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From childish things: the evolving sandbox approach in the EU's regulation of financial technology

Jonathan McCarthy

School of Law, University College Cork, Cork, Ireland

ABSTRACT
The background to this article is the seeming revival of a sandbox approach to FinTech regulation within the EU, as epitomised by legislative initiatives on AI and DLT. The article contributes to existing literature on the topic by highlighting how the current design of sandboxes is not being informed by sufficiently comprehensive empirical evidence from international examples. As well as examining relevant provisions of the European Commission's proposals on AI sandboxes and introduction of a DLT pilot regime, the article refers to UK and Australian examples to demonstrate the varying features of sandboxes. Even if there is continued ambiguity as to the characteristics of sandboxes, broader regulatory supports, such as innovation hubs, can be vital. However, this should not diminish the need for improved clarity and transparency on sandboxes' operations. The ability to make necessary refinements will determine how the EU's regulatory approach to FinTech generally will evolve.

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KEYWORDS Regulatory sandboxes; FinTech; artificial intelligence; distributed ledger technology; EU

1. Introduction

Regulatory sandboxes are consistently advocated as a central feature of approaches to the regulation of technological growth in finance. Sandboxes are possibly so infamous a regulatory stance towards FinTech at this point that it is unclear whether concerns over the apparently unique nature of various technologies are even being alleviated by the use of sandboxes. The apprehension over how best to regulate FinTech may not be reduced by a sense that technological firms are somehow furtively availing of specialised protections, essentially akin to sanctuaries or safe play-area spaces for innovative experimentation. As a seemingly innovative regulatory technique in response to innovative technologies, sandboxes can immediately attract

CONTACT Jonathan McCarthy jonathan.mccarthy@ucc.ie

attention, if not praise. The question is whether much of the commentary is based on factual understanding of regulatory sandboxes' purposes and outcomes.

Within recent legislative proposals of the European Commission, the sandbox approach is notably revived in European Union regulation. This is epitomised in proposed Regulation provisions designed to promote innovation in artificial intelligence (AI) and, to a similar extent, in the formulation of a pilot regime for distributed ledger technology (DLT) in market infrastructures for securities trading and settlement.

By reference to the legislative proposals and to instances of established sandboxes (specifically the UK and Australia), this article contributes to the existing literature on FinTech regulation by means of a fundamental, but logical, two-fold argument. Firstly, as exemplified by the provisions of the AI Regulation proposal, there can be a lack of sufficiently precise guidance on the practicalities of how sandboxes should function, ranging from objective entry criteria to the level of supervisory rigour. Even if discretion and flexibility are intrinsic to principles-based financial regulation, learning from international examples can prove informative as to what works well and what does not. Secondly, there remains a necessity for improved comprehensive empirical data on the operation of sandboxes, partly because of their very modern antecedents. The need for empirical data must also be addressed when sandbox measures are established on an EU-wide basis.

To set the background to the altered outlook towards pan-EU regulatory measures, the second section of the article explains the envisaged format of the sandboxes within the AI Regulation proposal and the nature of the pilot regime for DLT financial market infrastructures (FMIs). In drawing parallels with what has been implemented to date, the third section of the article refers to UK and Australian examples and queries the depth of empirical evidence as to the key characteristics of sandboxes since 2016. The fourth section considers how broader FinTech 'ecosystems' have been elevated to complement the objectives of sandboxes. There are very compelling arguments for enabling wider supports and for avoiding being overly reliant on sandboxes in FinTech regulation. However, compared to other aspects of FinTech, it will be argued that legislative intervention specifically for sandboxes (and, accordingly, piloting) represents a proactive step by progressing from an almost cursory application of principles-based regulation.

The article concludes that the next vital step is to ensure certainty and a level of transparent detail to EU sandbox procedures. Even if claims about what sandboxes can accomplish for FinTech regulation and innovation are spurious or not, the establishment of sandboxes in various jurisdictions could risk being perceived as being quite imitative of what are assumed to be definitive characteristics of sandboxes. Authoritative judgements on the most apt and effective design features and conditions for sandboxes can be best achieved by learning from international evidence. In view of the scarcity of comprehensive global data, enhanced collaboration between EU and international agencies is essential to attaining this knowledge.

2. Current EU legislative initiatives: sandboxes and piloting

To highlight how sandboxes are being given prominence in EU law and policy-making on FinTech and digital finance, this section of the article concentrates on two legislative measures proposed by the European Commission, one on AI, and the other is an enacted pilot regime for DLT FMIs (in securities trading and settlement). Rather than examining the (occasionally dense) content of the initiatives in their entirety, the article maintains its focus on analysing how both measures appear to indicate that a sandbox approach is becoming the favoured regulatory technique for EU-wide legislation in respect of AI and DLT. The measures also reveal subtle differences between what should be regarded as strands of an overall regulatory stance towards FinTech.

2.1. Sandboxes within the AI Regulation proposal

Aside from the relevance to this article for its inclusion of sandbox measures, it should be acknowledged at the outset that the Commission's Regulation proposal in laying down harmonised rules on Artificial Intelligence (termed an 'Artificial Intelligence Act')[1] has gained as much criticism as acclaim for its interventionist approach. The classification of AI systems in terms of being unacceptable (prohibited), high-risk or low-risk practices signals an outwardly brave approach in trying to impose some regulatory order to what are expected to be one of the most rapidly expanding of technologies in finance. However, the categorisation attempted in the Regulation proposal is characterised as much by what it is omitted (or, at the very least, unsatisfactorily defined), as by what is included within each category.[2]

For the purposes of this article, and subject to amendments during the legislative procedures, the most pertinent aspects of the proposal are the

[1] European Commission, Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts, COM(2021) 206 final [hereinafter the 'AI Regulation proposal'].

[2] For instances of critiques of the AI Regulation proposal at the time of writing, especially in relation to the ambiguity of the definition assigned to AI and the proposal's failure to sufficiently cover the use of AI for military uses, see Michael Veale and Frederik Zuiderveen Borgesius, 'Demystifying the Draft EU Artificial Intelligence Act – Analysing the Good, the Bad and the Unclear Elements of the Proposed Approach' (2021) 22(4) *Computer Law Review International* 97, and Bernd Carsten Stahl, 'EU is Cracking Down on AI, But Leaves a Loophole for Mass Surveillance' (The Conversation Blog, 21 April 2021): https://theconversation.com/eu-is-cracking-down-on-ai-but-leaves-a-loophole-for-mass-surveillance-159421 (accessed 3 May 2022).

provisions expressly stated as being 'measures in support of innovation'. In aiding the prospects of sustained AI innovation through Title V of the Regulation proposal, sandboxes are patently envisaged by the Commission as best capable of effecting a regulatory framework which is conducive to technological development, while also ensuring clarity of robust sector-specific rules. AI is discerned in the proposal as requiring 'novel forms of regulatory oversight and a safe space for experimentation', but that it should be balanced with 'ensuring responsible innovation and integration of appropriate safeguards, and risk mitigation measures.' The objective is to formulate an EU regime that is innovation-friendly, future-proof and resilient to disruption.[3] The question of achieving this balance is hardly anything new in discussions surrounding FinTech. For the Commission's proposal, it seems that the answer can be yielded from the use of sandboxes.

