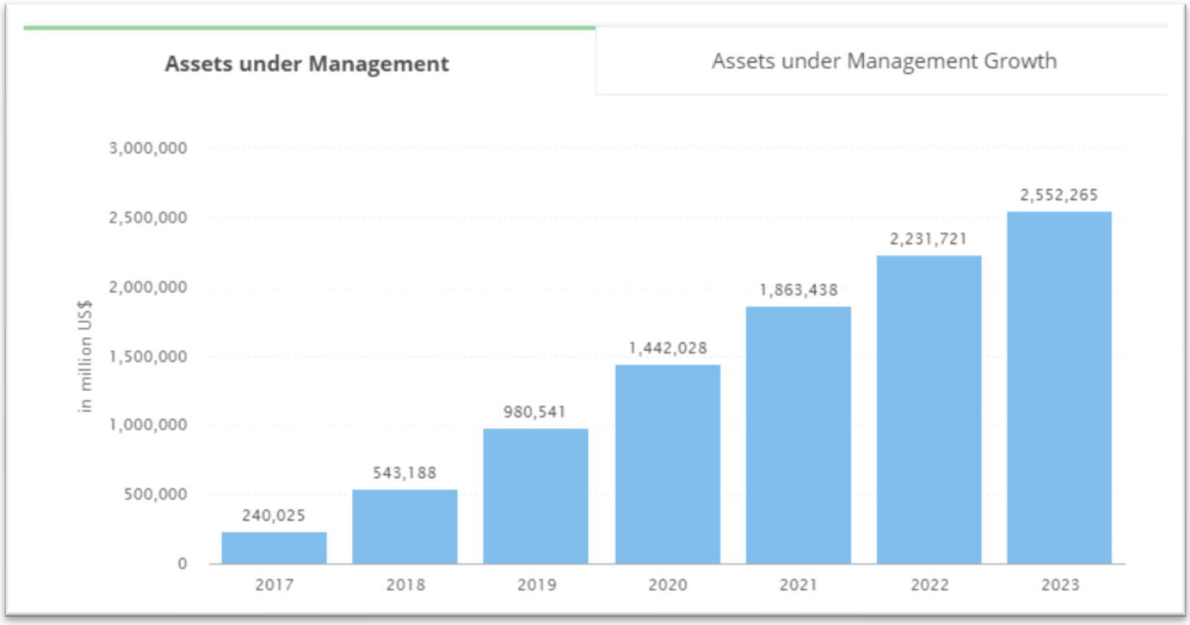


Figure 4. Actual data and forecast of assets under management in the robo-advisory segment

(Source: (Statista, 2019))

Clients are also attracted by the simplicity of the whole Robo-Advisory process, its availability (24/7) and lower fees with respect to the traditional financial advisory. US robo-advisors average fees applied are 0.4%, which is lower than 0.8% fees charged by European competitors (Kaya, 2017).

From the fintech firms' perspective that are offering Robo-Advisory services, lower fees could be applied partially thanks to not paying a human financial advisor and exploiting scale economies. As a matter of fact, this system is highly scalable, and the marginal cost of each new transaction is relatively low. Moreover, the minimum amount required by this new way of investing is relatively lower compared with those of the traditional channels. In turn, this provides better financial inclusion for those investors with low to medium wealth. Another characterizing factor is the large use of exchange-trading funds (ETFs) in Robo-Advisory. ETFs are low-cost financial instruments that have grown exponentially in the past years because of their ability to diversify and relatively easy to understand for the investors. This is one of the factors which allows Robo-advisory industry to charge low fees, according to Deutsche Bank (Figure 5).

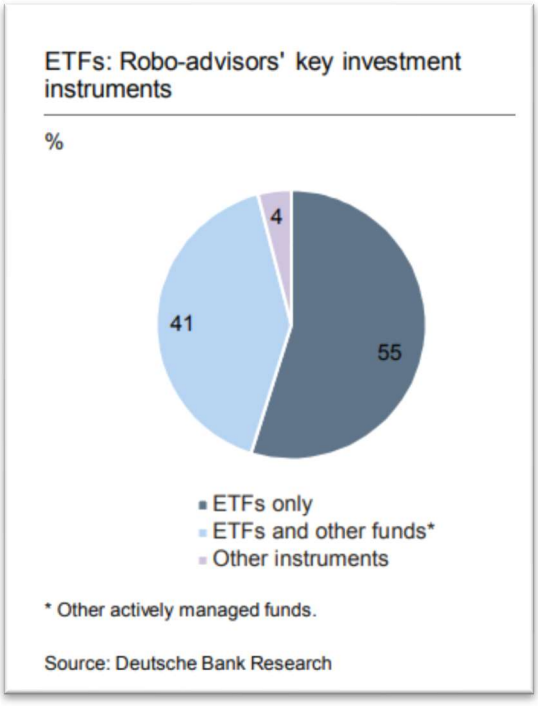


Figure 5. ETFs are key instruments for Robo-Advisors

(Source: (Kaya, 2017)

Considering the large number of ETFs, it is important to underline the robo-advisory conservative approach toward ETF investments. As shown in Figure 6, only 3 to 6% of ETFs are selected by Robo-Advisory.

