

## THE SANDBOX APPROACH TO FINTECH REGULATION: A CASE STUDY OF CHINA

### *EL ENFOQUE SANDBOX PARA LA REGULACIÓN DE FINTECH: UN ESTUDIO DE CASO DE CHINA*

MIAO HAN\*  
DONGGEN XU\*\*

**ABSTRACT:** Finance has become increasingly enabled by innovations and technologies after the global financial crisis, calling for profound reforms regarding the regulatory regime. Regulation has lifted requirements to deal with systemic risk in the post-crisis era, but being slow to address the rise of FinTech activities. Such a mismatch requires more accommodative regulatory treatments, bringing about the sandbox among others. As far as Mainland China is concerned, it has been very active in applying technologies to finance, but its regulators and policy makers have struggled to manage market dynamics. This article is aimed to explore how to balance between ongoing regulatory reforms and a sharp rise of FinTech activities via the sandbox approach in China.

As an innovative regulatory tool, the sandbox is a safe space set to test innovation activities without harming consumers' interests and fair competition. Since 2015, a growing number of sandboxes have been introduced to both developed and developing countries. This article selects some of them to make a comparative study. As presented by such cases, convergences co-exist with divergences, and the key elements can be summarized accordingly. The sandbox has been further examined as a form of principles-based regulation, alongside risk-based approach. It is not the only option or best practice to boost innovations, but it is beneficial as long as to get it designed carefully. Then this article reviews newly-established sandboxes in China by drawing insights from the comparative study, proposing a "to-reform" list to Chinese reformers. As the conclusion, it highlights that the sandbox, carrying critical limitations, might face extra challenges in China.

**Keywords:** Regulatory sandbox, FinTech, Principles-based regulation, Risk-based approach, Pilot programs, Convergence and divergence

**RESUMEN:** Las finanzas se han vuelto cada vez más habilitadas por las innovaciones y tecnologías después de la crisis financiera mundial, lo que exige reformas profundas con respecto al régimen regulatorio. La regulación ha levantado los requisitos para hacer frente al riesgo sistémico en la era posterior a la crisis, pero ha tardado en abordar el aumento de las actividades de *FinTech*. Tal desajuste requiere tratamientos regulatorios más acomodaticios, lo que genera el *sandbox*, entre otros. En lo que respecta a China continental, ha sido muy activa en la aplicación de tecnologías a las finanzas, pero sus reguladores y formuladores de políticas

\* Dr. Miao HAN, KoGuan School of Law, Shanghai Jiao Tong University, N° 1954 Huashan Road, Xuhui District, Shanghai, 200030, China, email: helenmhan@163.com. This research is funded by Shanghai Planning Office of Philosophy and Social Science (China) [2018FX004]. The funding source had ONLY provided financial support. It was updated until October 2021.

\*\* Dr. Prof. Donggen XU, KoGuan School of Law, Shanghai Jiao Tong University, N° 1954 Huashan Road, Xuhui District, Shanghai, 200030, China, email: translaw@126.com.

han tenido dificultades para gestionar la dinámica del mercado. Este artículo tiene como objetivo explorar cómo equilibrar las reformas regulatorias en curso y un fuerte aumento de las actividades de *FinTech* a través del enfoque de *sandbox* en China.

Como herramienta regulatoria innovadora, el *sandbox* es un espacio seguro establecido para probar actividades de innovación sin dañar los intereses de los consumidores y la competencia leal. Desde 2015, se ha introducido un número creciente de sandboxes tanto en países desarrollados como en desarrollo. Este artículo selecciona algunos de ellos para realizar un estudio comparativo. Tal como se presenta en tales casos, las convergencias coexisten con las divergencias, y los elementos clave se pueden resumir en consecuencia. El *sandbox* se ha examinado más a fondo como una forma de regulación basada en principios, junto con un enfoque basado en el riesgo. No es la única opción o la mejor práctica para impulsar las innovaciones, pero es beneficiosa siempre que se diseñe con cuidado. Luego, este artículo revisa las cajas de arena recién establecidas en China extrayendo información del estudio comparativo, proponiendo una lista de “reformas” a los reformadores chinos. Como conclusión, destaca que el *sandbox*, que tiene limitaciones críticas, podría enfrentar desafíos adicionales en China.

**Palabras clave:** Sandbox regulatorio, FinTech, Regulación basada en principios, Enfoque basado en riesgos, Programas piloto, Convergencia y divergencia.

## I. INTRODUCTION

The increasing interplay between finance and technology, known widely as FinTech, is argued to reshape how financial services and products have been provided at a worldwide scale after the global financial crisis (GFC). Regulators are required to be innovative in overseeing market dynamics whilst pursuing systemic stability, which has been prioritized in the post-crisis reforms. Amongst, the regulatory sandbox (sandbox), formalized by the Financial Conduct Authority (FCA) in the UK in 2015, is employed to re-examine such a role played by regulators. The analogue has been introduced to China after the sharp rise of FinTech investments has encountered regulatory uncertainty.<sup>1</sup> It is still too early to make conclusive remarks. However, reflections and limitations should be summarized to enable the sandboxes to fulfill regulatory goals as set whilst fitting into China’s financial ecosystem.

This article is aimed to explore how to balance between ongoing regulatory reforms and an inflated but controlled financial market via ‘the sandbox approach’ in China. It is apparently outdated to transplant certain models; instead, cases are selected to show options and alternatives. In essence, the sandbox is a form of principles-based regulation. A to-reform list will be presented by drawing insights from the comparative study and its nature. It is further examined as a pilot program, which has been widely applied during China’s market-oriented reform. This article concludes that the sandbox should be employed to signal regulator’s commitment towards innovations but far more fundamental reforms are required to make a shift towards a more principles-based regulation and an innovation-friendly ecosystem in China.

<sup>1</sup> The cases selected include the sandbox in Hong Kong SAR (HK). To differentiate, “China” in this article refers to the mainland.