AI regulatory sandboxes are to be established by Member States' competent authorities or by the European Data Protection Supervisor. Sandboxes should 'provide a controlled environment that facilitates the development, testing and validation of innovative AI systems for a limited time' prior to market placement or release as a service in accordance with a specific plan. If 'significant risks' to health, safety and fundamental rights are identified, there should be immediate mitigation, or, failing that, suspension of testing.[4] Coordination of national authorities' activities should be enabled through cooperation with a European Artificial Intelligence Board (comprised of national supervisory authorities and the European Data Protection Supervisor), including through submission of annual reports on implementation outcomes.[5] For safeguarding substantial 'public interest', personal data may be lawfully collected and processed during the sandbox development and the testing of certain AI systems.[6] All processed personal data should not be transmitted, transferred or otherwise accessible to third parties,[7] and should be deleted once participation in the sandbox has terminated or once the data has reached the end of its retention period.[8]

There is sparse detail given in the Regulation proposal on entry criteria and on set durations for Member States' sandboxes. Nonetheless, the

[3]AI Regulation proposal, Recital 71.
[4]AI Regulation proposal, Article 53(3). Participants in a sandbox remain liable under applicable law for any harm to third parties resulting from the sandbox experimentation: Article 53(4).
[5]AI Regulation proposal, Article 53(5).
[6]AI Regulation proposal, Article 54(1)(a). The public interest areas are specified as: (i) prevention, investigation, detection and prosecution of criminal offences or the execution of criminal penalties (including safeguarding and preventing threats to public security); (ii) public safety and public health, including disease prevention, control and treatment; and (iii) high level of protection and improvement of environmental quality.
[7]AI Regulation proposal, Article 54(1)(e).
[8]AI Regulation proposal, Article 54(1)(g). Logs of processed personal data should be maintained for the duration of participation in a sandbox and for one year after the termination of participation: Article 54 (1)(h).

innovation measures opt to concentrate on a particular kind of FinTech firm. Small-scale providers and users (including start-ups) are to be allowed priority access, insofar as any eligibility conditions are fulfilled.[9] Awareness-raising activities should be tailored especially towards the needs of small-scale providers and users,[10] who should also be able to avail of a dedicated communication channel for guidance and responses to queries.[11] The needs of small-scale providers and users are equally to be acknowledged through the proportionate reduction of fees for conformity assessment of certain high-risk AI systems.[12]

It should be contemplated how sandboxes could practically contribute to a perceptible boost in AI innovation – or FinTech generally – across the EU. Another obvious question could be to ask why AI should be considered so special as to warrant designated supports within an overall regulatory framework? As reiterated by Anton Korinek, Martin Schindler and Joseph Stiglitz, AI is capable of profoundly transforming global dynamics of economic productivity, primarily by widening inequalities between developed and developing economies. Due to the degree of expertise and resources necessary in developing these technologies, winner-takes-all patterns can quickly emerge. Current positions of market dominance can become embedded, giving rise to monopolies.[13] It would stand to reason that as even a distribution of innovative growth as possible should be encouraged across jurisdictions, including through the introduction of uniform standards. Moreover, there is every indication that incumbent financial institutions remain very willing to pursue and refine the use of AI applications, despite inhibited investment in new technologies in the midst of COVID-19.[14]

To evaluate how sandboxes could help to spur AI innovation, much will depend on the policy context and the types of technologies being tested. A market launch ‘in real world conditions’ could be a more telling assessment of an application’s performance than any form of sandbox.[15] Regulatory flexibility has become almost an inherent by-product of adapting to

[9]AI Regulation proposal, Article 55(1)(a).
[10]AI Regulation proposal, Article 55(1)(b).
[11]AI Regulation proposal, Article 55(1)(c).
[12]AI Regulation proposal, Article 55(2).
[13]Anton Korinek, Martin Schindler and Joseph Stiglitz, ‘Technological Progress, Artificial Intelligence, and Inclusive Growth’ (IMF Working Paper 21/166) (June 2021). See also Anton Korinek and Joseph Stiglitz, ‘Artificial Intelligence, Globalization, and Strategies for Economic Development’ (NBER Working Paper No. 28453) (February 2021)
[14]See Julia Anderson, David Bholat, Mohammed Gharbawi, and Oliver Thew, ‘The impact of COVID-19 on Artificial Intelligence in Banking’ (Bruegel blog, 15 April 2021): https://www.bruegel.org/2021/04/the-impact-of-covid-19-on-artificial-intelligence-in-banking/ (accessed 3 May 2022). For commentary on the wider trends towards AI investment, see Wang Jin, Georgios Petropoulos and Sebastian Steffen, ‘Concentration of Artificial Intelligence and Other Frontier IT Skills’ (Bruegel blog, 21 October 2021): https://www.bruegel.org/2021/10/concentration-of-artificial-intelligence-and-other-frontier-it-skills/ (accessed 3 May 2022).
[15]Ross Buckley, Dirk Zetzsche, Douglas Arner and Brian Tang, ‘Regulating Artificial Intelligence in Finance: Putting the Human in the Loop’ (2021) 43(1) *Sydney Law Review* 43, 63.

technological changes. The same is as true for AI as for any other technology which can be beneficial to financial practices. If sandbox measures do not prove wholly effective, then regulators should, in principle, have margin to adjust accordingly. However, as observed by Nathalie Smuha, regulatory convergence is more pronounced than ever, making such flexibility less feasible in AI regulation.[16] Apart from the AI Regulation proposal, the progress towards harmonised standards – and towards sandbox-like regulatory techniques – is also conspicuous through other legislative proposals within the Commission's Digital Finance Strategy.[17]

2.2. Variation on a theme: a DLT pilot regime for securities markets

The EU's DLT pilot regime for FMIs[18] is imbued with many of the same considerations as the AI Regulation proposal. Although the scope of the legislation is interesting as an example of regulatory innovation in itself, the particular focus of this article is on the nature of a pilot regime and its shared characteristics with a sandbox model of FinTech regulation.[19]

The Commission's original Regulation proposal was based on the use of DLT as 'a class of technologies which support the distributed recording of encrypted data.'[20] The eligible FMIs for the pilot regime are multilateral trading facilities (MTFs), as authorised under the second Markets in Financial Instruments Directive (MiFID II),[21] and securities settlement systems operated by Central Securities Depositories (CSDs), in accordance with the Central Securities Depositories Regulation (CSDR).[22] For either category of FMI (MTF or CSD-operated system), the pilot regime is therefore firmly centred on existing market incumbents. Unlike the AI Regulation proposal, there are no explicitly supportive sentiments towards the archetypal small start-up firm seeking to trial products from scratch.

[16]Nathalie Smuha, 'From a "Race to AI" to a "Race to AI Regulation": Regulatory Competition for Artificial Intelligence' (2021) 13(1) *Law, Innovation and Technology* 57.

[17]See Commission website at: https://ec.europa.eu/info/publications/200924-digital-finance-proposals_en (accessed 3 May 2022).

[18]Regulation (EU) 2022/858 of the European Parliament and of the Council of 30 May 2022 on a Pilot Regime for Market Infrastructures Based on Distributed Ledger Technology, and amending Regulations (EU) No. 600/2014 and (EU) No. 909/2014 and Directive 2014/65/EU, OJ L 151 [hereinafter 'DLT Regulation'].

[19]For a more detailed analysis of the original DLT Regulation proposal, see Jonathan McCarthy, 'Distributed Ledger Technology and Financial Market Infrastructures: EU Proposals for a Pilot Regulatory Regime' (2022) 17(3) *Capital Markets Law Journal* 288.

[20]DLT Regulation proposal (European Commission, Proposal for a Regulation of the European Parliament and of the Council on a Pilot Regime for Market Infrastructures Based on Distributed Ledger Technology, COM(2020) 594/3), Article 2(1).

