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Chapter 8: Exploring the role of robo-advisors and autonomous wealth platforms in digital finance

8.1 Introduction

Digital finance refers to financial activities whose efficient functioning relies on the ubiquity and power of digitalised processes. Services that enable an efficient flow of surplus funds into poorly functioning economies are the basis of capital markets; these, however, are often still encumbered by meagre offerings of asset managers in the mutual fund industry, whose competitive structure and conditions make it hard to deploy innovation, thereby undermining potential gains (Sironi, 2016; Jung et al., 2018; Belanche et al., 2019). Robo-advisor platforms promise to eliminate information frictions and excess fees that non-disruptive incumbents impose on investors. By frictionless digitalising processes, these services also promise to broaden the offering of products to clients. Autonomous wealth platforms further digitalise the traditional work of wealth managers by introducing oracles and financial infrastructures that are natively digital. These products promise to bring clients closer to powerful capabilities that were previously only accessible by high-net-worth individuals or institution-driven platforms. They will also bridge the gap between an increasingly volatile world of crypto assets and the subaltern and illiquid realm of cheap labour and lack of capital, as many developing economies abandon digital reticence in dealing and managing cryptocurrencies and blockchain technologies. Market forces are probably signalling that the future may bring us autonomous wealth-enabled business models naturally created by emerging or continuing networks, thus replacing the promise of a democratised, fully decentralised, distributed, trust-enabled, dematerialised economy(D'Acunto et al., 2019; OECD, 2021).

8.2. Overview of Robo-Advisors

8.2.1. Definition and Functionality Robo-advisors are online, automated investment management services. They utilize algorithms to create portfolio management processes

that are normally performed by financial advisors. They request data on the client's financial condition, preferences, and goals and then develop a portfolio typically made based on modern portfolio theory, which emphasizes diversification and risk management. The algorithm typically periodically rebalances the portfolio to maintain the risk-return profile established. The amount of client interaction is typically low and done through a website or mobile app, and the human investment professional involvement is limited, often only to account setup or exceptionally complex issues. Robo-advisors have low fees because the services are automated and provided at a scale. Robo-advisors have become increasingly popular in recent years, particularly among millennials and younger investors. This is due to their low fees, ease of use, and ability to manage accounts with low balances. Robos have also begun to offer more advanced services, including social responsible investment strategies, tax loss harvesting, portfolio optimization using modeling tools and the incorporation of alternative assets. While robos have been disruptive to the financial advice industry, they still represent a small fraction of investment assets. Traditional investment firms now offer robo services, seeking to capture the robos market segment. 8.2.2. Historical Development Robo-advisors started emerging in the United States in 2008 after the financial crisis. Leading early entrants included Wealthfront, Betterment, and FutureAdvisor. Technology development costs were lower because of advances in cloud computing and the establishment of the blockchain and cryptocurrencies industries. Their success was driven by an aging investor demographic that increasingly shifted asset management online, a belief that technology-driven investing could outperform actively managed funds, and a desire for low-cost investing. They were initially passive investment vehicles making low-cost investments in exchange traded funds that took the long view while seeking to maximize diversification and minimize tax liabilities.

8.2.1. Definition and Functionality

In recent years, digital financial technologies have become rapidly integrated into the financial services industry. These technologies, widely classified under the umbrella "fintech" have encompassed a wide range of services and products designed to streamline or enhance the functions of financial services firms and their offerings. Robo-advisors are a subset of fintech in the sense that they leverage these advanced technologies to offer cost-competitive, algorithm-driven, low-friction, and contactless investment advisory services. The primary services offered by robo-advisors include portfolio construction, risk tolerance and customer suitability analysis, asset rebalancing, and tax loss harvesting. They have gained especially rapid adoption among the Millennial generation and Generation Z, who are skeptical of the traditional wealth management industry and often resist paying high fees to seasoned financial advisors at traditional wealth management or investment firms.

Robo-advisors utilize digital platforms made easily accessible through mobile technology and the cloud, leveraging clients' digital profiles and analytics to assess their investment goals, attitudes toward risk, and overall sophistication to assess client profiles. Based on the available customer data, advisors have the capability to determine asset allocation strategy and optimized portfolios utilizing advanced quantitative approaches and machine learning capabilities on the back end. Once a portfolio is created for a client and funded, the advisor basis this automated allocation platform offers continuous rebalancing services based on asset price fluctuation dynamics. Although developing features to enhance the attributes of a "human touch," built on advice provided by seasoned advisors, many robo-advisors have paid special attention to enhancing the investment performance features of "robo" investing.

Fig 8.1: Revolutionizing Wealth Management with White Label Robo Advisors

8.2.2. Historical Development

Broadly, the emergence of Robo-Advisors can be delineated into three different development stages. The First Generation: The Early Years (2000-2010) of Robo-Advisors which finally brings Automated Intelligent Trading. Traditionally, managing

investments required a high level of interaction with a financial advisor and significant capital requirements. However, with volumes of data available on the internet and the new artificial intelligence and technological advancements like Social Media Listening, Natural Language Processing, Algorithm Analysis, Big Data Cloud Scalability – Finance and Health Data Aggregators were the first movers of the automated advisory domain along with Few Wealth Management Firms. They helped break the entry barriers to investment and wealth management by integrating technological advancements with traditional advisory functions and compliance standards. The procedural development was enabled by gamification features and built-in APIs for document verification, approval and KYC/AML along with digital wealth aggregators. These early Robo-Advisors took bulk investments from individuals who had access to internet and helped them select and invest in financial instruments algorithmically using AI-based engines without much assistance from advisors.

The Second Generation Robo-Advisors: The New Flavours (2010-2015) is named so because, more and more innovations are now being introduced in the industry; investors can now invest in diversified asset classes without the entry barriers and fees and with different Hybrid Investment Models: Digital Investment Managers taking an algorithmically-controlled discretionary service providing a largely low-cost service through a digital, cost-effective model, Hybrid Financial Advisors who combine human and machine, by taking a high-tech and low-cost and assisted approach.

8.3. Autonomous Wealth Platforms Explained

What are Autonomous Wealth Platforms (AWPs)? AWPs target affluent investors and HNWIs. Some offer investment, and tax advice and planning solutions. Others expanded their wealth solutions to include mortgages, pension and retirement advice, Wills, and Estate and Inheritance Tax planning, amongst others.

How are AWPs different from traditional advisors and wealth managers? Traditionally, the UK wealth management sector charged clients a certain percentage of assets under management (AUM) on an ongoing basis. This high level of fees might make sense for clients when wealth managers invest large amounts of work and expertise in the investment and financial decisions of HNWIs. The recent advent of advanced technology has made it feasible, profitable, and attractive for professional wealth managers to offer non-traditional, away from a percentage of AUM charge. AWPs enable independent advice, on a pay-as-you-go basis, using automated services, without reliance on regulatory-compliance driven ongoing checks, rebalancing, adjustment, and performance oversight.