## II. REGULATION IN THE FINTECH ERA: OVERVIEW

Finance has continued to shape how technologies develop, whilst the latter are widely used in the financial sector<sup>2</sup>. The popular term "FinTech" came into existence in the early 1990s<sup>3</sup>, and hereafter, financial industry has become the most important buyer of IT products and services. FinTech investments totaled more than US\$1,100 billion in the end of 2018<sup>4</sup>. But it is still hard to give an exact definition. By category, computing and internet-based technologies escalate into Internet of Things (IoT), enabling online platforms<sup>5</sup>. Big data and distributed ledger technology (DLT) allow for innovative and low-cost products and services<sup>6</sup>. Sub-sectors, including DLT, mobile payments and online platforms for lending and wealth management, have brought individual innovations into the entire financial sector<sup>7</sup>. During this course, digitalization has been highlighted<sup>8</sup>. With a long and symbiotic relationship, finance and technology have been interwoven deeper and faster in the post-crisis era than in the previous decades with digitalization touching on the heart of innovation-enabled technologies<sup>9</sup>.

Financial authorities and supervisory agencies used to support and initiate new developments in innovations<sup>10</sup>. But the recent unprecedented growth of FinTech investments has first triggered their hostility. Based on internet networks, digital platforms and services do not require a large-scale location, reducing significantly costs and barriers for FinTech firms to enter the market<sup>11</sup>. Ever-faster computing networks enable them to reach a growing number of end-users across the globe with few limitations caused by borders<sup>12</sup>. Both disintermediation and decentralization have made FinTech disruptive, conceptualized op-

<sup>2</sup> ARNER, BARBERIS and BUCKEY (2015); WILDE (2019).

<sup>3</sup> Citigroup initiated a project to facilitate technological cooperation, named "Financial Services Technology Consortium", HOCHSTEIN (2015). Debates have revolved around "FinTech" or "TechFin", depending on whether technology firms or financial intermediaries dominate innovation developments, DORFLEITNER and others (2017) pp. 5-10. A similar debate did happen in China, SHEN and XU (2019) pp. 31-33. Such distinction would gradually diminish as data analytics will be widely utilized by all market participants, ZETZSCHE and others (2017b). This article doesn't intend to conceptualize terminologies, and thus, will use "FinTech" for the convenience. FinTech is also used interchangeably to describe both innovation-enabled technologies and a specific group of firms which combine innovative business models with such technologies; the latter will be named as "FinTech firms" here.

<sup>4</sup> KPMG (2019).

<sup>5</sup> EU PARLIAMENT (2018a).

<sup>6</sup> BRUMMER and GORFINE (2014) p. 4. It can be further classified according to the types of innovations, FAYKISS and others (2018).

<sup>7</sup> GAO (2017).

<sup>8</sup> OECD (2018) pp. 14-18.

<sup>9</sup> Without a precise definition, it is hard to calculate the exact size of FinTech. But both multinational organizations and financial institutions have produced and updated reports of FinTech investments with data, statistics and further breakdowns, DELOITTE (2017); CLAESSENS and others (2018); PWC (2019a).

<sup>10</sup> GROUP OF TEN (2001).

<sup>11</sup> BRUMMER (2015) pp. 1020-1031.

<sup>12</sup> PWC (2016).

posite to traditional financial intermediations<sup>13</sup>. At that moment, regulators were urged to deal with risks effectively whilst protecting customers. Stricter regulatory and compliance requirements have been exercised on the liquidity of banking institutions. A total fine of US\$200 billion was charged on banks in 2015<sup>14</sup>. Further information disclosure and obligatory stress testing have been conducted to restore customers' confidence on the industry<sup>15</sup>. Thus, reforms following the crisis are oriented to maintain systemic stability, leaving regulators behind the changing and inflated financial market.

Regulators have shifted to support beneficial innovations as FinTech investments become further influential after 2014<sup>16</sup>. Especially, financial exclusion can be alleviated by applying new technologies<sup>17</sup>. Challenges should be carefully examined. First, financial institutions have increasingly relied upon third-party platforms to provide data-related services, including data provision, cloud storage and analytics, and physical connectivity, whereby non-financial firms enter the financial market<sup>18</sup>. Regulators are facing a further fragmented market with new participants<sup>19</sup>. For example, Tech startups have their own business models and operations, including balance sheet and portfolios management, rendering it difficult for regulators to effectively trace their activities<sup>20</sup>.

In principle, regulators should consider whether and if so, how the rise of FinTech has changed risks and their implications for systemic stability. At the technical level, innovations have substantially raised market complexity, questioning if we truly understand such technologies that underlie financial activities<sup>21</sup>. As far as consumers are concerned, FinTech could bring new risks and also manifest existing risks, arising from new types of products and services, new models of business and also lack of education<sup>22</sup>. Moreover, technologies have enlarged information asymmetry, which is one primary contributor to systemic risk<sup>23</sup>. As of the banking industry, at the micro level, risks carried by FinTech activities should be addressed to ensure the safety and soundness of individual institutions, and meanwhile regulators need to be vigilant for opportunities to facilitate beneficial innovations. Regulators are required to strike a refined balance between prudential regulation and innovation developments at the macro level<sup>24</sup>. However, FinTech activities are innovative, which means that they are not covered by existing regulations, or they have progressed fast-

<sup>13</sup> ANAGNOSTOPOULOS (2018) pp. 9-11; XU (2018b). Traditional financial institutions have both similarities and differences with such new players, SHEN (2022).

<sup>14</sup> KPMG (2019b).

<sup>15</sup> STEVENSON and WOLFERS (2011).

<sup>16</sup> SCHWEITZER and others (2018); EU PARLIAMENT (2018b).

<sup>17</sup> PHILIPPON (2017).

<sup>18</sup> FSB (2017).

<sup>19</sup> KPMG (2019b).

