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A Regulatory Sandbox for Robo Advice

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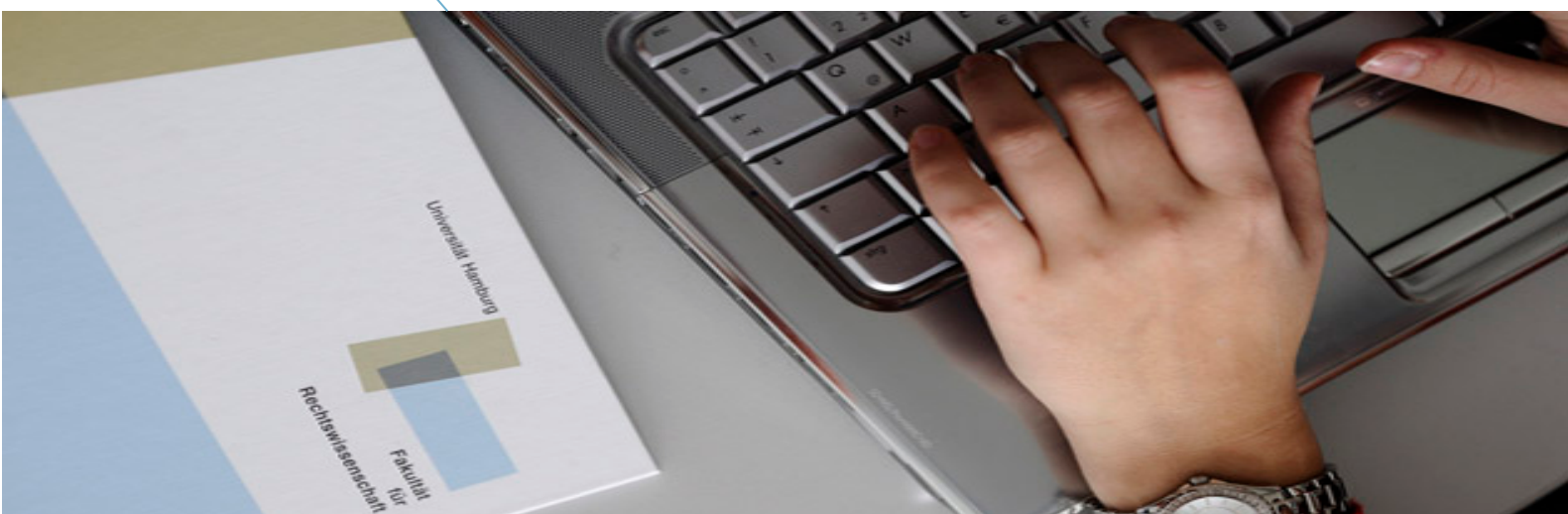
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Abstract

Robo advice, the automated provision of financial advice without human intervention, holds the promise of cheap, convenient and fast investment services for consumers – freed from human error or bias. However, retail investors have limited capacity to assess the soundness of the advice, and are prone to make hasty, unverified investment decisions. Moreover, financial advice based on rough and broad classifications may fail to take into account the individual preferences and needs of the investor. On a more general scale, robo advice may be a source of new systemic risk.

At this stage, the existing EU regulatory framework is of little help. Instead, this paper proposes a regulatory “sandbox” – an experimentation space – as a step towards a regulatory environment where such new business models can thrive. A sandbox would allow market participants to test robo advice services in the real market, with real consumers, but under close scrutiny of the supervisor. The benefit of such an approach is that it fuels the development of new business practices and reduces the “time to market” cycle of financial innovation while simultaneously safeguarding consumer protection. At the same time, a sandbox allows for mutual learning in a field concerning a little-known phenomenon, both for firms and for the regulator. This would help reducing the prevalent regulatory uncertainty for all market participants.

In the particular EU legal framework with various layers of legal instruments, the implementation of such a sandbox is not straightforward. In this paper, we propose a “guided sandbox”, operated by the EU Member States, but with endorsement, support, and monitoring by EU institutions. This innovative approach would be somewhat uncharted territory for the EU, and thereby also contribute to the future development of EU financial market governance.

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I. Introduction

Machines and automated processes are replacing human beings in many areas. “Robo advice” is the catchphrase for a new phenomenon in the world of investment advice: automatic, web-based tools that help individuals with their investments into certain types of financial assets. Robo advisors will not fully replace human interaction with their clients – far from it – but they have gained a considerable market share over the past several years and are predicted to grow at least at the same pace. The advantages for investors are obvious: they promise higher speed and significantly lower costs in comparison with regular investment services provided by humans. Moreover, their availability is around the clock, and automated advice holds the promise on an unbiased and neutral approach that is free from human error or prejudice.

While the availability of robo advice is clearly a welcome addition to the choices available for many investors, its merits warrant close scrutiny. The main target group of robo advice are retail investors acting in their personal capacity. Such consumers have limited capacity to assess the soundness of the advice, and are prone to make hasty, unverified investment decisions. Moreover, financial advice based on rough and broad classifications, as used by robo advisors, may fail to take into account the individual preferences, situations, and specific needs of the investor. On a more general scale, where automated services recommend certain asset classes to investors on a similar pattern, this bears the risk of large-scale parallel behaviour, the development of bubbles, and ultimately the emergence of systemic risks.

Regulation, which should address these concerns, is of little help. The key elements of the European body of financial regulation concerning investment advice are still written with the leitmotif of human interaction in mind. Many categories used by the Markets in Financial Instruments Directive (MiFID) are difficult to match to the activities of this new breed of investment advisors. Worse still: parts of the European framework have been implemented differently across EU Member States. Even where harmonisation has been achieved, rules are partly interpreted differently by the national authorities. The result is a patchwork of different rules and requirements that applies to robo advisors, depending on which EU Member State they are operating in, creating great uncertainty not only among robo advisors, but also on the side of the regulators.

The challenge is thus to design a regulatory environment where new business models can thrive, where potential risks to both investors and to financial stability are monitored and which simultaneously creates legal certainty for all market participants. This paper proposes a regulatory “sandbox” as a first step to facilitate this. A regulatory sandbox would allow market participants to test robo advice services in the real market, with real consumers, but under close supervision of the regulator. The benefit of such an approach is that it fuels the development of new business practices and reduces the “time to market” cycle of financial innovation while simultaneously safeguarding consumer protection. At the same time, a sandbox allows for mutual learning in a field concerning a little-known phenomenon, both for firms and for the regulator. This would help reduce the prevalent regulatory uncertainty for all market participants.

In the particular EU legal framework with various layers of legal instruments, installing a sandbox is not straightforward. In this paper, we propose a “guided sandbox”, which should be guided by an interplay between the federal (EU) and national levels. More specifically, it would be the Member States who operate the sandbox, but with endorsement, support, and monitoring by EU institutions. This innovative approach would be somewhat uncharted territory for the EU, and thereby also contribute to the future development of EU financial market governance.

This article is organised as follows. Section II. explores the phenomenon of robo advice and discusses the risks and promises of this new business practice. We also detail the shortcomings of the present regulatory framework. Section III. responds to these concerns and proposes the establishment of a regulatory sandbox at the EU level, along with a trajectory of regulation over the coming years. Subsequently, Section IV. turns these considerations into a concrete proposal of implementation. Section V. concludes.

II. The Phenomenon of Robo Advice

Robo advice is a fast-growing phenomenon in the financial services market that, among other rising financial technologies (“fintech”¹) has the potential to severely disrupt the

¹ “Fintechs” are computer programmes and other technology used to support or enable banking and financial services.

financial market.² The emergence of disruptive technologies puts many established business practices and regulatory paradigms into question. Consequently, regulators are faced with the question of whether the present regulatory framework is still appropriate.

This section explores the phenomenon of robo advice by briefly tracing its historical development, explaining the way robo advisors function including their business models, their risks and promises, and ultimately detail the shortcomings of the current regulatory framework. This will lay the ground for a reconsideration of the present regulatory approach and the idea of setting up a regulatory sandbox, which we discuss subsequently (sections III. and IV.).

A. What is Robo Advice?

There is no standard definition of “robo advice”. We use the term to refer to digital investment advice tools that match consumers on the basis of their personal preferences to financial products. Different from other commentators,³ we concentrate on “client-facing” tools. This means we exclude “internal” robo tools that financial professionals use as a basis of their face-to-face advice, since these are far from being a new phenomenon in financial markets and – from the regulator’s perspective – belong to the category of traditional (human) advice. We also limit the definition of “robo advice”. The variety of products that could be the subject of robo advice is extensive: insurances (e.g. life, home or car insurances), consumer credits, mortgages and investment products, to name but a few. Indeed, this paper focusses on the service that robo advisors are most frequently associated with, which is the recommendation of investment products.⁴

The advice provided by the robot is mostly based on two key elements: the input information provided by the consumer and the algorithm. The former is commonly collected via an online questionnaire that asks investors to provide personal information (e.g. age, profession, monthly net income) and some investment related data (e.g. investment experience, risk aversion, investment goals). Subsequently, based on the user’s answers,

² See for example Bob Ferguson, ‘Robo Advice: an FCA perspective’ (2 November 2017) <<https://www.fca.org.uk/news/speeches/robo-advice-fca-perspective>> or Benjamin P Edwards, ‘The Rise of Automated Investment Advice: Can Robo-Advisors Rescue the Retail Market?’ (2018) 93 Chicago-Kent Law Review 97.

³ FINRA, *Report on Digital Investment Advice* (March 2016) <<https://www.finra.org/sites/default/files/digital-investment-advice-report.pdf>> or Tom Baker and Benjamin Dellaert, ‘Regulating Robo Advice Across the Financial Services Industry’ (2018) 103 Iowa Law Review 713.

⁴ FINRA (n 3); FSB, *Financial Stability Implications from Fintech: Supervisory and Regulatory Issues that Merit Authorities’ Attention* (27 June 2017) <<http://www.fsb.org/wp-content/uploads/R270617.pdf>>; Melanie L Fein, ‘Robo-Advisors: A Closer Look’ (2015) <https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2658701>.

the algorithm constructs a portfolio proposal with various investment products, in which the user can invest. The composition of the output differs among providers, however, it typically and predominantly consists of passive Exchange Traded Funds (ETFs) based on the stock, pension, or commodity markets⁵ along with some mutual funds. The weighting of these components depends on the given answers, especially on those relating to risk appetite. As soon as the investor has created an account and transferred funds to it, the subsequent processing depends on the characteristics of the respective robo advisor: Some provide continuous monitoring and evaluation of the investment strategies, whereas others offer automatic reallocating or rebalancing of the portfolio according to the stated preferences and information given. In any case, investors retain the opportunity to (manually) adjust their portfolio or recalibrate their preferences.

The costs for robo investment services typically range from an annual fee between 0.25% and 1% of the investor's account value.⁶ Other providers charge provision-based fees. In addition to the advisory fee, customers usually pay a fee for the underlying investment product, which is the fee that is generally charged for the purchase of an ETF or a mutual fund.

B. The Development of Robo Advice

While financial professionals have used digital investment advice tools for many years, the rise of "client-faced" digital investment advice tools began roughly ten years ago. Pioneering that evolution were two American robo advisors called Betterment and Wealthfront who started their business as early as 2008, but actually began offering robo advice to public investors after 2010.⁷ The European market lags the US in the rise of robo advice. The first UK robo advisor for instance was founded in 2011 and launched in 2012.⁸ Since then, the market has seen a number of launches with a significant increase since 2014.⁹

⁵ Orçun Kaya, 'Robo-advice - a true innovation in asset management' Deutsche Bank Research (10 August 2017) <https://www.dbresearch.de/PROD/RPS_DE-PROD/PROD0000000000449125/Robo-advice_-_a_true_innovation_in_asset_managemen.PDF> states that the final set of ETFs for robo-advisory purposes comes down to only app. 3-6% of all available ETFs.

⁶ Average fee in Europe: (app.) 0.8%, whereas in the US only 0.4%: see Kaya (n 5) 1.

⁷ See <<https://www.betterment.com/resources/the-history-of-betterment/>> and <<https://www.wealthfront.com/origin>>.

⁸ See <<http://www.businesswire.com/news/home/20161110006318/en/Robo-Advice-UK-Europe---Revolution-Evolution>>.

⁹ Jill E Fisch, Marion Laboure and John A Turner, 'The Economics of Complex Decision Making: The Emergence of the Robo Adviser' (August 2017) 21 f. <<http://www.geog.ox.ac.uk/events/170911/Robo-vs-Human-Advisers-Aug-28.pdf>>.

Even though existing data on robo advice market share varies strongly, all indicate a rapid growth, particularly during the recent years. As a research paper from Deutsche Bank documents, this growth was particularly impressive in the US: assets under management of robo-advisory start-ups¹⁰ increased by approximately 800% from \$ 2.3bn in 2013 to \$ 20bn in Q1 2017.¹¹ As of 2018, the US is by far still the leading market of robo advice, comprising about \$ 266bn in assets under management out of a global \$ 371bn.¹² Other sources estimate even higher numbers.¹³ Moreover China is a rapidly growing market for robo advisors, showing a more than an elevenfold increase in assets under management within only two years (2016 to 2018).¹⁴ This trend also did not go unnoticed by major regulators: The US Securities and Exchange Commission (SEC) reacted by including robo advice in its examination priorities¹⁵, whereas the British Financial Conduct Authority (FCA), noticing the potential of robo advice, established an 'Advice Unit' providing regulatory feedback to robo advisors.¹⁶

Compared to the United States, the European market is still underdeveloped.¹⁷ The dissemination of robo advice within Europe varies strongly, with the UK spearheading the development (around 75% of the European assets under management), followed by Germany (around 17%). However, when looking at the number of firms, the number of registered robo advisors in the UK and Germany are on a par: They each comprise about one third of all robo advisors in the EU.¹⁸ In contrast, in some Member States, robo advice is not (yet) an economic concern at all.¹⁹

However, not only the data about current market shares, but also their estimates vary considerably. Prognoses for the global assets under management by robo advisors in the year 2020 start at USD 0.82tn²⁰ over USD 1tn²¹, or USD 2.2tn²² and run up to USD 8.1tn²³.

¹⁰ Therefore excluding established asset management providers who offer automated portfolio management.

¹¹ Kaya (n 5) 8.

¹² Statista, *Fintech 2017 – Digital Market Outlook – Trend Report* (2017) 20.

¹³ As of BI Intelligence 'The Robo-Advising Report' (June 2016) the assets under management (AuM) in the US in 2015 is around USD 300bn, estimating a global AuM of roughly USD 600bn.

¹⁴ Statista (n 12) 20.

¹⁵ See SEC, Investment Guidance Update (February 2017) <<https://www.sec.gov/investment/im-guidance-2017-02.pdf>>.

¹⁶ See <<https://www.fca.org.uk/firms/advice-unit>>.

¹⁷ Kaya (n 5) states that the AuM of EU robo-advisors is some 5-6% of that in the US.

¹⁸ Kaya (n 5) 8.

¹⁹ For a regularly updated overview of robo advisors' dissemination in Europe, see <<http://www.techfluence.eu/investtech.html>> (for example entry from 13 December 2017).

²⁰ Statista (n 12) 20.

According to the 2017 Statista Fintech report, in 2021 China will have almost caught up with the US in regard of assets managed by robo advisors, with Europe lagging far behind.²⁴

C. Promises and Risks

The established goals of financial regulation have included consumer protection and financial stability, with an increasing focus on the latter, especially since the outbreak of the recent financial crisis.²⁵ Good regulation, however, should not only focus on addressing potential risks, but should also strive to identify market developments that are desirable for the system, and moreover promote those. In the following, we discuss the benefits of robo advice that regulation should support.

As mentioned above, the key promise of robo advice is to deliver convenient, unbiased financial advice at significantly lower costs than human advisors. Of those promises, low financial costs are most evident. Whereas robo advisors charge average fees between 0.4% (mainly in the US) and 0.8% (mainly Europe), the fee for human financial advice usually amounts to 1-2%.²⁶ The reason is simple: Robo advisors make use of the economies of scale. The “advice” is provided by one computer algorithm, no matter how many customers there are. Human advice, in contrast, naturally has to reflect a fix cost for each individual advice process, namely the human’s time and salary. Hence, the growth of robo advice will be most likely accompanied by increasing returns to scale, and continuing decrease in costs for consumers. In addition to that, there are other financial aspects that make robo advisors more attractive for consumers: Firstly, human advisors often tend to recommend actively managed funds to generate higher commissions.²⁷ Those funds are usually substantially more expensive than ETFs, which robo advisors mostly recommend, while often not being able to outperform them.²⁸ Second, unlike human advisors,²⁹ robo

²¹ See FSB (n 4). 44 referring to a study by Morgan Stanley.

²² Michael P Regan, ‘Robo Advisors to Run \$2 Trillion by 2020 if This Model is Right’ (18 June 2015), available at <<https://www.bloomberg.com/news/articles/2015-06-18/robo-advisers-to-run-2-trillion-by-2020-if-this-model-is-right>>.

²³ Andrew Meola, ‘Robo-advisors have a \$2 trillion opportunity in front of them’ (11 June 2016) <<http://www.businessinsider.de/the-2-trillion-opportunity-for-robo-advisors-2016-6?r=US&IR=T>>.

²⁴ Statista (n 12) 20.

²⁵ See for example John Armour and others, *Principles of Financial Regulation* (OUP 2016) 64 ff.

²⁶ BI Intelligence (n 13). Note that fees vary by geographical region.

²⁷ Fisch and others (n 9) 14.

²⁸ See for example graphic no. 13 at Kaya (n 5) 10.

²⁹ In contrast, human financial advisors (in the US) often require a minimum asset volume of more than 500.000 USD (see <<https://investorjunkie.com/35919/robo-advisors/>>).

advisors usually require no or relatively few minimum volume in providing financial advice.³⁰ Consequently, this makes their advice accessible to a wider range of investors.

What makes robo advice so convenient for customers is the simplicity and accessibility of the advice. In contrast to bank opening times, robo advice is available around the clock, each day of the year, and from any location in the world the consumer may find herself, provided there is a good internet connection. Further, the customer is able to receive the advice after about 15 minutes, without having to go through the traditional client process, often involving extensive paperwork.