[21]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 and Directive 2011/61 (recast) [2014] OJ L173/349.

[22]Regulation (EU) No. 909/2014 of the European Parliament and of the Council of 23 July 2014 on Improving Securities Settlement in the EU and on Central Securities Depositories and amending Directives 98/26 and 2014/65 and Regulation 236/2012 [2014] OJ L257/1.

However, this is how a pilot regime contrasts to a sandbox. Rather than being about meticulously testing fresh technologies used by heretofore little-known firms, piloting equips established market institutions with means by which novel technologies can be integrated into their current activities.[23]

The same attributes of a pilot regime are reflected in the degree of oversight and supervision within the regime. Specific permissions to operate as either a DLT MTF or a securities settlement system are granted after an application is made to a national competent authority, and after a non-binding recommendation being provided by the European Securities and Markets Authority (ESMA) after receipt of the notification of the application.[24] Once a specific permission is granted, a report should be submitted every six months by the DLT FMI to the competent authority and to ESMA.[25] Furthermore, FMIs are to notify competent authorities and ESMA upon becoming aware of certain stipulated matters, including a material change to a business plan, a detected cyber-threat, any technical or operational difficulty in delivering its service, or of any risk to investor protection, market integrity, and financial stability.[26]

ESMA's function is essentially to 'fulfil a coordination role', so as to build 'a common understanding' of the technology, 'as well as a common supervisory culture and convergent supervisory practices, ensuring consistent approaches and convergence in supervisory outcomes.'[27] The DLT Regulation is thus finding a practical way by which the *Meroni* doctrine of EU law (concerning legitimate delegation to a centralised EU regulatory agency) can be complied with. ESMA, as a single EU agency, is not exercising discretionary powers and is effectively acting as an overarching, or 'guiding', authority for a regime that is ostensibly being administered at Member State level.[28] In practice, the role of ESMA would be a more decisive one than might be intimated at first glance. Aside from the procedures surrounding specific permissions, ESMA's significance is exemplified by the responsibility being given to ESMA for presenting a report to the Commission following the legislation's entry into force. The ESMA report is to lead to the Commission's formal review of the pilot regime to determine the regime's extension

[23]On the advantages of piloting for previously authorised firms and operators, see especially Dirk Zetzsche, Ross Buckley, Janos Barberis and Douglas Arner, 'Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation' (2017) 23 *Fordham Journal of Corporate and Financial Law* 31, 83–85.
[24]DLT Regulation, Articles 8 and 9. ESMA's recommendations, relating to any exemptions requested by an FMI, are to be made where 'necessary to ensure investor protection, market integrity and financial stability.'
[25]DLT Regulation, Article 11(4).
[26]DLT Regulation, Article 11(1).
[27]DLT Regulation, Article 11(5).
[28]An approach which is evidently close to the EU regulatory model envisioned in Wolf-Georg Ringe and Christopher Ruof, 'Regulating Fintech in the EU: The Case for a Guided Sandbox' (2020) 11(3) *European Journal of Risk Regulation* 604.

(either in duration or in the range of financial instruments), its amendment, its permanent retention, or its termination.[29]

As epitomised by the legislative provisions, a pilot regime should not be understood as being the very same as a sandbox. A sandbox can typically enable an ongoing and mutually cooperative relationship between admitted participants and regulators. ESMA's position within the regime seems to be the equivalent of a pan-EU umbrella. National authorities are not required to engage directly and continuously with DLT FMIs through advisory or guidance activities. Moreover, there is no 'test' to determine the innovative potential of the technologies or services being piloted. Nonetheless, the differences between piloting and sandboxes are merely nuanced. As characterised by Dirk Zetzsche, Ross Buckley, Janos Barberis and Douglas Arner, a pilot regime is inherently an instance of 'structured experimentalism', of the same hue as a regulatory sandbox, in creating safe harbour conditions within existing legal frameworks for eligible firms. [30]

Along with the AI Regulation proposal, it is not confounding to see references to sandboxes and piloting within the recent EU legislative strategies. Far from being a passing phase as the 'new thing' of regulation, these regulatory initiatives have, in less than a decade, become ingrained in approaches to FinTech within individual Member States and in jurisdictions internationally. Instead, what generates curiosity is the extent to which the Commission has seemingly opted to espouse this overall approach for a future direction of standardised FinTech regulation across the EU. As set out in the next section, it is arguable as to whether enough is truly known about sandboxes' design and efficacy to make such a committed gesture.

3. Determining the characteristics of regulatory sandboxes

While the EU legislative initiatives evince progress towards sandbox measures on an EU-wide basis, this section highlights that the outcomes of international examples need to be recognised. The results of international examples can prove instructive as to the most effective design and operational features of sandboxes, such as apposite entry thresholds and the degree of supervision. However, as reflected in the specific examples of the UK and Australia, there are several problems encountered by new forms of regulation that aim to adapt to new forms of technology. The availability of reliable and consistent empirical data is one such glaring issue. If lawmakers and regulators can only base their approaches

[29]DLT Regulation, Article 14.
[30]Zetzsche, Buckley, Barberis and Arner (n. 23).

on the very limited information which is presently available, it raises doubts about what is truly known about definitively effective features of sandboxes.

3.1. Selected international examples

If the creation of sandboxes is to be guided and informed by instructive practices, existing data and reports cannot be dismissed. For the EU's current approach, there are two international examples which are especially worth pondering. One is the apparently successful, or, at least, very well-known, example of the UK's Financial Conduct Authority (FCA) sandbox. The other is an initially flawed, but subsequently, amended and 'enhanced' regulatory sandbox established through the Australian Securities and Investments Commission (ASIC). The common denominator is that both jurisdictional sandboxes introduced changes over time, in efforts to satisfactorily define genuine innovation, to implement consistent entry criteria, and to gain further participants.

Since its 2016 establishment, the FCA sandbox is regularly considered to be a prototype, the key features of which should be deserving of imitation in other jurisdictions.[31] From an early stage, the sandbox's success was being proclaimed, particularly in its appeal to small, start-up FinTech firms. Firms could be granted a restricted degree of authorisation in order to test their products and services, before then proceeding to secure authorisation.[32] The FCA sandbox's seeming successes have prompted recommendations for an enhanced sandbox within the 2021 Kalifa governmental report on UK FinTech. It was proposed that the sandbox be made available on a sustained or rolling basis, rather than through defined windows for receipt of applications from prospective entrants within 'cohorts.' The Kalifa Review further recommended that the sandbox provide support to applicants that may not be offering a completely novel proposition, but one which is still an innovative delivery for the market. A dedicated space within the sandbox, providing specialist support for 'Priority FinTech Areas', has also been urged.[33]

The apparent triumphs of the sandbox have been reflected in its expansion to an ancillary 11-week digital sandbox, in collaboration with the City of London. The digital sandbox was launched in November 2020, and the Kalifa Review has recommended that it should be made a permanent

[31]See the overview of the FCA sandbox's exemplary features in Michael Huertas, 'The UK FCA's Regulatory "Sandbox": Any Lessons for the EU?' (2018) 33(2) *Journal of International Banking Law and Regulation* 50.

[32]FCA, *Regulatory Sandbox Lessons Learned Report* (October 2017), paras. 2.9. and paras.3.6.