<sup>20</sup> MAGNUSON (2018) pp. 1176-1178 & 1206-1207.

<sup>21</sup> BIS (2017).

<sup>22</sup> BOEDDU, CHIEN and ISTUK (2021).

<sup>23</sup> SPINA (2019).

<sup>24</sup> BCBS (2018).

er, leaving regulators behind<sup>25</sup>. To compete with new market participants, banks have upgraded their internal risk controls, and their convergence with such industries as software and internet, telecom and hardware have been accelerated<sup>26</sup>. With growing technological interdependencies among key market players and infrastructures, such disaggregated actors might be more susceptible to external shocks than incumbents<sup>27</sup>. An IT risk event, arising from individual institution, might escalate into a systemic crisis given that the financial market carries massive environmental features which are conducive to a systemic cyber compromise<sup>28</sup>. Innovations can also be used by criminals to develop monetary laundering techniques and finance terrorist activities.

The technology-enabled financial market has also lifted regulatory complexity, making it hard, if not impossible, to continue absolute regulatory policy prescriptions upon ever-changing FinTech activities; instead, versatile application of agile approaches and tools might better match with market dynamics<sup>29</sup>. Regulatory technologies (RegTech) refer to applying innovations and technologies to regulatory monitoring, reporting and compliance<sup>30</sup>. Following the crisis, stricter regulatory requirements made the use of such as automation of reporting and targeted risk management being a natural and promising solution for incumbents to reduce compliance costs<sup>31</sup>. In terms of regulators, they have become aware that agile financial technologies will assist to better enforce prudential regulation and supervise institutions accordingly. Financial institutions and infrastructures have produced more and better-qualified data, providing the most fertile area for regulators to develop advanced RegTech solutions, which are aimed to generate greater granularity, precision and frequency in data reporting, aggregation and analysis<sup>32</sup>. Regulators are thus attracted to improve their capacities to collect, analyze and exchange data and information to deal with risk in a quicker and exact manner, supplying early-stage warnings, identification, and management. The maturing FinTech market has contributed to the development of

<sup>25</sup> FSB (2019) pp. 8-10 & 17-20; SHEN (2019).

<sup>26</sup> The cross-industry convergence started decades ago but has speed up due to innovation developments, ALT, BECK and SMITS (2018) pp. 235-238.

<sup>27</sup> ALT, BECK and SMITS (2018) pp. 239-241.

<sup>28</sup> Cyber risk was first viewed as an idiosyncratic operational risk of doing business through the internet and has evolved to include operational risks linked to the firm's immediate business partners and customers, KAFFENBERGER and KOPP (2019). Systemic cyber risk can be understood as the risk that "a cyber event (attack(s) or other adverse event(s)) at an individual component of a critical infrastructure ecosystem will cause significant delay, denial, breakdown, disruption or loss, such that services are impacted not only in the originating component but consequences also cascade into related (logically and/or geographically) ecosystem components, resulting in significant adverse effects to public health or safety, economic security or national security." It is controversial whether a cyber risk could have systemic impact directly on the financial sector, WARREN, KAIVANTO and PRINCE (2018).

<sup>29</sup> DELOITTE (2015).

<sup>30</sup> Another analogue is SupTech, supervisory technologies. The difference is argued to lie in which party, the regulator or the regulated, will benefit from innovations, but doubt revolves around whether such a division carries real differences, ARNER, BARBERIS and BUCKEY (2017).

<sup>31</sup> ENGLISH and HAMMOND (2017).

<sup>32</sup> ARNER, BARBERIS and BUCKEY (2016); KAVASSALIS and others (2018); ABUR and MURPHY (2019).

RegTech solutions being accelerated smoothly and quickly<sup>33</sup>. With joint efforts from both regulators and the firms, RegTech is making a paradigm shift towards a new and different regulatory framework situated at the nexus of data and digital identity<sup>34</sup>.

Overall, the large-scale introduction of innovations and technologies has spread changes across the entire scope of services and products which were traditionally supplied by financial intermediaries. RegTech solutions come into play, strengthening the link between regulators and the regulated via a new dimension. The post-crisis regulatory framework has been challenged to monitor a changing market effectively and efficiently. Regulators have combined the sandbox, the innovation center and other pilot programs to facilitate FinTech activities and meanwhile deal with risks associated.<sup>35</sup>

### III. THE SANDBOX APPROACH TO FINTECH REGULATION

#### 3.1. SANDBOXES: FROM THE UK TO THE WORLD

Borrowed from computing science, the sandbox refers to an isolated testing environment for new programs or applications. In a regulatory context, it can be understood as a "safe space" for innovative financial institutions to test their activities<sup>36</sup>.

The FCA launched the sandbox as part of its Project Innovate to facilitate innovations<sup>37</sup>. It carries three goals: innovation boost, customers' protection, and fair competition. Those should be achieved by removing unnecessary regulatory barriers to innovations, which are argued to lie primarily in market-entry requirements, safeguards, and legal framework. The FCA continued its criteria for testing under the Innovation Hub, including the scope of the applicants, genuine innovation, consumer benefit, the need for the sandbox and background research. When applying, authorized and unauthorized firms are differently treated. The former is granted with no-enforcement action letters (NALs), freeing them from enforcement actions at a later stage relating to their testing activities provided they abide by the conditions agreed with the sandbox unit. Individual guidance is available from the FCA on interpreting applicable rules. When issuing waiver or modification, the FCA was limited by EU legislative requirements<sup>38</sup>. Unauthorized firms

<sup>33</sup> KPMG (2018).

<sup>34</sup> ARNER and others (2017) pp. 55-57.

<sup>35</sup> UNSGSA FINTECH WORKING GROUP and CCAF (2019).

<sup>36</sup> ZETZSCHE and others (2017a) p. 45.