Consequently, AWPs complement and compete with traditional advisors. They offer all the features of traditional advisors, but at a lower cost and greater efficiency. As a result, affluent investors want AWPs to streamline, facilitate, and manage their wealth creation and preservation decisions. In short, AWPs democratize, enhance, and digitalize HNWIs' wealth decision journeys. Except in special cases, they do not replace traditional advisors. Traditionally, wealth managers created personal relationships with clients forged through trust, care, and mutual respect over many years, generally face-to-face.

8.3.1. Key Features

Different types of automated investment services have emerged recently and to varying levels of sophistication. Automated Dirty-Hands Services (ADHS) focus on automating and streamlining the back-office trading task of traditional investment advisers. These services are similar to equity traders using sophisticated tools to build short-term trading positions based on their client preferences. The services typically charge low fees to automate the execution of investment decisions for financial advisers, pension fund managers, and hedge funds. In addition, business clients without the resources to set up and operate their own in-house trading desks are starting to use ADHS for developing their short-term employments focused on investment assets. The emphasis is on the trading-smartness and efficiency of the algorithms, and not on financial planning and portfolio allocation services. Thus, ADHS represent low-tech and entry-level autonomous service solutions.

At the opposite end of the spectrum is an Autonomous Holistic-Service Platform (AHSP). These services are sophisticated, data-intensive executive services providing for all aspects of the investment life cycle from holistic client interaction and service level management to asset and portfolio allocation advisory management. They also include investment selection advisory services and portfolio performance assessment. These services focus on the decision-smartness and the ease of doing business with the application while minimizing the client-facing human effort. These tax-smart, interactive holistic wealth service providers go beyond weekend consumerism to change everlasting frictions into delight maximizers, thereby servicing their clients' entire wealth life cycle.

8.3.2. Comparison with Traditional Advisors

Client-advisor relationship of traditional advisors and investment platforms is quite different in nature. Traditional investment advisory firms often take away a sizeable chunk of the core wealth pie through high management fees, which makes the wealth

accumulation for the client slower. On the other hand, autonomous wealth platforms generally charge significantly lower fees, while sometimes choosing to provide the service free of cost and charging only for ancillary services. This is fundamentally a better personal finance business model, as it allows maximization of client returns. The fees will have to be substantively lower than what is charged traditionally, while also decoupling from third-party providers. It is important to note how the nature of services are different. Traditional advisors generally provide generic services which are based on models that are dependent on speculation. These services include: retirement account contribution, claiming capped pension and insurance for accumulated assets, insurance for losses, account creation for tax minimization, estate planning, allocation of taxable and tax-deferred investment accounts, and tax-loss harvesting. In contrast, Autonomous Wealth Platforms exploit digitally available unique data and leverage algorithms deployed on multi-core computer clusters to provide services that are most suitable for the individual, such as that of risk profiling, etc. This is in itself a very significant advance. These unique profiles of users develop over time, which enables prediction of investment behavior. The predicted investment behavior can be changed with the help of nudging, which can help enhance or alter the clients' portfolio in order to optimize for return or risk redistribution.

8.4. Technological Foundations

The intelligent Robo-Advisors and Autonomous Wealth Platforms, at their core, are based on various technological foundations and algorithms, which directly affect both their functionality and efficiency. This chapter discusses, in brief, the most prominent innovations that form the backbone of the Advancement and then explains, in bits, the wider technology tools and algorithms that power the new-age Investment service supply workers and Portfolio Management firms.

The field of workspace automation is presently being transformed by Artificial Intelligence (AI). AI relies on the development of smart machines and systems that may assist humans in the execution of tasks that require a specific kind of sophistication. AI, in contrast to algorithms, can operate autonomously, speeding up tasks and lowering expenses. However, the design and supervision of AI-based financial solutions are not without difficulties. The intransparency of several AI methodologies is one of the several issues of fintech design that appears to be creating enormous uproars. Although attracting a lot of attention, the architecture is naturally simple and the inner workings of deep learning networks, such as ensembles of synthetic computer vision neurons, remain an area of excitement and inquiry. The computational cost of these methods is significant, primarily due to the need to train millions of parameters on large datasets. The entire notion of learning is mapped onto the wide neural architecture because deep

learning adopts a hierarchical approach to map data from the original space to target labels.

Deep learning is simply a method that has a close resemblance to Standard Machine Learning and its derivatives. Generally speaking, Machine Learning is concerned with outfitting machines with the aptitude to acquire new talents. It appears that methods based on the idea of pre-programmed explanation of data associated with capabilities to generate trial-and-error rules might be sufficient for portfolio optimization. Although it is unclear if there is a real need for the two hierarchies being Nested, the econometrics of Machine Learning has various modeling bumps. The various families of machine learning models might certainly be redenable by their uses. Such definitions acknowledge that there is value in classical modeling and parameter estimation, even though most current implementations concentrate on the actual learning phase.

8.4.1. Artificial Intelligence in Finance

Introduction to Artificial Intelligence in Finance The revolutionary development of mathematical theories of finance in the 20th century allowed the introduction of quantitative risk management-based financial applications. The great success of the adoption of quantitative finance revealed a surprising lack of creativity in finance. The increasing uncertainty of financial markets, the tremendous quantity of available financial data, and the technological, computational, and theoretical progress made possible by new computer technologies led to a second more spectacular revolution in money management, investment management, and wealth management, with Autonomous Wealth Platforms and the emergence of such products as Robo-Advisors. The technological and information sector developed new tools such as cloud computing and new theories in prediction regarding highly complex models of the prediction of probabilities in tumultuous markets.

The technology to elaborate automated intelligence mechanisms capable of executing complex decisions of prediction and decision assistance exist. We can use for this purpose automata capable of detecting hidden structures in complicated high-dimensional data, mortals capable of learning, evolving, and recursing in the complexity of financial markets. It has become widely accepted that in many regions. With the AI name, we name the implementation in automated systems of knowledge discovery-building and learning, evolving, and renewing in the creation of models capable of predicting and assisting in the decision-making of humans-assisted intelligent agents. In particular, in the domain of finance, we call AI the havoc of blended knowledge systems.

8.4.2. Machine Learning Algorithms

In finance, machine learning algorithms can help solve complex empirical tasks such as prediction, classification, and clustering, which are at times less effective when implemented using traditional econometric or statistical approaches. For example, machine learning classification algorithms can identify groups of customers likely to default on a loan, customers whose accounts are at risk of going negative, customers likely to be affected by financial fraud, and customers likely to buy certain products or services. These algorithms can also estimate quantiles or moments of distributions, say of stock returns, while avoiding distributional assumptions. At least in principle, they can outperform classical estimators like those based on GARCH or stochastic volatility models, especially if the existences of structural breaks are taken into account.