Moreover, although to our knowledge there has no comprehensive study on the performance of robo advisor compared to their human equivalent been conducted to date, the quality of automated advice is likely to benefit consumers. Backend have started to collect some data on the performance of robo advisors in their “Robo Report”.³¹ It opened and funded accounts at 20 (US-based) robo advisors, all with an approach for moderate and somewhat risk-averse testing and regularly compares their one-year return.³² The latest report showed a decent performance of the respective providers: One-year returns³³ ranged from 12.39% to the top performer “TD Ameritrade” with 16.47%³⁴. This is surely far from being representative for the entire robo advice market and, since investors take a long-term outlook on their investments, gives an incomplete picture, but it may be useful to give us a flavour of their capabilities. Finally, research in diverse fields demonstrates that even simple algorithms outperform humans in their respective task. There is ample reason to believe the same for automated financial advice.³⁵

Automatisation is further said to mitigate internal agency conflicts that normally arise between financial advisors and their customers. Since robo advisors are transparent and the same algorithm is available equally to every customer, a high degree of advice consistency is ensured. Also the vulnerability for conflicts of interest seems to be much lower:³⁶ First, they

³⁰ See for instance Kaya (n 5) 9 or Morgan Lewis, ‘The Evolution of Advice: Digital Investment Advisers as Fiduciaries’ (October 2016) <<https://www.morganlewis.com/~media/files/publication/report/im-the-evolution-of-advice-digital-investment-advisers-as-fiduciaries-october-2016.ashx?la=en>>.

³¹ Accessible at <<https://theroboreport.com/>>. In this paper we refer to data taken from the 2017 Q4 Robo Report.

³² Starting from the Q4 2017 Report, Backend is also comparing two-year returns and seeks to provide more perspective on how robo advisors perform in the long term.

³³ Excluding those where the returns could for various reasons not be assessed.

³⁴ Backend, ‘The Robo Report’ (Q4 2017) 8.

³⁵ See Baker and Dallaert (n 3) 716 with further references at footnote 10.

³⁶ Fisch and others (n 9) 20f.

typically³⁷ do not themselves sell the same investments that they recommend, which appears to address some traditional biases in the product selection. Secondly, the fees charged by robo advisers are always the same, irrespective of the chosen investment product, and their fees are also much more transparent than human advisory fees. Finally, full automation in robo-advisory services holds the promise of improved compliance and record keeping.³⁸

There is a chequered history of (human) financial advice. In particular, widespread practices of fraud and other illegal practices that contributed to the global financial crisis in 2007-2009 have led to a significant mistrust in financial advisers.³⁹ Robo advisers that emerged as small start-ups in the aftermath of the crisis are however not as much tainted as incumbent financial firms let alone associated with the causes of the crisis. Promising an automated advice that is free from human bias, they could thus fill that trust vacuum. However, as various studies indicate, robo advisers struggle with a trust problem of different nature: Investors still seem to be quite reluctant in confiding their money to a fully automated system.⁴⁰ According to a 2016 Gallup survey on investors' perceptions of human versus robo advice, more than 70% of US investors believed human advisors to better serve their interest and make a better investment recommendation than robo advisors.⁴¹ Within a survey conducted by ING, 91% of respondents stated that they would not like an automated programme to conduct financial activities for them, at least not without their final approval.⁴² Even millennials, to whom robo advisers are supposed to be particularly appealing, still seem to prefer face-to-face interaction.⁴³ Related to the trust problem another observation is that

³⁷ Jonathan W Lam, 'Robo-Advisers: A Portfolio Management Perspective' (2017) <https://economics.yale.edu/sites/default/files/files/Undergraduate/Nominated%20Senior%20Essays/2015-16/Jonathan_Lam_Senior%20Essay%20Revised.pdf> however comes up with a robo advisor from "Charles Schwab" as a counterexample in the emergence of robo advisers (2017).

³⁸ Greg Medcraft, 'Digital disruption and how regulators are responding' speech at the regulators panel on FINSIA (Sydney, 5 November 2015).

³⁹ See for example Douglas W Arner, Janos Barberis, Ross P Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?' (2016) 47 *Georgetown Journal of International Law* 1271, 1286f. with further references.

⁴⁰ See for instance FINRA Investor Education Foundation, 'Report on Investors in the US' (December 2016) <http://www.usfinancialcapability.org/downloads/NFCS_2015_Inv_Survey_Full_Report.pdf> or Chance Barnett 'Fintech Trends: Wealth Management and The Rise of Robo Advisors' (1 September 2015) <<https://www.forbes.com/sites/chancebarnett/2015/09/01/fintech-trends-wealth-management-and-the-rise-of-robo-advisors/#76702301b0d3>>.

⁴¹ Lydia Saad, 'Robo-advice Still a Novelty for U.S. Investors' (27 July 2016) <<http://news.gallup.com/poll/193997/robo-advice-novelty-investors.aspx>>.

⁴² ING International Survey 'Mobile Banking 2017 – Newer Technologies' (May 2017) <https://think.ing.com/uploads/reports/IIS_Mobile_Banking_2017_Newer_Technologies_FINAL.pdf>. However, it should be noted that surveys conducted by big financial institutions can be biased and therefore should be treated with caution.

⁴³ Barnett (n 40). Given the obvious bias of its principal, the validity of the study can however be questioned.

the investors' reluctance seems to increase with the size of their portfolio.⁴⁴ Apart from general scepticism concerning a fully automated advice process, investors' expectations may also explain this: Sophisticated investors with large portfolios may expect a more complex and personalised advice of a quality which robo advisors to date might not offer. This suggests that robo advice is yet more relevant to investors with smaller portfolios. Ultimately, the feature that is perceived as most valuable to date seems to be the low costs, rather the quality of the advice.⁴⁵ Robo advisors will only succeed if they manage to convince consumers to trust in the quality of their service. Since financial services, including robo advice, are credence goods, their prospective development will highly depend on this issue. Hence, earning such trust will be crucial and one of robo advisor's primary task in the coming years.

In sum, robo advisors' most appealing asset still seems to be their cost advantage over traditional advisors in combination with better accessibility. Additionally, their features could reduce some elements of behavioural bias, conflicts of interest and poor judgement. This theoretically gives them a substantial "trust advantage" over human advisors, which, however, has not been materialised to date. Despite of the prevailing trust issue, there is a strong consensus that robo advice is one of the fastest growing and most promising fintech phenomena.

Besides those (more obvious) potential benefits for consumers, some commentators also highlight the broader (macrofinancial) implications that result from the emergence of robo advice.

First, robo advisors could enhance access to financial markets for consumers and therefore promote financial inclusion.⁴⁶ Consumers that may – for various reasons⁴⁷ – not

⁴⁴ See for instance Kelly Reuba for Allianz GI 'Robo-Advisors: Early disruption in Private Wealth Management' (12 May 2017) <<https://www.allianzgi.com/en/insights/artificial-intelligence/robo-advisors-early-disruptors-in-private-wealth-management>>; Kaya (n 5); or Teodoro D Cocca 'Was Robo Advisors noch nicht können' (1 March 2017) <available in German language at: <https://www.fuw.ch/article/was-robo-advisors-noch-nicht-koennen/>>.

⁴⁵ This assumption is further endorsed by a survey of the CFA Institute reaching a similar conclusion: CFA Institute, 'Fintech Survey Report' (April 2016), <https://www.cfainstitute.org/Survey/fintech_survey.PDF>.

⁴⁶ In this paper we use the term 'financial inclusion' in the meaning of widening financial market access to broader parts of the social community. In particular, this would apply to households that were yet not able (e.g. due to income) or willing (e.g. due to mistrust in financial advisors, favouring bank deposits) to participate in it before.

⁴⁷ See FCA, 'Financial Advice Market Review (FAMR) Baseline Report' (June 2017) <<https://www.fca.org.uk/publication/research/famr-baseline-report.pdf>> includes various surveys that offer some explanations, see e.g. table 3.2. on page 11.

contact a human advisor and are reluctant to participate in the financial market on their own, could feel more confident about using an automated advice tool, such as their smartphone. This effect can certainly be driven by a reduction in perceived costs of market entry.⁴⁸ A survey from 2016, conducted on behalf of the Association of Professional Financial Advisers⁴⁹ found that 69% of the polled advisors had turned away clients, with too little investment volume being the most common reason. As robo advisors require far less minimum volume for their advice, they could integrate those investors in the financial market.⁵⁰

Irrespective of this aspect, saving habits in Europe seem to substantially differ from those in the US. Data from the OECD show that in contrast to US households, European households rather deposit their money in bank accounts than investing it in the stock market.⁵¹ In times of dramatically low interest rates though, even a small inflation is able to continuously burn money that is stored at the bank. Meanwhile, stock markets are breaking one record after another, providing investment opportunities that generate a decent rent at a reasonable risk.

Offering a low-cost and simplified way to invest in the capital market, robo advice provides a good opportunity for consumers to change their investment habits for their benefit. This might as well be desirable from a political perspective. As real wages remain mostly static, while on the other hand companies and high net worth individuals continue to increase in their wealth, mid-income households increasingly feel being economically left behind. Robo advisor could play a significant role in enabling participation of those households in the growing economy.

Enhancing participation in the capital market would also have beneficial effects for the overall economy. Capital is allocated more efficiently when channelled through the capital market. When stored on a deposit account at a bank or invested in real estate,⁵² capital is not used in a productive way, i.e. not effectively facilitating economic growth or (in the case of

⁴⁸ FSB (n 4) 44.

⁴⁹ See HM Treasury and FCA, *Financial Advice Market Review: Final Report* (March 2016) 6, <<https://www.fca.org.uk/publication/corporate/famr-final-report.pdf>>.

⁵⁰ However, despite the increase of accessibility, some believe that there will be no significant financial inclusion taking place. BI Intelligence (n 13) for instance assumes that in 2020 99% of assets managed by robo advisors will be held by people, who already have assets under management with traditional asset managers.

⁵¹ Data was taken from <https://data.oecd.org/hha/household-financial-assets.htm>; Kaya (n 5) 9 notes that this is particularly the case for the German market, which therefore offers a lot of potential for robo advice.

⁵² Investing in real estate is another very common form of investing in Europe, particularly in Germany (see for example Deutsche Bundesbank, 'Monthly Report' (March 2016) <https://www.bundesbank.de/Redaktion/EN/Downloads/Publications/Monthly_Report_Articles/2016/2016_03_household.pdf?__blob=publicationFile> Chart on page 68.

real estate investment) a socially productive outcome⁵³. On the contrary, intermediated by a robo advisor, it would provide liquidity for the capital market and in that way provide capital for economic activities. In sum, encouraging those households to access the financial market is a confluence of political as well as private interests of the financial sector.⁵⁴

From a EU perspective, this promise seems to be particularly appealing. In 2015 the European Commission adopted an action plan on building a Capital Markets Union (CMU)⁵⁵, setting out 33 tasks of which – according to a recent midterm review⁵⁶ – 20 have been achieved. The CMU project was initially launched since EU capital markets were and still are relatively underdeveloped and fragmented. While the European economy is as big as the US one, Europe's equity market comprises only less than half the size. Complementing Europe's bank-based system with stronger, deeper capital markets will supposedly lead to efficiency gains, higher growth rates and make the financial system more stable. Promising to facilitate access to the capital markets for many not yet participating consumers, robo advice and fintech could play an important role in completing the Capital Markets Union.⁵⁷ Not less, its reduced geographical proximity and promotion of access to cross-border investments may also make an important contribution to the CMU agenda.⁵⁸ Further strengthening and integrating the EU capital market may have become 'more important than ever'⁵⁹, since the UK as the Member State with the largest capital market has decided to leave the EU.⁶⁰

⁵³ Hillary Allen, 'A New Philosophy for Financial Stability Regulation' (2013) 45 Loyola University Chicago Law Journal 173, 221.

⁵⁴ Also Iris H-Y Chiu, 'Fintech and Disruptive Business Models in Financial Products, Intermediation and Markets – Policy Implications for Financial Regulators' (2016) 21 Journal of Technology Law & Policy 55, 71.

⁵⁵ European Commission, 'Action Plan on Building a Capital Market Union' COM (2015) 0468 <<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0468>>.

⁵⁶ Commission, 'Mid-Term Review of the Capital Markets Union Action Plan' COM (2017) 292 final <https://ec.europa.eu/info/sites/info/files/communication-cmu-mid-term-review-june2017_en.pdf>.

⁵⁷ Maria Demertzis, Silvia Merler and Guntram B. Wolff, 'Capital Markets Union and the Fintech Opportunity' (2018) 4 Journal of Financial Regulation 157.

⁵⁸ See also European Commission, 'Fintech: a more competitive and innovative European financial sector' (Consultation Document 2017) 7 <https://ec.europa.eu/info/sites/info/files/2017-fintech-consultation-document_en_0.pdf>.

⁵⁹ As stated by Markus Ferber, vice chairman of the European Parliament's economic affairs committee in an interview with Reuters (Huw Jones, 'Europe's slow-moving capital markets plan gets Brexit reboot' (8 June 2017) <<https://www.reuters.com/article/us-eu-markets-regulations/europes-slow-moving-capital-markets-plan-gets-brexite-reboot-idUSKBN18Z18W?il=0>>); also mentioned in the CMU Midterm Review (n 56) 8.

⁶⁰ On the implications of Brexit for European financial integration see Wolf-Georg Ringe, 'The Irrelevance of Brexit for the European Financial Market' (2018) 19 European Business Organization Law Review 1; Wolf-Georg Ringe, 'The Politics of Capital Markets Union: From Brexit to Eurozone' in Franklin Allen and others (eds), *Capital Markets Union and Beyond* (MIT Press, forthcoming).

Robo advisors⁶¹ also might have the potential to disrupt the financial market by putting pressure on incumbents, stealing market shares and diversifying the market.⁶² Since the financial market is highly concentrated, this would be a desirable effect. Nevertheless, looking at current developments, there is no improvement in sight: Most incumbent firms either build up “innovation hubs” or similar institutions⁶³ to develop their own fintechs, or are acquiring small fintech firms⁶⁴ to provide the respective service in their own name. Still, those increasing consolidation and innovation efforts of incumbent institutions indicate the existence of pressure through competition. In the case of robo advisors this pressure could lead to a reduction in costs and make pricing more competitive, ultimately enhancing the efficiency of financial advice services.⁶⁵

From a regulatory perspective, attention should be paid to the risks of a new phenomenon, as they often trigger regulatory intervention. The risks of robo advice can be classified in consumer risks (microfinancial risks) and systemic risks (macrofinancial risks).

The most prevalent consumer risk seems to be the unsuitability of the individual advice, meaning that the output does not fit the *actual* situation and risk preferences of the respective individual. One problem that may lead to unsuitability is the design of the advice process. Since the robo advisor’s output directly depends on what information it seeks and what information the investor provides, it may not assess the individual’s situation including all particular events exhaustively.⁶⁶ A “one-size-fits-all” questionnaire may be too narrow in

⁶¹ This does not only apply to robo advice, but rather for the entire fintech movement.

⁶² FSB (n 4), p. 45; In regard of the general Fintech movement, see Rory van Loo, ‘Making innovation more competitive’ (2018) 65 UCLA Law Review 232.

⁶³ E.g. Deutsche Bank’s “digital factory” (<https://www.db.com/company/en/digitalisation.htm?mea=10factsabouttheDigitalFactorythatyoushouldknow>) and Commerzbank’s “main incubator” (https://www.commerzbank.de/en/nachhaltigkeit/markt_kunden/mittelstand/main_incubator/main_incubator.html); For additional information, see for example PwC, ‘Beyond automated advice: How FinTech is shaping asset & wealth management’ Global Fintech survey 2016 (July 2016) <<https://www.pwc.com/gx/en/financial-services/pdf/fin-tech-asset-and-wealth-management.pdf>>.

⁶⁴ See for example Victor Hedwig in Frankfurter Allgemeine Zeitung “Banken zähmen die FinTechs” (28 July 2017) or M Fehr, ‘Die jungen wilden lassen sich domestizieren’ (4 August 2017) <<http://www.wiwo.de/finanzen/geldanlage/fintech-die-jungen-wilden-lassen-sich-domestizieren/20148250.html>>.

⁶⁵ See also FSB (n 4).

⁶⁶ The problem is also addressed by Marika Salo, Helena Haapio, Robo-Advisor and Investors: Enhancing Human-Robot Interaction Through Information Design’ in Erich Schweighofer et al. (eds), *Trends and Communities of Legal Informatics. Proceedings of the 20th International Legal Informatics Symposium IRIS 2017* (Österreichische Computer Gesellschaft, Wien 2017) 443ff. Within their Guidelines on certain aspects of the suitability requirement, ESMA also observes this issue and attempts to provide advice how to overcome these issues (see ESMA, ‘Guidelines on certain aspects of the MiFID II suitability requirement’ (Consultation Paper, July 2017) <https://www.esma.europa.eu/sites/default/files/library/2017-esma35-43-748_-_cp_on_draft_guidelines_on_suitability.pdf> 13ff.). For the ongoing discussion in an US law context,

some cases, as opportunities for clients to include additional or connected information to supplement their responses are limited. Furthermore, online questionnaires are often not designed to ask follow-up questions to address inconsistencies.⁶⁷ Two investors who want to take out precautionary savings may have something completely different in mind regarding the “bad-case” situation. On top of that a recent study has shown that the impact of the given answers on the investment recommendation varies widely.⁶⁸ There are cases where only a single answer (more specifically, the recommended portfolio was directly correlated to the customer’s chosen risk level) determines the outcome.⁶⁹ Focusing on the output, automated advice tools are usually designed to fit the customer into a range of pre-determined investment portfolios. The limitation of this range may be problematic when the pre-determined assumptions or categories are not entirely appropriate to the customers’ personal situation. In such case, the customer would not be aware of the inappropriateness, despite answering the questionnaire correctly.⁷⁰ Furthermore the appropriate processing of advice depends on the consumer reading and digesting information. In contrast to human advice, possibilities to seek clarification are limited. Taking into account that the average financial literacy in the population is low⁷¹, the risk of misunderstanding parts of the questionnaire as well as information provided within, the probability of incorrect, increases.

Another risk that has been identified is related to the possible malfunctioning of the tool or its underlying algorithm⁷². Within the complex structure of the robo advice software, there is always the risk that an error can occur, for instance due to flaws in the development process. This could lead to unsuitable advice. As against the case of human advice the unsuitable recommendation is likely to affect a large number of customers and therefore

see FINRA (n 3) or Melanie L Fein, ‘Regulatory Focus on Robo-Advisors’ (September 2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3028259>.

⁶⁷ See also Dan Ryan, Julien Courbe and others, ‘PWC discusses SEC’s Increased Scrutiny of Robo-Advisors’ (8 November 2017) CLS Blue Sky Blog <<http://clsbluesky.law.columbia.edu/2017/11/08/pwc-discusses-secs-increased-scrutiny-of-robo-advisors/>>.

⁶⁸ Michael Tertilt, Peter Scholz, ‘To Advice, or Not to Advice – How Robo-Advisors Evaluate the Risk Preferences of Private Investors’ (February 2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2913178>.

⁶⁹ Tertilt, Scholz (n 68) 13.

⁷⁰ ESAs, ‘Joint Committee DP on automation in financial advice’ (4 December 2015) <https://esas-joint-committee.europa.eu/Publications/Discussion%20Paper/20151204_JC_2015_080_discussion_paper_on_Automation_in_Financial_Advice.pdf> 25.

