

Financial Technology: The Regulatory Tipping Points

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Mr. Prime Minister, Ministers, distinguished guests, ladies and gentlemen,

It is both an honour and a great pleasure to be here today to speak at the FMA's FinTech conference.

Let me start by thanking the Finanzmarktaufsicht of Liechtenstein for its generosity in hosting us today and having invited me to participate. The issue of FinTech and the regulatory response is a critical challenge for both regulators and market participants. The challenge is what I call a regulatory 'tipping point', by that I mean when does the regulator step in --- the point between 'too small to intervene' and 'too large to ignore'.

In my speech today, I will present to you a regulatory perspective on the opportunities and the challenges arising from financial technology. Allow me to add that the topics of technology and regulations are especially relevant to innovation, as most academic literature on the topic of financial innovation places them as the primary drivers of innovation.

ESMA Mission

Let me start by looking back. ESMA was established on 1, January 2011 as part of a series of measures taken to reinforce financial supervision across the European Union. ESMA forms part of the overall European System of Financial Supervision, which includes our sister authorities EIOPA, responsible for insurance and pension regulation and supervision, and EBA, responsible for banking and payment services regulation and supervision. The European System of Financial Supervision provides a forum for bringing together national regulators and supervisory authorities from across the European Union to find common regulatory solutions, improve understanding of relevant risks in financial markets and enhance supervisory convergence.

ESMA's focus is on European securities markets and it has as its primary objective to promote investor protection, orderly markets and financial stability. It achieves this by: assessing risks to investors, markets and financial stability, completing a single rule book for EU financial

markets, promoting supervisory convergence and directly supervising credit rating agencies and trade repositories. And specifically in terms of innovation, ESMA is in charge of ensuring a coordinated approach to the regulatory and supervisory treatment of new or innovative financial activities in the securities markets.

What do we mean when we say financial innovation? The definition we employ is ('...the act of creating and distributing new financial instruments, processes, business models and markets, including the new application of existing ideas in a different market context.'). We view Financial Technology or 'FinTech' as a subset of financial innovation, and define it as a type of financial innovation that relies on Information Technology to function, e.g. internet, cloud etc. and that can result in new business models, applications, processes, products, or services with an associated effect on financial markets and institutions and the provisions of financial services. Let's next discuss ESMA's approach to monitoring Financial Innovation.

Approach to Monitoring Financial Innovation

ESMA has put in place a framework within which the analysis of financial innovation can best take place. The framework provides a principles-based approach to the work both in terms of the range of innovation we track as well as the tools we employ. In designing the framework, we have been guided by the three core objectives of ESMA --- investor protection, financial stability and orderly markets. The ESMA objectives serve to ground the analysis of financial innovation for a number of reasons. We bring to the subject a balanced approach, both protective and supportive.

Challenges

However, the design of a framework to analyse financial innovation across the EU is not without challenges. – I will name 6.

First is the heterogeneity of the financial markets across the 28 Member States. They differ markedly in breadth, depth, volume, and sophistication of market participants.

Second is the concept of 'innovation spiral'. What may have been designed and targeted to a given segment of sophisticated market participants may over time migrate to a market segment home to less informed investors for whom the product introduces unexpected risks. An example of this is the institutional futures market evolving into a retail 'contracts for differences' market.

Third, our task is complicated by the fact that when an innovation is newly introduced its user base is typically narrow and in turn its scope for creating systemic harm is limited. Our challenge lies in recognizing and inhibiting the growth of flawed products before they become widely distributed, that is recognizing the 'tipping point'. We must be proactive, not just reactive.

Fourth, the perceived utilities of innovations are often situation/time-dependent. Weaknesses in certain innovations may only become apparent during periods of extreme illiquidity or economic crisis, e.g. U.S. subprime securities.

Fifth, our ability to monitor innovative products using classical risk management tools is limited. One of the primary obstacles to understanding the risk profile of newly introduced products is the lack of time series information with which to measure volatility and tail risk.

Finally, we recognize the existence of the 'regulatory dialectic'. The private sector has incentives and resources to respond rapidly to regulatory measures with innovative tools, techniques and products that seek to circumvent the intended regulation. Let's next discuss FinTech in particular, but first some history.