The main goal of supervised machine learning is to predict the target variable from the feature space as well as possible. More specifically, it tries to minimize the expected predictive error where Y is the target variable, b(x) is the predicted class label and b(x) is the corresponding probability. Classification is necessary when the target variable Y is categorical, while regression is used when Y is continuous. Supervised machine learning could also be used to approximate the density function of a variable or the conditional expectation E(Y|X). In statistical terms, supervised prediction aims at estimating either the likelihood, the conditional expectation E(Y|X), or the conditional density f(Y|X). In the case of classification, b(x) is obtained by minimizing subject to a threshold on the conditional probability or = 1.

8.5. Market Trends and Growth

The development of different global markets created various trends of wealth building. In the early developed market economies, currencies of recruitment of assets became obsolete. Wealth generation was facilitated to those privileged members of the society that achieved significant amounts of wealth to maintain a lifestyle much higher than the average. In the recent past, the average person's increased wealth has been a result of several monetary policies adopted by market economies since the beginning of the capitalist age. The brief swing in private equity holdings in the early 2000s created several multi-breakers at the Base of the pyramid level, which eventually started investing in equity markets for increased prosperity. Shifted from self-consumption and life insurance plans, the domestic market soon started trading more and investing more. Sustaining economic growth in the extensive use of technology was a question drawn in the collective mind. It, however, did not take long for the digital footprint to substantiate. With reduced transaction and communication costs, e-commerce began scaling new heights; global markets opened up, becoming more integrated and interdependent. Financial markets mirrored this development in the late 90s. Information about financial

products and services became available even to the unbanked. With the birth of fintech, the race was on to capture and recruit the AUMs of the unbanked. Intending to achieve an economy of scale while doing business in asset management, financial service providers jumped into the recruiting game to build an AUM base large enough to ensure a viable business model. Today it is not uncommon for HNIs to share space for investment opportunities alongside a retail investor through personalized services offered by Robo-advisers and autonomous wealth platforms.

8.5.1. Current Market Landscape

The current state of the online wealth management market is one characterized by intense growth and marked by evolving types of platforms and competition among both new and established companies. Independent investment advice combined with a low-cost platform has opened the wealth management market to millions of new clients, often younger and more tech-savvy, requiring different products and services than traditional investors. Driven by technological disruptions like machine learning, the upcoming automatization of traditional investment processes will also allow a broader group of people to search more personalized products and services.

Thus far, this trend has mainly contributed to the growth of hybrid advisory services. What is commonly termed ‘robo-advisors’ can now be found at the large majority of prominent retail banks, used as a digital budget option for wealth management for its own clients that need personalized services but can’t afford them. These solutions tend to be hybrid in the use of established social and wealth management channels of both institutions and clients, where significant amounts still flow through traditional advisory services. On the invested wealth levels that apply to most retail banks, there has often been a restricted selection of passive investment portfolios, often exclusively sustainable portfolios.

As hybrid advisory solutions are further integrated into the existing infrastructure, either through expansion and partnerships with players or through independent internal development, more providers comply with the transition toward the automated wealth management model, ranging from independent niche players to large institutions. For the independent players, scale and specialized offerings are key drivers: either offering a broad range of similar investment strategies at somewhat lower costs than incumbent players or targeting special investor classes with specific needs with targeted solutions.

8.5.2. Future Projections

Digital wealth management has seen explosive growth in both users and assets over the past 5 years, and the trend of increased user adoption is set to continue. By 2025, the global assets in the digital wealth management industry are projected to exceed US$ 5 trillion, compared to US$ 1 trillion in 2020. A recent study indicates that 58% of mass affluent users are willing to use robo-advisors, while 67% of millennial investors are reported as preferring robo-advisors over traditional wealth management companies. The projected compound annual growth rate for the digital wealth management industry over the next 5 years is around 34%, driven primarily by the aforementioned millennial users, as this demographic of investors will inherit approximately $45 trillion from the baby boomer generation over the next decades, thus becoming the richest generation in history.

The surging interest in and demand for passive management strategies is the main driver of this hyper-growth of the digital wealth management industry. Millennials tend to have longer investing horizons and prefer low-fee investment options, both of which favor the outsourcing of investment management to software applications that automate algorithm-driven investment strategies by providing services using artificial intelligence in a low-cost manner. For robo-advisors, the high demand for sophisticated and tailored investment strategies can be served with a delegated trading approach where expert advisors create the trading strategies that the robo-advisors will automatically run. There is a clear tendency to combine human emotional intelligence with automation advantages to provide superior services to clients at lower costs.

8.6. User Experience and Accessibility

Innovative technology is making changes across all financial and economic markets, enabling creative new business models. The need to support a variety of digital investor types, from less sophisticated to more sophisticated investors, from the super-rich to those with modest amounts, puts pressure on wealth technology systems to be usable and accessible, without sacrificing robust solutions at the margin. The best platforms use high design standards to achieve these practitioners' multiple goals. The first point of contact that new clients will have with the capabilities of a wealth management infrastructure is the intuitive interface presented on their screens. This interface is also likely to be the main mode of interaction between an investor and their portfolio company. Providing an optimal interface presents many new challenges for wealth management technology firms. They must carefully tune their design choices to meet the needs of a broad spectrum of potential customer base. This design means differing between the needs of digital investors with deep pockets but less complex portfolio strategies, of traditional investors wanting to permit their portfolios to be optimized by

forage portfolios but not much more, and of all investors wanting, at key moments to be able to ask questions via SMS chats and phone calls. Digital platforms with user interfaces that permit low-friction onboarding process for new clients will have a significant competitive advantage. Decision leading practices for integrating investors into their digital systems, using proven behavioral science techniques that include default options, choice outlines, task delegation, scheduled information delivery, progressive targeting, role modeling, and task simplification will help to ensure a seamless onboarding experience.

8.6.1. Interface Design

The interface design differs much between platforms. We distinguish three distinct categories of design approaches. In one category, platforms aim to educate users, deploying graphical interfaces consisting of hedonic elements. In another category, prescriptive portfolio strategies are displayed using a comprehensive approach to wealth management mainly employing organic design elements. In contrast, a third category of wealth platforms offer aesthetically attractive design with a minimum of detailed content presented and a focus on rapidly executing desired transactions. Thus, there seems to be a strong positive correlation between the depth of services offered and the overall level of perceived interface quality.

The design of the external user interface (UI) of a robo-advisor, that can be defined as the point-of-service used to interact with the robo-advice system, is essential. Some have pointed out that poor usability design can increase the barriers to adoption of technology-enabled services. Many banking websites can be considered to be hard to navigate for specific user groups, since the websites present an overload of products offered by financial institutions. Thus, in general, high-quality usability design works to facilitate navigation to the actual product or product information a web user is currently looking for. Also, the actual UI design of complex systems can significantly impact the perceived level of trustworthiness and quality of the underlying service. Especially the perceived usability design quality, as opposed to the visual design quality, is of utmost importance for any online business. In addition, a lack of sufficient good design quality can hinder investment decisions of potential investors.