⁷¹ As a recent study by the OECD (OECD International Network on Financial Education, ‘International Survey of Adult Financial Literacy Competencies’, (2016) < <http://www.oecd.org/daf/fin/financial-education/OECD-INFE-International-Survey-of-Adult-Financial-Literacy-Competencies.pdf>>) indicates that financial literacy among consumers is relatively low. See also Salo, Haapio (n 66) 444ff.

⁷² ESAs (n 70) 26f. and the corresponding Report (ESAs, ‘Report on automation in financial advice’ (16 December 2016) <[https://esas-joint-committee.europa.eu/Publications/Reports/EBA%20BS%202016%20422%20\(JC%20SC%20CPF1%20Final%20Report%20on%20automated%20advice%20tools\).pdf](https://esas-joint-committee.europa.eu/Publications/Reports/EBA%20BS%202016%20422%20(JC%20SC%20CPF1%20Final%20Report%20on%20automated%20advice%20tools).pdf)>) and FSB, (n 4) 45.

cause damage on a much bigger scale than a human's incorrect advice. At the same time, this would possibly result in a high number of complaints. A flood of lawsuits – imagining the worst-case scenario – could be deadly for a (start-up) robo advisor, as well as for the investors, who could possibly see themselves not being compensated due to the small size of the liable entity.

Naturally, as robo advisors base their service solely on algorithmic software, they may be vulnerable to third-party manipulation or hacking, likewise resulting in unsuitable advice for the customer.⁷³ Depending on the size of the company and its internal risk and compliance system, it may take quite some time for the financial institution to identify instances where cyber threats have occurred.

Moreover, Jill Fisch and others have identified an advantage of traditional financial advisors over robo advisors in what they call the “warm body effect”.⁷⁴ Survey data indicate that people tend to favour advice from a person more than from businesses that provide online advice only.⁷⁵ Apart from the potential advantage, as discussed above, of helping to overcome the lack of financial literacy or better understanding and evaluating the individual situation of the client, there are other preferable aspects of human advice to robo advice. Firstly, a robo advisors might do less well than financial advisers in preventing the client from selling low and buying high.⁷⁶ If consumers are able to adjust their portfolio and preferences without the consultation of a professional, they might be more prone to various “hypes” in the market. Secondly, not all aspects of traditional investment advice are yet covered by the robo advisor. To date, robo advisors focus largely on the matching and rebalancing function, while this represents only a part of the service human advisors (optimally) provide. A traditional financial advisor can help clients with how much to save, create plans, set up structures and counsel those clients who fall short of their plans etc.⁷⁷ Those coaching and relationship aspects are harder to automate and therefore basically not (yet) provided by robo advisors.

This might explain the recent development towards hybrid models⁷⁸: Some of the major US financial management companies such as Vanguard or Schwab now offer robo-

⁷³ ESAs DP (n 70) 26 and corresponding Report (n 72).

⁷⁴ Fisch and others (n 9) 15.

⁷⁵ Lisa Greenwald, Craig Copeland, Jack VanDerhei, ‘The 2017 Retirement Confidence Survey: Many Workers Lack Retirement Confidence and Feel Stressed about Retirement Preparations’ (March 2017) Employment Benefit Research Institute Issue Brief No. 431 <https://www.ebri.org/pdf/briefspdf/EBRI_IB_431_RCS.21Mar17.pdf>.

⁷⁶ See also Fisch and others (n 9) 15.

⁷⁷ See also Baker and Dallaert (n 3) 729.

⁷⁸ Hybrid models are basically robo advisors, added with the possibility of consulting a (human) financial adviser.

advisory services with the (additional) possibility to contact a certified financial planner 24/7. While fees for those services are often comparable to those of genuine robo advisors, the account minimums are usually significantly higher,⁷⁹ and range from between those of genuine robo advisors to traditional financial advisor minimums. Finally, one of the pioneers of robo advice, Betterment, for the first time opened a call centre in 2017.⁸⁰

Aside from consumer risk, there are potential systemic risks that may accompany the phenomenon of robo advice. Relevant focus areas for policymakers in this regard are financial stability and cyber risks.⁸¹ Such systemic risks are likely to appear when robo advisors grow in scale and become a major force in the financial markets. Due to the fact that currently automation in financial advice is not widespread, those problems are commonly seen as unlikely to materialise in the near future.⁸² Nevertheless, looking at the rapid pace of growth that robo advice experiences, they should be assessed as early as possible.

In this context, a predominant concern associated with the phenomenon of robo advice is the so-called “herding risk”.⁸³ The basis of this concern is that most robo advisors, to a certain degree, will act in similar or parallel ways as they process and evaluate their customers’ data, since the composition of their portfolios as well as their underlying algorithm that allocates the assets are to a certain degree similar.⁸⁴ Assuming that risk models are highly correlated, robo advice has the potential to exhibit greater herding behaviour than traditional portfolio advisors and lead to concentration risks. Since market participants can act in ways that exacerbate the degree and impact of fluctuations on economic growth and market prices, herding can increase the amplitude of swings in asset prices and lead to an increased incidence of unidirectional portfolio shifts.⁸⁵ Also, correlated algorithms may similarly react to external shocks, leading to solvency problems that can spiral through the financial system. Robo advisors may tend to be more active during periods of low volatility

⁷⁹ For example Vanguard’s charge a fee of 0.3% for their service and require an account minimum of 50.000 USD (see <<https://investor.vanguard.com/advice/personal-advisor>>).

⁸⁰ See Fisch and others (n 9) 24.

⁸¹ See for example Mark Carney, Governor of the Bank of England in a speech to representatives from the G20 group, ‘The promise of Fintech – Something New Under the Sun?’ (25 January 2017), available at: <<https://www.bankofengland.co.uk/-/media/boe/files/speech/2017/the-promise-of-fintech-something-new-under-the-sun.pdf?la=en&hash=0C2E1BBF1AA5CE510BD5DF40EB5D1711E4DC560F>>.

⁸² FSB (n 4) 32; ESA Report (n 72) 11; also Kaya (n 5) 6 seeing the use of “mean-variance”-portfolios as a reason for that.

⁸³ See for example: FSB (n 4), p. 46; Baker and Dallaert (n 3) 742f.; ESA Report (n 72) 11; FSB, ‘Artificial Intelligence and machine learning in financial services’ (1 November 2017) <<http://www.fsb.org/wp-content/uploads/P011117.pdf>> 25.

⁸⁴ Kaya (n 5) states that robo advisors usually use mean-variance optimisation (see on page 6).

⁸⁵ FSB (n 4) 20, 45f.; ESAs DP (n 70) 27.

but rapidly withdraw from the market during periods of market stress when liquidity demands are high and thereby increase asset price volatility. Moreover, predictable patterns in the behaviour of algorithms could be used by cybercriminals to manipulate market prices.⁸⁶

An aspect of (systemic) risks that algorithmic trading implies allegedly occurred during a so called “flash crash”⁸⁷, the most prominent of which took place in 2010. The 2010 flash crash lasted for approximately half an hour during which time the American stock indices collapsed and dropped by about 9%.⁸⁸ Even though the stock market recovered quickly, the event caused substantial uncertainty among investors and regulators. Most recent investigations suggest that the collapse was initially triggered by a “lone trader” based in London, making use of a shady trading method called spoofing, which has been banned as a consequence of that incident. Spoofing refers to a technique where the trader puts up a significant amount of futures for sale slightly below the market price (with intent to cancel before the orders are filled), and thereby causes a drop in their market price. This drop is at least partly a consequence of algorithms reacting to the actions of the trader and therefore an issue that could be subject to exacerbation from the growing dissemination of automatised on financial markets. Ultimately, this event has shown that a drop in prices of futures can lead to a high-speed selling spiral (to a significant degree) caused by algorithmic trading and affect the stock market in a significant way.⁸⁹ Another incident where the British Pound Sterling dropped significantly within a few minutes occurred in October 2016 and is also said to be at least exacerbated by algorithmic trading.⁹⁰

Current robo advisors were trained during times of predominantly low volatility. Accordingly, it remains rather unclear how they will react to a major shock in the markets. However, Brexit could be seen as a first test for the performance of robo advisors in that regard, as it led to one of the most significant shocks in the financial markets in the recent years, taking place on 24 June 2016. From an investor’s perspective, however, most robo

⁸⁶ FSB (n 83) 25.

⁸⁷ The term ‘flash crash’ refers to a sudden fall in stock prices caused by manual or algorithmic errors.

⁸⁸ For more information on the events, see the two SEC reports that had been issued in regard of the Flash Crash. First report: SEC, ‘Preliminary Findings Regarding the Market Events of May 6, 2010 – Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issue’ (18 May 2010) <<https://www.sec.gov/sec-cftc-prelimreport.pdf>> and the second Report: SEC, ‘Findings Regarding the Market Events of May 6, 2010 – Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issue’ (30 September 2010) <<https://www.sec.gov/news/studies/2010/marketevents-report.pdf>>.

⁸⁹ Considering that doubts concerning the stability of ETFs in general have been raised (see for example Al Weinberg, ‘Should You Fear the ETF?’ (6 December 2015) <<https://www.wsj.com/articles/should-you-fear-the-etf-1449457201>>) and that recommended portfolios mostly consist of ETFs, the risk may be even more alarming.

⁹⁰ See for example Jamie Condliffe, ‘Algorithms Probably Caused a Flash Crash of the British Pound’ (7 October 2016) <www.technologyreview.com/s/602586/algorithms-probably-caused-a-flash-crash-of-the-british-pound/>.

portfolios overcame that challenge. The way it was overcome, however, may give some ground for critique: Major robo advice firms decided to halt trading for several hours on that day to prevent investor overreaction.⁹¹ Naturally, this intervention provoked fundamental critique as being patronising, arguing that investors should be the ones to decide when to trade. More importantly though, that reaction revealed an inherent weakness of robo advisors: The inability of the programme itself to solve a comparable situation without the need for human interaction. It would have been interesting to see how the algorithms had reacted to that event, had they not been halted.

Risks may also occur not only due to actual events, but also in consequence of wrongly propagated information.⁹² As algorithms commonly rely on patterns that were predictive for market movements in the past, they may overreact to certain false information. For example, in April 2013, markets significantly reacted to a false tweet, which was sent from the hacked Associated Press twitter account, reporting of two explosions at the White House.⁹³ Even though it is difficult to prove a clear causal link between the tweet and the algorithms' reaction,⁹⁴ scenarios like these may be exacerbated with the widespread use of algorithms and robo advice.

Another risk that merits regulatory attention, not only in regard of robo advice, but rather concerning the fintech phenomenon as a whole, is the problem of cyber risk. The susceptibility of financial activity to cyber attacks is likely to be higher the more the systems of different institutions are interconnected. That is, the more institutions or systems are interconnected, the higher the possibility of a "weak link", endangering the whole system. Given that fintech startups are frequently not in possession of a proper cyber-security system comparable to those of big financial institutions, cyber-risk is an issue that merits further scrutiny.⁹⁵ On the other hand, in case of more diversity and less concentration in the market that may come along with the rise of fintech, a single cyber-attack could be less systemically relevant.

One factor that plays a great role in the future development of robo advice, bearing great potential for the quality of robo advice, but also posing considerable risks, is the

⁹¹ Kaya (n 5) 11.

⁹² This concern is also raised in FSB (n) 11.

⁹³ The text of the original tweet was: "Breaking: Two Explosions in the White House and Barack Obama is injured".

⁹⁴ For more information on this topic, see for example Tero Karppi and Kate Crawford, 'Social Media, Financial Algorithms and the Hack Crash' (2016) 33 Theory, Culture & Society 73, 74ff.

⁹⁵ FSB (n 4).

emergence of Artificial Intelligence (AI) and machine learning. AI can be described as the theory and development of computer systems being able to perform tasks that traditionally require human intelligence. Machine learning, which is a sub-category of AI, can be defined as a method of designing algorithms that optimise automatically through experience with limited or no human interaction.⁹⁶ This experience is created by using a large training data set that the algorithm can repeatedly go through, learning by trial and error how to connect the data and apply it in order to make intelligent future decisions. In the case of robo advisors, this data can consist of parameters about the individual investor, such as credit history, employment history, assets, purchasing history as well as data that stems from social media, e.g. Facebook or Twitter.⁹⁷ Also, the algorithm can be fed with data about macroeconomic parameters, such as market movements and collective behaviour during volatility.

With datasets about the individual, robo advisors using AI could design a portfolio more tailored to the individual preferences, i.e. give a more customised advice.⁹⁸ Some commentators see the inclusion of AI and machine learning as the yet missing piece in the puzzle that will allow robo advisors to widely replace human advisors.⁹⁹ The idea behind this hypothesis is, as Adam Nash, the CEO of Wealthfront puts it: “actions speak louder than words”.¹⁰⁰ In other words, if the algorithm is capable of collecting and connecting all the necessary information of the customer by tracking her actual behaviour, it would then probably be in a much better position to provide a suitable investment advice than advice based on a personal conversation. Obviously, this could present an opportunity to overcome the problems associated with the use of a questionnaire that we described earlier. Also, big data in combination with AI could enable the robo advisor to offer a more comprehensive product to the customer and automate parts of the financial advice service that are to date reserved for human advisors.¹⁰¹ Access to that information about the customer regularly

⁹⁶ Definitions are broadly taken from the FSB Paper (n 83).

⁹⁷ See also Sviatoslav Rosov, in CFA article ‘Machine Learning, Artificial Intelligence and Robo-Advisers: The Future of Finance?’ (4 August 2017) CFA Institute Talk <<http://www.cityam.com/269679/machine-learning-artificial-intelligence-and-robo-advisers>>.

⁹⁸ See also FSB (n 83) 27.

⁹⁹ See for instance Michael Rozanski, ‘How AI will cause robo advice to completely outperform human advice’ (10 July 2017) <<http://fintechcircle.com/insights/ai-will-cause-robo-advice-completely-outperform-human-advice/>> or Patrick Hunger, ‘Was Robo-Advisors von der Automobilindustrie lernen können’ (16 September 2017) <<https://www.nzz.ch/wirtschaft/vermoegensverwaltung/was-robo-advisors-von-der-automobilindustrie-lernen-koennen-ld.1316075>>.

¹⁰⁰ Wealthfront is one major robo advisor in the US. The quote was taken from the following article: Ryan W Neal, ‘Wealthfront Turns to Artificial Intelligence to Improve Robo Advice’ (31 March 2016) <<http://www.wealthmanagement.com/technology/wealthfront-turns-artificial-intelligence-improve-robo-advice>>.

¹⁰¹ As described earlier, these parts largely consist of relationship management and coaching.

requires the consent of the customer as well as access by the company that initially collected and presently possess the data.¹⁰² In order to gain the customers consent, robo advisors could create certain incentives e.g. by giving a discount on advisory fees. Access to the data may be achieved by engaging in a cooperation with legacy financial institutions or major tech companies. This cooperation can create synergies and therefore be beneficial for both sides. However, it also gives those companies controlling the data a significant competitive advantage: They are able to block or limit small robo advisors' access to customer data, while (potentially) using it for their own services.¹⁰³ In the worst case, large financial institutions could choose to simply deny access to their data, however not with the objective of offering innovative services themselves, but to protect their traditional advice segment, i.e. preventing disruptive innovation. Aiming at removing the monopoly of financial institutions on their customers' data, the new EU Payment Services Directive PSD2¹⁰⁴ may bring significant improvements in that regard.

More customised portfolios could also have systemic implications: A higher degree of individuality could simultaneously result in less correlation with other portfolios.¹⁰⁵ This could further lead to greater diversity in market movements, i.e. potentially mitigating the above mentioned "herding risk". On the other hand, if machine learning prevails and more robo advisors adopt similar algorithms, it could also go the other way around.

Ultimately, feeding the algorithm with macroeconomic data could enable it to even anticipate market movements and the occurrence of shocks and to better estimate certain risks. As opposed to its human equivalent, a well-trained algorithm would not be susceptible to make hasty decisions when the market is moving in an unexpected way. Therefore it could be in a better position to handle such a situation. However, it may seem naïve to assume the algorithm could adequately predict and anticipate all kinds of market situations.¹⁰⁶ Since it is always "trained" on historical data, the threat is prevalent that it fails to anticipate utterly novel categories of risks.¹⁰⁷ Relying on the algorithm irrespectively may pose an idiosyncratic risk: Algorithms using machine learning develop their own dynamics, which can lead to the

¹⁰² The use of that kind of data may entail data privacy and information security issues, in parts also arising from the new data protection regulation GDPR, which is coming into force in May 2018. Those issues are however not in the scope of this paper.

¹⁰³ Regarding the relationship between banks and fintech on data, see also van Loo (n 62) 243f.

¹⁰⁴ Directive 2015/2366/EU 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 [2015] OJ L337/35.

¹⁰⁵ Similar implication made by the FSB (n 83).

¹⁰⁶ A comparable assumption is made by Helen Edwards and Dave Edwards, 'AI does not have enough experience to handle the next crash' (12 December 2017) <<https://qz.com/1151664/ai-does-not-have-enough-experience-to-handle-the-next-market-crash/>>.

¹⁰⁷ See also FSB (n 83) 34.

problem that commentators commonly refer to as ‘black boxes’ in decision making.¹⁰⁸ This describes a decision made by algorithm, which stakeholders, consumers or regulators find difficult or impossible to trace and understand. Such black box decisions pose difficult questions in relation to liability, auditability and – of course – regulation. Also, as a consequence of unpredictable and unexpected decisions, market movements may be ascribed to AI and interpretation of market shocks may therefore be hampered.¹⁰⁹

On balance, robo advice combines several important benefits, for consumer as well as for the financial market as a whole. However, a significant amount of risks are still unresolved, notably the risk for consumers in receiving unsuitable advice and the market risks of increasing volatility and potential flash crashes. In this regard, we may see some interesting developments with AI and machine learning in the future. Again, more data and time is necessary to form a comprehensive assessment of the phenomenon of robo advice. Thus, more research is needed: a strong focus on the regulatory side should be on the collection of data, insights, knowledge and resources that build a proper basis to support the potential, whilst mitigating risks.

D. Current regulatory situation

One of the foremost objectives of financial regulation is to improve the functioning of the financial system. To that end, regulators and legislatures have identified a number of common objectives along which a regulatory framework is developed. Among these are ensuring consumer protection, financial stability and (good) competition. Too much regulation on the other hand stifles innovation, competition, and ultimately economic growth. Therefore, the starting point of the discussion should still be “if it ain’t broke, don’t fix it”.¹¹⁰ By following a technology-neutral and proportionate approach, the regulatory framework in the EU seeks to achieve those principles in a dynamic way that is adaptable to new technologies.¹¹¹ The emergence of a new, potentially disruptive power in the market is a good opportunity to evaluate the rules in place and to reassess whether their underlying principles and objectives are still effectively achieved. Hence, this section seeks to examine if and how the current rules apply to robo advisors and what consequences they entail. In doing so, we seek to find

¹⁰⁸ See for example Rosov (n 97).