Financial Innovation in History

I need only mention high frequency trading, synthetic exchange traded funds, contingent convertibles, distributed ledger technology and automated advice to name but a small handful of the innovations that have recently emerged. However, these are but the latest chapter in financial ingenuity, financial innovation has been alive for much of history. Indeed, even the more recent innovations, introduced as novel, were not entirely new. While growth in option trading accelerated in markets with the emergence of the Black Scholes Option pricing model in the early nineties, the bulk of the contracts traded on the seventeenth century Amsterdam stock exchange, then the financial center of the West, were options and contracts resembling futures. Further, even the electronic based technological innovations that have attracted much attention recently are not new to financial services. The development of the telegraph in the 1840s soon led to its use for wire transfers of funds and for the dissemination of price information ('quotes') with respect to gold and securities that were traded on various exchanges.

There are some observers who view the proliferation of financial innovations as a negative externality driven by profit seeking financial service providers seeking to meet the need of yield hungry market participants. They see the innovations as the product of rent seekers looking to take advantage of market participants by providing shades of product differentiation. In this view, the promise of ex ante returns is instead met with higher than expected ex post volatility and below market returns, in turn wasting economic resources and creating social costs.

For example, sceptical observers of financial innovations may justifiably point to certain innovative products that contributed to the credit bubble of 2007-2008 --- the proliferations and devastating effect of credit default swaps, CDOs, CDO squared and synthetic CDOs. The counter argument is that the majority of successful innovations (I say successful because most innovations fail to move beyond the idea phase) have improved the social and economic welfare of market participants – deposit insurance, credit cards, the money market sector, fixed income and equity markets, index funds and a variety of pension savings vehicles to name but a few. These innovations have served to greatly improve the opportunities for households to tailor investment strategies over their lifecycle that best meets their risk/return objectives

especially during the accumulation phase of the working years and spending phase of the retirement years.

Let's now turn our attention to FinTech.

Drivers of FinTech Innovation

We have observed that while we are now witnessing a virtual torrent of technological innovations coming to market, why has the FinTech phenomena occurred only now when compared to non-financial sectors some of which were borne over 20 years ago? If we look to commerce, we know the way in which goods and services are traded has been permanently transformed by the like of Amazon (founded in 1994); peer to peer merchandise trading such as EBay (founded in 1995); and more recently Airbnb (founded in 2008) and Uber (founded in 2009),

So what are some of the factors driving today's post-financial crisis FinTech revolution. Let's break them down by supply factors and demand factors. Supply factors are those that lead innovators to offer a new product or service, and demand factors are those that lead customers to use the innovation.

On the supply side. First, there has been a sharp increase in power of technological capabilities and an attendant decrease in costs. We see this in the increased ability to process large volumes of data combined with a sharp fall in hardware, software and storage costs.

Second, is a phenomenon that we refer to as the 'innovation spiral', where multiple new products or services may spring from a single innovation, which itself may or may not have been successful. For example, we see this in the way smart phones are transforming the way in which certain financial services are transacted --- payments, budgeting and investments. As we said, often times the original innovations are failures, but some derivative of the original spawns' successful innovations. The potential for the distributed ledger technology to change the way in which we transact, borne out of the largely discredited bit coins, is one such example.

Third, the withdrawal of traditional financial firms from some markets has opened the door to new entrants. Often these entrants arrive with novel ways of providing a service that legacy providers may have overlooked. Those entrants employ new technology to scale up quickly. They often come unburdened by regulatory incumbency, compliance costs, capital requirements and legacy systems. Some point to the retreat of many traditional banks from certain riskier lending activities owing to capital requirements as the window that has allowed online market place lenders to occupy that space. Let's turn to the demand side.

On the demand side. First, trust, post-financial crisis there has been a notable decline in trust in traditional institutions, i.e., banks. Previously this 'trust' factor had been a barrier to entry for new entrants to financial services. As a result, consumers may now be more willing to use the services of new market entrants, and crucially they may now be willing to use 'a la carte'

specialist providers of some services, such as payment services and savings products, that formerly were offered by a single bank.

Second, heightened expectations, the spread of internet access and the real-time transacting capability of users of internet-connected devices provide an enhanced customer experience. This experience has given rise to higher customer expectations with regard to convenience, speed, cost and user-friendliness of financial services, which has in turn become one of the most important factors in consumer purchasing decisions. Furthermore, as consumers become increasingly accustomed to using internet-connected devices to undertake financial transactions, they may become more willing to use newer Fintech financial services providers.