8.6.2. Client Onboarding Process

The client onboarding process is critical in establishing a relationship with end investors. Once the client has access to the relevant platform, she often has to answer a considerable number of questions before being able to open her account, let alone receiving investment advice. A typical process is that the client first answers basic questions on

her intentions and general financial history. Based on that information, frictional costs in terms of time and effort to establish an investment strategy may be lower. Some platforms provide interactive graphics and colorful pixels so that clients are guided rather than overwhelmed when answering the questions. Then, however, the real work starts: Based on rules from the banking industry, questions on the client's income, wealth, and risk preferences, as well as specific investment topics the client wants to invest in or exclude from investment, are asked in more or less detail. This process is usually necessary in order to comply with requirements mandated by the respective financial authorities.

Usually, the answer to this question is: Yes, but it is easier with human advice, meaning that substantial efficiency and comfort advantages are not so clear-cut. However, technology can reduce these (dis)advantages. Tools can facilitate answering of the onboarding questions. Furthermore, these inefficiencies are expected to be lower for completely new clients with no previous investment history. But in this case, the required data aggregation can be done by the client through transactions at the firm as little as 42 days after onboarding on the way to a better customer experience. For new clients, person-to-person contact can follow quickly at the early stage of the relationship.

8.7. Regulatory Framework

Legislation focused on addressing specifically traditional robo-advice services presently remains acute and still evolving. The distinctive aspects about wrap fee programs associated with financial premises holding a Federal Regulatory Credit examination supervision typically are applicable universally to the full range of these new autonomous wealth platforms services offerings. However, social media directed marketing campaign merchandising and laundry list associated website witticisms seem to attract especially keen compliance inquiries from regulatory authorities. It is notable to appraise that over-use of informal digital posting and vernacular slang language in regulatory supervision could have a tendency to confuse presumptive investors of risk associated safety relied complete service. The growing service proliferation and associated variations from these baseline elements might be a key influence on the lack of a more specified statutory structure. Additional legal consideration becomes associated with the fact that many of these contemplated autonomous platforms acting as Account Aggregators or more likely Unregistered Asset Managers are potentially intentionally attempting to straddle the fine line about providing SEC or advisory service oversight. In doing so the service providers earlier mentioned rationale could be based specifically on the justification of offering these services solely to specific defined accredited investor classes. Respective potential qualification areas concerning them could be High Net Worth Individuals and Family Offices; Institutional Investors; or the

associated Private Placement offering exemption services categories recognized under SEC Regulation D Rule 506(c). An ever-present caveat, however, is that since specific investment decisions both apply universally and exclusively to all platform account users there exists within the business conflict the need for provision concurrent fiduciary level oversight. This fiduciary oversight is essential whether the user account investment types are either traditional equities or fixed income instruments or Alternative Investments comprised of Commodities, Real Estate, or Venture Investments.

8.7.1. Legal Considerations

The supply of automated wealth management services is increasingly positioned as a regulated business in various jurisdictions. Different types of regulations are employed across jurisdictions. Some existing regulatory measures create a more stringent shield of protection for investors. Digital investment platforms still have to comply with regulatory rules and requirements applicable to conventional providers of investment services. Nevertheless, the investment strategies employed in relation to these services may attract different levels of regulatory scrutiny. Schooling the compliance around services is warranted. All firms that are subject to the investment services rules and requirements must comply with the duty to act honestly, fairly, and professionally in the best interests of the client. Additionally, persons tied to these firms performing promotions, recommending or presenting the products to clients must also comply with these rules and be appropriately qualified to do so. Examinations and the running of firms cannot only contain financial requirements. These requirements are designed to ensure that these providers are financially sound and capable of meeting their obligations to their clients. The examination standards entail a degree of investor protection in and of itself.

There are also conduct of business rules containing conduct standards to which investment firms must adhere when providing services to clients. Thus far, regulatory uncertainty surrounding robo-advice does not seem to hinder the growth of digital investment services. The main qualification for firms that want to provide progressive features of robo-advisors and asset allocation apps seem to be mainly KYC obligations and suitability assessments. Some countries have recently introduced a new category of legislation specifically dealing with the provision of automated investment services. These new laws create a framework specific to automated investment advice. License exemptions for the providers companies that are subject to very streamlined service offerings or volume of robo-advice, fees, or business models are generally applicable to all firms, including regulated banks. While the traditional securities advisory industry has been quite vocal in its opposition to robo-advisors, it has, so far, little evidence to

back up its warnings that clients will be channeled into the relatively high-margin, low-duties of ETF investing.

8.7.2. Compliance Challenges

The new generation of automated investment platforms introduces couple of major regulatory issues. First, the holiday of these highlights a general problem of developing rules and guidelines concerning automated services in the digital domain. Following preconceptions originating from the pre-internet markets is most likely a wrong approach. First adaptations have been found, which require hybrid services addressing customers in a digital way and preserving human accompaniment for important decisions and possible escalation scenarios. However, robo-advisors act increasingly independent and invest money without prior human contact and monitoring overridden. On the other hand, robo-advisors do not necessarily need qualification as traditional financial service providers. They use different operation modes, and develop different cost and fee structures. Pure investment services can focus on one specific detailed task of asset building and acceleration, possibly designated as asset boosters or asset accelerators. Other digital tools such as savings, budgeting, controlling, reward, encourage and coach customers. These functions do not classify as investment services but allow aware guided entering into risk taking investments. Other robo-service functions – be it hybrid or pure – work as support tools along the investment cycle, enhancing traditional advisor, specialist, and manager functions by extra support, enhanced empirical and analytical background information, process automation, and reduced transaction costs, dealing with number crunching.

Second, compliance with data privacy does play a major role, dealing with private life aspects of virtually every client. First aspects regarding regulations dealing with privacy and sensitivity of personal life aspects address security of hacking risk for clients, and responsibility of data security as well as accuracy of the tools used behind the screen, the programmers, the analyzers, the institutional capacity of the control and monitoring systems, and thus the need for a digital space surrounding the investor.

8.8. Investment Strategies Employed

The research reveals that the majority of quasi-autonomous investment management platforms provide broad asset allocation among a range of exchange-traded funds and offer passive investment strategies focused primarily on market responses to business developments or economic fundamentals. Macro-level correlations are the strongest factors in these investments, with ETF returns evidencing high correlation with U.S. economic growth rate variability and the ETFs' own prior return variability. Most of the

quasi-autonomous platform portfolios utilize more than one ETF, and within these multiple ETF portfolios, market allocation is generally used, following complex consideration of the risk-adjusted return properties of the component assets. This indicates that, among U.S. quasi-autonomous wealth management platform portfolios focused on equity and fixed-income investments, passive investment of a macro nature is the most widely utilized investment strategy. However, the market tends to penalize wealth management platforms focused on narrow niche strategies by not recognizing their trading acumen, and so it is relatively riskier to concentrate on such a narrow segment of the wealth management space.