¹⁰⁹ FSB (n 83) 30.

¹¹⁰ Armour, Awrey and others (n 25) 51.

¹¹¹ See for example the respective clarification by ESMA in its Q&A on MiFID II (ESMA, ‘Questions and Answers On MiFID II and MiFIR market structures topics’ (18 December 2017) <https://www.esma.europa.eu/sites/default/files/library/esma70-872942901-38_qas_markets_structures_issues.pdf> 38).

an answer to the question of whether the current rules constitute an *unnecessary* burden for robo advisors.

At the EU level, regulatory standards that are relevant for robo advice are primarily within the Market in Financial Instruments Directive (MiFID) framework.¹¹² The original MiFID framework dates from 2004¹¹³ and was substantially revised with the implementation of MiFID II in national law in January 2018.¹¹⁴ The underlying purpose of the reform was to strengthen investor protection and to improve the functioning of financial markets making them more efficient, resilient and transparent.¹¹⁵ Further, the new regime is supposed to enhance powers of supervision and regulation authorities. Even though robo advice was barely a phenomenon at the time even when MiFID II Directive was negotiated,¹¹⁶ it generally applies to automated advice as well as to all other entities which qualify as investment firms under MiFID. To be designated as an investment firm within MiFID, the robo advisor must either perform *investment advice* or *portfolio management*.¹¹⁷ These requirements are “function-based”, and therefore apply to all kinds of entities that meet the respective requirements, irrespective of provision by a human or an algorithm.¹¹⁸

Investment advice in the meaning of the Directive is the provision of “personal recommendations to a client...” (Article 4(1) no 4)¹¹⁹, whereas portfolio management means “...managing portfolios in accordance with mandates given by clients on a discretionary client-by-client basis where such portfolios include one or more financial instruments” (Article 4(1) no. 8)). Firms that provide *investment advice* or *portfolio management*, whether automated or not, generally fall within the scope of the directive including all its corresponding obligations. An exception can be made under the propositions set out in

¹¹² Other eventually applicable EU directives or regulations are, for instance, CRD/CRR or GDPR, which are however not in the scope of this paper.

¹¹³ Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing Council Directive 93/22/EEC, [2004] OJ L145/1.

¹¹⁴ 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, [2014] OJ L173/349.

¹¹⁵ See for example <<https://www.esma.europa.eu/policy-rules/mifid-ii-and-mifir>>.

¹¹⁶ MiFID II was finalised in the beginning of 2014 and entered into force on 2 July. That was also the time when robo advice became increasingly widespread and accordingly drew the attention of lawmakers and regulators. The first time robo advice was explicitly mentioned was in the ESMA guidelines on MiFID II (n 66).

¹¹⁷ These are just the options that are relevant for robo advisors.

¹¹⁸ ESAs Report (n 72) 21. Also mentioned by Ferguson (n 2).

¹¹⁹ Further specified in Art. 9 (1) of Commission Delegated Regulation 2017/565 (supplementing MiFID II) as a recommendation “presented as suitable for that person, or [one that] shall be based on a consideration of the circumstances of that person”.

Article 3.¹²⁰ A firm meeting those propositions does not fall within the scope of the Directive and can be regulated by the domestic initiative. Whereas under MiFID I the regulation of firms meeting requirements of Article 3 was entirely within the responsibility of the national initiatives, MiFID II sets out new requirements, referred to as “analogue” requirements.¹²¹ According to these, firms that seek to avail themselves of the exemption of Article 3 are now subject to a comparable authorisation process and an obligation catalogue that applies to financial institutions. In the context of Article 3, the distinction between *investment advice* and *portfolio management* is an issue, since the exemption is only available for firms providing investment advice. Even more problematic though is the distinction between *investment advice* and the mere intermediation of investments. Since the latter is not regulated under MiFID, its regulation is mainly in the responsibility of the domestic legislature or regulator. As opposed to an investment advisor, the intermediary or agent simply receives and transfers orders from the investor, without giving a (personal) recommendation.¹²²

The application of MiFID involves some substantial legal obligations for regulated firms. First, firms must be authorised by the competent federal authority.¹²³ For that, they need to satisfy various requirements, for instance having a sufficient initial capital endowment. Further several conduct of business standards have to be met when providing the service. Those standards for example consist of obligations to provide information to the client about the firm and the service and to collect relevant information from the client in order to be able to give a suitable recommendation (*“suitability test”*).¹²⁴ The latter is considered to be one of the most important requirements for investor protection. Also, all necessary steps to prevent a conflict of interest have to be taken by the firm.¹²⁵ Since MiFID II came into force, robo advisors and other institutions see themselves confronted with additional regulatory burdens: the new law prescribes large amounts of information to be obtained about the client,¹²⁶ to be presented to the client¹²⁷ and to be documented.¹²⁸

¹²⁰ For example the firm is limited in the range of financial products it is allowed to recommend to the client.

¹²¹ MiFID II article 3(2) requires national regulation to be to be ‘at least analogous’ to the provisions in respect of authorisation and supervision, conduct of business and organisational requirements.

¹²² See Charlotte Baumanns, ‘Fintechs als Anlagenberater? Die aufsichtsrechtliche Einordnung von Robo-Advisory’ (2016) Zeitschrift für Bank- und Kapitalmarktrecht 366, 369ff., also providing further differentiations.

¹²³ MiFID II Article 5.

¹²⁴ MiFID II Article 25(2) and Articles 54 and 55 of the Commission Delegated Regulation 2017/565; see also ESAs Report (n 72) 11.

¹²⁵ MiFID II Article 23.

¹²⁶ E.g. information about the risk tolerance and the ability to bear losses (Article 25(2)).

¹²⁷ For instance, firms are now obliged to inform the client whether or not the advice is independent (Article 24(4) lit. a). They must further explain why their advice is qualified as independent or non-
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Despite the technology-neutral approach of EU regulation, one issue that seems to prevail among robo advisors is regulatory uncertainty.¹²⁹ Pre-defined categories and fine distinctions make it hard for new forms of financial advice to assess their regulatory situation. New innovative approaches or hybrid technologies may be hard to reconciled with those categories or to be categorised at all. First, firms seem to struggle with the distinction between investment advice and portfolio management and between investment advice and investment intermediation. While the first differentiation is especially relevant to the question of whether that firm is able to rely on the exemption of Article 3, the latter determines whether the firm is regulated under EU or domestic law. For instance, under German law, investment intermediation does not have to meet a suitability requirement or equivalent.¹³⁰ The uncertainty caused among robo advisors is obvious: A significant number of robo advisors in Germany claim to only intermediate financial products rather than provide advice. When applying the above mentioned criteria though, many of them seem to fall within the category of *investment adviser*.¹³¹

For firms who find themselves in a regulatory “grey zone”, the reaction of the respective authority regarding their regulatory obligations would be difficult to predict. Consequently, the more innovate a new method for financial advice is, the greater the regulatory uncertainty. A 2017 Discussion Paper by the European Banking Authority (EBA)¹³² seems to corroborate these arguments. The Discussion Paper entails the outcome of a mapping exercise, which EBA undertook to gain better insight into the spectrum of fintech firms in the EU and corresponding services and their respective regulatory treatment. As a

independent by clarifying the differences (further specified in Article 52(3) of the Implementing Directive).

¹²⁸ Under Article 25(6) a suitability report has to be conducted and made available for the client (generally) prior to the transaction.

¹²⁹ See ESAs Report (n 72) 18f.; Mark Battersby, ‘Regulatory uncertainty frustrates pace of robo-advice growth’ (15 October 2015) <<http://www.international-adviser.com/news/1025395/regulatory-uncertainty-frustrates-pace-robo-advice-growth>>; Gregor Dorfleitner and Lars Hornuf, *The Fintech Market in Germany – Final Report for the German Finance Ministry* (17 October 2016) <http://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Topics/International_affairs/Articles/2016-12-13-study-fintech-market-in-germany.pdf>; referring to new technologies in the financial sector in general, see e.g. European Financial Services Round Table, ‘EFR Paper on Regulatory Sandboxes’ (September 2016) <<http://www.eur-fr.be/documents/news/99.2.%20EFR%20paper%20on%20Regulatory%20Sandboxes%2029.09.2016.pdf>>.

¹³⁰ See also for further differences between those categories in German law: Florian Möslin and Arne Lordt, ‘Rechtsfragen des Robo-Advice’ (2017) *Zeitschrift für Wirtschaftsrecht*, 793, 794ff.; Baumanns (n 122).

¹³¹ Baumanns (n 122).

¹³² EBA, ‘Discussion Paper on EBA’s approach to financial technology (FinTech)’ (4 August 2017), <<https://www.eba.europa.eu/documents/10180/1919160/EBA+Discussion+Paper+on+Fintech+%28EB+A-DP-2017-02%29.pdf>>.

part of this exercise, EBA examined how a sample of firms applying a particular service is regulated and, if so, pursuant to which regime (national or EU). In the case of robo advice, the data show that out of the sample¹³³ of robo advisors 35% are under no regulatory regime, whereas 41% are regulated under EU law and 24% under a national regime.¹³⁴ Firstly, considering that the common robo advisor (as described in Section II.A.) is supposed to be regulated by MiFID¹³⁵, the relatively high number of unregulated robo advisors seems striking. A service that is not regulated at all may bear uncovered risks and ultimately harm consumers. Secondly, the data implies that those firms being subject to different regulatory treatment often apply the same service. This indicates that there are most likely divergences in the treatment of robo advisors across the EU. A related example (dealing with the allowance of video identification for fund management companies) is provided by Dirk Zetsche and others¹³⁶ who explain that in one instance the German BaFin and the Luxembourgish market authority CSSF read the same rule¹³⁷ in a completely different way, resulting in varying regulatory treatment for the same service. Similar concerns were raised within the responses to the European Commission's Consultation Paper on fintech.¹³⁸ Given the fact that the regulatory framework is widely harmonised by EU law, this indicates that there is also substantial uncertainty among regulators regarding the application of current regulation to new technologies. This not only runs contrary to the regulatory objectives of consumer protection and preserving financial stability, it also adversely affects innovation. In order to establish regulatory certainty among firms and investors, consistency and predictability in application of rules is predominating objective. Therefore uncertainty on the side of regulators necessarily intensifies the uncertainty among regulated firms.

The effects of high regulatory uncertainty are manifold: First of all, it constitutes a substantial market barrier for potential market entrants. The fear of being sanctioned when

¹³³ EBA worked with a sample of 282 FinTechs in total from which 11 were providing robo advice, see on pages 16,22, 24.

¹³⁴ It will be interesting to see how the share of robo advisors regulated under a national regime will develop against the background that the exemption of Article 3 became much less attractive in the course of MiFID II.

¹³⁵ Meaning here regulated under Mifid directly or by the national regime, using the exemption under Article 3 of MiFID.

¹³⁶ Dirk A Zetsche, Ross P Buckley, Janos N Barberis, Douglas W Arner, 'Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation' (2017) 23 Fordham Journal of Corporate & Financial Law 31, 43.

¹³⁷ The German and Luxembourgish rules both rest upon the same EU rule.

¹³⁸ European Commission, Detailed summary of individual responses to the 'Public Consultation on Fintech: a more competitive and innovative European financial sector' (– CP on Fintech: a more competitive and innovative European financial sector - Responses (2017) <https://ec.europa.eu/info/sites/info/files/2017-fintech-summary-of-responses-annex_en.pdf> 42.

introducing a new technology to the market or being forced to end the business may lead fintechs to be cautious with innovation and may prevent them from entering the market in the first place. Evidence from other areas suggests that time-to-market can be increased by about a third in this way, at a cost of about 7 or 8% of product lifetime revenue.¹³⁹

Regulatory uncertainty also creates a barrier for (potential) investors¹⁴⁰ as they try to factor in risk which, under those circumstances, they are not well placed to assess.¹⁴¹ In other words, investing in a fintech that has not yet been approved to conduct business, bears great risks. There is evidence from another sector, the pharma industry, that valuations may be reduced by 15% due to regulatory uncertainty.¹⁴² And this does not include cases of firms failing to raise any funding at all. Thus, under regulatory uncertainty it becomes hard for firms to raise fresh capital, what ultimately means a drag for innovation.

The inconsistent application of regulation (or deviations in domestic regulation) mentioned above can additionally lead to regulatory arbitrage. Robo advisors may shop for the jurisdiction whose regulatory system or enforcement appears more favourable to them, potentially causing the well-known “race to the bottom” as a result of regulatory competition.¹⁴³ This might simultaneously bare risks for consumers, because the service might not be properly evaluated by the respective authority. Moreover, diverging, inconsistent and unclear application of regulation can cause confusion among consumers who under which circumstances is responsible in case of detriment. As we have noted above, the creation of trust and confidence in the service of robo advisors is crucial for their future development.¹⁴⁴ Regulation plays a key role in that regard. Good regulation functions as a seal of approval in the sense that the consumer can make use of that product without having to worry about hidden risks. Uncertainty on the other hand signals the opposite: It gives the consumer grounds to doubt the regulators’ expertise and as a consequence may become overcautious in regard of new products and services. Against that backdrop uncertainty on the side of regulators as well as firms is a major risk for the development of robo advice and fintech in general and needs to be addressed by the regulator.

¹³⁹ Ariel D Stern, ‘Innovation under regulatory uncertainty: Evidence from medical technology’ (2017) 145 Journal of Public Economics 181, 189.

¹⁴⁰ Hereby referring to investors for firms (i.e. robo advisors).

¹⁴¹ See FCA, ‘Regulatory Sandbox’ (November 2015) <<https://www.fca.org.uk/publication/research/regulatory-sandbox.pdf>> 5.

¹⁴² See Deloitte, ‘A challenging future for biopharmaceutical innovation’, (2014) <<https://www2.deloitte.com/content/dam/Deloitte/us/Documents/life-sciences-health-care/us-lshc-biopharmaceutical-innovation-in-the-face-of-uncertainty.pdf>>.

¹⁴³ WG Ringe, ‘Regulatory Competition in Global Financial Markets – The Case for a Special Resolution Regime’ (2016) 1 Annals of Corporate Governance 175.

¹⁴⁴ See Sec. II.C.

Aside from regulatory uncertainty, another main obstacle of the current framework appears to be licencing requirements.¹⁴⁵ As stated above, to receive a regular license, among other things an initial capital endowment is required, as specified in the Capital Requirements Regulation and the Capital Requirements Directive IV.¹⁴⁶ Especially for small fintechs constantly struggling to find investors and to raise capital, this poses a considerable barrier to enter the market.

As a consequence of this, many robo advisors sought the option that was provided by MiFID I Article 3.¹⁴⁷ Although this exemption seemed to be a good opportunity to enter the market without having to run through the strict authorisation process as a whole, most of its attractiveness vanished when taking a closer look at its propositions – even when considering just those that were set out in MiFID I: First, its only availability for firms providing “financial advice” was an obstacle due to its blurry distinction from portfolio management that has been described above. Secondly, limitations on the firms’ activities (e.g. restrictions in regard of recommended financial products, cooperated institutions) were constraints on the commercial freedom and chilled incentives for innovation. Thirdly, firms using the exemption were not able to utilise a major benefit that comes along with being governed by MiFID, which is the use of the ‘passport’. Those rules have now been tightened further under MiFID II (see above), meaning that the exemption under Article 3 is more an “empty shell” than a considerable opportunity for robo advisors in the long term. In contrast, robo advisors that had been regulated under a national regime (due to Article 3), are as of January 2018 subject to a significantly higher regulatory scrutiny. For some of them this means an increase in regulatory requirements that they are unable to cope with.

Furthermore, although said to be technology-neutral, many EU rules are obviously written with the leitmotif of human interaction in mind. For example, certain provisions appear to require paper disclosure, handwritten signatures or physical presence.¹⁴⁸ Provisions as such are an obstacle for the digitalisation of financial services.

With regard to consumer protection, the regulation generally applicable to financial advice primarily relies on the suitability requirement, the prevention of conflicts of interest and the education of the customer by obliging the firms to provide a stack of information. Ensuring the quality of the advice, the suitability requirement certainly has its justification and

¹⁴⁵ As shown above, out of the EBA sample, 65% of all robo advisors have an authorisation.

¹⁴⁶ See MiFID II Article 15, which refers to Regulation (EU) No. 575/2013 (Capital Requirements Regulation).

¹⁴⁷ See for example Jürgen App, ‘Regulation von Fintech’ (22 April 2016) <<http://private-banker.online/news/die-app-kolumne.html>> showing that half of robo-advisors (from his sample) are regulated under the German GewO, which is mainly the domestic regime for those robo advisors that prevail the exemption of article 3 MiFID.

¹⁴⁸ Commission Responses (n 138) 39.

is considered to be as one of the most important requirements for investor protection. Just recently, the European Securities and Markets Authority (ESMA) comprehensively adjusted its guidelines on the suitability requirement to robo advisors and initiated a consultation on this issue.¹⁴⁹ Despite this, it remains an open question whether the particular recommendation of a robo meets the suitability requirement in a sense that it comprehensively takes into account the individual situation of the customer.¹⁵⁰

Promoting education and preventing conflicts of interest through disclosure obligations is generally desirable since informed customers are more likely able to identify malfunctioning products and effective competition. Enhancing disclosure and transparency obligations is a common way to promote consumer education.¹⁵¹ Looking specifically at robo advice, automatised and standardisation of the advice process simplify the collection and provision of the necessary information. Therefore, it could be argued that the more information is disclosed, the better placed the consumer is in understanding and answering the questionnaire.

On the other hand, the online-setting paired with the simplification of the advice process might bare a new risk: in exceeding a certain quantity of information, customers might not read them at all. There are studies showing that especially in an online-setting, people tend to “skip and skim” information¹⁵² inter alia due to losing concentration.¹⁵³ Thus, important information presented in order to improve the consumers’ understanding of the service, may be dismissed as “legal small print” without the presence of a person who can endorse the importance of certain information.¹⁵⁴ The chance of information getting skipped increases with the amount of information provided. Thus counterproductively, the more information is provided, the higher the risk of unsuitability due to the lack of knowledge. Also, there is evidence that the design of information has a huge influence on the probability of it being read.¹⁵⁵ Hence the focus of regulation should not only lie on if and what kind of

¹⁴⁹ See ESMA Guidelines (n 66).

¹⁵⁰ Concerns may arise against the backdrop of the above mentioned (see section II) limits of the questionnaire and available portfolio compositions. A related discussion about robo advice their ability to act in the clients’ best interest is currently ongoing in the US, see for instance Melanie L Fein, ‘Are Robo-Advisors Fiduciaries?’ (September 2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3028268>.

