Thinking Inside the Box: The UK FCA Sandbox, a Playground for Innovation

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The growing application of blockchain and other distributed ledger technologies to financial products, services and business models raises a host of regulatory issues due, in particular, to the fact that many of the relevant regulatory regimes have been crafted to cater to centralised ledger systems. Developing regulations for this emerging reality is, at best, an iterative, time-consuming process. While it is obviously important that consumers and the integrity of the market are protected, it is equally important that the financial products and services industry is allowed to continue to develop and innovate.

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The *regulatory sandbox* can be a powerful tool for providing regulatory oversight while allowing companies the latitude necessary for effective innovation. Firms participating in a sandbox can test a new product or service in real-world conditions, under the oversight of the relevant market regulator but without having to comply with the full extent of the applicable regulations.

The UK Financial Conduct Authority ("FCA") has been a pioneer of the sandbox in the financial regulatory sphere. The FCA sandbox ("FCA Sandbox") accepted its first applications in June 2016 with the aim of fostering innovation in financial products and services and promoting effective competition in the interests of consumers. Since its launch, the FCA Sandbox has supported almost 70 firms in testing innovative new products and services.

HOW THE FCA SANDBOX WORKS

Each firm participating in the FCA Sandbox ("Participant") will be assigned a case officer who will support the design and implementation of tests on the proposed project and provide guidance on how each project would fit within the regulatory framework. A set of standard safeguards is imposed on all FCA Sandbox tests and bespoke safeguards are added where needed. For example, the FCA requires all Participants to establish an exit plan to ensure that the test can be terminated at any time with minimal harm to participating consumers. Additionally, firms that propose testing the use of digital currencies in money remittance are required to provide full guarantees for the funds

being transmitted. Where Participants introduce new technologies or the application of existing technologies in new ways, the FCA conducts technology and cyber resilience reviews. These reviews allow the application of such technologies on a small scale in the market while ensuring that controls are in place to minimise the risk of harm to customers.

While testing a product in the Sandbox, Participants are given a restricted form of FCA Authorisation. In addition, the FCA provides Participants with a number of tools to help address concerns regarding the risk of being subject to future enforcement action stemming from the activities tested, including:

- Individual guidance on the interpretation of the rules applicable to the activities being tested.

- No Enforcement Action Letters ("NALs"), stating that the FCA will not take enforcement action against activities being tested where the FCA is reasonably satisfied that the activities do not breach the relevant conditions agreed with the FCA or their objectives. It should be noted that NALs only address the risk of FCA enforcement action and do not affect a Participant's liability towards its customers.

- Waivers to Participants who have breached the applicable FCA Sandbox rules but meet the waiver criteria under section 138A(4) of the Financial Services and Markets Act 2000. [1]

While Participants must still apply for full FCA Authorisation to launch the project outside the FCA Sandbox once testing is complete, the FCA has indicated that products that have been successfully tested are likely to obtain FCA Authorisation more quickly than products that have not.

There are several additional benefits to participating in the FCA Sandbox. Participants can develop their projects with the guidance of the FCA and mitigate the risk of harm to consumers by implementing appropriate safeguards. This potentially reduces the costs and risks normally associated with launching an un-tested product. The greater likelihood that the project will be regulation compliant and that full FCA Authorisation will be secured puts Participants in a stronger position to secure investor funding. Participants are also able to assess a project's commercial viability and gauge potential

[1] The FCA may not give waivers or modifications unless they are satisfied that (a) compliance by the person with the rules, or with the rules as unmodified, would be unduly burdensome or would not achieve the purpose for which the rules were made, and (b) the waiver or modification would not adversely affect the advancement of any of the FCA's objectives.

consumer receptiveness towards various pricing strategies, business models and other variables.

ADMISSION TO THE FCA SANDBOX

Firms are admitted to the FCA Sandbox on a cohort basis, with two six-month test periods each year. There are a number of requirements firms must fulfil to qualify for FCA Sandbox testing, including having a significant UK presence (*i.e.*, a certain level of staff and a head office located in the United Kingdom), and a contractual relationship with all relevant partners, if any. The following FCA table lists the eligibility criteria and guidelines applied by the FCA when reviewing applications.