[33]*Kalifa Review of UK FinTech* (UK Government, 2021), Recommendation 2.1; available at: https://www.gov.uk/government/publications/the-kalifa-review-of-uk-fintech (accessed 3 May 2022).

option.[34] As one of the foremost changes of recent times to the overall sandbox mechanism, the UK's pilot digital sandbox focused on ESG (environmental, social and governance) data and disclosure-related applications. In assisting with the development of innovative propositions, entrants liaised with mentors and with an expert advisory panel of external stakeholders.[35]

The operation of the FCA sandbox has responded to the Kalifa recommendations by ensuring that it is now 'always open', in that applications can be made throughout the year. For cohorts of entrants, several express eligibility criteria are accessibly listed on the FCA website.[36] A proposition must within the scope of the sandbox, with a 'positive indicator' being whether the innovation is intended for the UK market, whether it is an FCA-regulated activity or whether it may be used by FCA-regulated firms. The relevant proposition must exhibit 'genuine innovation', which is described in terms of there being no comparable offerings in the market or no artificial product differentiation. For acceptance to the sandbox, the innovation must enable benefits to consumers. The need for sandbox testing for the proposition must also be accounted for. This includes an assessment of the regulatory burdens and costs to be met by the applicant, if authorisation cannot be approved or if the innovation cannot be tested. The final specified criterion is that the proposition must be ready for testing upon acceptance within a cohort. If an application is successful, there is a duration of six months of trialling and experimentation, which can be extended by a further six months.

If the FCA initiative could be perceived as being the Rolls Royce of regulatory sandboxes, then it could be reasonable to have a look beneath the bonnet and to take a closer examination of the outcomes for firms who have engaged with the sandbox. Empirical findings indicate that there is an average increase of 15 per cent in the capital raised by firms following entry to the sandbox, a finding which is especially observable for smaller and younger firms.[37] The sandbox continues to be in demand. The last three sandbox cohorts at the time of writing (Cohorts 7, 6, and 5) had a total of 225 applications. However, only 64 were eventually accepted for

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[34]See the FCA website on the second phase of the digital sandbox (launched in November 2021) at: https://www.fca.org.uk/firms/innovation/digital-sandbox (accessed 3 May 2022). On the proposals for a new enlarged digital sandbox, see *Kalifa Review* (n. 33), Recommendation 2.2.

[35]For an appraisal of the pilot sandbox with reference to results of feedback from participants, see FCA, 'Supporting Innovation in Financial Services: The Digital Sandbox Pilot' (April 2021).

[36]See https://www.fca.org.uk/firms/innovation/regulatory-sandbox-prepare-application (accessed 3 May 2022).

[37]Giulio Cornelli, Sebastian Doerr, Leonardo Gambacorta and Ouarda Merrouche, 'Inside the Regulatory Sandbox: Effects on Fintech Funding' (Bank for International Settlements Working Paper No. 901) (November 2020). See also Giulio Cornelli, Sebastian Doerr, Lavinia France and Jon Frost, 'Funding for Fintechs: Patterns and Drivers' in Bank for International Settlements, *Quarterly Review* (September 2021).

entry. For the two cohorts prior to then, there were a total of 130 applications, of which only 47 were accepted. Furthermore, not all of the entrants constitute the stereotypical plucky start-up firm, possessing more innovative ideas and dreams than financial resources. Previous entrants to sandbox cohorts include some of the largest of the established incumbents of the UK financial market such as Barclays, Natwest, Lloyds, and HSBC. [38]

When delving beneath the veneer of supposedly forward-thinking regulation involving protected sanctuaries for the fortunate chosen few, it can be revealed that many firms do not fare particularly well following completion of sandbox testing. According to the research data cited by Ross Buckley, Douglas Arner, Robin Veidt and Dirk Zetzsche, a substantial proportion of participating firms are 'not operational', are insolvent, or have been acquired.[39] Small firms can be the victims of premature success which could be better scaled by larger market players. After sandbox exit, these firms could be visible and easy pickings for 'killer' acquisitions by Big Tech firms. [40]

From an operational perspective, with approximately 100 staff dedicated to FinTech, it should be acknowledged that the FCA is something of a peculiarity, relative to regulatory authorities internationally.[41] In view of the recommendations that a greater onus be placed on a collaborative digital sandbox, it is noteworthy that the FCA's evaluation of the original digital sandbox pilot deemed that applications were not subject to the same scrutiny and rigour as the applications for the pre-existing regulatory sandbox.[42] The criteria for sandbox entry are already quite vaguely construed, especially in trying to (subjectively) ascertain what represents genuine innovation.

The Australian example is effectively the opposite of the FCA experience, even to the extent to which amendments were made. No statistic illustrates more clearly the effects of the December 2016 establishment of the ASIC sandbox than the meagre total of six entities which entered the sandbox until the introduction of legislative reforms. By contrast, the ASIC innovation hub (which, as explained below, is an informal contact point for FinTech queries) responds to an average of over 100 communications each

[38]For the full list of cohorts and participating firms, see the FCA website at: https://www.fca.org.uk/firms/innovation/regulatory-sandbox (accessed 3 May 2022).

[39]Ross Buckley, Douglas Arner, Robin Veidt and Dirk Zetzsche, 'Building Fintech Ecosystems: Regulatory Sandboxes, Innovation Hubs and Beyond' (2020) 61 *Washington University Journal of Law and Policy* 55, 57.

[40]On the effects of Big Tech mergers and acquisitions, see Cornelli, Doerr, France and Frost (n. 37), p. 40. In a US context, the wider issues relating to Big Tech acquisitions and the consequent antitrust challenges are notably explored in Thomas Philippon, *The Great Reversal: How America Gave Up on Free Markets* (Cambridge, Ma.: Harvard University Press, 2019).

[41]World Bank, *Global Experiences from Regulatory Sandboxes* (Fintech Note No. 8, 2020), 3.2.3 (p.20).

[42]FCA (n. 35), para. 5.18.

year from FinTech firms.[43] The reforming reaction was to create a governmental 'Enhanced Regulatory Sandbox' (ERS), which came into effect from 1 September 2020. The ERS was configured on the basis of two sets of legislation, the Corporations (FinTech Sandbox Australian Financial Services Licence Exemption) Regulations 2020, and the National Consumer Credit Protection (FinTech Sandbox Australian Credit Licence Exemption) Regulations 2020.

To give a broad summary of the changes, an ERS test is extended from 12 months to 24 months' duration. It is accompanied by an array of precise requirements that make the FCA guidance appear negligible. Eligibility revolves around a net public benefit test and an innovation test. If the severe lack of uptake was a crucial catalyst for reform, the early signs are promising. At the time of writing, there are already eight users who are availing of licensing exemptions, five of whom entered the sandbox during 2021. [44]

A prescribed notification form must be lodged with ASIC by an interested applicant, in respect of either financial services or credit activities. For the net public benefit test of eligibility, applicants are specifically questioned as to how an exemption for the proposed service or activity 'will result, or be likely to result, in a benefit to the public that will outweigh the detriment to the public that will result, or be likely to result … ' from an exemption. Important factors within this test are whether the service or activity increases consumer choice, reduces cost, provides better user experience and enhances efficiency.[45] For the innovation test, an adequate explanation is required as to how the eligible service, product or activity 'is new, or is a new adaptation, or new improvement, of another' service, product or activity. Applicants must also stipulate how their proposals are new or different to what is available in the Australian market, and what comparable offerings are already established in the Australian market.[46]

As a synopsis of the requirements and limits imposed on users availing of the ERS exemptions, the core obligation is that entrants must comply with a maximum aggregate client exposure of $5 million (which applies to wholesale and retail clients and credit consumers). The previous incarnation of the ASIC sandbox provided for a maximum number of 100 retail clients,

[43]See Buckley, Arner, Veidt and Zetzsche (n. 39), 71, and, for an example of information on ASIC innovation hub engagement with businesses, see *ASIC Annual Report 2019-20*, 'Section 5 – ASIC cooperation': https://asic.gov.au/about-asic/corporate-publications/asic-annual-reports/#ar20 (accessed 3 May 2022).