¹⁵¹ E.g. Baker and Dallaert (n 3) 728, 731.

¹⁵² Salo and Haapio (n 66) 442; Also EBA (n 132) (Proposing e.g. a “time-lag” between provision of information and continuing, videos or quizzes on page 50); ESAs DP (n 70) 22, 28.

¹⁵³ See Kaya (n 5) 3; A recent study documented that visitors of a website had a dwell time on average before leaving the website, 80% had a dwell time of less than 100 seconds (see Nicola Barbieri, Fabrizio Silvestri, Mounia Lalmas, ‘Improving Post-Click User’s Engagement on Native Ads via Survival Analysis’ in Proceedings of the World Wide Web Conference (2016) 761ff.

¹⁵⁴ ESAs DP (n 70) 22.

¹⁵⁵ Salo and Haapio (n 66) 448ff. with further references.

information are being provided, but also on the (genuinely) necessary amount and especially how they are provided.

In sum, even though the present regulatory framework at the EU includes rules that formally apply to robo advice, they cause a number of concerns. Since those problems are (to this date) localised in the application rather than in the (hard) “wording” of the law, we argue in what follows in favour of a “soft” measure that provides regulators with some flexibility and facilitates the exchange of knowledge in order to stabilise the application of the regulatory framework.

III. Regulatory Sandbox and Trajectory

After exploring the merits of the phenomenon of robo advice and evaluating the current regulatory situation, we find ourselves in a difficult position: Whilst the assessment of the development has turned out to be ambiguous, with great expectations on the one, but also alarming risks on the other side, the evaluation of the regulatory framework has revealed not only substantial shortcomings in addressing certain risks, but also high market barriers for new entrants. This uncertainty makes it seem premature to take a definitive stance that is either to heavily regulate robo advice due to its presumable risks or to ultimately remove regulatory impediments in order to fuel the development. Meanwhile, the status quo is unsatisfactory in that it creates unnecessary high market barriers for market entrants and investors, stifling innovation and economic growth.

Against that backdrop we seek to find a dynamic solution that addresses the shortcomings of the current regulatory situation, while also ensuring consumer protection and simultaneously engaging with the phenomenon to develop the necessary expertise to review existing regulation and adjust it as appropriate.

The following section proposes a “regulatory sandbox” to facilitate this. We argue that a sandbox is at this stage the optimal solution since it fuels the development, addresses a major part of the shortcomings of the current regulatory framework and simultaneously ensures consumer protection. No less importantly: it facilitates a mutual “learning process” that on the one hand allows regulators to better assess the risks that are connected with robo advice, while on the other hand enables robo advisors to benefit from the regulator’s expertise in applying the regulatory framework.

This section is structured as follows: First, we explain what a “regulatory sandbox” is and describe its underlying principles. Subsequently we give a brief overview of existing implementations of regulatory sandboxes. Then, after showing the general benefits of the principle, we apply those benefits to the situation of robo advisors and demonstrate how it can provide an adequate solution to the questions posed above. Ultimately, we will address the disadvantages of regulatory sandboxing and conclude that we consider it not the ultimate objective, but rather a good and necessary first step towards an improved future regulatory framework.

A. Description and General Principle

A good starting point of what the principle of a sandbox is can be derived from its name. A safe playground to experiment, collect experiences and play without having to face the strict rules of the “real world”. Whereas the sand of an actual sandbox ensures the prevention of harm while playing, certain consumer safeguards are established to fulfil that task for its regulatory counterpart. Meanwhile clear entry and exit requirements as well as a pre-defined scope display the borders of the box.

Recently this concept has been applied in several (non-financial) areas. A “sandbox” for programmers was established, where potentially unsafe codes could be run and studied. Due to the sandbox, problems were not able to spread across the borderlines of the sandbox and infect the entire system.¹⁵⁶ The term “sandbox” is also used in medicine where it refers to clinical trials for new methods of treatment. That is, a drug is being tested on a limited and specified group of patients to evaluate its effect before becoming authorised for the market. Each of those and other “sandbox” analogies have in common that before an (innovative) product is being put on the market, it is tested in a safe environment, where the potential harm is strongly limited and cannot break out of the box to cause widespread damage.

The sandbox as it is used in this paper is a regulatory tool that has been explored and tested by various jurisdictions lately. In the financial sector it – irrespective of its specific implementation – refers to a controlled space in which businesses can test and validate innovative products, services and business models and delivery mechanisms with the support of an authority for a limited period of time.¹⁵⁷ The risk of harm for consumers is

¹⁵⁶ For a description of a sandbox in programming, see for example Chris Hoffmann, ‘Sandboxes Explained: How They’re Already Protecting You and How To Sandbox Any Program’ (2 August 2013) <<https://www.howtogeek.com/169139/sandboxes-explained-how-theyre-already-protecting-you-and-how-to-sandbox-any-program/>>.

¹⁵⁷ Same definition used by EBA (EBA’s Approach on fintech).

limited through special safeguards, and regulations which normally occur when conducting the respective service are significantly reduced.

B. Existing Forms of Regulatory Sandboxes]

As of March 2018, there are currently 17 sandboxes in operation worldwide, plus several ones announced with two already having draft bills in the legislative process.¹⁵⁸ Jurisdictions having a regulatory sandbox established are¹⁵⁹: UK (4/2016)¹⁶⁰, Hong Kong (9/2016)¹⁶¹, Malaysia (10/2016)¹⁶², Singapore (11/2016)¹⁶³, Abu Dhabi (11/2016)¹⁶⁴, Australia (12/2016)¹⁶⁵, Mauritius (1/2017)¹⁶⁶, Netherlands (1/2017)¹⁶⁷, Indonesia (1 and 7/2017)¹⁶⁸, Brunei-Darussalam (2/2017)¹⁶⁹, Canada (2/2017)¹⁷⁰, Thailand (3/2017)¹⁷¹, Bahrain (6/2017)¹⁷², Switzerland (8/2017)¹⁷³, Saudi Arabia (01/2018)¹⁷⁴, Denmark (02/2018)¹⁷⁵, and the state of Arizona (US) (03/2018)¹⁷⁶.

¹⁵⁸ For a comprehensive overview, see Zetsche and others (n 136) 64ff.

¹⁵⁹ With the date of the initial launch in brackets.

¹⁶⁰ <<https://www.fca.org.uk/firms/regulatory-sandbox>>.

¹⁶¹ <<http://www.hkma.gov.hk/eng/key-functions/international-financial-centre/fintech-supervisory-sandbox.shtml>>.

¹⁶² <http://www.bnm.gov.my/index.php?ch=en_announcement&pg=en_announcement&ac=467>.

¹⁶³ <<http://www.mas.gov.sg/Singapore-Financial-Centre/Smart-Financial-Centre/FinTech-Regulatory-Sandbox.aspx>>.

¹⁶⁴ <<http://fintech.adgm.com/regulatory-laboratory/>>.

¹⁶⁵ <<http://asic.gov.au/for-business/your-business/innovation-hub/regulatory-sandbox/>>.

¹⁶⁶ <<http://www.investmauritius.com/schemes/rsl.aspx>>.

¹⁶⁷ <<https://www.dnb.nl/en/supervision/innovationhub/maatwerk-voor-innovatie-regulatory-sandbox/index.jsp>>.

¹⁶⁸ See press release: <http://www.bi.go.id/en/ruang-media/siaran-pers/Pages/sp_187316.aspx>.

¹⁶⁹ <<http://www.ambd.gov.bn/fintech-office>>.

¹⁷⁰ <https://www.securities-administrators.ca/industry_resources.aspx?id=1588>.

¹⁷¹ For Thailand's experiences with regulatory sandboxing, see <https://www.nbc.org.kh/download_files/others/4_Sandbox_cambodia_05_05_AS_170508.pdf>; A description can be found at Baker McKenzie, 'Thailand: The FinTech wave and regulatory response' (3 August 2017) <<http://financialinstitutions.bakermckenzie.com/2017/08/03/thailand-the-fintech-wave-and-regulatory-response/>>.

¹⁷² <http://www.cbb.gov.bh/page-p-regulatory_sandbox_en.htm>.

¹⁷³ See press release in German at <<https://www.admin.ch/gov/de/start/dokumentation/medienmitteilungen.msg-id-67436.html>> or announcement at <<https://www.finma.ch/en/news/2016/03/20160317-mm-fintech/>>.

¹⁷⁴ The Saudi Arabian sandbox has a very limited scope and is only available for securities activities. See CMA, 'Financial Technology Experimental Permit Instructions' (2018), available at: <https://cma.org.sa/en/RulesRegulations/Regulations/Documents/FinTech_en.pdf>

¹⁷⁵ See press release at: <<https://finanstilsynet.dk/en/Nyheder-og-Presse/Pressemeddelelser/2018/FTLab-06022018>>. More information on the sandbox criteria and purpose can be found here: <<https://www.finanstilsynet.dk/en/Tilsyn/Information-om-udvalgte-tilsynsomraader/Fintech/FT-Lab>>.

¹⁷⁶ Corresponding press release available at: <<https://www.azag.gov/press-release/arizona-becomes-first-state-us-offer-fintech-regulatory-sandbox>>.

While the heterogeneity that can clearly be observed within the enumeration of countries is also evident in their implementations of the respective sandbox, they share common policy objectives particularly consumer and investor protection, market integrity, financial inclusion and promoting innovation and competition.¹⁷⁷ In the following we describe common parameters that these sandboxes entail – although they differ in their implementation.¹⁷⁸

1. Entry conditions: Each regulator defines certain requirements to determine which firm should be granted access to the sandbox. Hereby, aspects usually of importance are: An innovation test, its effect on market stability, individual need for participation (i.e. regulatory burden on the regular market) and some specific safety requirements that needs to be met by the potential participant.¹⁷⁹ The British Financial Conduct Authority (FCA) for instance publishes a list of eligibility criteria for the upcoming cohort.¹⁸⁰ Interested firms have to explain how they meet those criteria within the application form. Also the scope of firms that sandboxes potentially cover varies strongly. There are sectoral restrictions that are for instance based on the scope of the respective regulation authority. That means for example that Hong Kong's sandbox which was established by the HKMA is limited to the scope of its regulatory authority, that is banks and banking authorities. The Dutch as well as the UK sandbox on the other hand have no sectoral restrictions. In case of the Dutch sandbox, this is achieved by a cooperation between the Dutch National Bank (DNB) and the Dutch Financial Market Authority AFM (together supervising all financial institution under the so called "Twin Peaks" model). Differences in scope of the sandboxes can further be observed regarding the treatment of existing regulated entities. While most sandboxes are open for regulated as well as unregulated entities, some regulators refuse entry to regulated entities, therefore solely supporting unlicensed firms, which are mostly start-ups.¹⁸¹ Furthermore, the sandbox is usually limited to a certain number of participants.¹⁸² For example, cohort 2 of the FCA's sandbox consisted of 24 participants.¹⁸³

¹⁷⁷ FSB (n 4) 4f.

¹⁷⁸ The following enumeration is neither definite nor claims to be exhaustive. A comparable categorization is used by Zetsche and others (n 136) 69ff.

¹⁷⁹ For consumer safeguard standards of the FCA's sandbox, see FCA, 'Default standards for sandbox testing parameters' <<https://www.fca.org.uk/publication/policy/default-standards-for-sandbox-testing-parameters.pdf>>.

¹⁸⁰ See <<https://www.fca.org.uk/firms/regulatory-sandbox/prepare-application>>.

¹⁸¹ For a brief description, see Zetsche and others (n 136) 73.

¹⁸² The Australian sandbox however has no limitation on participants.

¹⁸³ See <<https://www.fca.org.uk/firms/regulatory-sandbox/cohort-2>>.

2. Consumer protection/safeguards: There are numerous approaches that are taken to protect customers that participate in the sandbox testing. The FCA for example ensures customer protection on a case-by-case basis with the following standards:¹⁸⁴

- *“retail customers – this type of customer should not bear the risks of sandbox testing, thus, they should always have the right to complain to the firm, then to Financial Ombudsman Service and have access to the Financial Services Compensation Scheme (FSCS), if a firm fails;”*
- *“sophisticated customers – depending on the specifics of the trial, and if legally possible, we could consider tests that only engage with sophisticated customers who have consented to limiting their claim for compensation;”*
- *“Additional safeguards – depending on the size, scale and risks from the trial, additional safeguards may be necessary, e.g. disclosure about being involved in a sandbox test to retail customers.”*

In the case of robo advice an “additional safeguard” was established, which in most cases comprised of the duty for the firm to include qualified financial advisers checking the automated advice outputs generated by the underlying algorithms in order to avoid unsuitable advice.¹⁸⁵

The Australian Securities and Investments Commission (ASIC) on the other hand – apart from compensation arrangements and disclosure obligations – additionally set up a number of limitations for eligible participants.¹⁸⁶

- The company provides services to no more than 100 retail clients;
- The maximum exposure limit for each client is 10,000 AUD;
- And the total exposure of all clients is less than 5 million AUD.

There are numerous other restrictions that regulators are able to impose for security reasons. The application of those measures often lies in the discretion of the authority. Usually the number or intensity of restriction increases with number of retail clients or the focus of the firm¹⁸⁷.

¹⁸⁴ FCA, Default standards (n 179).

¹⁸⁵ FCA, *Regulatory sandbox Lessons Learned Report* (October 2017) <<https://www.fca.org.uk/publication/research-and-data/regulatory-sandbox-lessons-learned-report.pdf>>

¹⁸⁶ See ASIC, ‘Further measures to facilitate innovation in financial services’ (June 2016) Consultation Paper 260 <<http://download.asic.gov.au/media/3889025/cp260-published-08-june-2016.pdf>> 28f.; for further differences between the FCA and the ASIC sandbox, see e.g. Banking Stakeholder Group, ‘Regulatory Sandboxes’, Proposal to the EBA (20 July 2017) <https://www.eba.europa.eu/documents/10180/807776/BSG+Paper+on+Regulatory+Sandboxes_20+July+2017.pdf>.

¹⁸⁷ Zetsche and others (n 136) 75.

3. Timeframe of sandboxing: The testing period for participating firms is in most cases limited to either a standard duration (typically 6 to 12 months) or an individual duration, set on a case-by-case basis.¹⁸⁸ Some sandboxes though are more dynamic and not strictly limited to a specific period.¹⁸⁹ Naturally, the duration is less strictly limited in sandboxes that already have a strict functional limitation (such as limits on number of customers or a transaction threshold).

4. Relaxation of regulatory burden: When looking at the core competence of the sandbox, namely the relief of regulatory requirements that normally need to be met, a variety of different approaches can be observed. Most authorities do not specify what exact requirements may be waived and which may not. Albeit varying in detail, almost all have in common that they aim at reducing unnecessary authorisation requirements and other regulatory burdens, with a special emphasis on *unnecessary*.¹⁹⁰ It is true that certain rules can be deemed as unnecessary where a specific (formal) requirement is not met by the firm, but its underlying purpose is. Furthermore, a legal rule may apply to firm, even though the risk that the rule is intended to mitigate does not exist in that case. Instruments for achieving that purpose are for instance “No enforcement action letters”, waivers or modifications, alternative interpretation of rules and – and no less important – individual guidance. Also some sandboxes, including the Dutch and the UK versions, offer restrict licences for unregulated firms.

Particular considerations apply in the EU context. As opposed to completely sovereign jurisdictions, EU Member States are limited in their ability to waive regulatory requirements since many elements of the legal framework stem from the EU level.¹⁹¹ Put differently, EU legislation restricts the flexibility of national supervisors and sandboxes in that the national level is not allowed to waive rules stemming from EU legislation. In that regard, the Dutch AFM and DNB outline a hierarchy for the possible scope of a sandbox.¹⁹² They state that supervisors have most room for sandboxing in terms of their own policies, followed by policies set by the European Supervisory Authorities (ESAs), where “supervisors may

¹⁸⁸ See for instance the Sandbox in Singapore: <<http://www.mas.gov.sg/~media/Smart%20Financial%20Centre/Sandbox/FinTech%20Regulatory%20Sandbox%20Guidelines.pdf>>.

¹⁸⁹ E.g. the proposal for the Swiss Sandbox is not limited timewise.

¹⁹⁰ In the Australian sandbox though, under its fintech licencing exemption all requirements regard the authorisation are waived, without a case-by-case analysis on their “unnecessity”.

¹⁹¹ See e.g. the apparent constraints of the Dutch authorities: AFM, DNB, ‘More Room for innovation in the financial sector’ (December 2016) <https://www.dnb.nl/en/binaries/More%20room%20for%20innovation%20in%20the%20financial%20sector_tcm47-350715.pdf> or those of the FCA (n 141).

¹⁹² AFM, DNB (n 191).

deviate from the guidance, or interpretation or impose it in a different way, always providing they are able to demonstrate that legal and regulatory aims are being met in an alternative fashion". In terms of national legislation, supervisors may offer tailored arrangements where the law offers scope or room for interpretation. The possible sandbox scope in regard of implemented EU laws is narrow, offering tailored options only where the legislation explicitly provides scope to do so.¹⁹³ This may explain that the Danish sandbox seems to focus on the clarification of rules and licencing requirements.¹⁹⁴ Other regulators (without sandboxes) even claim to not be authorised to promote individual treatment at all.¹⁹⁵ In those cases, preceding actions by the legislature would be necessary to pave the way for a regulatory sandbox.

5. Exit: In most sandboxes, participants must provide an "exit strategy" as part of their application. The purpose of this requirement is to minimise the potential detriment to participating consumers, and it can therefore be partly understood as an investor protection device. Another aspect regarding the exit from the sandbox is that there are typically specific grounds on which the regulator may remove the privilege, hence withdraw a firm from the sandbox.¹⁹⁶ Reasons for such an exit may be non-compliance with rules and misconduct or simply the non-achievement of the sandboxes purpose.

What we can observe from the discussion above is that there is a common ground in regard of underlying principles of sandboxes across all jurisdictions, while the specific implementation varies. Since the sandboxing phenomenon is still in its infancy, there is not yet much data on the efficacy of different varying approaches. Therefore, to date, it is not feasible to properly evaluate the respective effects of each respective design and – on that ground – prefer one approach over another. Against this backdrop, a diversity of approaches should be highly appreciated as the best way to find the most appropriate approach is still through experimentation.

C. General Benefits of a Regulatory Sandbox

¹⁹³ *ibid.*

¹⁹⁴ See <<https://finansstilsynet.dk/en/Tilsyn/Information-om-udvalgte-tilsynsomraader/Fintech/FT-Lab>>.

¹⁹⁵ For example Felix Hufeld, president of the German Financial Supervisory Authority BaFin in a speech at BaFin's 2016 New Year press reception (available in German at: <https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Reden/re_160112_neujahrspresseempfang_p.html>).