<sup>37</sup> Project Innovate was initiated in October 2014 to encourage innovations in consumers' interests whilst promoting competition through disruptive innovations. George Osborne, the Chancellor, wanted London to become "the global center for fintech", and the FCA committed the Project to this goal. The idea of the sandbox first came from Britain's former chief scientific adviser Sir Mark Walport, arguing that the financial market would benefit from such that was equivalent to clinical trials in health and pharmaceutical sectors, GOVERNMENT OFFICE FOR SCIENCE (2015).

<sup>38</sup> Due to EU legislative requirements, two options were available before the Brexit: New Regulated Activity or Amending the waiver test. If the first rule applies, a new regime needs to include all the sandboxing activities and expand the authorization requirement to applicants to become eligible for testing. If otherwise, a new test for sandbox firms should be introduced to waiver rules. After the Brexit, regulatory relief can be made by amending either Exemptions Order or By Way of Business Order.

can apply but subject to Financial Services and Markets Act of 2000 (FSMA 2000)<sup>39</sup>. The Advice Unit, opened in May 2016 to support firms engaging in robot-advice businesses, expands to offer informal steers to clarify potential regulatory implications of an innovative product or business model that is still at the early stage of development. Further dialogue can be sought if an application is denied. The FCA agrees on the case-by-case safeguards of consumers on disclosure, protection, and compensation appropriate to testing activities. By enhancing and diversifying interactions, the regulator can have a better understanding of such sandbox firms that have complex and different business models from incumbents, and meanwhile it has become easier and quicker for new market players to meet regulatory requirements<sup>40</sup>.

In Australia, an innovation hub was first included in the government's deregulatory agenda, and Australian Securities and Investment Commission (ASIC) set up a sandbox under the Regulatory Guide 257<sup>41</sup>. A fixed list of products and services from a selection of firms can be tested for a limited period. Under its regulatory framework, the ASIC provides three options, and the "FinTech license" allows eligible firms to test limited banking businesses with customers protection under dispute resolutions and indemnity insurance without holding an Australian financial services license (AFSL)<sup>42</sup> or Australian credit license (ACL)<sup>43</sup>. If failing outside the eligible criteria, the applicant can still turn to other exemptions or an individual waiver.

In Asia, Singapore, and Hong Kong SAR (HK) are very active in attracting FinTech investments. Their monetary authorities, which also control banking regulation, have introduced the sandboxes. In Singapore, Financial Technology & Innovation Group (FTIG) drives the smart financial center<sup>44</sup>, and FinTech Office is responsible for collaborations among various government agencies, which is particularly important for a mega regulator. If registered with Accounting and Corporate Regulatory Authority, "any firm that is looking to apply technology in an innovative way to provide new financial services they are or are likely to be regulated by Monetary Authority of Singapore (MAS)" can apply for a sandbox. Beforehand evaluation and case-by-case assessment are employed to decide whether to maintain or relax possibly regulatory requirements. Specified reasons have been announced to discontinue the sandbox, including MAS's judgment and the applicant's discretion<sup>45</sup>. Hong Kong Monetary Authority (HKMA) first designed FinTech Supervisory

<sup>39</sup> S.19, The General Prohibition, Part II Regulated and Prohibited Activities, FSMA 2000.

<sup>40</sup> FCA (2015).

<sup>41</sup> Regulatory Guide 257 is enacted to test FinTech products and services without holding an AFSF or ACL. The exceptions or flexibility mainly refer to Corporations Act 2001, National Consumer Credit Protection Act 2009, and ASIC Corporations (Concept Validation Licensing Exemption) Instrument 2016/1175 & 1176.

<sup>42</sup> Corporations (FinTech Sandbox Australian Financial Services License Exemption) Regulations 2017.

<sup>43</sup> National Consumer Credit Protection (FinTech Sandbox Australian Credit License Exemption) Regulation 2017.

<sup>44</sup> It was claimed in late 2016 by the Singaporean government to embrace innovations and technologies to "enhance value, increase efficiency, manage risks better and create new opportunities and improve the lives of Singaporeans", MAS (2016).

<sup>45</sup> iMF(2019) pp. 29-32.

Sandbox (FSS) to test innovations from incumbents<sup>46</sup>. The enhanced version –FSS 2.0– accepts applications from both banks and their partnering technology firms (BigTech); the latter can directly seek feedbacks from FinTech Supervisory Chatroom (Chatroom). Besides FSS 2.0, Securities and Futures Commission is open to both licensed corporations and start-ups that intend to carry on a regulated activity under the Securities and Futures Ordinance (SFO); Insurance Authority (IA) aims to facilitate authorized insurers to run pilot programs of testing innovative technologies and appliances in their business operations<sup>47</sup>. Among three sector-based sandboxes, the FSS 2.0 sets a single point of entry, whereby the “most-relevant” rule allows the applicant to conduct a pilot trail of a cross-sector FinTech product.

Recently, sandboxes have been further favored in Asia. In Japan, the sandbox, open also to overseas companies<sup>48</sup>, has supported particularly projects about the aging problem after financial services, health care industry, mobility, and transportation<sup>49</sup>. Financial Services Commission in South Korea evaluates sandbox applications according to whether services and technologies produce innovativeness, inclusiveness, and positive effects<sup>50</sup>. By enabling Financial Technology Development and Innovative Experimentation Act, Taiwanese government inserts a sandbox under Financial Supervisory Commission, which is the first adopted at the statutory level globally<sup>51</sup>.

The transition from an analogue to a digital financial industry started in sophisticated markets, but policy makers in developing countries have increasingly relied on finance to support economic growth. Those countries have competed with, rather than followed, sophisticated financial and technologies centers to generate new technologies and applications<sup>52</sup>. They have also set up innovation facilitators, and the thematic sandbox is used to prioritize local needs<sup>53</sup>. Since FinTech is estimated to have benefited certain disadvantage groups in Asian-Pacific region<sup>54</sup>, financial inclusion sandboxes are established in Jordan and Malaysia<sup>55</sup>, and Thailand Securities and Exchange Commission sponsors several sector-based thematic sandboxes<sup>56</sup>.