[44]The majority are focused on retail clients. For an outline of current users, see https://asic.gov.au/for-business/innovation-hub/enhanced-regulatory-sandbox/enhanced-regulatory-sandbox-exemption-users/ (accessed 3 May 2022).

[45]'Information Sheet 248: Enhanced Regulatory Sandbox', 4. Net Public Benefit Test. See notification forms at: https://asic.gov.au/for-business/innovation-hub/enhanced-regulatory-sandbox/info-248-enhanced-regulatory-sandbox/ (accessed 3 May 2022).

[46]'Information Sheet 248: Enhanced Regulatory Sandbox', 5. Innovation Test.

whereas it is unlimited for the ERS. In terms of individual client exposure limits, there are none applying for wholesale clients, but the limit is for $10,000 per retail client. All users are required to conform to compensation arrangements (in addition to professional indemnity insurance coverage), as well as committing to internal and external dispute resolution processes. Reporting and evaluations can extend to a post-test document, containing information on the numbers of customers, the client demographic, descriptions of issues, challenges to viability, and a financial report. Rather than it being a cliff-face scenario, applications and decisions can be made on the cessation of operations or on licensing and authorisation before the end of the exemption period.[47]

The FCA's endeavours have acquired much publicity and interest, but it is the Australian story which could be the more enlightening in the long run. The ASIC sandbox was clearly struggling, and, following timely legislative intervention, there is a revived impetus for participation at this very initial phase. Judgements will have to be withheld until there are completions of exemption periods and progressions to full authorisation of participants. From this vantage point, the requirements associated with the ERS can seem prescriptive in comparison to the FCA model. However, there is inevitably scope for discretion in adjudging net public benefit and innovation. The added layer of rigour may well be the sacrifice which had to be made so as to strengthen the feasibility of the Australian sandbox. If this is truly so, it leads to reservations as to what the discernible design features of sandboxes ought to be. How far can, or should, regulators steer from an unequivocally principles-based stance? From the varying features of the UK and Australian examples, it could be plausibly wondered whether the same kinds of regulatory measures are even being compared.

3.2. Wiser as to the most effective design features?

The variations in the above examples attest to how the European Commission could find itself hard-pressed to find conclusive lessons in adding more clarity to the proposed Regulation provisions on AI sandboxes. The very meaning of a sandbox, and its functions, can be open to debate. The World Bank has conducted one of the extremely rare global surveys (if not the most comprehensive one thus far) of 73 implemented sandboxes in 57 countries, including eight EU Member States. A sandbox is defined in the World Bank study as being 'a controlled, time-bound, live testing environment, which may feature regulatory waivers at regulators'

[47]As well as the provisions of the 2020 Regulations, the differences between the current ERS and the prior ASIC sandbox are concisely set out in the informational document at: https://download.asic.gov.au/media/5763623/comparison-asic-sandbox-enhanced-regulatory-sandbox-published-25-august-2020.pdf (accessed 3 May 2022).

discretion.'[48] In a very general way, such a definition does subsume the key elements of sandboxes like those considered in the UK and Australia. It is missing the central ingredient as to how eligibility is determined, particularly in how innovation can be objectively interpreted, and by whom. On the other hand, a Goldilocks situation can quickly arise if a definition of a sandbox aims to include innovation but fails to pinpoint the design features of the sandbox, such as authorisation waivers or timescales.[49]

The abundance of examples for the World Bank may have produced findings on the preponderance of certain design features, but there is little information on the outcomes for participating firms. Based on a smaller sample of 45 sandboxes, there are variations found in the periods of testing as a 33 per cent majority have one-year durations.[50] The most common inbuilt safeguards are disclosure requirements (for just under 80 per cent) and limits on client numbers (over 70 per cent). Limits on funds received from clients and the availability of complaints-handling mechanisms rank lower among the most regularly utilised protections (at approximately 45 per cent).[51] Although the Australian example evidently adopts most of these safeguards, it further accentuates the contrasts with the FCA approach and with other sandboxes.

The use of restrictions in sandboxes tends to be questioned in academic commentary and reports generally, especially when sandboxes are confined to specified economic activities. The assertion is that a sandbox should not be exclusionary to various firms and technologies. On the contrary, this may be where the Commission has got it right with its proposals for designated AI sandboxes and for a DLT pilot regime. A specialised sandbox could be altogether far more effective in promoting the technologies in question. A relatively generic sandbox would be devoid of defined admission thresholds and devoid of sufficient expertise or skills for some technologies relative to others.[52]

Admission and eligibility remain the most complex of the features to settle on. As honestly and accurately acknowledged by a 2018 European Supervisory Authorities (ESAs) joint report, '[d]etermining whether or not a proposition is genuinely innovative is typically a subjective assessment by the competent authority based on the information provided by the applicant

[48]World Bank (n. 41), p. 64 (Glossary) and Appendix 1 (p. 59).

[49]For instance, the description of a sandbox in Buckley, Arner, Veidt and Zetzsche (n. 39), 56 – while ensuring that innovation is present – could be overly broad for its own good: 'Regulatory sandboxes are safe spaces in which FinTech start-ups and other innovative enterprises can develop and test their innovations without being subject to the full extent of financial regulation.' See also the summary of predominant sandbox features in J. Truby, A. Dahdal, and I. A. Ibrahim, 'Sandboxes in the Desert: Is a Cross-Border "Gulf-Box" Feasible?' (2022) 14(2) *Law, Innovation and Technology* 447.

[50]World Bank (n. 41), Figure 3.4. (p. 22).

[51]Ibid., Figure 3.6. (p. 25).

[52]The suitability of specialised sandboxes in these exceptional circumstances is conceded in Buckley, Arner, Veidt and Zetzsche (n. 39), 64–65.

… ', inferring that the 'burden is placed squarely on the firm.' [53] As with the Australian procedures, careful completion of a prescribed form is pivotal to an applicant firm's chances of acceptance. The onus is on the applicant to convey how the product or service is distinct from others in the market. The stark truth indicated by Buckley, Arner, Veidt and Zetzsche could be that the task expected of regulatory authorities to assess innovation is 'arguably beyond their skill set … '[54]

In Hilary Allen's analysis of the attributes of sandboxes, the question of there being a real market need, or not, should be foremost when judging whether an innovation should be supported by regulators.[55] Moreover, this should be followed by a series of enquiries as to the possibilities for systemic risk, threats to consumer protection, or damage to financial stability. For Allen, rather than corresponding to an idealistically 'perfect experimental setting', the unsurprising pattern in most jurisdictions has been for 'unscientific' selections of firms in the very first stages of the sandbox process.[56]

As noted above, the Commission's plans are closely oriented towards the 'guided sandbox' proposal of Wolf-Georg Ringe and Christopher Ruof in advocating for national sandboxes which are coordinated at EU level.[57] Yet, it is not proving easy to ensure that science has a role to play. As surmised by Ringe and Ruof, the infancy of the sandbox phenomenon means that there is not yet much data on the efficacy of different approaches. As a consequence, 'it is not feasible to properly evaluate the effects of each respective design and – on that ground – prefer one approach over another.'[58] The consistent availability of data can also be endorsed as a means of guaranteeing that a sandbox is avoiding the pitfalls of regulatory capture.[59] As manifest from the variations in international examples, the authorities responsible for a sandbox can work quite intimately with entrants. Regulators could become unduly familiar with, and impressed by, participating firms, their management and the novelty of the technologies. Regulators could consequently almost unintentionally begin to coach sandbox participants. In these scenarios, internal governance of regulatory authorities can be eroded. The