¹⁹⁶ E.g. see ASIC, 'Testing fintech products and services without holding an AFS or credit licence' (August 2017) Regulatory Guide 257.54 <<http://download.asic.gov.au/media/4420907/rg257-published-23-august-2017.pdf>>, p. 16 or DNB, AFM (n 191), section 4.

The first and probably most apparent benefit of a sandbox is the reduced time-to-market-cycle, lowering the corresponding market barrier: In tightly regulated areas, just like the financial sector, firms must meet a list of propositions to conduct their business. This prolongs the development phase, while conversely delaying the start of the business, from which point investments that were undertaken during development phase can be amortised. This ultimately raises the stakes for young firms. Besides, high regulatory market barriers are a common incentive for arbitrage activities in order to circumvent the overwhelming requirements. Discovering and sanctioning those activities is laborious and resource-intensive.

A regulatory sandbox can address these problems: It reduces time-to-market-cycle by reducing the regulatory burden and the uncertainty within a safe space for innovation. Hereby firms can usually already determine whether their new product is worth to be put on the regular market or not. Also reducing the time-to-market-cycle mitigates the risk for firms that their (innovative) business model is copied by a competitor with deeper pockets during a long authorisation process.

The second and maybe even more important benefit of a regulatory sandbox is the implementation of an “institutionalised” dialogue between the regulator and firms. This dialogue enhances a mutual learning process that strongly benefits both sides, regulators and regulated firms.¹⁹⁷ New, potentially disruptive technologies emerge on the market, and the authorities need to assess the risks as soon as possible and decide whether the incumbent rules are suited to those risks or may rather be an unnecessary burden. As we simply lack the ability to predict negative consequences that may be associated with a new technology in advance, the task of establishing facts and data on its effects should always be the starting point.¹⁹⁸ Gathering information and creating an in-depth knowledge of the new phenomenon is therefore always the logical and necessary first step to address that question.¹⁹⁹ In this regard, digitalisation bares huge potential, as almost every part of the respective process is automatically being saved in the provider’s system. Ideally regulators (in cooperation with the legislature) will then be in the position to adequately react to risks before they even materialise, instead of making exaggerated regulatory changes after materialisation. New firms on the other hand struggle to comply with the burdensome

¹⁹⁷ Also, this purpose is explicitly outlined for example by the Danish FSA in regard of their sandbox (see <<https://finansstilsynet.dk/en/Tilsyn/Information-om-udvalgte-tilsynsomraader/Fintech/FT-Lab>>).

¹⁹⁸ See also Mark Fenwick, Wulf A Kaal, Erik PM Vermeulen, ‘Regulation Tomorrow What Happens When Technology is Faster than the Law’ (2017) 6 American University Business Law Review 561.

¹⁹⁹ See also Fenwick et al. (n 198); Baker and Dallaert (n 3) 745f.; European Parliament, ‘Report on FinTech: the influence of technology on the future of the financial sector’ (2016/2243(INI)) <<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A8-2017-0176+0+DOC+XML+V0//EN>>.

regulatory authorisation process and obligation catalogue that may be difficult to match for new technology. Not least, an early-stage, mutually beneficial dialogue serves as a good basis for further cooperation, ideally creating a private sector culture of compliance.²⁰⁰ Regulatory inertia on the other hand can stifle innovation by reinforcing the status quo, but also (alternatively) leads to regulatory under-inclusiveness, allowing new emerging technologies to operate unchecked,²⁰¹ either way resulting in an adverse situation for consumers.

Adding the instruments of the sandbox²⁰² to that dialogue, the sandbox is able to reduce a large portion of regulatory uncertainty that is commonly prevalent among providers of new technology. More than that: Within the sandbox, the regulator provides clear, suitable and appropriate (and eased) regulatory requirements for the firms, which might not only eliminate constraints for firms, but even encourage them to experiment within that (normally) legally uncertain “grey zone”.

Reducing the above mentioned market barriers therefore holds the promise of fuelling innovation by incentivising experimentation with new technologies. This incentive becomes even stronger considering the positive signalling effect a sandbox creates through communicating regulatory flexibility and open-mindedness towards new technologies and innovative firms. This effect can already be observed in the UK: The FCA sandbox has been credited with contributing to London becoming the foremost fintech hub in the world.²⁰³ Strengthening innovative forces can ultimately lead to more competition and put pressure on incumbents, which may be especially desirable in high concentrated industries.

Zetsche and others furthermore point out positive external effects regulatory sandboxes could entail.²⁰⁴ First, it could incentivise incumbent firms to accelerate their digitalisation process. Second, it could boost regulatory competition among jurisdictions as to which one is to become the pre-eminent fintech hub.²⁰⁵

D. A Sandbox for Robos

²⁰⁰ See also Hillary Allen, ‘A US Regulatory Sandbox?’ (Draft from 23 October 2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3056993> 44f.

²⁰¹ See Lev Bromberg, Andrew Godwin and Ian Ramsay, ‘Fintech Sandboxes: Achieving a Balance between Regulation and Innovation’ (2017) 28 *Journal of Banking Law and Finance Practice* 314, 327.

²⁰² See section III.

²⁰³ See Allen (n 200) with further references on page 2.

²⁰⁴ Zetsche and others (n 136) 78.

²⁰⁵ For desirable effects of regulatory competition, see Ringe (n 143).

After demonstrating the problems of the current regulatory framework for robo advisors and displaying the benefits of regulatory sandboxes in general, we now put those two things in context to each other and show how a regulatory sandbox addresses the majority of those problems, while avoiding premature changes in “hard law” regulation. Many of the identified problems are directly addressed through the sandbox; for some, however, a ready solution is not immediately at hand. Nevertheless, even those are addressed in an indirect way, since the established dialogue and the corresponding learning-process build up the grounds for adequately addressing those problems in the future.

1. How a sandbox benefits robo advisors. The most prevalent market barrier that has been identified in section II.D. appears to be the regulatory uncertainty that exists among robo advisors. This uncertainty is mainly a result of the confusion in applying MiFID obligations to robo advice firms and blurry, unfitting distinctions between financial advice, portfolio management and other categories.²⁰⁶ This, in addition to the lack of regulatory expertise of start-up firms, turns the certainty a regulatory sandbox is able to provide into one of its key attractions. Before beginning to test in the sandbox, every participant is provided with the exact game rules, exact instructions, therefore leaving no room for uncertainty. Within the sandbox, regulators may help robo advisors to navigate through the EU legislative framework which compensates their lack of expertise. The Lessons Learned Report, published by the FCA in October 2017, indicates that the British sandbox successfully met those objectives: Feedback from former sandbox participants as well as the fact that a vast majority of participants continued towards a wider market launch following the test phase indicates that the sandbox in the UK was successful in meeting those objectives.²⁰⁷ Even after exiting the sandbox, the preserved dialogue and the presumably good relationship make it easy for robo advisors to seek clarification with the regulator when it comes to problems in applying legal rules. Within the sandbox regulations that are presumably not suited for digital advice (for instance those mentioned in section II.D.) and therefore represent an unnecessary obstacle for robo advisors can be identified and addressed by the supervisor. Moreover, different approaches to certain propositions may be tested, e.g. regarding the problem of disclosing (too much) information, as mentioned in Section II above.

Secondly, sandboxes would reduce the time-to-market cycle. As we have seen, the authorisation process under MiFID constitutes a major market barrier for robo advisors. However, the barrier to become part of a sandbox is significantly lower. To enter a sandbox

²⁰⁶ See section II.D.

²⁰⁷ FCA, lessons learned (n 185) in 2.8, 2.9. It must however be acknowledged that given its small scale, no robust conclusions can be derived of that.

firms typically do not need a (full) market licence.²⁰⁸ After successfully exiting the sandbox, robo advisors should benefit from the knowledge they gained and from the dialogue with the authority, such that they are better equipped to face the (full) authorisation process. Effectively, the sandbox would significantly smooth the entrance for small firms to the financial market.

Thirdly, an early close supervision ensures safety for consumers, as discussed above. The better robo advisors are supervised and guided, the more probable it is that a certain quality is ensured. Creating safety and ensuring a certain quality of the robo advisor may further enhance trust on the investor side. Knowing that the product has been under the supervision of a competent authority from its infancy can give the consumer the essential certainty to entrust the robo with their money. The combination of improvements in quality and the ensured safety might tackle the trust issue that robo advisors currently face.²⁰⁹

As described in section II., market barriers for firms go hand in hand with investment barriers. Just like any other fintech firm, robo advisors often find themselves in a vicious cycle: if they are not authorised they will find it hard to attract investors, and if they do not find investors, it is hard to get authorised. By establishing regulatory certainty and offering a quicker route to authorisation, a regulatory sandbox would be in a position to attract more potential investors, making more capital available for young robo advisors. In its Lessons Learned Report, the FCA states that testing in the sandbox has helped facilitate access to finance for participants.²¹⁰

2. How a sandbox helps regulators. Section II.C. has shown that there are several - especially macroprudential – risks that accompany the emergence of robo advice. Albeit these are not yet severe, when looking at the pace of growth of robo advice, they have to be taken seriously. To this date, the lack of (good) data makes it hard for regulators to properly assess those risks.²¹¹ Simultaneously there is the unpredictable development of AI and machine learning. In those regards the sandbox for robos entails great opportunities. Testing all different kinds of robo advisors in a safe space makes it possible to collect a huge amount

²⁰⁸ See section III.B.

²⁰⁹ As discussed above Section II.C.

²¹⁰ See FCA, Lessons Learned (n 185) paras 2.9ff. The FCA thereby provides the fact that at least 40% of firms, which completed testing received investment during or following the sandbox. It's not clear however, how many would have received investment without sandbox participation.

²¹¹ The necessity of data and expertise is also highlighted by the FSB (n 4); Regarding this problem, see also Douglas W Arner, Janos Barberis, Ross P Buckley, 'FinTech, RegTech and the Reconceptualization of Financial Regulation' (2017) 37 Northwestern Journal of International Law & Business 371.

of various data. Due to the all-digital-functioning of the participants, every action and every outcome can be preserved in the system of the regulator. Looking at the prevailing risks, data is and will even more be the most valuable and essential resource for regulators. They should therefore use the opportunity and find ways to make use of the (potential) multitude of data as soon as possible, for instance with the help of RegTech.²¹² Without doing so, they are likely to lose track of the fast moving digitalisation process of the financial industry. The sandbox provides a useful platform for that task. Regulators could also take that opportunity to simulate different market scenarios within the sandbox. For instance, the fall of the oil price or other critical situations could be simulated to assess the reaction of the robo. Here the predictability of robo advisors (compared to intuitive actions by human advisors) can be of great advantage. As shown in section II.D. above, regulators not only struggle with the assessment of (future) risks and corresponding questions of appropriate legal design, but already when applying the existing legal rules. In this context, the mutual learning facilitated by an institutionalised dialogue should be able to establish some certainty in applying the current legal framework. To be able to match the purpose of a rule to a new technology, regulators need a profound understanding of that technology. Moreover, removing uncertainty on the side of the regulator is a premise for addressing regulatory uncertainty among sandboxed firms.

3. How sandboxes benefit investors and contribute to their protection. As the sandbox framework enable firms to manage regulatory risks during the testing stage, more innovative products can potentially be introduced to the market. Those products have, among other things, the potential to be cheaper, more efficient and more convenient for consumers. Obviously, an authority that is more experienced in risk assessment and better at addressing new risks (as described in 2.) is also in the interest of investors. Hence, the benefits that we identified for the regulator are likewise beneficial for consumers in the long run. Within the sandbox, investor protection is ensured via the respective mechanisms that have been described above. Those give consumers the opportunity to make use of innovative new advice services, without the risks of detriment that are likely to occur otherwise.

Conversely, this “consumer benefit” also displays an upside for robo advisors: Ensuring consumer protection by adequate, prudently developed regulation creates trust in

²¹² RegTech is defined by the Institute of International Finance as the use of new technologies to solve regulatory and compliance requirements more effectively and efficiently.

new technologies, consequently stimulating demand for those products. Higher demand on the other hand fuels innovation, which is again in the consumer interest.

4. How a sandbox can support financial stability. Financial markets are usually highly concentrated and lack competitive pressure from new entrants. Apparently, high market barriers are one major reason for this. Irrespective of the question of whether, to what degree and under which propositions competition is desirable in financial markets,²¹³ a certain flow of market entrants is commonly considered to be vital for the market in any case.²¹⁴ Recent years saw regulators around the globe dedicating an increased focus on competition objectives. The emergence of regulatory sandboxes can partly be seen as a consequence of that development. By lowering barriers to entry, creating trust in new financial products and making new firms more attractive for potential investors, the sandbox fosters competition in the respective market.

Despite the issue of whether this will actually lead to more diversity in the sector, positive effects of competitive pressure from new entrants can in fact already be observed through incumbent financial institutions setting up innovation labs and putting resources in digitalisation in order to defend their share in the respective market.

Finally, a sandbox will help regulators to deal with rising threats for financial stability, such as side effects of AI and machine learning (see above). It is highly recommended to keep on pace with those issues, starting at the very beginning of their development. Otherwise it might be impossible to come back on track.

Having applied the benefits of a regulatory sandbox to the specific case of robo advice, we can observe that many benefits and interests are often highly correlated. For example the dialogue between firms and regulators will not only promote innovation on the side of firms (by making it easier for them to comply with applicable regulation), but will also improve regulators' understanding of new technologies, contributing to consumer protection and financial stability. Not less, it can strengthen the trust of the consumer towards those technologies. Also, fuelling innovation on the one hand benefits consumers by providing better or cheaper products, while on the other hand has the potential to facilitate competition,

²¹³ That question is not subject of this paper. For specific information on this issue, see for example OECD, 'Competition and Financial Markets' (2009), <<https://www.oecd.org/daf/competition/43067294.pdf>>.

²¹⁴ See for example van Loo (n 62).

which may contribute to financial stability by diversifying the risks that are currently concentrated at systemically important financial institutions.

E. Advantages over a Change of the Regulatory Framework

The advantages of implementing a regulatory sandbox compared to directly adjusting the regulatory framework to emerging technologies such as robo advice are numerous. In regular circumstances, the regulator or legislature needs to assess risks on the market. In that case, they cannot rely on a cooperative, mutual supporting relationship with the regulated firm, which potentially complicates the process. By the time the risks have been assessed with sufficient certainty, the stakes are usually already high, or the risks may have already materialised in form of a crisis. Subsequently, a proper answer to the problem needs to be found, and the legislature is under pressure (in case of a crisis not at least by the public) to take action. In the past, this frequently resulted in overhasty adjustments of the legal regime that were inappropriate and poorly designed. Also, in particular in the EU the traditional law-making process is immensely time consuming since most new EU instruments have to be transposed into domestic law²¹⁵ or supported by delegated (secondary) EU acts. Given the urgency of regulatory action that is typically prevailing at this stage, this procedure seems largely inefficient.

The other possibility – to take precautionary action – is not recommended either: The main justifications for regulation are risks for financial stability and for consumers. At an early stage, as right now in the case of robo advice, risks cannot be identified with necessary certainty. Premature regulatory adjustment of the law would risk unnecessary burdens for market players and most likely slow down development and economic growth.²¹⁶ Also, a new phenomenon may be volatility, which cannot be judged at the time of its appearance. That could mean once the regulation has changed, the phenomenon has already disappeared. The development of robo advice is still at an early stage, when it is too soon to decide whether legislative adjustments are necessary. The responses to the Commission's consultation underpin this view, as there is a broad variety of opinions on the necessity of legislative action.²¹⁷

Against this background, a regulatory sandbox is a reasonable compromise. It does not take any premature regulatory actions while speeding up the process of assessing the

²¹⁵ In the (common) case where EU institution use the form of a Directive.

²¹⁶ Armour, Awrey and others (n 25) 51.

²¹⁷ See Commission Responses (n 138) 39ff.

risks of new technologies and creating necessary capacities for prospective actions. After some time of testing robo advisors inside the sandbox, the regulator would be in a better position to adjust respective regulations, if necessary.

F. Downsides and preliminary conclusion

Of course, a sandbox for robos is no panacea. Like every concept it has its limits: It offers no solution to some of the threats identified, for instance the problem of cyber risk. Also, for some of the problems discussed above it may only offer an indirect cure (if a cure at all), as the real solution is expected to result from the knowledge that has been developed with the help of the sandbox.²¹⁸ Even more fundamental scepticism can be observed at some national authorities, above all the German BaFin.²¹⁹ Arguments put forward are that a sandbox would not be covered by their mandate as well as level-playing-field concerns. BaFin for instance keeps on putting a strong emphasis on the old principle “same business, same risks, same rules”.²²⁰ Apart from that, there are some obstacles that depend on the respective implantation. Sandboxing may be resource-intensive, thus costly. For jurisdictions with no well-equipped and financially strong regulators, this poses a problem. In this regard some commentators assert that due to the lack of expertise, those regulators may either make promises of liberal treatment that they cannot live up to, or they may tend to allow unacceptable levels of risks.²²¹ Additionally the capacity in regard of participants (and correspondingly its effect) is strongly dependent on the resources put into the sandbox project. Engaging with robo advisors on a case-by-case basis, as it is the case in the FCA and many other sandboxes, imposes a natural limit on the sandboxes scalability,²²² as typically every participant is allocated to an individual agent within the authority.²²³

Also, as mentioned before, one objective of regulatory sandboxes is enhancing innovation and competition. This objective may be thwarted if incumbent (“too-big-to-fail”) institutions are the ones to benefit most from its implementation. Even when excluded from the sandbox, this scenario may occur if those institutions were to begin acquiring firms from

²¹⁸ Further explained in below section III.C. and D.

²¹⁹ In his speech at the New Year press reception 2016 (see n 195), BaFin CEO Felix Hufeld insisted there will be no “little buckets and spades” for Fintech companies (speech available in German at: <https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Reden/re_160112_neujahrspresseempfang_p.html>).

²²⁰ See for example Felix Hufeld, ‘Opinion on low interest rates, digitalisation and regulation’, BaFin 2016 Annual Report, available at: <https://www.bafin.de/EN/PublikationenDaten/Jahresbericht/Jahresbericht2016/Kapitel0/kapitel0_artikel_en.html?nn=9649528#doc9649554bodyText3>).

²²¹ See Zetsche and others (n 136). 79.

²²² See also Zetsche and others (n 136) 46.