Fig 8.2: Robo-advisor Platform Development Costs, Benefits and Process

Portfolio diversification is a popular risk management strategy involving the allocation of funds into a variety of financial instruments to reduce risk. It is an investment approach based on the premise that assets do not move closely together. Many investment and financial management platforms have thus long argued in favor of diversification since a portfolio consisting of a variety of different asset holdings is often viewed as a less risky investment than most individual holdings. Supporting the rationale for risk diversification, studies have shown that a portfolio consisting of a large number

of common stocks diversified away most unsystematic risk and had superior risk-adjusted returns to Treasury bonds over long periods.

8.8.1. Portfolio Diversification

Are robo-advisors' solutions generating superior or inferior performances when compared to traditional services? Is their platform applicable mainly to millennial customers? Are the automatic solutions able to generate wealth for all? These are only few of the unanswered questions afterwards the development of such interesting and innovative solutions, transforming the fields of investing and saving. In the wake of such considerations, this section aims at explaining the investment strategy used by this automatic solutions, addressing two main aspects. The first one relates to portfolio constructions, the reasons why robo-advisors follow such diversification strategies, and why they might be superior to traditional funds with respect to their asset allocations. Finally, the second one relates to the risk assessment, which highlights the instruments employed in the risk control judgments.

As a technology-enabled alternative to behavioral-active, high-cost traditional wealth managers, robo-advisors target price-sensitive investors by offering a compelling value proposition that combines automated portfolio management, minimum investment thresholds, and the use of low-cost exchange-traded funds. Despite the heuristic advantages of robo-advisors, the performance of their constructed portfolios remains in doubt. Prior studies on portfolio returns employed different independent variables to estimate the differential, such as day-of-the-week portfolio hedge designs and equal-weighted versus value-weighted portfolios. Using different datasets and sample periods, these authors find different conclusions regarding the identification of "superior" performers, ranging from funds with high forecasted turnover to funds with low investment expense ratios and high institutional ownership. Additionally, most of these studies start from funds that have already been in operation for several years or even decades, when only a small subset of the available investment funds can be included, given that the remaining ones have gone bankrupt. In contrast, robo-advisors are accessible services for investors currently, with most of them just starting or recently started their investment procedures.

8.8.2. Risk Assessment Techniques

Risk is defined as the probability of an investor losing or at least not obtaining a pre-estimated revenue from an investment. Its measurement consists of two procedures: the first is estimating the probability distribution function of the security or portfolio return; the second is identifying the risk measure, and the most widely used are the variance or

standard deviation, the semi-deviation, Value at Risk, or Expected Shortfall. However, many classical risk assessment measures are criticized for their limitations, and alternative assessment procedures emerged having the goal of avoiding, or at least minimizing, those drawbacks. An important issue for all the contemporary risk measures is to analyze the behavior of the security price over time: the Drunkards Walk philosophy that defines the basis of almost all empirical studies for equities declares that in a huge sample of equities there are some very few ones that do not share with the other equities a very long standing statistical memory. The solution is to use a Windowing Technique able to control the behavior of the stock inside the window.

Assuredly, in a market characterized by transactions executed by machines and techno-stress, a large investment towards the creation of AI systems, making use of one or more variables that emerged from the research like Neural Networks, and able to manage windows of risk measures, is desirable to avoid or at least minimize unexpected losses, acting on two levels of risk through two variables or other techniques still unknown. The two levels of risk are the rapidly growing engagement, managed by a Techno-stressed or an analyst and the contribution of the status of the assets purchased on the Volatility of the Portfolio, Matrix Technology-based, directly managed by Artificial Intelligence.

8.9. Ethical Considerations

The impacts of ethical considerations pertaining to an investment process are not new; the typing of potential material risks of a company's business model could be performed manually and at significant resource costs by specialists. However, ethical considerations in the investment process are of a different order of difficulty, supervision, and transparency when performed entirely automatically. Societies have developed laissez-faire equity market rules; such rules give portfolio managers the flexibility not to prepare quarterly justification of investment selections. Such private assurance may be sufficient justification for investors to select portfolios of financial instruments managed by traditional portfolio managers with experience, education, and reputation selected by each investor.

The difference with a fully automated robo investor is enormous – the analysts and specialist advisors guiding the investor to a portfolio selection do not meet the investor at regular intervals. The interaction is through a computer screen justifying a managerial decision about the risk and expected rewards for the investor in the Portfolio Management Model. Negative news about volatility or significant potential value losses from the global equity market will affect portfolio performance and individual fund performance in a different manner than traditional mutual fund systems. Good news is likely to generate more investments in robotic portfolio management systems destroying

the vaunted advantages of scale. The question of assets becoming “too large” possibly compromising returns becomes compulsive for robotic fund available portfolios.

8.9.1. Data Privacy Issues

The usage of information, in conjunction with the rapid development of artificial intelligence, deep learning, and machine learning techniques, generates breaches of fundamental rights and freedoms of individuals, especially data subject protection. Autonomous wealth technology platforms draw on technology and data to deliver cost-effective, scalable services that are fast becoming the rule, rather than the exception, for all aspects of Digital Finance. Robo-Advisors leverage technology and collective data sources to make investment management decisions. In particular, the volume of data collected by Robo-Advisors can be staggering. In addition to client asset data, credit bureaus hold extensive records about individuals in their databases. Credit bureaus also collect other information that can facilitate Robo-Advisors in their investment decisions.

The importance and increasing prevalence of data privacy issues compel us to examine the implication of data privacy within the context of Autonomous Wealth Technology. Although these technologies promise to break down traditional barriers to investment, including the costs of doing business and the difficulty of accessing markets, they also rely heavily on algorithms and gathering of private information, including sensitive data about existing clients. In essence, the emergence of these new tools presents various ethical issues regarding privacy. By relying on vast troves of data, these entities largely operate outside established frameworks for privacy protection. Accessing decision-making processes is almost impossible for clients at the expense of transparency. These developments raise significant ethical questions regarding privacy. The ethical implications of a lack of transparency in human decision-making, including Robo-Advisors’ automated trading decisions, have proliferated in finance.

8.9.2. Bias in Algorithms

As AI's influence expands in finance, exploring ethical standards in the algorithmic context becomes paramount. Given that algorithms typically operate without human oversight, what qualifies as ethical within algorithmic constructs? What principles should underlie technology industry algorithms? Perhaps the most pressing question is whether an algorithm can serve as an autonomous decision maker, as humans are. Bias exists in every dimensional area of algorithmic engineering, including the premises upon which algorithms are built, the training data, and the technologies used for constructing models.