[53]ESAs, *Report: FinTech: Regulatory Sandboxes and Innovation Hubs* (JC 2018/74), para. 60.
[54]Buckley, Arner, Veidt and Zetzsche (n. 39), 62–63.
[55]Hilary Allen, 'Regulatory Sandboxes' (2019) 87 *George Washington Law Review* 579, 608.
[56]Allen (n. 55), 625.
[57]Ringe and Ruof (n. 28).
[58]Ringe and Ruof (n. 28), 611.
[59]See especially Cheng-Yun Tsang, 'From Industry Sandbox to Supervisory Control Box: Rethinking the Role of Regulators in the Era of FinTech' (2019) 2 *University of Illinois Journal of Law, Technology and Policy* 355, 394, which elaborates on the aspects of regulatory capture described by Lawrence Baxter, 'Capture in Financial Regulation: Can We Channel It Toward the Common Good?' (2011) 21 (1) *Cornell Journal of Law and Public Policy* 175.

'revolving door' of regulatory figures accepting positions in the private sector would be readily availed of.[60]

The risks of regulatory capture may be mitigated by the AI Regulation proposal, to some degree, through the guided coordination of national authorities by a European AI Board.[61] The DLT pilot regime may also reduce such risks through the sheer precision of the requirements stipulated in its provisions. Instead, because of lingering ambiguities over the supposedly most basic features of sandboxes, the Commission is left with few international touchstones upon which to give clarity to AI sandboxes about innovation tests, about requirements for eligible entrants to sandboxes and even about their durations. As explicated by Deirdre Ahern, challenges to a common formalised EU approach emerge from the wide differences globally in legal forms of sandboxes, as some sandboxes are based on rules set out on authorities' websites and others could require legislative enactment.[62] As regulation is compelled to gradually mature in tandem with the technologies being tested in sandboxes, there could be the equally gradual (and potentially frustrating for less patient observers) realisation that regulatory answers may not be found through sandboxes alone.

4. Growing pains: the broader regulatory perspective

In seeking to reduce regulatory reliance on sandboxes, academic commentary has generally emphasised the significance of broader supports which act in the interests of sound regulation and in encouraging innovation. Albeit somewhat nebulous, the ecosystem concept is strengthened by a raft of interlinked EU policy objectives associated with digitalisation. The influence of environmentally flavoured discourse is noticeable by how this rather holistic perspective on FinTech is termed 'smart' regulation. To persist with the environmental analogy, it could be questioned whether the version of flexible principles-based regulation that is currently being witnessed in relation to FinTech sandboxes is genuinely sustainable.

4.1. The idea of FinTech ecosystems

Rather than being an abstract or far-fetched analogy, an ecosystem for FinTech regulation can have a rationale which is rooted in substance.

[60]See Iris H-Y Chiu, 'A Rational Regulatory Strategy for Governing Financial Innovation' (2017) 8(4) *European Journal of Risk Regulation* 743. On the benefits of having 'contrarian' viewpoints within regulatory authorities for FinTech sandboxes, see also Allen (n. 55), 638.

[61]n. 5 above.

[62]Deirdre Ahern, 'Regulatory Lag, Regulatory Friction and Regulatory Transition as FinTech Disenablers: Calibrating an EU Response to the Regulatory Sandbox Phenomenon' (2021) 22(3) *European Business Organization Law Review* 395, 422. See also ESAs (n. 53), paras. 42–45, on how sandboxes are established by some Member States to fulfil statutory objectives of existing national legislation.

While a sandbox is unlikely to be the magic formula to address the depth of FinTech regulatory challenges, there must be appropriate pre-existing conditions for regulatory intervention. The hazards are expressed by the World Bank's summary of jurisdictions which had 'little to no material' FinTech activity and which opted to introduce sandboxes. These sandboxes were greeted with indifference through a low number of applications and a miniscule number of entrants.[63] Knowing the lay of the land in terms of FinTech activity and possible sandbox entrants is paramount to the choice to implement a sandbox. Lessons are learned only when there is something there which is worth learning – for regulators and for FinTech firms alike.[64] The same applies to the EU, and to the eurozone, in which there are clear variations in the frequency of FinTech firms relative to population.[65]

Even if some jurisdictions have subdued FinTech sectors, the overwhelmingly greater proportion of FinTech firms are informally assisted by innovation hubs, innovation offices or their equivalent supports than by sandboxes, with estimates considering it to be up to twelve times more than sandboxes.[66] For some firms, the prospect of a sandbox could be an uninviting one. Rather than a sanctuary, a sandbox could cause trepidation for businesses that their activities will be supervised to the point of being stifled within a makeshift form of incarceration.

Innovation hubs are regulatory techniques which the EU should be already well acquainted with, since Luxembourg's establishment of the first hub internationally in 2014. For the ESAs, an innovation hub is formally defined 'as a scheme whereby regulated or unregulated entities can engage with competent authorities on FinTech-related issues', as well as seeking 'non-binding guidance on the conformity of innovative financial products, services, business models or delivery mechanisms with licensing, registration and/or regulatory requirements.'[67] With the exception of the Portuguese innovation hub (which is empowered to issue legally binding guidance), the definition gives the impression of a much more formal regulatory mechanism than is actually the case. Innovation hubs are dedicated units for regulatory authorities but are essentially contact points for any queries that may be received. To favour a technically

[63]World Bank (n. 41), pp. XI–XII.
[64]This is also reflected in the 'concluding notes' of World Bank (n. 41), p. 49, where it is advised that, prior to embarking on creating a sandbox, regulatory authorities 'should step back and objectively review the environment in which they operate … ' This includes reviewing the 'maturity and pervasiveness' of the FinTech market within a jurisdiction and the 'broader market conditions.'
[65]See especially European Central Bank, *Financial Integration and Structure in the Euro Area* (2020), pp. 50–54 (Box 4: Characterisation of the Euro Area Fintech Scene), which shows how Luxembourg, Estonia, Lithuania, Ireland, and Finland have high numbers of FinTech entities relative to their populations.
[66]World Bank (n. 41), pp. 31–32.
[67]ESAs (n. 53), para. 1.

minded metaphor, an innovation hub can fit within a 'hub-and-spoke' framework for FinTech regulation in a jurisdiction, often operating to accompany a sandbox.