²²³ Not engaging with participants individually, but granting general relieves however imposes other problems and risks, see e.g. on page 48 of this paper (there in the context of the Australian sandbox).

the sandbox.²²⁴ Indirectly, the firms that benefit from the sandbox (which is conducted at public expense) would then be the same whose costs of failure will be borne by the public.²²⁵ In regard of the same objective, regulators should pay attention to actually provide sandbox firms sufficient room for innovation. In its Lessons Learned Report, the FCA states that around one third of participants in the first sandbox cohort significantly pivoted their business model ahead of launch in the wider market.²²⁶ This might be a hint that the FCA advised some more exotic concepts to adapt a more regulation friendly model.²²⁷ As regulators develop preferences (within the sandbox) about specific product designs, oversight might lead to a model convergence²²⁸ that potentially increases the herding risk. Another downside that has been raised by scholars²²⁹ as well as (potential) sandbox participants²³⁰ is the lack of transparency. Firms claim that it is not clear on which basis the regulator makes the assessment and determines whom to grant access to the sandbox. In this context it may also be problematic that some criteria for entering the sandbox are in essence of a subjective nature.²³¹ This can intensify opaque practices and reduces legal certainty among (potential) participants. As a key element of regulatory sandboxing is the close relationship between the regulator and firms, regulators might be particularly prone to cognitive capture.²³² Broadly, cognitive capture in regulation or regulatory capture refers to the process whereby firms influence the regulator with the consequence that the latter views the firms' interest as a synonym for the public interest.²³³ A common channel in finance through which the industry can capture the regulator is through financial contributions and lobbying. For regulatory sandboxing however, this seems a rather unlikely scenario. More probable appears to be the sole identification with the industry due to extensive interaction, perhaps accompanied by sympathies for their views. Allen reasonably observes that this risk is heightened particularly by the FCA's sandbox version, as each firm will be allocated a dedicated case officer.²³⁴

²²⁴ Allen (n 200) 37, 46.

²²⁵ However, excluding incumbents from the sandbox might raise level-playing-field issues. This might on the other hand be justified by their presumed competitive advantage in managing the regulatory framework as well as their imposed risk on the society (in case of a SIFI). For more arguments on this issue, see for instance Bromberg and others (n 201) 9 f. or Allen (n 200) 37f.

²²⁶ FCA lessons learned report (n 185), 2.16 (on page 6).

²²⁷ For similar comments, see Kaminska, 'The FCA want to have its cake and eat it', *Financial Times* (25 October 2017), available at: <<https://ftalphaville.ft.com/2017/10/25/2195224/the-fca-wants-to-have-its-cake-and-eat-it-sandbox-edition/>>.

²²⁸ See also Baker and Dallaert (n 3) 747.

²²⁹ Zetsche and others (n 136) 80.

²³⁰ See Commission (n 138) 52ff.

²³¹ Zetsche et al. (n 136), 80.

²³² See also Allen (n 200) 43ff. with further references.

²³³ See Allen (n 53) 199. For a more detailed description of the phenomenon, see Armour, Awrey and others (n 25) 560ff.

²³⁴ Allen (n 200) 44. Allen also presents possible solution for that problem on page 45.

However, the sandbox phenomenon is still in a very early stage of development and thus far from perfect. It is a positive aspect that sandbox criteria, instruments, and requirements are not set in stone and can therefore be easily adjusted by the authority.²³⁵ Consequently, those aspects should not be seen as insurmountable disadvantages of the sandbox idea as a whole, but rather as issues that still need to be improved. In sum, we view a regulatory sandbox as definitely a step in the right direction which has the potential to significantly improve the quality of the regulator's work.

IV. Specific Proposal

After demonstrating the benefits a regulatory sandbox would entail for various sides, this paper now turns to the question of what kind of implementation could be adequate and feasible in an EU context. The multi-layer EU framework for financial services is a complicated mix of legal instruments, and we mentioned earlier that some countries struggle to adopt a meaningful sandbox within this relatively rigid system.²³⁶

In this convoluted context, we see three basic options to set up a regulatory sandbox. The first option would be a genuine EU-level sandbox, designed and implemented at the EU level. In that scenario, the most adequate institution to design and oversee the sandbox would presumably be either ESMA or the European Commission. However, since the competence for enforcement of laws and supervision of financial markets largely rests with Member States and their national authorities, this would require a revision of the European Treaties. A second variant of an EU-based sandbox could be common EU rules that would harmonise Member States' regulatory sandbox approaches, whilst maintaining national authorities as the pivotal point for execution and day-to-day communication. And as a third option, sandboxes could also be realised at a Member State level, and include the EU in a coordinating role. This paper proposes an implementation of the latter version, since it is more feasible and best-suited to the current situation.

A. An EU-wide Regulatory Sandbox

²³⁵ For instance the FCA and the ASIC are continuously making discreet, small adjustments to the contours of their regulatory sandboxes. See FCA (n 141) stating that the sandbox can be revised in light of experiences made; regarding recent adjustment of the ASIC, see L Sacks et al. 'Growing the Sandbox – Australia's enhanced Fintech Regulatory Sandbox' (7 November 2017) Clifford Chance Client Briefing <https://www.cliffordchance.com/briefings/2017/11/growing_the_sandboxaustraliasenhance.html>.

²³⁶ See above section III.B.

Following the ongoing discussions, an EU-wide approach on regulatory sandboxing seems to be the zeitgeist.²³⁷ In September 2016 Olivier Guersent, Director-General for Financial Stability, Financial Services and Capital Markets, fuelled rumours of an EU-wide sandbox by saying “*we think we should dedicate a bit of thought to how we can have a sound regulatory sandbox approach in Europe that allows markets to develop, that allows innovation to flourish, that allows those companies that innovate to go across borders in the single market while being consistent with our framework*”.²³⁸ Further, in the European Commission’s Consultation Document on fintech, respondents, particularly from the industry side, but also national authorities expressed the need for such a measure.²³⁹ However, a closer look reveals that the perceptions of an “EU-wide sandbox” among its proponents are not always homogeneous. While most of them seem to have a harmonised approach in mind,²⁴⁰ resting the execution on Member State level, some seem to advocate for a genuine EU sandbox, also executed at the EU level.²⁴¹

The strongest barrier to the concept of a genuine and centralised EU sandbox (as mentioned above) is that it appears largely unrealistic and legally difficult to implement. Such a step would require a delegation of regulatory powers from Member States to the EU, which has proven to be politically and legally challenging. For example, the *Meroni* doctrine sets limits to entrusting EU agencies with discretionary powers.²⁴² Even if feasible, the realisation of necessary amendments would be enormously time-consuming. Since robo advice is a fast-developing and dynamic phenomenon, the prospect of a lengthy implementation on the EU level would not satisfy the need for a quick and flexible measure. An EU-based regulatory sandbox would represent a complex readjustment of the entire EU legal framework, which should only be attempted after the collection of sound analysis and data. Robo advice however, as stated above, is still at an early stage, in a phase where the focus should be on

²³⁷ See for example European Banking Federation, ‘Innovate.Collaborate.Deploy. The EBF vision for banking in the Digital Single Market’ (14 November 2016) <<http://www.ebf-fbe.eu/wp-content/uploads/2016/11/EBF-vision-for-banking-in-the-Digital-Single-Market-October-2016.pdf>>; Within a report of the European Parliament (n 199), the Committee on the Internal Market and Consumer Protection express the view that is of the view that a regulatory; Banking Stakeholder Group (n 186); European Financial Services Roundtable (n 129).

²³⁸ See corresponding interview with Law360 at <<https://www.law360.com/articles/840834/eu-weighs-cross-border-financial-regulatory-sandbox>>.

²³⁹ See EC Responses (n 138) 53ff.

²⁴⁰ For example Banking Federation (n 237) European Banking Stakeholder Group (n 186); European Financial Services Roundtable (n 129); also a significant number of respondents in the Commissions Consultation Document (n 58) seem to favour the harmonised approach.

²⁴¹ Some respondents in the Commissions Consultation Document (n 58) seem to favour an approach as such, see for example on page 51 or 54.

²⁴² For more information on the Meroni-doctrine, see e.g. N Moloney, *EU Securities and Financial Markets Regulation* (3rd edn, OUP 2014) 909f. and 994ff.

collecting data, gaining knowledge and developing expertise to reach a position which allows it to take further steps. Against this backdrop, any ultimate answer seems to be premature.

A less ambitious and more realistic approach has been proposed by, among others, the European Banking Federation (EBF) and the Banking Stakeholder Group (BSG).²⁴³ These institutions recommend a harmonised framework for experimentation with harmonised tools that avoid national divergences in implementation and facilitate the establishment of a level playing field for all countries and participants, while letting the execution of this framework rest within the power of national authorities. Comparable concepts are also favoured among a significant number of respondents to the Commission consultation. Arguments that are being put on the table most frequently are that this approach would avoid creating additional fragmentation in the single market, avoid distortion of competition between operators in the EU and prevent regulatory arbitrage and a corresponding 'race to the bottom'.²⁴⁴ However, the possibility to implement a variety of different sandbox approaches across Member States with a dose of regulatory competition also presents potential benefits.

Although not as time-consuming as the first alternative of a genuine EU-based sandbox, the harmonised version would still take a lot of time to be implemented. Again, the effects of different sandbox approaches have not yet been properly evaluated, which is why it is too soon to make a final decision at this stage. Just like the phenomenon of robo advice, sandboxing itself is still in a phase of experimentation. And the similarities do not stop there: Regulators neither possess much experience with sandboxing, nor have any robust data or certainty about its effects. Therefore – in line with the arguments in favour of a regulatory sandbox for robo advisors – it seems to be more appropriate in the current situation to start a form of guided policy experimentation,²⁴⁵ i.e. testing different approaches on regulatory sandboxes in order to develop the respective expertise. Also a fully-harmonised version of a sandbox would fall short of taking into account legal as well as cultural differences among Member States.

Responses in the Consultation Document further imply the reasonable claim that different approaches cause legal uncertainty among applicants. A vast majority of respondents underline a lack of clarity when it comes to definitions, terminology and

²⁴³ European Banking Federation (n 237) and Banking Stakeholder Group (n 186).

²⁴⁴ See European Banking Federation (n 237) and Commission Responses (n 138) 53f.

²⁴⁵ Fenwick and others (n 198) also advocate for a form of policy experimentation on how to deal with emerging technologies. Moreover, Committee on the Internal Market and Consumer Protection of the European Parliament encourages Member States to experiment with new regulatory instruments, see European Parliament (n 199).

transparency.²⁴⁶ However, as we shall see, legal certainty and transparency can also be achieved without harmonisation of sandbox requirements.

B. The Case for a “Guided Sandbox” on the Member State Level

The challenge is therefore to design an implementation concept that exploits the benefits of experimentation and regulatory competition, while simultaneously not losing the upsides of an EU-wide approach that primarily lie in legal certainty. For reasons that have already been described above (mainly flexibility and no time-consuming implementation process), we advocate for finding an option that fits within the current legal framework. To facilitate this, we propose the idea of a ‘guided sandbox’ on the Member State level. This idea is essentially a sandbox version that is operated by the Member States, but in close interaction with the EU institutions as a monitor and guardian. Those would also serve as a forum for the exchange of knowledge and experiences.

In its first function as a “guardian”, the EU could provide guidance to Member States in regard of regulatory sandboxing. Such guidance should be based on experience that national authorities have already collected, especially those of the FCA. Right now, there is little data to make use of, since there are only three European sandboxes established (one of them very recently). However, this data in addition with the data that is available from foreign authorities can build the ground for a preliminary sandbox body. Given the resources and expertise that is available at the EU level, various improvements can be tested. Technically, the guidance would be best executed by the ESAs within their given power hence on the third level of EU lawmaking.²⁴⁷ The ESAs could issue guidelines, high-level principles and recommendations that set out best practices on the implementation of a regulatory sandbox as well as basic principles that each sandbox should be built on.²⁴⁸ This could be complemented by further informal Q&A, FAQs, reports and tailored advice to regulators. Those guidelines etc. could include specific recommendations about the key sandbox parameters that have been presented in Section III. In that frame, the ESAs could propose different conceivable approaches on each parameter, for instance varying measures that work as consumer safeguards. Consequently national authorities could choose, in their own discretion, which version works best for their market. To ensure a certain degree of

²⁴⁶ The lack of transparency is also named as one of the major downsides of regulatory sandboxes by Zetsche and others (n 136) 80.

²⁴⁷ For further information on the Lamfalussy-process see Moloney (n 242) 854ff.

²⁴⁸ A concept similar to this one was also suggested by some respondents (from the industry side) in the See Commission Responses (n 138) 53.

transparency for potential participants, those recommendations should be made publicly available by the ESAs.

The advantage of this method over a harmonised sandbox would be not only the speed of issuance, as those guidelines etc. would avoid the lengthy process of regular EU legislation. Moreover, they would gain the corresponding flexibility in adjustment and therefore be more responsive to market innovation. Smaller, less well equipped regulators would particularly benefit of the external research on sandboxing that is conducted by the ESAs and the certainty that comes with those recommendations. This means that the process of designing a regulatory sandbox at the national level would be much less resource intensive. Consequently, those regulators would be able to concentrate their manpower in the mere implementation of any given recommendations. If they do so and only implement what has been pre-defined by the ESAs, they could signal this to (potential) participants, ensuring they can rely on those publicly available EU sandbox parameters. For more sophisticated authorities on the other hand, this concept maintains the possibility of a competitive advantage over other regulators by experimenting on other/ better approaches. When deviating from EU recommendations, those regulators may provide explanations for participants on why they do so and emphasise the benefits of their respective approach. Within the close dialogue between national regulators and the ESAs, regulators would also have an opportunity to seek advice on their individual sandbox approach. In case of concerns about the consistency of a specific approach that deviates from the EU guidelines, the ESAs could by that provide some certainty.

Secondly, the EU would function as a coordinating forum for continuing exchange of experiences that have been made by national regulators with sandboxing. While national regulators would report regularly to the ESAs, the ESAs in turn would be able to provide constructive feedback on those experiences and also collect and analyse reported data in order to make assessments for the continuous improvement of the process. Given the flexibility of this concept, the iterative feedback between national regulators and the ESAs would facilitate continuing refinement and improvement of the guidance. The objective of this exchange is to engage in a mutual learning process that allows collecting more data and expertise on the nascent phenomenon of regulatory sandboxing. In regulatory sandboxing, a cooperative and mutually beneficial relationship is one key elements of this concept. Depending on the outcome of this process, the EU could subsequently engage in further steps which might be an EU-wide sandbox, an adjustment of the regulatory framework, or any other action.

A widespread concern that is being raised against an unharmonised approach on EU regulatory sandboxes is regulatory arbitrage and a corresponding race to the bottom.²⁴⁹ If executed properly, this concern has very little bearing. The existing regulatory framework within the EU already entails a highly integrated regulatory standard. As one objective of the sandbox concept is to ensure appropriate and adequate application of existing rules to robo-advice, the risk of a race to the bottom is more likely to decrease rather than to increase. The opposite may be true: we could expect a quality-based competition between Member States in providing the best conditions and the innovation-friendliest environment. That is, improvements of sandboxes' quality may not only be nurtured by the above mentioned mutual learning process, but also – and perhaps even to a higher degree – through competition between Member States. A reason for this is the dynamic and speed of the market. National authorities may become aware very fast if robo advisors are particularly attracted by another authority's sandbox. After having identified the reason of that attraction, they may then seek to copy the respective feature or even try to design a better version of it. Positive signals or suggestions may also come from the private sector, i.e. from (potential) sandbox participants. Those may express the desire for or emphasise benefits of a particular sandbox feature to their respective regulator. This lobbying effort is probable in regard of existing features (in other Member States) as well as completely new ideas.

Given the existing regulatory body with its rather rigid legislative standards, one might however raise the question of how a sandbox could work within such a setting. Since Member States are not able to grant relief of rules that are based on European legislation, possible instruments and flexibility within the sandbox are admittedly more limited than they might be for completely "independent" jurisdictions. The Australian sandbox for instance is able to grant full relief for firms without a case-by-case review.²⁵⁰ Firms that meet the eligibility criteria are freed from any licensing requirement. No application process is needed, and candidate firms only need to notify the Australian Securities and Investments Commission and provide certain information.²⁵¹ The obvious benefits of this approach are the extremely low costs of operation, making the process less resource-intensive than for

²⁴⁹ See e.g. Commission CD (n 58) Also Zetsche and others (n 136) see the risk of a "race-to-the-bottom style competition", however stating that the more likely outcomes from Sandboxes will be beneficial (on page 78f.). Allen (n 200) makes a raises a comparable concern regarding a Sandbox in the US with enforced by different state agencies.

²⁵⁰ More specifically, the regulatory sandbox regime in Australia is comprised of both, an individual licencing exemption and the (general) fintech licencing exemption (see ASIC Regulatory Guide 257). For more information on the Australian Sandbox, also in comparison to the FCA sandbox, see Bromberg and others (n 201) 320ff.

²⁵¹ ASIC Guide (n 196).

example the FCA sandbox. Also, there is no limited number of sandbox participants. On the other hand, the requirements for relief are quite narrow (e.g. by being only available to firms dealing with or advising on specific products), which also narrows the room for innovation. Moreover, firms applying for relief are obliged to disclose whether or not they have a regulatory licence, while also being limited in numbers of customers and assets under management. Under these circumstances, the relief granted by this limited sandbox appears to lose much of its attractiveness: Firms are limited in innovation, while also not being able to operate under real market conditions. This is impressively demonstrated by the fact that up until now, only four firms have taken advantage of the Australian sandbox licensing exemption.²⁵² Furthermore, the lack of communication and individual engagement with innovation from the regulator's side cuts the sandbox concept short of one of its key justifications, which is the mutual learning process.

The feasibility of regulatory sandboxing within the existing EU regulatory framework is evidenced by the three existing implementations in the UK and the Netherlands. Also, the Dutch sandbox is not simply a copy of the UK version – far from it. Compared with the FCA, the Dutch authorities take a more “principles based” approach by attempting to use the scope offered within the legal framework. Put differently, they seek to provide a regulatory solution for firms only if the underlying purposes of the respective policies, rules, and regulations are satisfied.²⁵³ The FCA meanwhile focusses more on individual guidance and coordination with sandbox participants. While there is no data on the Dutch sandbox available yet, effects of the FCA sandbox can already be observed: A growing number of applications in each cohort, and the position of London as the world capital of fintech²⁵⁴ indicate a demand for the concept as well as some return on the investment. Moreover, both approaches have in common that they provide restricted authorisation, which implies that the current regulatory framework offers some scope to mitigate the regulatory burden for firms.

As mentioned above, one goal of the proposed concept is to encourage especially smaller jurisdictions to engage in the process in order to lure robo-advisors, presumably benefiting from the creation of jobs and economic growth. Given the relatively high amount of resources that are needed for running a sandbox, an issue that might be raised is the “credibility” of those sandboxes.²⁵⁵ It is obvious that small country regulators will not have the resources and capacity comparable to the FCA. Nevertheless, smaller regulators also have

²⁵² See <<http://asic.gov.au/for-business/your-business/innovation-hub/regulatory-sandbox/entities-using-the-fintech-licensing-exemption/>> (last visit: 16.11.2017).