For traditional financial advisory services, respect of fiduciary duty is key to the absence of bias. For algorithms that invest wealth or make loan decisions mechanically, conscious will can be set aside in favor of built-in bias factors as translators of data into risk heuristics. Heuristics are subjective, and can deviate from expressed desires since they inherently reflect inaccuracies. However, most Robo-advisors rely on established rules to develop portfolios for services and product limitations. Algorithms prefer to operate on a basis of risk/reward given restricted user choices. However, risk/reward thresholds must be programmed for individual users, lest biases in algorithm constraints be felt. To ensure ethical behavior, developers must wrestle with self-imposed boundaries as they introduce algorithms into settings that interact directly with investors. This raises macro issues beyond fiduciary duty boundaries. For example, is programmer bias likely to be more or less accretive to investment returns? Associated with this question is the fiduciary duty issue: "Which within the programmer/algorithm versus investor relationship binds for ethical obligations?"

8.10. Impact on Financial Advisors

As robots and automation perform certain tasks, humans increasingly focus on those duties involving emotional and social intelligence, deep experience, and capacity for integrating large amounts of information into sound holistic recommendations. The semi-automated services offered by robot-advisors can be integrated into the practice of traditional financial advisors. Robo-advisors can serve as a useful adjunct to financial advisors at specific stages of a client's investment lifecycle, automating and integrating simplistic trades. Traditional financial advisors also can incorporate client-facing technology and increasingly offer investment and advisory services at lower costs, turning to the advisors for services with higher fees. The financial advisory profession stands at a crossroads. Relying on their expertise, intuition, and ongoing client relationships, they have previously specialized in fee-based financial planning and collected commissions on sales of financial products. As in other major industries, this traditional business model has been altered by the emergence of low-cost, algorithm-driven solutions. New lower-cost automated investment solutions represent formidable competition for financial advisors. Consumers increasingly expect low-cost solutions for wealth creation and preservation, as well as streamlined solutions for cash management. Such expectations are fueled by other service industries which have successfully automated service delivery with lower costs and better communication. The successful banks, retailers, and hoteliers now provide individualized service and automation through sophisticated technology, enhanced client relationships, and targeted marketing.

8.10.1. Changing Roles

While it's a joy to witness these changes, it can also be concerning for some advisors. Experiencing rapid growth, these online service providers have turned a lot of attention towards the services formerly exclusively provided by financial advisors. In some ways, it is understandable that individuals, neglected by advisors, would turn towards other means of getting unpersonalized investment management for cheap, self-selected risk preferences, and highly tax-efficient portfolios. Even more concerning is that these companies are disrupting the semiautomated services that advisors provide to individuals, such as providing basic services to create a portfolio around certain preferences. These companies are graduating individuals towards fully autonomous services, thereby erasing the possibility of some entry level business for the human advisor. In addition, wealth platforms are subservicing directly through white-labels the business of traditional advisory firms that saw their business model being disrupted. It is clear that these wealth companies are taking some business away from advisors, especially in the low-fee category of investors.

The truth is, our business of advising clients on wealth management has always covered two very dichotomous tasks. The first has been the guidance provided to individuals that have a complex financial situation or a specific personal need. The second is providing optimized return for risk portfolios, running risk adjusted returns reports, overseeing rebalancing timelines, optimizing tax efficiency, and reporting and explaining the investment activity. The automation of the second task has, in some way, simplified the business model of wealth advisors while freeing their time to dedicate on the first task. But in doing so, it has made their service offering much less unique, creating a race to the bottom in terms of fees. Furthermore, at a time where some wealth managers face the need to reduce costs the most, these services are being offloaded to competing platforms.

8.10.2. Collaboration Opportunities

Robo-advisors may increasingly make transparent their portfolio decision and risk flows while simultaneously allowing human advisors and their clients the ability to customize asset allocation preferences, according to a risk communication interface and control platform provided through the human advisor’s practice. Moreover, a variety of additional financial and non-financial goals may be integrated in the collaborative efforts. In this effort, human advisors and investors would first design portfolios aligned to an investor’s tolerance for perceived risks associated with shifting market conditions, preliminary return targets, withdrawal and funding plans, duration objectives, and tax management parameters.

For organizations employing many advisors utilizing risk communication, control, and model portfolios, the design should also include advisors' investor-suited client profile preferences, employment risk factors associated with individual advisors, and proprietary model portfolio avoidance regimes. Risk communication, control, and collaborative model portfolio services may be offered on either an outsourced or fully integrated platform basis through the use of decision algorithms for stressed values at risk.

The AI algorithms could be modeled to maximize the time-weighted returns of the risk communication and decision processes associated with each client's targeted asset allocation prescribed by the advisor, and the associated financial goals, preferred assets, and behavioral aspects of the targeted investor and optimal client advisor behavioral model. Risk communication, control, and collaborative model portfolio services would incorporate the human advisors' ability as stated earlier to minimize the downside risk during critical withdrawals and peripheral rebalancing phases of the client.

8.11. Case Studies

These studies are of interest because some have made successful use of robo-advisors or digital portfolios, providing examples for the future. Further, the disentangling of successes and failures is important in understanding the space of digital finance and in creating plausible expectations about the near future of wealth management and investment. We will emphasize that not just any identifiable segments have had success with the technology of automated-placement but those populations primarily composed of participants from "the digital native generation."

A global fund manager has over $8 trillion of assets under management. An institutional capital market trades processing system, originating over 30 years ago, is ready for retail. A new initiative makes the technology available for retail-ready investment portfolios, to be accessed by cost-conscious investors who are not yet institutional clients. This initiative was begun in partnership with many of the world's largest banks who have selected as their associate or partner an independent registered advisory firm. Consumer-oriented marketing is associated with the information analytics provided by the system. The firm will be able to provide for these retail customers pricing, where the service is low-cost and revenues generated by other operations of its bank partners.

A pioneer in electronic brokerage has stepped beyond its core business. It has added optional goal-oriented planning and a series of discount funds. At its core is a portfolio allocator that recommends strategic portfolios based on customer preferences for risk factors and for goal time horizons. The selected risk portfolio is additionally calibrated

with a volatility and strategic asset allocation problem. The recommendation is an optimized portfolio allocation, selected every day, from among the hundreds of possible allocations. The recommended portfolio allocations are based on two behavioral economic concepts: 1. prospect theory's aspects of choice challenging the main predictive economics theory of risk preference utility maximization.

8.11.1. Successful Implementations

In this section we explore three case studies that illustrate successful implementations of Robo-Advisors intended for different market segments. All three have succeeded in attracting a significant customer base, and have implemented innovative lead-generation mechanisms aimed at retirement-age investors eager for investment solutions that provide for consistent post-retirement income.