Depending on the knowledge and the acumen of the staff of innovation hubs, hubs can be a gentle means of enabling regulators to interact with FinTech firms and to obtain an improved understanding of firms' concerns. This is not to underestimate the functions of innovation hubs whatsoever, especially considering that hubs are now present in over 20 EU Member States.[68] As strongly articulated by Buckley, Arner, Veidt and Zetzsche, '[w]hile sandboxes tend to attract the headlines and the attention, the real work of providing and facilitating innovation in financial services tends to be done in virtually all jurisdictions where it does occur, by some form of innovation hub.'[69] For Buckley, Arner, Veidt and Zetzsche, innovation hubs encapsulate how ecosystems can begin to flourish. The benefits of interconnected supports, coupled with evidence of firms' engagement with hubs instead of sandboxes, remove the justification for asserting 'that regulatory sandboxes, on a stand-alone basis, are the most effective means to further fintech innovation.'[70]

EU policies, geared towards galvanising increased digitalisation and economic output, can be smoothly assimilated within a fabric of broader supports. Even since the outbreak of the COVID-19 pandemic, the action plan for European Capital Markets Union is the pre-eminent instance of how several linked agendas and goals – including encouraging innovation, enhanced digitalisation and the adoption of technology in finance – can be cohesively brought within long-term objectives.[71] The Commission's stated aims for a Digital Decade until 2030 are related to four cardinal points of a 'Digital Compass' of business, government, infrastructures, and skills.[72] With multi-country projects at the centre of the initiative, it is a welcome sign of the progress being made towards standardised EU-wide efforts at cultivating ecosystems of supports. It is enticing to be cynical about the marketing of such policies, but the implications for a more informed EU outlook should not be disregarded.[73] On the other hand, it could also be contended that

[68]See list of Member States which had established innovation hubs at the time of the survey in ESAs (n. 53), Annex A.
[69]Buckley, Arner, Veidt and Zetzsche (n. 39), 59.
[70]Buckley, Arner, Veidt and Zetzsche (n. 39), 83.
[71]Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on A Capital Markets Union for People and Businesses – A New Action Plan, COM(2020) 590 final.
[72]See Commission website at: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en (accessed 3 May 2022).
[73]For an example of how these policy initiatives could be seen as linking to legislative proposals, see Jonathan McCarthy, 'Evaluating the EU's Digital Finance Strategy: Ambitious Glimpses of Future Regulation?' (2021) 36(9) *Journal of International Banking Law and Regulation* 379.

an evolution towards a broader regulatory perspective is simply pushing the boundaries of what has already become a vague and fluid regulatory stance.

4.2. FinTech principles-based regulation: 'smart' and evidence-grounded, or artificial?

As the leading academic proponents of 'smart regulation' of FinTech, Zetzsche, Buckley, Barberis and Arner candidly credit the term to its origins in environmental regulation.[74] The interaction between terminology relating to environmental issues and terminology used for FinTech could be such a recurring theme at this point that it would be worthy of a separate discussion. Nonetheless, the concept of smart regulation marks another progression in the renewal of forms of principles-based regulation since the Global Financial Crisis (GFC). [75] For Zetzsche, Buckley, Barberis and Arner, smart regulation of technological innovations should be flexible and proportionate, but not permissively light touch. In effect, approaches should be capable of adjustment as knowledge is gained by regulators or when risks transpire. Sandboxes can assist in achieving something of a higher state of smart regulation by pairing a sandbox 'with a strong, fact-based, research-driven dispensation and licensing practice that furthers innovation while minimising risk.'[76]

The natural partnership between sandboxes and the accumulation of verifiable data continues to be recognised, such as in studies prepared through the Cambridge Centre for Alternative Finance (CCAF).[77] CCAF findings highlight that, in practice, sandboxes can be complex to establish, costly to operate and are not necessary for the bulk of FinTech firms which do not require live testing environments. Even if a sandbox could be 'a significant tool for developing evidence-based policy', a sandbox should not be treated as a token manoeuvre by regulatory authorities. No single initiative is 'a silver bullet' and regulators should not be distracted 'from pursuing or, at least, exploring other avenues.[78] This straightforward

[74]Zetzsche, Buckley, Barberis and Arner (n. 23), 47 (at fn. 64).

[75]On the post-GFC status of principles-based regulation, see Julia Black, 'Paradoxes and Failures: "New Governance" Techniques and the Financial Crisis' (2012) 75(6) *Modern Law Review* 1037. For a contemporary analysis of how differing approaches to financial regulation have adapted, and even combined, to respond to market complexity and amplified risks since the GFC, see Dan Awrey and Kathryn Judge, 'Why Financial Regulation Keeps Falling Short' (2020) 61(7) *Boston College Law Review* 2295. An evaluation of different forms of regulation is provided in Julia Black, 'Regulatory Styles and Supervisory Strategies' in Niamh Moloney, Eilis Ferran and Jennifer Payne (eds), *The Oxford Handbook of Financial Regulation* (Oxford University Press, 2015)

[76]Zetzsche, Buckley, Barberis and Arner (n. 23), 79.

[77]FinTech Working Group of United Nations Secretary-General's Special Advocate for Inclusive Finance for Development (UNSGSA) / CCAF, *Early Lessons on Regulatory Innovations to Enable Inclusive FinTech: Innovation Offices, Regulatory Sandboxes, and RegTech* (2019).

[78]Ibid., pp. 7–8.

summation does reiterate what has been voiced in this article – and, indeed, elsewhere.[79]

Sandboxes should be used to produce learnings from their outcomes. There are pragmatic motives for making use of broader regulatory supports, including innovation hubs and related policy measures. These supports can be used in conjunction with sandboxes, thus avoiding over-reliance on sandboxes for FinTech regulation. Yet, to pose an irritatingly academic point, just because this might be the sensible option in practice, does it mean that it is equally a sensible option in theory? Could this really be regarded as a sophisticated principles-based approach to regulation?

Although the 'familiar metaphor' of smart regulation has been considered by Saule Omarova to be 'a loose label' for a regulatory philosophy, Omarova maintains that there are compelling reasons why regulation of technological innovations in finance must be inherently flexible and discretionary in its decision-making. A prime reason is to depart from a disproportionately technocratic and siloed model of financial regulation.[80] In other work, Omarova elaborates on the necessity for open-ended authority, but which precludes undue leniency, by explaining that 'a fintech-appropriate regulatory framework has to be fundamentally principles-based in a true sense of that term and not as a euphemism for regulatory forbearance.'[81]

A more contentious argument from Omarova is that it is a salient technocratic bias for regulatory 'solutions', and 'good' financial regulation, to be explicitly justified by reference to economic theory or empirical data. For Omarova, this fixation on theory or data is 'typically framed in the sterile language of economic efficiency or necessity.'[82] The prospect of principles-based regulation steadily becoming rules-based by these approaches – through a proliferation of enforcement actions and ossifying rules – is a danger which Allen is also alert to in her work.[83]

This article accepts the legitimate arguments for protecting principles-based regulation (even from its own flaws when regulation is potentially being too lenient). However, the author's reasoning in this article is that the time has arrived for improved clarity on the rules and procedures which ought to govern sandboxes. Without there being simple, but clear, rules on eligibility criteria, on disclosure requirements, and on durations

[79]For a similar assessment, see IMF Policy Paper, *Fintech: The Experience So Far* (2019), para. 39, where it is affirmed that '[s]andboxes are providing valuable insights to policymakers but cannot be relied upon to be a comprehensive solution for harnessing innovation and regulating fintech.'

[80]Saule Omarova, 'Dealing with Disruption: Emerging Approaches to Fintech Regulation' (2020) 61 *Washington University Journal of Law and Policy* 25.

[81]Saule Omarova, 'Technology v Technocracy: Fintech as a Regulatory Challenge' (2020) 6(1) *Journal of Financial Regulation* 75, 108.

[82]Omarova (n. 81), 82.