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<sup>46</sup> In 2016, Fintech Facilitation Office was established by the HKMA to facilitate the healthy development of the fintech ecosystem. In September 2017, seven initiatives announced HK's entry into the Smart Banking Era: 1. Faster Payment System; 2. Enhanced FSS 2.0; 3. Promotion of Virtual Banking; 4. Banking Made Easy initiative; 5. Open Application Programming Interface (API); 6. Closer cross-border collaboration; and 7. Enhanced research and talent development.

<sup>47</sup> Fast Track was introduced in July 2018 for authorizations of new insurers owning and operating solely digital distribution channels.

<sup>48</sup> Act on Special Measures for Productivity Improvement of 2018.

<sup>49</sup> HARVARD BUSINESS REVIEW (2020).

<sup>50</sup> Special Act on Financial Innovation Support of 2019. FSC (2019).

<sup>51</sup> TSAI, LIN and LIU (2020).

<sup>52</sup> FinTech 3.5 is named as FinTech activities have become popular in both developed and developing countries, Arner, BARBERIS and BUCKEY (2015) pp. 20-30.

<sup>53</sup> DUFF (2019).

<sup>54</sup> JAHAN and others (2019).

<sup>55</sup> WECHSLER, Perlman and GURUNG (2018).

<sup>56</sup> CORBETT (2018).

### 3.2. COUNTRY-SELECTED COMPARATIVE ANALYSIS

So far, sandboxes have been settled in both sophisticated financial centers and less developed countries. It is not possible nor necessary to list all but some are particularly relevant to China. Both Australia and the UK launch their designs under a twin-peak model, which has been newly set in China; the arrangements in HK and Singapore show alternatives. Above all, they have operated for a comparatively long period, providing valued assistance for further discussion. Four cases are compared as follows:

TABLE 1  
Convergence and Divergence of Sandboxes in UK, Australia, Singapore, and HK

Jurisdiction	UK	Australia	Singapore	HK
Market Structure	Direct-Financing			
Institutional Structure	Twin Peaks		Mega regulator	Sector-based regulators
Regulatory Goals	innovation, customers' protection, and efficient competition			Currency stability
	Project Innovate	Innovation Hub	Smart Financial Centre	Smart Banking Era
Innovation Facilitator	Project Innovate	Innovation Hub	Smart Financial Centre	Smart Banking Era
Preparation	Innovation Hub	Former version	FTIG FinTech Office	FSS 1.0
Legal Framework	Limited by EU legislative requirements	Regulatory Guide 257	Accounting and Corporate Regulatory Authority	HKMA supervisory requirements
Sandbox Regulator	FCA	ASIC	MAS	HKMA
Qualified Applicants	Authorized and unauthorized firms under differentiated arrangements	A selection of firms with limited customer exposure	Registered with Accounting and Corporate Regulatory Authority	Banks and Big-Tech firms
Criteria	Pre-set	3 options	Regulated by MAS	Most-relevant rule
FinTech Activities	New appliances to existing products or services, esp. RegTech solutions	A fixed list of products and services; FinTech license	Innovative applications of technologies	Technologies partnering with banks, esp. RegTech projects
Process	By cohorts	Expanding	3-stage; Sandbox Express	Pilot trails

Jurisdiction	UK	Australia	Singapore	HK
Assessment	Individual guidance	Guidance & waiver	Case-by-case evaluation	Chatroom
Policy Instruments	NALs, restricted authorization individual guidance, waivers, informal steers	FinTech licensing exemptions; individual waiver	In-progress adjustments, re-application, regulatory relief	Chatroom contacts
Miscellaneous	Differences before and after the Brexit	Government's deregulatory agenda	Specific reasons to discontinue	Sector-based sandboxes: also, SFC and IA

Source: Own elaboration.

This table has summarized the co-existence of convergences and divergences among the selected cases. Launched as part of an expansive program to facilitate innovations, they are all open to adjustments. After accepting only one start-up application during the first six months, the ASIC has continued to broaden the eligibility criteria through new legislations<sup>57</sup>. At the core, regulators have prioritized interactions by working with applicants on applying for test, as well as choosing the best-practice option inside the sandbox. Accordingly, the decision-making has been modified: regulators' discretion is based on the case-by-case assessment and firms are granted with certain autonomy, deciding to withdraw or to "go to the market". Broadly, the structure of direct or indirect financing doesn't specify the design of the sandbox.

In terms of differences, the goals of regulatory policy vary depending on the mandates of individual regulator. Under the twin-peak model, capital market regulators are responsible for the sandboxes whilst carrying specific responsibilities regarding market behaviors. Alternatively, central banks and sector-based regulators can control the sandboxes, including MAS and HKMA. There are no single definitions in appointing the sandbox regulator<sup>58</sup>.

It is argued that regulatory barriers start with the market entry, and thus, the criteria are pre-clarified but applied differently in the cases, including the prerequisite to entry, the type of eligible firms and the scale for testing. Both authorized and unauthorized firms have applied to the FCA, aiming "to make financial market work well so that consumers get a fair deal". Where the "most-relevant" rule applies in FFS 2.0, the regulator is the primary point of contact to liaise with other regulators to assess a cross-sector FinTech product. Amongst, it is not hard to tell regulators' preference for RegTech solutions. The FCA launched RegTech initiatives to help overcome regulatory challenges and benefit the wider economy<sup>59</sup>,

<sup>57</sup> BOCHAN (2017). Government's 2017-18 budget also clarified to create better competition and accountability in the entire banking system via the sandbox.

<sup>58</sup> It is still controversy whether how regulation is organized may help or hinder the process to develop the most efficient and beneficial regulation, and thus have competitive effects, BROWN (2010) p. 574.