Eligibility criteria	Key questions	Positive indicators	Negative indicators
In scope	Are you looking to deliver innovation that is either a regulated business or supports regulated business in the UK financial services market?	Innovation appears to be intended for the UK market.	Innovation does not appear to be intended for use in the United Kingdom.
Genuine innovation	Is your innovation ground-breaking or a significantly different offering in the marketplace?	Desk research produces few or no comparable offerings already established on the market. Steep change in scale.	There are numerous examples of similar offerings already established on the market. It looks like artificial product differentiation.
Consumer benefit	Does the innovation offer a good prospect of identifiable benefit to consumers	The innovation is likely to lead to a better deal for consumers directly	Likely detrimental impact on consumers, markets or the

Eligibility criteria	Key questions	Positive indicators	Negative indicators
	(either directly or via heightened competition)?	or indirectly. You have identified any possible consumer risks and proposed mitigation. The innovation will promote effective competition.	financial system. It looks designed to circumvent regulations.
Need for a sandbox	Do you have a genuine need to test the innovation in our sandbox?	The innovation does not easily fit the existing regulatory framework, making it difficult or costly to get the innovation to market. You will benefit from using a sandbox tool to test in a live environment. You have no alternative means of engaging with the FCA or achieving the testing objective. The full FCA Authorisation process would be	Live testing is not necessary to answer the question that you want answered (to achieve the testing objective). You are able to undertake the test easily without the support of the FCA. A dedicated supervisor or our Direct Support team could answer the query.

Eligibility criteria	Key questions	Positive indicators	Negative indicators
		too costly/difficult for a short viability test.	
Ready for testing	Are you ready to test the innovation in the real market with real consumers?	You have a well-developed testing plan with clear objectives, parameters and success criteria. Some testing has been conducted to date. You have the resources to test in the sandbox. You have sufficient safeguards in place to protect consumers and are able to provide appropriate redress if required.	Unclear objectives for testing and/or plans for testing are underdeveloped. Little to no testing has been done. You do not have the resources for the test. The proposed customer safeguards are inadequate and/or appropriate redress cannot be provided.

In its October 2017 report, the FCA identified a number of obstacles that applicants have encountered. We discuss three of them below.

Bank Accounts

Most firms will need a UK bank account before they can participate in the FCA Sandbox. However, a number of banks are refusing to offer banking services to certain types of firms due to a perception of greater money laundering and terrorist financing risks. These difficulties are particularly marked for firms seeking to leverage decentralised ledger technology ("DLT"), become payment institutions, or become electronic money institutions.

Customer Acquisition

Relative to larger firms with well-established customer bases, smaller firms and start-ups might face difficulty acquiring customers for testing. One solution is for smaller firms to enter into partnerships with larger firms. There can be benefits for both sides: smaller firms get access to a larger pool of existing customers for project testing, while larger firms get access to innovation and additional technological expertise. In December 2016, for example, HSBC Bank collaborated with fintech start-up Pariti to test HSBC's SmartSave app in the FCA Sandbox.

Meeting the Conditions for FCA Authorisation

Firms seeking to test in the FCA Sandbox must meet the relevant conditions for FCA Authorisation for the activities they want to conduct. This is to ensure that Participants possess the necessary competence and resource capacity to sustain their operations and protect customers. While the FCA noted that the non-traditional business models of certain FCA Sandbox applicants required a more complex assessment process relative to the more traditional firms, FCA Sandbox applicants have generally been able to demonstrate that they can meet the necessary conditions for FCA Authorisation.

In addition, certain types of firms faced increased difficulty in meeting the initial regulatory requirements. For example, firms that proposed underwriting insurance products during testing have to qualify for FCA Authorisation as insurers but failed to do so in many instances. The FCA suggested that such firms could, alternatively, become insurance intermediaries and partner with incumbent insurers to underwrite the proposed insurance products. Likewise, a number of firms seeking to operate multilateral trading facilities have struggled to meet the requirement to hold a substantial level of initial regulatory capital.

FCA SANDBOX PARTICIPANTS

Participants in the FCA Sandbox thus far are predominantly from the retail banking sector, but also include general insurance and protection, retail investments, wholesale banking, and retail lending firms. While participation in the FCA Sandbox is open to firms regardless of their size or maturity, the majority of Participants were start-up companies and those not yet authorised by the FCA.