Third, a related factor, are demographic factors driving demand. Today, the iPhone 6/7 has infinitely greater speed, processing power and memory than did the Apollo Guidance Computer that powered the first astronauts to the moon. As a result, generation Z are what we call 'digital natives' and have a very different relationship with, and expectation of, technology from the generations before it.

ESMA's balanced approach towards financial innovation.

Let me move on to provide some concrete examples of ESMA's balanced approach towards financial innovation. As I said at the outset of my remarks, technological advances and regulation as the primary drivers of innovation in finance. Indeed, innovators look for opportunities that exploit regulatory gaps, regulators impose new regulations, and each new regulation gives rise to new opportunities for more innovation.

I want to emphasize that regulators in general and ESMA in particular are not hostile towards financial innovation.

We recognize that financial innovation can foster competition especially in financial services where network effects can otherwise create monopolies and render financial services expensive and exclusive. However, it is of utmost importance that any potential risks innovative products or practices may create are not overlooked and this is why ESMA brings a balanced approach to the subject.

The organisers of today's meeting, told me in advance that you are interested not only in what ESMA is doing, but also what the other two ESAs' are focused on, cross cutting the three sectors of banking, insurance and the securities markets. In turn, I would like to discuss four topics: two of which are formally Joint Committee work across the 3 ESAs --- Robo Advice and Big Data; and two that are not formally JC work, but are of informal interest to each of us --- crowd funding and the Distributed Ledger Technology.

RoboAdvice

'Robo advice' also known as automated advice is of interest to us as regulators across the financial sectors. In December 2015, the Joint Committee of the three European Supervisory Authorities launched a Discussion Paper on the topic of automation in financial advice, which

explained the concept of automated advice and highlighted the potential benefits and risks to consumers and to financial institutions. The aim of the document was to assess what, if any, regulatory or supervisory action is required to mitigate potential risks and at the same time how best to harness the potential benefits of this innovation.

Among the benefits repeatedly highlighted, was that this new-found means of delivering financial advice can potentially provide inclusion to consumers previously excluded from the provision of professional advice. Additionally, this expanded access to financial advice comes at a lower cost and with the potential to deliver highly consistent consumer experiences for those seeking financial advice. Other possible benefits relate to the standardisation that automation can bring, which can result in a more consistent consumer experience. A fully automated and standardised advice process can also facilitate record-keeping, allowing institutions to more easily check and audit the quality of the advice they have provided.

The results of the Discussion Paper highlighted certain risks to the automation of financial advice compared to traditional 'human' professional advice cited: first, the risk that consumers could misunderstand advice provided to them without the benefit of a professional advisor to support them through the advice process; second, the potential for limitations or errors in automated tools; and third risks associated with the widespread use of automated advice tools, for example the possibility of a "herding risk" if a significant volume of consumers end up transacting in the same way in relation to the same financial products and services.

The three ESAs having analysed the responses received to the DP and are in the process of deciding whether further cross-sectoral action is warranted or needed at this stage. The high number of responses shows that this is clearly a topic of interest to various stakeholders in the marketplace. From a securities regulators standpoint, it appears that robo advice can exist within the technologically neutral MiFID framework.

Big Data/Artificial Intelligence

Second, big data and AI. Internet and connected devices have become core elements of our lifestyle. Data is generated, collected, stored, processed and used at unprecedented rates and entire business sectors are being reshaped building on data analytics. The ESAs have noted the continued increase in the use of Big Data across the banking, insurance and securities sectors, i.e. the processing and use of high volumes of different types of data from various sources, using IT tools, in order to generate ideas, solutions or predict certain events or behaviours (for example to draw actionable insights from these diversified volumes of data in order to profile customers, identify patterns of consumption and make targeted offers). All kinds of financial activities/products could be impacted, such as credit profiling of consumers, risk profiling for insurance underwriting, marketing campaigns, developing products, pricing products/services, preventing fraud, increasing internal efficiency within firms, etc. I could go on.