[83]Allen (n. 55). However, Allen does take a measured view on integrating greater certainty to regulation and, at 606, she makes it clear that her article 'joins the chorus of voices cautioning that financial innovation should not be pursued uncritically as something that is inherently good.'

and exit strategies, the balance between robust regulation and stimulation of innovation is unlikely to be struck.[84]

If there are no intelligible rules on design features, empirical information on the results of sandboxes will either be hampered in its availability or skewed in its reliability. For instance, even despite her misgivings as to the use of empirical data generated for regulatory decision-making, Omarova admits that the efficacy of a data-gathering effort 'depends fundamentally on the design features' of a sandbox.[85]

Clarity on the preferred features of sandboxes should ideally be instilled through legislative intervention, as exemplified by the European Commission's proposals. As emphasised above, the provisions on AI sandboxes could particularly have benefited from being more precise. The provisions are seemingly leaving substantive decision-making at the behest of national authorities. If there is a failure to bring clear rules on how sandboxes should operate, it could perpetuate a domino effect of the disparate features of certain sandboxes being copied by other jurisdictions, which can arise out of a misplaced belief that a sandbox (irrespective of the actual differences between sandboxes) is the regulatory gold standard for FinTech.[86] The international race towards regulatory standards is borne out by how 56 per cent of the World Bank's surveyed sandboxes were created between 2018 and 2019, and about 20 per cent in the first half of 2020 alone.[87]

If legislative proposals are refraining from expressly stipulating what the mandatory design features should be, then the EU sandbox measures should heed international experiences. Referring to international examples cannot be in a selective or haphazard manner, but through careful assessment of reliable and accessible empirical evidence. Connections can be nurtured through collaborative standard-setting efforts involving agencies and institutions such as the Financial Stability Board (FSB), the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO).[88]

From an EU standpoint, memoranda of understanding and arrangements with third countries (who are not EU Member States) can facilitate cross-border applications for sandboxes. These arrangements can build more indelible ties between countries and can subsequently enable exchange of

[84]On the trade-offs to be accommodated by regulatory sandboxes (and innovation hubs) in promoting rules simplicity and financial innovation, see especially Chris Brummer and Yesha Yadav, 'Fintech and the Innovation Trilemma' (2019) 107(2) *Georgetown Law Journal* 235.

[85]Omarova (n. 81), 112.

[86]Chiu (n. 60), 746.

[87]World Bank (n. 41), p. 6.

[88]See especially Yesha Yadav, 'Fintech and International Financial Regulation' (2020) 53(3) *Vanderbilt Journal of Transnational Law* 1109, and Lev Bromberg, Andrew Godwin and Ian Ramsay, 'Cross-Border Cooperation in Financial Regulation: Crossing the Fintech Bridge' (2017) 13(1) *Capital Markets Law Journal* 59.

information on the impact of regulatory measures. As noted by the ESAs, there are scant instances of such interactions to date.[89] Nonetheless, these enhanced agreements offer opportunities to achieve the internationalised coordination that will be formative to adoption of standards and to the future of FinTech regulation globally.[90]

Other than international collaboration, the data which does become available to regulators (and lawmakers) should thoroughly account for the impact of sandboxes for participants. It may be too soon for there to be concrete findings in many circumstances, and for a sandbox to be branded a 'success.'[91] However, the most revealing method by which the design features of a sandbox can be evaluated is to determine their ultimate effects for the FinTech firms who participated. Practical questions to be addressed should include whether innovative technologies, products and services were developed to their full potential or not, and whether participating firms survived post-exit or went on to profitably thrive. The outcomes for these questions can be illustrative of the fitness of eligibility criteria (incorporating any innovation tests), disclosure requirements set by supervisory authorities, the extent of cooperation between national authorities and EU-level oversight, and the duration of protection or exemptions.

By consulting data as it becomes available (and guaranteeing that it can be accessible to EU authorities), the regulatory application of sandboxes can become more evidence-based than it is at present. EU regulation of FinTech does not have to depend on sandboxes exclusively. Information on the outcomes of regulatory measures would help in moulding the kinds of broader supports to be provided and in tweaking the services being provided by innovation hubs.

Otherwise, the alternative is that the EU's espousal of regulatory sandboxes in the recent legislative initiatives could be vigorously criticised, firstly, for being spread across aspirational and patchily incoherent (and imitated) 'innovation-friendly' goals; secondly, for sandboxes being impervious to transparent analysis; and, thirdly, for simultaneously neither providing a functional framework of measures within the EU itself nor being appropriately in touch with international practices.

5. Conclusion

If the sandbox term itself connotes images of childhood, then regulators could be advised to take a temperate response towards the youthful

[89] ESAs (n. 53), paras. 82–85.
[90] To date, specific cross-border examples of collaborative testing of technologies can be found in the projects overseen through the Global Financial Innovation Network (GFIN) (see: https://www.thegfin.com/crossborder-testing (accessed 3 May 2022)) and the Bank for International Settlements Innovation Hub (see: https://www.bis.org/about/bisih/about.htm (accessed 3 May 2022)).
[91] See IMF Policy Paper (n. 79), para. 39.

exuberance of technological advances in finance, not just AI and DLT. Academic work on FinTech regulation is laden with repeated concerns over when, and how, to intervene. The same questions are presented in relation to cryptocurrencies, to Big Tech sponsorship of digital finance platforms, to payment services' providers access to bank customers' data, and to almost any other area of FinTech that could be mentioned. What makes sandboxes unique within FinTech discourse is that sandboxes are mechanisms which are intentionally aimed towards accomplishing a balance between appropriately strong regulation and incentivising innovative growth of businesses and technologies. It would be assumed that achieving such a balance would necessitate a higher level of focus on empirical outcomes. Yet, the continued absence of sufficiently comprehensive international evidence is a problem.

Within this vacuum, jurisdictions are free to establish sandboxes at will, often to signal how conducive their legal and regulatory regimes are towards innovation. The choice of features of those sandboxes may not be grounded in factual motives. If sandboxes are not operating as effectively as they could for participating firms, there will be profound harm to the credibility of lawmakers embracing sandboxes of any type, especially if lawmakers are motivated only to advertise the pro-innovation qualities of their jurisdictions.

The European Commission's legislative proposals represent a suitably proactive mindset by introducing sandboxes in respect of AI and, similarly, a pilot regime for DLT-based FMIs. The proactive mindset does not extend to giving especially detailed guidance on sandboxes' design within the provisions of the proposed AI Regulation. Not that the Commission could be unfairly blamed for this. The UK and Australian examples demonstrate the variations which exist.

Although there is ambiguity as to what works best for sandboxes, the academic commentary on FinTech ecosystems shows that there are other options which can be explored, and which should be beneficial to FinTech innovation. While this article agrees with the value of a broader regulatory perspective and wider supports, the article takes the view that the excuses could be running thin for not making adjustments to provide for more clear-cut rules and procedures for sandboxes specifically.

International collaboration is integral to the future use of, and knowledge about, sandboxes. Coordination will not amount to much if there are deficiencies in the availability of empirical data. Reasons for these deficiencies can be either because of flaws in the design of particular sandboxes, or because of failures to study how firms coped after exiting sandboxes which possessed certain design features. The argument seems an old one in relation to very new technologies. Nonetheless, it remains true that regulation can best function when it is based on verifiable, aggregated and up-to-date information.

Without empirical evidence, sandboxes will be assumed to be all the same in their features and their repercussions for entrants. Without timely reforms to how sandboxes are created and applied, regulatory initiatives may not last the pace against rapidly emerging technologies. FinTech firms and providers would simply ignore sandboxes. EU regulation and evidence-based approaches will therefore need to grow alongside technological innovations. How the EU utilises and refines sandboxes will be an indication of how successfully, or not, that regulatory evolution occurs.

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Note on contributor

Jonathan McCarthy is a lecturer at the Law School, University College Cork, Ireland. His research interests relate primarily to the regulation of technological innovations in finance, financial regulation generally, and issues of corporate and commercial law. His work on these research topics has been published in international, European and national journals.

ORCID

Jonathan McCarthy http://orcid.org/0000-0003-4031-3063