The first case is evolution securities pte ltd, which is based in Singapore. Founded in 2002 in Singapore, evolution Securities provides broker-dealer services specializing in equity and equity derivatives. With a focus on providing value-added services to a predominantly retail customer base, evolution has actively sought to enrich its customers' trading and investing decisions. Its families of invite-only portals are designed as incentive-based digital portals aggregating opinion and research inputs from many contributors. The services that evolution provides are comparable to those of a publicly traded entity, however the portals provided by evolution are limited to customers that have logged loyalty points. In October 2016, evolution launched its personalized investment advisory platform, which generates long-short personalized fund portfolio recommendations for customers interested in outsourcing their equity investments. Recommendations are generated based on customer-inputed investment preferences, taking into consideration their risk appetite, wealth crystallization events, tax treatment preferences, and investment characteristics considered. The platform has since onboarded a significant amount in equity AUM, and is on target to grow AUM substantially by 2023. This case study provides insights into the unique mechanism devised by evolution to onboard retail customers in search of wealth preservation, income generation, and wealth enhancement recommendations.

8.11.2. Lessons Learned

One important lesson learned in a previous implementation of a WealthTech enabled FinEco system prototype is the deployment of neutral and objective service modules. In a traditional stand-alone FinTech service, the service is completely owned by a company which has its own business targets and objectives, which may be in conflict with the best interest of the client. In contrast, a FinEco system connects multiple players along the

life-cycle of a participating client with each respective provider's area of expertise harnessed for the benefit of the provider's client, in a disintermediated manner. Service modules deployed in an open manner enables group synergies across modules from various, independent players in the FinEco, client level synergies, as well as ECO system level synergies that allows for joint elaboration of various goals.

Another important lesson learned is that in any deployment of an autonomous FinEco system, the deployment of advisory systems in a highly effective manner is important. Failure to deliver an engaging advisory experience would lead to misalignment between the end-user's mental model and the appearance and functioning of the client service and financial advisory modules, and the end-user's desire for engaging and customizable experiences.

Another design feature learned is the delicate balance between customizability and simplicity in the design of human-computer interface and interaction with the various advisory and client modules. High degree of personalization would likely lead to expensive, time-consuming processes and modules, which may deter clients from participation. However, the degree of personalization may be limited by the volatility and other specific characteristics of the financial market and products, the dynamics of the various tasks, and the life cycle stage of the participating clients.

A further lesson learned from previous efforts is that the overall design of the system has to provide for cross deep client engagement and joint elaboration of the various parameters and goals of the tasks to provide a sustainable joint segmentation of clients and the various tasks to be performed.

8.12. Challenges and Limitations

While users have plenty of reasons to be interested in using robo-advice services, there are equally many potential challenges and limitations to these investors' experiences overall. For one, many early adopters are not fully satisfied with their experience. Studies have shown that robot-users are typically novices, in need of assistance. Although algorithms are driven by technology, it does not mean they are totally substitute for humans in finance. In fact, giving customers the impression that they are completely cared for by machines and algorithms may discourage interest in EYAs among more affluent clients less willing to trust technology entirely. A fully digitally-based service is not seriously appealing to a significant portion of investors aged 55 or over, finding comfort in private contact with an advisor. In this sense, a trend towards hybrid wealth management platforms is emerging. This trend coincides with the younger generation's pursuit of financial empowerment along with the oldest generation's reluctance towards technology.

Indeed, services provided solely by robo-advisors stand to face two main categories of limitations when it comes to user experience: a series of technical information that types, methods and models cannot reply to. Research tasks such as algorithmic trading may go beyond simply feeding predetermined criteria into logical rules created by a human programmer. Neither the amount of high-dimensional data manipulated nor the degree of customization negotiable with these models is negligible. Some transactional services in particular require a greater factory presence, such as communications, due diligence, risk mitigation, post-transaction monitoring or structuring. These areas are particularly relevant in the provision of institutional banking services directed to corporate customers managing M&A or listed processes in general.

8.12.1. Technical Limitations

Major limitations of autonomous wealth platforms stem directly from the digital and decentralized technology used to design and deliver these services. The same technology that enables borderless delivery, low-cost and simple services, the scale and fast deployment of firm strategies, and vision of the future road of finance enabled by open application protocols, open standards and open innovation, create challenges of their own. In our more than three decades of services to global markets, spanning massively complex and mission-critical projects in more than forty countries and multiple global financial centers, with some of the most advanced institutions, and using ever-evolving and increasingly powerful technological and organizational concepts, the road from theory to implementation always presents an enduring Gauntlet of challenges.

Broadly speaking, these limitations tend to fall into one or more of the following categories: infrastructure agnosticism and data ownership, information incompleteness, algorithmic simplicity, and cybersecurity guarantees. Addressing these issues usually requires tight integrations with third-party service providers, and specifically with custodians, exchanges, exchange clearing services, data security providers, and importantly, market data aggregators. In some instances, third-party vendors are not available to meet needs. In extreme cases, the availability of technology that can meet specific needs does not imply that these systems will be forthcoming on exactly the timeline that is required, especially in that they may also be commercial offerings and not necessarily utility services.

8.12.2. Market Acceptance

Presently, robonovices still account for a small fraction of the wealth management industry and many financial advisors are skeptical. Industry-renowned financial advisor was quoted saying that “roboadvisors are merely a marketing gimmick” while other

empirical studies have found that many customers are still not comfortable with the idea of working with a robot, especially for high-stake services like investment management. Nonetheless, millennials – who have been largely underrepresented in traditional wealth management practices for several reasons – are now starting their wealth accumulation phase. Because of their comfort and familiarity with technology, they may have a greater acceptance of roboadvisors for investment management. Even though some analysts continue to focus their marketing efforts on trying to convince current holders of need-based insurance or pension products, most continue to attribute much of the expected rapid growth in demand – and supply – of pure physical insurance/advisory/asset management services to the millennials, who are generally more forthcoming about their desires to be engaged with and benefit from investments in etailers, social networks, and mobile. It is widely believed among industry insiders that 'roboadvice' is the natural eco-space for wealth management firms targeting this demographic segment until they accumulate considerable assets.

While Canadian and US wealth management markets have been more receptive to the idea of working with technicians, most countries around the world – even industrialized ones like Japan – remain slow to start accepting the new trend. In response, leading tech developers have started catering to established traditional players, hoping to cooperate instead of compete. Regardless, with the ease and convenience of web-based platforms, access to unrealized wealth may no longer be out of reach for those who had previously long been prone to excluding themselves from traditional wealth managers. The practice of providing those recommendations is slowly becoming mainstream, and it is inevitable that the wealth management industry will increasingly come to rely on automated services.

8.13. Future of Wealth Management

The wealth management industry is heading for major investments in technology to fuel growth. The ever-increasing threat of competition from digital-first wealth management firms is forcing wealth managers to match the omni-channel capabilities of the best digital companies in all other sectors to avoid the danger of defection, especially of higher-value clients, whose assets are more exposed than others to the impact of money and trading costs, concentrated positions in illiquid or low-performing assets, high fees, and tax exposure. The poles of the wealth management industry are thus separating and widening, as institutions invest heavily in human resources to attract assets and deliver portfolio performance for ultra-high net worth individuals, while at the same time, wealth managers are partnering or even custodizing the growing numbers of digital-first robo-advisors that are using passive, low-cost, index-linked strategies that are passively rebalanced to expose a wide audience to the returns of asset classes, and particularly

equity. The promise of personalization is what sets the institutions apart at the top end of the market, while automated portfolios tailored to a limited number of risk profiles are being offered by robo-advisors, using mobile channels and cash balances to monetize trading, loan, and credit card services.