Importantly, big data based applications allow for increasingly powerful search techniques to support behavioural analytics and collect and manipulate information from many different sources to identify and measure risks, trends, and customer preferences more

comprehensively than ever. In turn, artificial intelligence (AI) software largely relies on data to discern patterns, identify trends and make accurate predictions once reserved to humans

The three ESAs are working to better understand the phenomenon relative to the relevant regulatory frameworks and understand possible benefits and risks of the use of Big Data by financial institutions. Potential benefits could derive from an improved quality of services/products, more efficient processes or better management of risks or fraud situations. Potential risks may relate to the impact on access to products/services for certain consumers, the lack of transparency around the processing of data and the firms' decision-making using Big Data technologies, the potential limitations or errors in the data and analytic tools, or to security and privacy concerns.

The ESAs will analyse the issue in order to decide which, if any, regulatory and/or supervisory actions may be required to mitigate the risks while at the same time harnessing the potential benefits.

Crowdfunding

A third example of FinTech topic we have spent considerable efforts to analyse and monitor is one I am sure you are familiar with --- crowdfunding. Over the last few years, many investment based crowdfunding platforms have been created across Europe providing entrepreneurs access to scarce capital and investors an alternative investment solution.

Crowdfunding first became a topic of interest for ESMA in 2012 as a new means of providing financing and an alternative investment solution that was quickly growing, albeit from a small base. We realised that it could be a complementary source of funding for small businesses struggling to access capital. At the same time, we were alert to the fact that it was also likely to present risks which needed to be managed.

We were aware that Member States and National Competent Authorities had been working on how best to respond to crowdfunding. We were also aware that existing EU regulations were not necessarily designed with this type of industry in mind. At the same time, National Competent Authorities in many member states approached ESMA seeking to clarify how crowdfunding fit into existing legislation.

We had reached the tipping point. In turn, we adopted a step-by-step approach to enable crowdfunding to reach its potential as a source of alternative finance while ensuring that risks to users of crowdfunding platforms were identified and addressed in a proportionate and convergent manner across the EU. Drawing on member states regulators' experiences within their home market we first assessed the state of the crowdfunding sector, the variety of business models, and the various risks to crowdfunding project owners, platforms and investors. We then prepared a detailed analysis of how the business models mapped to the existing EU legislation. Finally, we identified issues for consideration by policymakers at EU level. This work led to the publication of our Opinion to National Competent Authorities on how to supervise crowdfunding and Advice to EU Parliament, Council and Commission in December 2014 on how they may wish to regulate crowdfunding. Later, in July 2015, we

published Q&As specifically regarding pertinent risks in relation to money laundering and terrorist financing in relation to investment-based crowdfunding.

The Opinion provides clarity on the rules likely to apply to investment-based crowdfunding. It mitigates the risk of divergent interpretations of existing legislation within the EU. We think that an important message from the Opinion is that the regulatory burden under legislation such as MiFID need not be as great as some in the industry seemed to think at the time.

The Advice to the EU institutions highlights our concerns that strong incentives currently exist for crowdfunding platforms to structure their business to fall outside the scope of regulation and note that one important driver for this seems to be the current rules on prospectuses. We advised the institutions to consider possible policy options to reduce the incentives.

DLT

Finally, in concluding my remarks I will provide you with yet another example of financial innovation and is occupying ESMA's attention --- the Distributed Ledger Technology ('DLT'), also known by some as the 'block chain'. The DLT is among the most discussed technologies of recent years. There are nearly daily announcements in the press about initiatives in this field. As are other regulatory institutions, ESMA is analysing the technology and its potential applications across the securities markets investment life-cycle.

ESMA began examining the topic in early 2013 as the virtual currency known as 'bitcoin' became a widely known alternative payment service. ESMA then began analysing the degree to which there existed investment products that used virtual currencies as an underlying asset. We learned that such investment products were at best marginal at the time but should be monitored were they to grow and introduce risks to investors. As time passed, ESMA became aware that market participant's focus was largely shifting from virtual currencies as such to the underlying technology.

In April 2015, ESMA published a 'call for evidence' on investments using virtual currency as an underlying and on the anticipated uses of the core distributed ledger technology. The resulting responses from the call for evidence indicated that investments using virtual currencies as underlying remained marginal. However, there was a clear consensus that the underlying core distributed ledger technology had many potential uses across the lifecycle of the investment chain and could have significant effects on the status quo. In particular, the responses emphasized that the DLT could be used as a more efficient lower cost alternative to the existing trading infrastructure.