Many FCA Sandbox projects have involved the new application of technology rather than the creation of entirely new products. DLT was the most popular technology employed in the first two FCA Sandbox cohorts, used mainly by electronic money or payments institutions. These projects included DLT-based payment services and AI software programmed to predict customer preferences prior to the rendering of financial advice.

The large number of Participants employing DLT in the FCA Sandbox is a testament to the potential that the FCA believes blockchain technology holds for the future of the financial services industry. We discuss three such notable projects below.

Nivaura

Nivaura is a fintech company with a platform aimed at automating the life-cycle of a financial instrument, from the agreement of commercial terms through to maturity. In 2016, the Nivaura platform was used by LuxDeco, an online purveyor of upscale home furnishings, within the FCA Sandbox to test the commercial viability of issuing bonds with blockchain technology. The test involved the issue and comparison of two bonds. The first was a regular registered sterling bond with a relatively normal structure (the "Control Bond"); the second was the world's first cryptocurrency-denominated bond, fully cleared and settled on a public blockchain (the "Crypto Bond"). For the purposes of this test, Nivaura, which was already FCA Authorised, was deemed to have the appropriate Client Assets Sourcebook permissions to hold client money and assets.

In a normal bond issuance, legal and beneficial title is split, with legal title held by a nominee and beneficial title held for the account holder by a custodian. The name of the nominee must be entered into the register, evidenced by a global certificate representing the entire issuance. A paying agent is appointed by the issuer to execute payments of principal and interest to the ultimate beneficial owners through the clearing system. Further, the relationship between the issuer and registrar, and the issuer and the paying agent, needs to be contractually agreed. The necessary documentation involved in the life-cycle of such bonds is complex and can be costly and time consuming, particularly for first-time issuers.

For the purposes of testing, slight adjustments were made to the structure of the issuance of the Control Bond. *First*, the Nivaura platform was used instead of a conventional clearing system. *Second*, Nivaura played the role of paying agent. *Third*, Link Asset Services played the role of registrar and trustee. While investor funds were paid directly into Nivaura's client account, Nivaura mirrored the transaction on a blockchain to show how a blockchain-based bond would operate. On settlement, the bonds were issued to LuxDeco's securities account and then transferred to investors on a typical delivery-versus-payment basis—securities passed from LuxDeco's securities account to the relevant investors' securities accounts as cash passed from the investors' cash accounts to LuxDeco's cash account.

The Crypto Bond was also issued on the Nivaura platform but was denominated in ether, the cryptocurrency of the Ethereum network. In this case, investors transferred ether from their own cryptocurrency wallets ("crypto-wallets") to their Nivaura crypto-wallets. Settlement involved the transfer of ether from the investors' crypto-wallets to

LuxDeco's crypto-wallet, and the bonds passed from LuxDeco's securities wallet to the investors' wallets. The bond life-cycle was recorded on the Ethereum blockchain and represented on the Nivaura platform interface.

The Nivaura platform's smart contract code automated delivery of the bonds and payment flows—LuxDeco's bonds were issued, and interest and principal were paid automatically without further action by the parties.

Several key observations emerged from the testing:

- The blockchain showed a clear record of ownership.
- The structure of the bond issuance was simpler—legal and beneficial ownership was not split, thus dispensing with the global note structure underpinning the issuing of securities.
- Replacing the registrar with the blockchain removed the need to establish the usual contractual relationship between the issuer and registrar.
- Principal and interest could be paid directly to investors via smart contracts, dispensing with the need to appoint a paying agent.
- A blockchain wallet is easy to open.
- The allocation of cash and assets on the blockchain can be independently verified without relying on Nivaura's platform—the underlying contractual relationships would thus remain enforceable between issuers and bondholders in the event Nivaura's systems cease to operate.
- Smart contracts do not alter the enforceability of a bond issuance; the relationship between the parties is still governed by regular contracts currently recognised by capital markets lawyers and the courts.

Parties transacting with DLT and other new innovative technological applications must continue to comply with existing regulatory requirements, including appropriate know your customer ("KYC") and anti-money laundering checks. While some observers have expressed concerns about the pseudoanonymity of users of the blockchain, the reality is that parties will have to transact over a platform or application and will inevitably have to undergo the relevant preliminary KYC procedures that would, in turn, facilitate the tracing of asset movement.