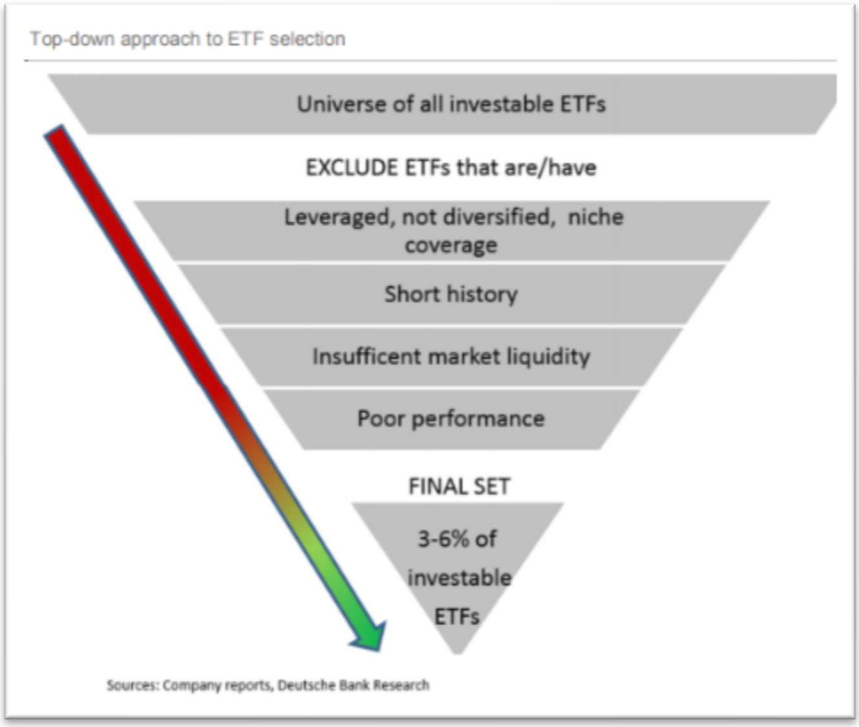


Figure 6. ETF selection in Robo-Advisory

(Source: (Kaya, 2017))

Robo-Advisor weaknesses

Pan and Statman (2013) have analyzed risk questionnaire and they underlined five potential weaknesses that could be used as a general framework for improving Robo-Advisor questionnaires (Pan C. H., Statman M., 2013):

- Each investor has a multitude of risk tolerances
- Existing questionnaire do not assess investors' risk tolerance in the correct way
- Investors' risk tolerance varies by circumstances and associated emotions
- Risk tolerance assessed in foresight probably differs from the one in hindsight
- Not only risk tolerance but also investors' propensities matter to an advisor

All those factors suggest that there should be a more sophisticated framework in order to make sound and reliable questionnaires, especially because of the virtually unlimited capability of Robo-Advisors to reach the crowd, particularly the less acknowledged. Furthermore, the spread of Robo-Advisors could lead to an increase in IT risk and flash crash in financial markets. For these reasons, regulatory and supervisory systems should be improved in order to avoid systemic sources of risk.

Conclusions

There are many advantages for using machine and artificial intelligence as Robo-Advisors in the financial industry, such as low-cost investment, 24/7 availability, easy to track, to access and to make comparisons, improved financial inclusion; potential to improve liquidity in financial markets, and it is also an attractive tool for the young generations. However, Robo-Advisors are not yet able to correctly assess an individual's risk profile. Moreover, the whole system may rely on incorrect assumptions. There are IT risk and a potential source of a flash crash. So far, Robo-Advisors have not been soundly regulated

Different opinions about Robo-Advisory in the financial industry seem to be affected by the difference between today's vs future view. It is not possible to undervalue the potential negative impact of this digitization process, especially because it is a global phenomenon and there is a clear lag in the regulatory framework. On the other hand, it is difficult to believe that the improvements brought by this innovation will fail to reach the target, and this is because of the positive characteristics mentioned above. We believe Robo-Advices will be a helpful tool and will gradually substitute human financial advisory, at least for low wealth investors. Moreover, artificial intelligence and machine learning are being deeply applied in the whole financial sector, advancing the machine-human substitution process.

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Please cite this article as:

Ranelli, V. (2019). Digitization in Finance: Fintech and Automated Investment Tool. Research Focus, 1(1), 26-33. doi: https://doi.org/10.36068/1.5

Research Focus. International Open-Access Scientific Journal for Students and Graduates Research

ISSN: 2668-4675