Our initial research finds that the potential benefits sit more squarely in the post-trade environment. We have found that clearing and settlement, collateral management, record of ownership and securities servicing are the areas where the technology is most likely to bring useful changes. It does so through the provision of a unique reference database, instantaneous reconciliation across all participants, immutable shared records and transparent real-time data.

At the same time, ESMA sees a number of possible limitations to the technology. In particular, we question the ability of the DLT to handle large volumes, to manage privacy issues and to ensure a high level of security. Furthermore, as we anticipate that the DLT is deployed gradually, it will need to demonstrate its ability to interact with certain systems that must continue to co-exist with the DLT, e.g. trade platforms. Similarly, if different ledgers were to be used for different types of instruments, the interoperability of the different networks could be a challenge. However, if the technology is successful in overcoming these hurdles, we can envision significant benefits for financial markets and its participants, both in terms of cost and efficiency.

In June 2016, ESMA published a Discussion Paper to collect feedback from the market on the potential uses, benefits and risks of DLT applied to securities markets. The Discussion Paper also provides a stock-take, with a particular focus on post-trade activities, of the key EU regulations that would be applicable to DLT. ESMA stresses that firms willing to use DLT should be mindful of the existing regulatory framework. More than 60 stakeholders have responded to our consultation, which closed on 2 September. We will use their feedback to develop a position on the use of the technology in securities markets and assess whether a regulatory response may be needed.

Volume of technological change and regulatory response

In summation, while we would look forward to ways in which FinTech can improve how the financial system operates, we at the same time are aware that such promises are not without risks. It is the reason that we as regulators must think carefully on how to respond.

Firms

For financial institutions, FinTech products pose the usual set of operational risks that arise from the known failure of systems and processes and risks posed by third party technology and service providers. Further, firms must be alert to cyber risk, resulting from interconnected computer based systems creates vulnerabilities that can be exploited by hackers with criminal intent, is the most talked about technology related risk. I know financial institutions are investing heavily in tools to protect themselves and their clients.

But perhaps the greatest FinTech related risk to incumbent financial institutions and greatest challenge is how to respond to the phenomena --- do you outsource certain services to nimbler FinTech providers? develop competing services internally? or acquire FinTech providers?, or ultimately disband certain legacy services? How incumbent institutions respond to the challenge may well determine their future survival.

Regulators

We as regulators have an important role to play. We are responsible for designing and supervising the rules of conduct by which financial institutions operate with the aim of minimizing disruption to the markets and harm to market participants. In turn, regulated entities

gain access to markets and certain safety nets by applying regulatory standards, and suffer penalties for non-compliance.

FinTechs pose challenges to regulators. First, as mentioned earlier, FinTechs may exist in a regulatory grey zone. They may perform some of the services of banks or investment advisors without being subject to similar licensing and regulatory regimes. Second, many FinTech products are digital and cannot be contained within national borders, so international coordination is needed to ensure that these activities do not move to less regulated jurisdictions.

In summation, regulators face a balancing act. We work to understand the risks that new entrants may introduce, cautious in allowing innovations to disseminate so widely such that in the event of unanticipated risks, they cannot be rolled back while at the same time not wanting to stifle innovation by restricting the use of certain technologies, they are.

Certain regulators are searching for new ways to manage the transition to the FinTech world. Some are promoting the concepts of regulatory sandboxes. In the past year, some have issued guidelines on sandboxes that will allow selected products of approved FinTechs to go live for a defined period. Only after the product proves successful, will it be subject to the full regulatory requirements. It is thought that this sandbox approach will allow regulators to understand the risks a product might introduce if widely deployed, but in a controlled environment. It will help FinTech firms, especially start-ups to test their products without having to bear the full cost of regulation and supervisory action.

Conclusion

We have said that our framework for monitoring financial innovation is a principles-based approach. In using this approach, we recognize that the topic of innovation differs in magnitude from the vast majority of work ESMA does in the policy space. There is no Level I legal provision to follow within the sphere of financial innovation. The types of innovation and need for innovation differ greatly across Member States. In turn, our framework needs to remain flexible and adaptive to market events. It also needs the subtlety to know when to respond in a supportive as opposed to a protective manner, a tipping point of sorts. We intend to revisit the framework on a regular basis to ensure it remains effective and relevant.

Thank you for your time this afternoon. [