The simplified structure and reduced number of parties required to issue a crypto bond would result in substantial time and cost savings due to shorter and less complex bond documentation. Further, eliminating one or more layers of intermediaries between bond issuer and bond holder would reduce the risk of mistake or misconduct from the parties to the bond issue. From a regulatory perspective, the FCA was satisfied that a public blockchain could fill the role of an independent third party reconciling the register because Nivaura had no direct control over the allocation of assets and money held on the register—the blockchain played the role of the register recording legal and beneficial ownership.

Billon

Billon's micropayment technology facilitates the independent management by corporate clients of loyalty incentive pay-outs. Firms receive a virtual bank account number at the time of registration and can pay to any UK banking account or withdraw from about 60,000 locations accepting digital vouchers.

Billon aims to use DLT to support smaller businesses that struggle with the high back-office costs of administering pre-paid card systems. Smaller firms may also encounter clients who are unwilling to share their bank account details for audit purposes. Billon's solution is to replace vouchers, pre-paid cards, and other semi-cash payment methods with a system that facilitates the transfer of funds using mobile phones and which audits transactions over a distributed ledger. With an audit trail secured by the distributed ledger and the elimination of most back-office costs associated with monitoring and reconciling pay-outs, it is expected that banks could reduce certain operating costs of corporate loyalty pay-out programs by up to 90 percent.

In Billon's FCA Sandbox test, a Billon client, Conduct Research, used Billon's system to transfer funds via mobile phone to 100 participants, who could pay bills, transfer the funds to their own bank accounts, or withdraw cash at over 40,000 PayPoint locations. The restrictions on Billon's registered status as a small e-money firm was lifted by the FCA following its successful FCA Sandbox trial. Beyond mere cost reduction, the Billion experiment demonstrated how DLT can give smaller firms access to a wider range of financial services and products.

Etherisc

Etherisc, previously known as FlightDelay, is an Ethereum and smart contracts-based insurance decentralised application focused on the claims process for flight delays. Etherisc has been accepted into the third cohort of the FCA Sandbox.

Etherisc hopes to automate the claims process so completely that a claim need not be made at all. Instead, the decentralised application, informed by flight data feeds from a

system called Oraclize, automatically processes and pays out compensation upon the cancellation or delay of a flight. Users only need to supply basic information, such as their flight number. Automating claim verification and pay-out processes reduces exposure to potential disputes. The application also facilitates the payment of insurance premiums. The Etherisc team foresees extending their existing platform to include coverage of train journeys and/or other services.

The FCA Sandbox has made notable strides towards achieving its intended objectives. Approximately 90 percent of firms that completed testing in the first cohort continued toward a wider market launch following testing, and the majority of firms granted Restricted FCA Authorisation in the FCA Sandbox proceeded to secure full FCA Authorisation post-testing. Further, at least 40 percent of the first cohort Participants which successfully completed testing received investment during or following their FCA Sandbox tests.

GLOBAL DEVELOPMENTS

The FCA Sandbox is a model that has been adopted by many financial services regulators around the world. The Hong Kong Monetary Authority launched its Fintech Supervisory Sandbox in September 2016 and the Canadian Securities Administrators sandbox launched in February 2017. The Bank of Lithuania intends to launch LBChain, its regulatory and technological sandbox platform-service, by 2019. The United States, on the other hand, has taken a more conservative approach to encouraging fintech innovation. For example, the U.S. Commodity Futures Trading Commission ("CFTC") initiative, LabCFTC, merely provides a forum for fintech firms to discuss their proposals with CFTC specialists, and educates the public and market participants on fintech developments more generally. Another example is the U.S. Office of the Comptroller of Currency ("OCC"), which proposed in its December 2016 white paper to create a new national bank charter for fintech companies, to position itself "to better evaluate and respond to the risks that accompany the delivery" of new technologies. While the efforts such as that of the U.S. CFTC and OCC appear to be a step in the right direction, such efforts still fail to provide a framework for actual collaboration between regulator and innovator that is as comprehensive as that provided by a regulatory sandbox.

The use of regulatory sandboxes represents an important shift towards a collaboration-focused approach between regulators and firms to foster innovation in the highly regulated financial products and services markets. In December 2017, the FCA opened the application process for the fourth cohort of the FCA Sandbox, which is expected to begin testing from June 2018. Meanwhile, the blockchain industry in the United States

will continue to look across the pond at the "playgrounds" of others in the hope that one will soon be built in its own backyard.

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