<sup>59</sup> It was first highlighted by the Government Office for Science and the government's budget in 2015.

and 44% of testing by the FFS 2.0 are the applications of innovations in regulatory process<sup>60</sup>. Initially, the FCA took a very prudential attitude to blockchain/DLT, due to its potential risks and uncertainty<sup>61</sup>. But Japan received the first application from a blockchain-based firm<sup>62</sup>, and certain areas are open for blockchain tests only in South Korea<sup>63</sup>.

With an enhanced focus on systemic stability in the post-crisis era, regulators have already been alerted to how innovations reshape the banking industry. Retail banking products and services have been increasingly supplied via various types of modern digital technologies instead of physical branches<sup>64</sup>. Although traditional banking laws have continued in most jurisdictions, the cases have shown alternatives. Under Open Banking Program, the FCA supports traditional banks to introduce APIs toolkits to enhance identity checks to protect customer<sup>65</sup>. Australian Prudential Regulation Authority (APRA) released a new framework in 2018, complementing the ASIC's "FinTech license", whereby restricted ADIs are permitted, when meeting specific requirements, to conduct a limit amount of low-risk business for up to two years. Singapore and HK trial special regimes to extend banking licenses to non-banks. Issued by the MAS, the digital wholesale bank (DWB) license authorizes applicants to serve smaller firms and other businesses but not accept deposits in Singapore dollars from individuals; the digital full bank license (DFB) allows for a wider range of financial services, including deposits-taking from retail customers. The key eligibility criteria include a track record in the technology or e-commerce field. In HK, virtual banks could obtain licenses when meeting the criteria under the Banking Ordinance<sup>66</sup>. In principle, they are required to adhere to the standards under the Treat Customers Fairly Charter<sup>67</sup> and the Code of Banking Practice<sup>68</sup>.

Furthermore, specific sandbox tools are varying while operational differences determine the way how the regulator interacts with applicants. The FCA expands its mechanisms to make regulatory relief by issuing the NALs, while the AISC's "FinTech license" is argued to have offered a "near-automatic right" for eligible firms to test some selected services<sup>69</sup>. The ongoing and constructive interaction can be achieved by either a case officer

<sup>60</sup> YUEN (2016) and YUEN (2018).

<sup>61</sup> MAGNUSON (2018) pp. 1183-1187.

<sup>62</sup> RAFTERY and OKI (2019).

<sup>63</sup> HEKTOR (2019). After two years, it is established that the Sandbox has created 380 blockchain-related jobs and over \$110 million new investment, ERAZO (2020).

<sup>64</sup> SAJIC and others (2017).

<sup>65</sup> Revised Payment Services Directives (PSD 2 2015/2366). In the UK, Competition & Market Authority set up Open Banking Implementation Entity in 2016 to publish operational guidelines to drive competition and innovation in the retail banking industry.

<sup>66</sup> Major requirements include the criteria of the incorporation, parent companies, physical presence and appropriate risk management controls with a business plan of an appropriate balance between building market share and earning a reasonable rate of return on assets and equity. Banking Ordinance, Authorization of Virtual Banks: A Guideline issued by the Monetary Authority under Section 16(10).

<sup>67</sup> The Charter sets out high-level principles, including how banks should design, advise, sell and explain their services and products to meet the needs of customers.

<sup>68</sup> The Code contains, among others, obligations relating how a bank should conduct itself in its dealings with customers.

<sup>69</sup> FINTECH AUSTRALIA (2018).

(FCA and MAS) or a standing forum for collaboration (HKMA). As per operation, the FCA first set cohorts to accept applications, and then moved to always open to "provide more value to firms". Alternatively, a rolling application process seems similarly workable<sup>70</sup>.

In nutshell, the sandbox is chosen to facilitate innovations, which is chiefly achieved by removing regulatory bias against FinTech firms and their activities. It generally carries clarified regulatory goals, deciding the appointment of the regulator, who controls the market-entry criteria for eligible applicants; selected FinTech activities are tested via constructive interactions without damaging consumers' interests. The cases have presented such similar elements, but significant differences do exist especially regarding specific sandbox tools and operational arrangements.

### 3.3. SANDBOX: PRINCIPLES-BASED REGULATION

In essence, the sandbox is a form of principles-based regulation. A better understanding of this nature will contribute to a more critical analysis of its effects and limitations.

Principles-based regulation emerged as the comparator for rules-based regulation in the late 19th century. By definition<sup>71</sup>, rules are precise, particularistic, and prescriptive, but principles focus on general rules which are higher in the implicit or explicit hierarchy of norms than more detailed rules<sup>72</sup>. When being implemented, rules should be strictly complied by firms after being announced by regulators. Since regulators emphasize the compliance process, firms can arrange their activities to comply with strict requirements of detailed rules at the cost of undermining or avoiding regulatory purposes<sup>73</sup>. On the contrary, principles express the aim of the rules, attaching significance to regulatory goals, whereby regulators are responsible for defining the outcomes that they require firms to achieve<sup>74</sup>. It is thus argued that principles-based regulation can be better able to achieve the congruence which is what the regulator is intended to achieve. As financial liberalization accelerated, rules-based regulators have been badly criticized for lacking flexibility, resulting in "one-size-fit-all" solutions<sup>75</sup>. In particular, the constraining framework was unfriendly to new market participants, due to their different business strategies and internal risk controls from incumbents. But it is not possible to have a pure rules-based or principles-based regulation. When initiated, Financial Service Authority (FSA) referred its "principles-based regulation" to different but non-rules approaches towards oversight<sup>76</sup>.

<sup>70</sup> GFIN (2018).

<sup>71</sup> The phrase "rules" can be used to describe all legal norms in a broad sense. Here it is interpreted in a narrow sense with the features followed.

<sup>72</sup> BLACK, HOPPER and BAND (2007) pp. 191-192.

<sup>73</sup> It is named as "creative compliance". Under rigid rules, professionals in finance, law and accountancy can still cooperate in helping the issuers of listed companies to manage financial reporting process in a way in which compliance was assured but regulatory purposes were avoided, SHAH (1996).