²⁵³ See DNB, AMF (n 191).

²⁵⁴ It is acknowledged that also other factors contributed to this development.

²⁵⁵ See Zetsche and others (n 136) 79.

the possibility to turn this perceived lack of resources into an advantage. As a first step of a 'guided sandbox', both the structure and implementation of the sandbox would be determined by the EU. Those regulators may then focus on the enforcement of these guidelines and recommendations. There are not nearly as many participants as there were applications for the FCA sandbox,²⁵⁶ which shows that there is still a prevailing gap between the demand for and the supply of regulatory sandboxes. Therefore, start-ups could avoid jurisdiction in overcrowded sandboxes by moving to less popular ones, where the chance of participation might be higher. To boost the quality of their sandbox, regulators in smaller Member States may consider to not overcharging themselves to a high number of participants, but rather start with accepting just a few, while making sure they provide a decent service. Also, they could avoid (direct) competition with stronger regulators by engaging in specialisation. Some sandbox features may be particularly suitable for a specific type of robo advisor. Identifying, designing and emphasising those features could make them more appealing for the respective type of robo advisor compared to a more general sandbox. Hence, the disadvantage in total amount of resources could be compensated by pooling them. Ultimately, this would also contribute to an increase in overall capacity of sandboxes within the EU, supporting a general enhancement of innovation in the Single Market. This might also provide potential to make ground on the US robo-advice market, as there is no such programme running to date or even expected to be in the near future.²⁵⁷

C. Follow-up Regulatory Trajectory

Having explored the phenomenon of regulatory sandbox and demonstrated that it would be a suitable instrument to improve the current regulatory situation regarding robo advice, we subsequently developed a specific proposal for the implementation of such a sandbox in the EU context. This section now will take a glance forward to the situation following the implementation of the sandbox.

We saw above that a regulatory sandbox constitutes only the basis of an adequate regulation of robo advice. At the present time it is a sound regulatory instrument, whose primary benefit lies in facilitating knowledge exchange, collecting information and reducing uncertainty. However, it does not offer a sustainable cure for flaws that are incorporated in the EU legal framework. Also, the value of the learning-process is limited, since some risks

²⁵⁶ The FCA received applications from 146 firms across the first two cohorts, of whom 50 were accepted and 41 actually began testing in the sandbox, see FCA sandbox lessons (n 185), 2.16.

²⁵⁷ For further information, also on the specific constraints regarding the implementation in the US, see Allen (n 200).

only appear as the phenomenon matures and robo advisors reach a certain scale, that is, long after the respective advisor has exited the sandbox.

As previously mentioned, one of the regulatory sandbox's key objectives is to lower barriers to *enter* the market for small firms. However, that alone may not be enough. In the following, we will argue that, after having facilitated market entry, regulation should stick to this underlying idea. That is, it should continue to address (unreasonable) barriers to scaling up that exist *within* the (regular) market. In this regard, it is important to note that this should not be understood as an unconditional support of robo advice. Most certainly, plenty of barriers and regulatory obstacles have their justification, also in regard of robo advice. Hence, only those barriers are to be addressed that constitute an *inadequate* obstacle. Moreover, common rules of competitive markets are preserved, while a sufficient level of consumer protection must be ensured at every time.

For these reasons, we take the view that the follow-up regulation after the sandbox phase should follow a regulatory 'trajectory' that proceeds in line with the size and risk-level of respective robo advisors. This trajectory should consist of the following elements: First, it should maintain the same close dialogue to the firms that has been established during the sandbox phase in order to collect more valuable information about the phenomenon of robo advice. Secondly, it should mitigate unnecessary barriers that appear at each stage of growth of robo advisors. To simplify, we categorise the development of robo advisors in three stages: First the stage that directly follows the sandboxing period, which we term 'probation phase'. Subsequently, after the respective robo advisor prevails in the market for a certain time it commonly enters the second stage, the 'expansion phase'. When the robo advisor has become an established player in the market, it is situated in the last phase, which we call 'globalisation stage'.

As it still too early to draw any definite conclusions, this section will take a brief outlook at issues that potentially warrant regulators' attention as robo advice matures and to give some corresponding impulses.

1. Maintaining dialogue and mutual-learning-process. The first and perhaps the most important element of the follow-up regulation of robo advice should be to maintain the mutual learning process that has been initiated during the sandbox phase. As stated above²⁵⁸, as the age of fintech and robo advice are hallmarked by their incredibly fast innovation cycles, establishing facts, data and information becomes the paramount as well as challenging part for regulators. The more and better information are available to regulators, the better they are

²⁵⁸ See section II.B. and C.

positioned to properly evaluate and regulate prevailing and emerging risks. Simultaneously, valid information and good data enable them to regulate robo advisors in a more dynamic and proportionate way, i.e. impose regulatory burden only where risks actually appear.

The growth of robo advisors that regularly takes places after exiting the sandbox allows regulators to collect data on a much bigger scale. Considering this, regulators should establish a solid data exchange system with respective robo advisors during the sandbox phase, which continues to stay in place afterwards.²⁵⁹ Ultimately, the sandbox therefore builds the ground for a high quality regulation on the regular market as well as a more collaborative relationship between regulators and regulated entities that ideally requires less oversight as opposed to one that is characterised by enmity. Robo advisors on the other hand would benefit from close advice by regulators and a proportionate and adequate regulation. Secondly, as robo advisors grow in scale and potentially become a significant force in the financial market, new idiosyncratic risks are likely to emerge. What is more, some risks that seem of limited importance during the sandbox phase might later turn out to develop a macroprudential relevance.²⁶⁰ Concerning that kind of risks, the 'learning process' on the side of the regulator is typically limited.²⁶¹ Those risks include but are not limited to the above-mentioned 'herding risk' and risks for cyber security. At this stage, regulators' focus should increasingly be put on their objective of ensuring financial stability. Ideally, the information exchange should not stop at the authorities' level. Certainly, there are cases, where the scope of regulators is limited. That is to say, problems with current regulation may be revealed, the remedy of which lies beyond the power of the executive branch of government. Therefore, it is worth considering expanding the exchange process to the legislature on the domestic level as well as to responsible institutions on the EU level. This would be a significant step towards a more dynamic regulatory framework and could ultimately well improve the quality of regulation.

On the other side of the coin, it cannot be dismissed that this continuing close relationship exacerbates the risk of regulatory capture. Growing in size, robo advisor firms might also become more influential as their financial resources increase, from which they typically spend a portion on lobbying activities. Consequently regulators have to stay aware

²⁵⁹ In this context, the development of another fintech species, namely Regtech could be of interest. For a comprehensive overview and outlook of the regtech development, see Arner and others (n 211).

²⁶⁰ See also FSB (n 3).

²⁶¹ For a critical analysis of regulatory sandboxing, which also raises the limitation of the learning process, see I Kaminska 'The FCA wants to have its cake and eat it, sandbox edition' (25 October 2017) <<https://ftalphaville.ft.com/2017/10/25/2195224/the-fca-wants-to-have-its-cake-and-eat-it-sandbox-edition/>>.

of that risk and should consider introducing monitoring mechanisms to address it.²⁶² Furthermore, this process is – just as the sandbox itself – presumably highly resource intensive. Not only that closer and more individualised regulation warrants more manpower at regulators, with the increasing data flow, the need for well-trained IT staff/expertise will increase. Although especially at the beginning those costs are huge and undeniable, in the long run the digitalisation of the regulation bares the potential to make the regulation process much more cost-efficient. As soon as the systems are in place and efficiently running, regulation will take place in a more automated fashion, with less need for human employees.

2. Stages and accompanied issues. Having successfully gone through the sandbox period, the next logical step for firms is to enter the real market. We distinguish three typical phases that call for an adjusted regulatory framework and practice.

This first and crucial stage of this period, which we call '**probation phase**', describes the stage where firms have to prove themselves to customers and investors. At this stage it is decisive for the firm to attract customers and thereby show their investors that there is a significant demand for the product. At the same time entering the real market means being confronted with the full panoply of regulatory obligations. Meeting those obligations implies costs and time for firms, which strongly complicates the firm's task of proving itself. Therefore the regulator's focus at this stage should be on the proportionality of regulatory requirements. A certain flexibility would be desirable, and adjusting the regulatory framework may seem reasonable. In this stage, most firms will still be relatively small, and opening the regulator's decisions towards a more principles-based approach may be a good way forward. Principles offer flexibility in compliance and are therefore typically cheaper for small firms to meet. In contrast to rigid rules, they are therefore more open for innovative business models as they allow for continuing refinement, improvement and flexible regulatory approaches. With increasing size of the firm (and correspondingly the increase of certain risks), it becomes more appropriate to promulgate a more detailed set of rules (as it is currently the case in the EU financial market).²⁶³ This flexibility could for instance be achieved by giving regulators

²⁶² There are already some ideas in the literature on how to address the risk of regulatory capture. E.g. Brett McDonnell and Daniel Schwarcz in 'Regulatory Contrarians' (2011) 89 North Carolina Law Review 1629, 1648 propose to integrate a contrarian to the work of regulators in order to mitigate the risk of regulatory capture. Those contrarians are supposed to force employees to also consider a different perspective. Allen (n. 200) advances this idea and applies it in the context of regulatory sandboxes (see on page 45).

²⁶³ C Brummer, D Gorfine, 'FinTech: building a 21st century regulator's toolkit' (October 2014), Milken Institute Centre for Financial Markets <<http://assets1c.milkeninstitute.org/assets/Publication/Viewpoint/PDF/3.14-FinTech-Reg-Toolkit-NEW.pdf>> 7 and Allen (n 200) 17.

more power to waive certain requirements in exchange for proving that the underlying purpose of the rule is met in another way.

Certainly, applying such a flexible approach to regulation solely for ‘sandboxed’ robo advisors would raise level-playing field concerns. Hence, this should apply to all robo advisors, regardless of whether they had started in a sandbox or entered the market without the help of regulators.

Other issues that should merit regulators’ attention at this stage are robo advisors’ relationship to incumbent firms. First, robo advisors are in certain regard highly dependent on incumbents. As mentioned above in section II.C., data and information about clients are a very important element of improving robo advisors’ service. The dependency on that data gives owning companies the ability to prevent robo advisors’ of developing better products.²⁶⁴ Facilitating access to that kind of data can therefore contribute to robo advisors’ growth, further fuel innovation and enhance competition. Albeit this lies largely beyond the regulators’ power, but rather requires legislative action (such as the PSD 2), regulators’ task is to identify such adverse dependencies and – as part of the learning process and corresponding information exchange – report them to the legislature. Secondly, there is an increase of consolidation in the market, meaning that successful fintech startups, including robo advisors, are frequently being acquired by large financial institutions. Considering that one major rationale for the sandbox is fostering competition and promoting innovation, it seems problematic when large financial institutions are the ones primarily benefitting from the sandbox. Not only would it foster or even increase their market power, it could also stifle innovation, as incumbent financial institutions may have very different interests. For instance, incumbents’ ownership stake in robo advisors could shape product development in directions less likely to disrupt the financial market landscape in order to protect their current business model.²⁶⁵ Not less problematic is the fact that large financial institutions, namely those considered to be ‘systemically relevant’ are benefitting from implicit government guarantees, while imposing a crucial risk on the society as a whole. Since the sandbox is conducted at public expense, it does not seem adequate to let them be the ones profiting.²⁶⁶ This is an issue that may have to be addressed in the future, either by financial regulation, or by competition law and policy.

Once having mastered those first challenges, within the second stage (“**expansion phase**”) robo advisors’ primary goal would be to further grow, seeking to offer their service to

²⁶⁴ To a certain degree already happening, see van Loo (n 62) 242 (with further reference at supra note 59).

²⁶⁵ Id. 248ff.

²⁶⁶ See also Allen (n 200) 46.

a broader audience. In order to support those efforts, ensuring a good environment in which robo advisors can easily conduct business across borders is of high importance. In an EU context, this is primarily achieved by a well-functioning single market for financial services and the (projected) completion of Capital Markets Union.

Even though – thanks to passporting – the investment firm licence under MiFID allows robo advisors to operate across all Member States, there are still certain domestic laws impeding the provision of robo advice across borders. In the ESAs' Report on automation in financial advice, main concerns that have been expressed were in relation to legal requirements for data protection, anti-money laundering, combating the finance of terrorism and foreign tax compliance/ Common Reporting Standards (CRS).²⁶⁷ Clearly, some of those barriers are beyond the remit of national as well as European agencies (e.g. national tax laws). However, wherever possible, barriers should be analysed and addressed. In line with our proposal of a guided sandbox, national barriers should be reported to ESMA, where they will be subject to further analysis. Subsequently ESMA evaluates further actions that could include issuing guidelines to respective Member States on how to mitigate those barriers, initiate changes of the regulatory framework or propose legislative adjustments to the Commission or the respective Member States. Not least, this part aligns well with the EU's goal of achieving a Capital Markets Union.²⁶⁸

Having become an established player on the European market, the next logical step would be to expand globally ("**globalisation stage**"). To conduct business in other, non-EU and non-EEA jurisdictions, robo advisors need to apply for a licence with the respective national or federal authority. As regulatory requirements can differ significantly from jurisdiction to jurisdiction, this imposes significant cost and time. To begin with, robo advisors typically need to mandate a law firm in the respective jurisdiction to assess their product meets those regulatory standards and what specific adjustments are necessary. Obviously the influence of European agencies or ESMA is limited in this regard, since they are not able to intervene in foreign legal or regulatory matters. However, not being able to address those issues unilaterally does not mean that there is no room for a bilateral solution. A number of regulators have already taken this opportunity and entered into cooperation agreements with foreign regulators.²⁶⁹ Most notably, the FCA just recently concluded such an agreement with

²⁶⁷ ESAs Report (n 72) 18. Some of these issues have also been named by P Martino, Robo-Advisory Markt im Aufschwung, Börsenzeitung (14.10.2017) <<https://www.boersenzeitung.de/index.php?li=1&artid=2017198807&artsubm=bf>>.

²⁶⁸ See Commission Action Plan (n 55).

²⁶⁹ To date, a majority of regulators that run regulatory sandboxes entered into such agreements. See for example the Australian ASICs cooperation at <<http://asic.gov.au/about-asic/media-centre/find-a-57>>

the US Commodity Futures Trading Commission (CFTC), being the first agreement of the CFTC with a non-US counterpart.^{270 271} Existing agreements mainly consist of two elements, which are information-sharing and the referral of fintech companies from one regulator to the other.²⁷² The latter element is typically accomplished through helping companies understand the regulatory framework of the respective jurisdiction, how it applies to their business and assisting them with the authorisation process. In some cases the referred fintech is being allocated to particular officers of the receiving regulator, who is then responsible for the guidance.²⁷³ Most of the agreements also stipulate guidance for the firm following the authorisation process. Whereas the referral directly intends to remove barriers to expand across jurisdictions, the information-sharing element is supposed to improve the learning-process on the side of the regulators. It primarily consists of exchanging experiences with innovative regulatory approaches, such as regulatory sandboxing and sharing information to advance their understanding of certain innovative firms, ultimately with a view to better construe their regulatory objectives. Both elements can be mutually beneficial for participating regulators. Integrating foreign regulators in the learning process increases the amount of information and data, which strengthens regulators' capacity to respond to future challenges. Meanwhile the simplified referral process enhances global competition, which can ultimately benefit consumers in the form of better, more convenient and cheaper products.

Against this backdrop, we (tend to) recommend supplementing the 'guided sandbox' with such cooperation agreements with other regulators. Particularly a simplified access to the US financial market, being the largest in the world, would be a great additional incentive for robo advisors to start their business in the EU (respectively in one of its sandboxes).

media-release/2017-releases/17-430mr-asic-broadens-fintech-cooperation-with-canadian-regulators/>.

²⁷⁰ See <<https://www.fca.org.uk/news/press-releases/fca-and-us-cftc-sign-arrangement-collaborate-fintech-innovation>>. The cooperation agreement can be accessed here: <<https://www.fca.org.uk/publication/mou/fca-cftc-co-operation-agreement.pdf>>.

²⁷¹ In their consultation on a global sandbox, the FCA even considered transferring this idea to the early stage of sandboxing. This means that firms would be able to test their service in sandboxes of two or more jurisdictions without any additional efforts. Meanwhile regulators could exchange experiences and address problems already at this stage.

²⁷² Some agreements however only entail the sharing of information, e.g. agreements between the ASIC and the Chinese or Indonesian regulator (see <<https://www.opengovasia.com/articles/australian-financial-regulator-signs-fintech-cooperation-agreement-with-canadian-provincial-securities-regulators>>).

²⁷³ See e.g. the agreement between the FCA and the CFTC (n. 270) or that between the ASIC and the Swiss FINMA (press release available at <<http://www.asic.gov.au/about-asic/media-centre/find-a-media-release/2017-releases/17-364mr-asic-expands-network-of-fintech-cooperation-agreements-to-switzerland/>>>).

Being able to provide support and an appealing regulatory environment from ‘birth to adulthood’ would to a great extent contribute to the attractiveness of the EU as location for robo advisors. Most effectively such agreements should be concluded by ESMA and apply to robo advisors that are in possession of a European ‘passport’, rather than being negotiated by each and every national regulator. This not least because the EU has a much better bargaining position than one single Member State and would therefore be able to negotiate more beneficial agreements for all.

V. Conclusion

This paper has explored the phenomenon “robo advice” – the automated provision of financial advice, typically based on algorithms, without human intervention. Robo advice holds the promise of cheap, convenient and fast investment services for consumers which would be free from human error or bias. However, retail investors have limited capacity to assess the soundness of the advice, and are prone to make hasty, unverified investment decisions. Moreover, financial advice based on rough and broad classifications may fail to take into account the individual preferences and needs of the investor. On a more general scale, robo advice and recommendations based on algorithms may be a source of new systemic risk.

At this stage, the existing EU regulatory framework is of little help. Neither does it adequately address these concerns, nor does it support the developments of robo advisors. Instead, this paper proposes a regulatory “sandbox” – an experimentation space – as a step towards a regulatory environment where such new business models can thrive. A sandbox would allow market participants to test automated services in the real market, with real consumers, but under close scrutiny of the supervisor. The benefit of such an approach is that it fuels the development of new business practices and reduces the “time to market” cycle of financial innovation while simultaneously safeguarding consumer protection. At the same time, a sandbox allows for mutual learning in a field concerning a little-known phenomenon, both for firms and for the market authority. This would help reducing the prevalent regulatory uncertainty for all market participants.

In the particular EU legal framework with various layers of legal instruments, the implementation of such a sandbox is not straightforward. In this paper, we propose a “guided sandbox”, operated by the EU Member States, but with endorsement, support, and monitoring by EU institutions. This innovative approach would be somewhat uncharted

territory for the EU, and thereby also contribute to the future development of EU financial market governance as a whole.