Funding for this new wave of what have been called autonomous wealth management firms, fintechs in the wealth space, is therefore flourishing, encouraged by the rapid growth of inflows into these digital-first personality-less platforms. Platforms believe they are providing a product for a passing fad, that potential users of these services will eventually realize is not a substitute for personalized advice. They fail to see the potential for the wealth management business to be turned upside down, by the rise of these autonomous platforms offering a narrow range of services, concatenated within a coherent user experience, but also integrated with an ecosystem of digital service providers, within which technology partners have both presence and presence in the minds of the consumer.

8.13.1. Emerging Technologies

Major advancements in internet connectivity, processing power, and user interface design have fostered an explosion of new tools and platforms disrupting the traditional practice of wealth management and capital markets. More recently, with the advent of new technologies, the acceleration of digital asset creation and proliferation is further disrupting wealth management. Robo-advisors and autonomous wealth management platforms will facilitate the participation of a much broader range of retail clientele, separating significantly between those with less complex and lower value portfolios gravitating toward low-cost automated services while those with less price sensitivity and higher complexity requirements are serviced by WealthTech professionals utilizing augmented intelligence and more advanced proprietary quantitative methods for products and services. Many such individual WealthTech professionals will be mini-entrepreneurs, employing on-demand experts and using no-code and low-code tools taking advantage of automation to provide the service more efficiently.

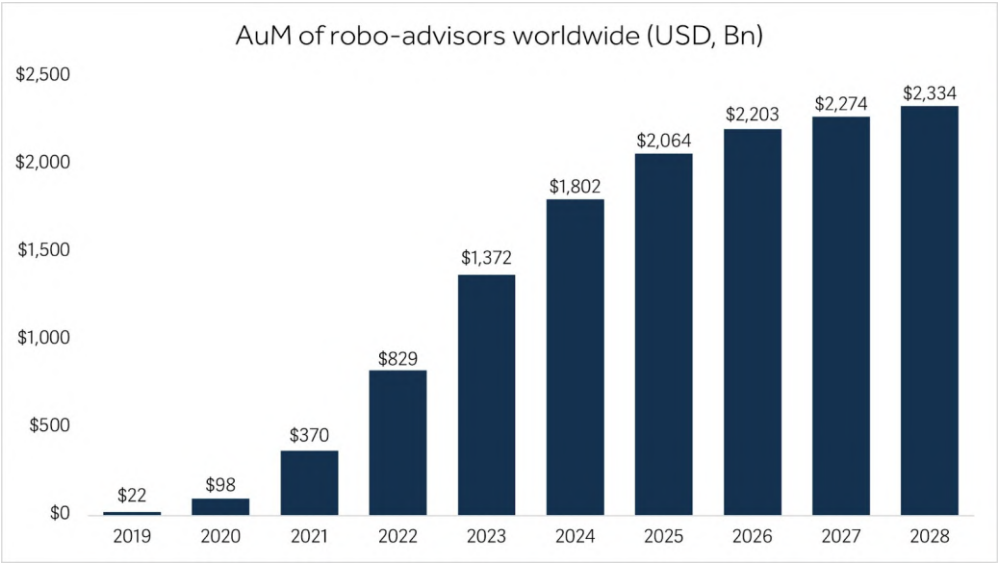

Fig : Robo-Advisors in Wealth Management

The wealth management disintermediation results in two problems: the route of return arbitrage for the discretionary trading of financial markets as well as the accumulation of price plus interest differentials resulting in permanent convergence to such values. Such difficulties in new model wealth management have no equivalent in the traditional asset and wealth management model. Typically, issues addressed in the establishment of a traditional family office or private bank with a family as a client. WealthTech is the only current solution to such specialized offerings to current and developing issues with asset allocation and management of digital native clientele.

8.13.2. Potential Disruptions

Many fintech start-ups are looking to disrupt the legacy wealth management model, primarily through the liberal application of technology and automation. These technology-driven wealth platforms are less capital intensive than traditional financial firms, enabling them to operate with a nimble structure that is highly sensitive to changing customer need. Significant digitization of the wealth management industry's market infrastructure, along with growing consumer demand for mobile-first tools, has enabled the proliferation of independent digital wealth platforms promising consumers ease-of-access, lower-cost, transparent advice with the value proposition of democratizing access to investment management services that were historically limited to affluent demographic segments. In addition, these technology-driven wealth management propositions often use smart algorithms, machine learning strategies and

the might of big data to build a deeper and more nuanced understanding of user choices and investment decisioning behavior.

Over the last few years, asset managers and wealth managers across the globe have witnessed rising competitive pressure from a host of start-ups launching asset management apps, many automating the investment advisory process. These platforms use AI- or algorithm-recommended model portfolios based on risk appetite assessments, but execute trades through relationships with custodial brokers. Most offer limited investment choice, limited investment education, and higher fee/transaction options. The wealth management relationships built on model portfolios and monthly check-in phone discussions on portfolio performance is akin to an ultimatum given by the consumer to the wealth manager: "Choose the investment profile that describes me best, and execute trades as per my monthly instructions".

8.14. Conclusion

The development of technology allowed the rise of numerous automated solutions in Financial Services. Robo-Advisors, to the extent that they are utilized for managing client's assets without investor's intervention, are a solid proof of the interest of the market in autonomous intelligent systems capable of replacing human agents for a given task. Much has been said about these platforms throughout the years, and although the wide range of liquidity invested through them is symptomatic of the acceptance of automated investment management, it might be that this demonstrates more the reluctance to face the consequences of investing and the painstaking decision process involved in order to choose an appropriately diversified asset allocation – a task where a robot can really come in handy – rather than a real validation of the technology. But Robo-Advisors are not what AI can do in Finance. They are likely what people want or can do in Finance. Robo-Advisors do the easy part, which is executing an algorithmic decision taken using risky assets based on static market factors of low frequency, such as time-hedging investments or risk-reward consistency or even ESG impact. So it's more a matter of deciding what to execute than a matter of deciding how to execute. AI, to our understanding, will take investor-proposed ideas and execute them by running and coding decision-based functions to be executed as fast as astrology predictions.

In the face of the above, how can we think about Robo-Advisory and Autonomous Wealth Solutions in the Digital Finance Environment? We believe Wealth Management is witnessing an unprecedented revolution where the consensus so far is that Robo-Advisors can and will coexist with Private Banking. The role of the Robo-Advisor, and of the Autonomous Platforms, will be to assist advisors in their due diligence on clients and in formulating Asset Allocation strategies, reducing contact time between clients

and advisors and allowing the latter to focus their work on the Risk-Reward analysis for the possible creation of a customized family of portfolios.

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