<sup>74</sup> It is termed as "goals-based" approach. Goals can be established at varying degrees of specificity, but compliance involves the substantive achievement of regulatory goals by the firms, DECKER (2018).

<sup>75</sup> In the banking industry, it is intensely attacked as "fitting none", ELY (2018).

<sup>76</sup> BLACK, HOPPER and BAND (2007) pp. 192-193.

Fundamentally, a more principles-based regulation (MPBR) demands a constructive dialogue between the regulator and the regulated. Both parties should have a better understanding of the requirements of the principles, including interpretations and applications, and the objectives of the regulatory regime, as well as their respective responsibilities and approaches to achieve such goals. Regulators rely on high-level, broadly stated principles to set standards by which firms must conduct business<sup>77</sup>. In order to assess whether a firm's method of doing business is appropriate to enable that firm to meet the principles, regulators should have a good level of knowledge and information probing into reasons why the firm has decided to do business in that particular way. They therefore need to adopt a more educative and advisory approach to supervision after shifting attention from the compliance process of the rules to the outcomes arising from firms' activities<sup>78</sup>. For instance, the FSA had long claimed to continue a strong predilection for a partnering relationship with the financial industry, which has whereas improved its own transparency and accountability<sup>79</sup>. On the other hand, firms are required to adhere to the spirit of high-level principles. Their business objectives should be consistent with regulatory goals, whilst compliance can be achieved via internal arrangements<sup>80</sup>. Firms and their senior managers are better placed than regulators to determine what actions and processes are chosen within their specific business models to achieve any given objectives<sup>81</sup>. Their active engagement is then appreciated to generate more principles and better compliance.

It is further argued that risks cannot be fully captured in precise rules, but better recognized by principles to achieve goals as set.<sup>82</sup> In the regulatory context, a risk-based approach is a system of decision-making frameworks and procedures for regulators to prioritize activities and deploy recourses based on the assessment of such risks that firms pose to regulatory objectives<sup>83</sup>. It is different from firms' own internal risk models and controls. Also, it is closely linked with, but not equivalent to, regulatory tools and policy instruments designed to manage risks. In the latter's case, risks are assessed and categorized into acceptable and unacceptable ones, clarifying which should be subject to surveillance and how such risks should be addressed. A risk-based regulatory approach is at the operational level, whereby regulators prioritize the allocation of their resources by assessing risks, deciding where to focus and where not<sup>84</sup>. In the financial market, systemic risk is among the top concerns for regulators and policy makers<sup>85</sup>.

Prior to the GFC, principles-based regulation, along with risk management in public services delivery, has been widely welcomed by central governments and regulatory

<sup>77</sup> MCPHILEMY (2013) pp. 758-761.

<sup>78</sup> BLACK, HOPPER and BAND (2007) pp. 194-196.

<sup>79</sup> MORAN (2003).

<sup>80</sup> BLACK, HOPPER and BAND (2007) p. 193.

<sup>81</sup> MCCARTHY (2006).

<sup>82</sup> BAMBERGER (2006).

<sup>83</sup> BLACK (2010b).

<sup>84</sup> BLACK (2005) pp. 512-514.

<sup>85</sup> Other reasons include prevention of fraud, monetary-laundering, and terrorism; consumption protection and deposit insurance; and competition policy, CRANSTON and others (2002).

authorities in the UK, Australia, New Zealand, and Canada<sup>86</sup>. The EU Commission also discussed how to bring into play the benefits of principles<sup>87</sup>, and the US regulators positioned themselves as being principles-based<sup>88</sup>. The crisis has reduced the allure, at least, to some extent but not a stigma to its significance and announced supervisory failures of such risk-based regulators as the FSA<sup>89</sup>, though in Canada and Australia, their approaches seemed more resilient. Reforms have reinforced efforts to refine the nexus between rules and principles. Moreover, principles need to be better implemented<sup>90</sup>, requiring an overall improvement on institutional settings and broader regulatory context<sup>91</sup>. For example, oversight regimes have been reformed in the US, UK and other European countries, but different approaches have been chosen<sup>92</sup>. In spite of mixed outcomes, risk-based approach has attracted both state and non-state regulators to deploy resources and improve compliance effectively<sup>93</sup>. The UK twin-peak regulators have advanced principles by modifying risk assessment among others<sup>94</sup>.

As finance is driven by technologies, the market and regulatory complexity requires flexibility and discretion in oversight. Under the MPBR, new participants can be covered by the oversight regime. At the core, a dialogic relationship invites the regulated firms (and other stakeholders) to play a growing important role within the process of generating regulation, which was whereas dominated by regulators under a rules-based regime<sup>95</sup>. Obviously, firms have enlarged their advantages in information, knowledge, and expertise, and are encouraged to share with regulators to achieve the alignment between their business activities and regulatory objectives. Regulators are thus required to relax their conservative constraints over the identification and articulation of regulatory principles, especially as regards technological contents. In terms of the sandbox, the MPBR can offer useful guidance. To be specific, the design of the sandbox should start with well-defined regulatory objectives, and supervisory conversations enhance the applicants' engagement; the assessment of risks exposed by technology-enabled finance should be prioritized to set up the eligible criteria for testing. The following checklist covers such issues:

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<sup>86</sup> BLACK (2011).

<sup>87</sup> MCCREEVY (2007).

<sup>88</sup> CUNNINGHAM (2007).

<sup>89</sup> Supervisory failure is defined by whether the regulator has failed to achieve its regulatory objectives rather than the failures of the firms under its oversight, FSA (2000). The FCA has clarified what constitute its supervisory failure in similar criteria, FCA (2019b).

<sup>90</sup> It is especially important for securities regulation, FORD (2010).

<sup>91</sup> BALDWIN, CAVE and LODGE (2012) pp. 302-311.

<sup>92</sup> MASCIANDARO and QUINTYN (2011) pp. 454-484.

<sup>93</sup> In general, regulators are driven by functional, environmental, political and legal motivations to employ the risk-based approach, BLACK (2010b) pp. 185-224.

<sup>94</sup> EDMONDS (2017).

<sup>95</sup> AWREY (2011) pp. 283-297 & 313-314.

**TABLE 2**  
Guiding Principles to Make the Success of a Sandbox

Elements	Criteria	Choices
Regulator	Regulatory goals; Educative and advisory approach toward dialogue; Risk assessment and evaluation	Central bank; Sector-based prudential regulator; Capital market regulator
Regulated	Business objectives; Strategic approach to regulation; Senior management’s engagement; Internal risk controls	Applicants: eligible criteria for market-entry
		FinTech activities: innovation esp. digital banking and RegTech solutions
Operation	A limited scale	Pilot: cohorts/rolling application
	Enhanced supervisory conversation since an early stage	Tools: Chartroom/case officer - licensing regime
	Firms’ discretion: discontinue, whether to go to the market	Exit: fixed expiration time; specified reasons to discontinue

Source: Own elaboration.

It is noted that a truly dialogic relationship, being central to the MPBR, requires mutual trust between the regulator and the regulated<sup>96</sup>. Besides, difficulties lie in assessing risks and the following resources allocation. Regulators should have a clear determination of their mandatory objectives, clarifying which risks are concerned to be controlled, and of the selection of their own risk appetite<sup>97</sup>. They will focus on such areas that pose highest risks to regulatory objectives. Risks can derive from new market players, as well as from a broader environment, where both new and incumbent firms operate<sup>98</sup>. To manage systemic risk better, they are required to be responsive to the behavior, attitude and culture of the regulated<sup>99</sup>, whilst to anticipate problems rather than making passive reactions<sup>100</sup>. In such a context, risk assessment, regarding technical issues particularly, requires a detailed framework set by regulators to supervise firms accordingly<sup>101</sup>. To fulfill this task, regulators should improve their competence in such crucial areas as risk assessment by being aided of information and expertise possessed by the regulated. Therefore, regulators need be more

<sup>96</sup> BLACK (2008) pp. 430-432 & 456.

<sup>97</sup> BLACK (2010b) pp. 23-24.

<sup>98</sup> BLACK (2005) pp. 528-538.

<sup>99</sup> A “really responsive risk-based approach” is proposed to interact with other strategies by considering broader institutions environments whilst being dynamic and capable of building on the regulator’s performance sensitivity by learning from and improving their past performance, BLACK and BALDWIN (2010).

<sup>100</sup> BLACK (2015).

<sup>101</sup> Technical assessment of risks can be very challengeable, and some are argued to be impossible. The highly complex technical assessment requires considerable cost, time, and expertise whilst alternative parameters might result in different outcomes. Those problems are estimated more server in such quantitative areas as environmental policy, ROTHSTEIN and IRVING (2006).

transparent about their objectives and approaches, whilst improving the border regulatory ecosystem for mutual trust<sup>102</sup>.

#### 3.4. EFFECTS AND LIMITATIONS OF THE SANDBOX

After six years, the FCA has supported around 700 firms out of over 1,500 applications in seven cohorts. It claimed to have gained refined insights into the innovation-enabled financial market whilst preliminarily fulfilling three goals carried by the sandbox<sup>103</sup>. However, critical limitations have already exposed.

To begin with, a sandbox is initiated to alleviate regulatory burdens facing FinTech activities, which is whereas viewed to have tailored the barriers to address specific risks exposed by applicants, especially tech startups<sup>104</sup>. It is then argued that regulators should examine carefully FinTech activities rather than their providers. Regulators have welcomed new technologies applied to improve existing products and services, triggering the concern regarding what constitutes genuine innovation.

700 tests are trivial compared with the size of the British financial market. Even so, it seems unmatched: the HK FSS has only trailed 126 initiatives, and the ASIC saw a rise of applicants from one to seven after massively expanding its license exemption scheme<sup>105</sup>. As admitted by the FCA, the limited testing scale has questioned the necessity of the sandbox from the fundamental level<sup>106</sup>. Stronger criticism has arisen from market participants: such FinTech activities that are eligible for test should be directly allowed into the market; the sandbox is a regulatory obstacle<sup>107</sup>.

As reported by the FCA, 40% has been reduced in time than a standard process for start-ups to get authorized to provide financial services and products with more access to finance. But it is not clear how efficient it is when compared with incumbents. For instance, the MAS has continued to simplify the process of application and assessment by adding "Sandbox Express". Meanwhile, 90% of the companies that participated in the first cohort have gone to the market with start-ups receiving £135 million in equity funding. However, it is still lack of robust evidence linking applicants' experience with their success in the real market. The US FinTech market has continued to set the pace, but the sandbox is slow in making. In 2016, a short bill was proposed to introduce one at the federal level<sup>108</sup>. The US Treasury released the final report in 2018, suggesting that a "regulatory sandbox

<sup>102</sup> VIRES (2014) pp. 165-183.

<sup>103</sup> FCA (2019a) p. 5.

<sup>104</sup> FRANCESCA (2019).

<sup>105</sup> The Treasury Laws Amendment (2018 Measures N° 2) Bill 2019. It has empowered the ASIC to cancel the business's exemption or apply to a court for an order requiring the firm to apply in a particular way. Other regulatory changes are contained in the Corporations (FinTech Sandbox Australian Financial Services License Exemption) Regulations 2017 and the National Consumer Credit Protection (FinTech Sandbox Australian Credit License Exemption) Regulation 2017.

<sup>106</sup> That is why a regulatory FinTech "scalebox" is suggested to provide additional support, OBE (2021).

<sup>107</sup> KELLY (2018).

<sup>108</sup> H.R. 6118, the Financial Services Innovation Act of 2016, 114th Congress (2016). For a detailed analysis of the design under this Act, THOMAS (2018).

can enhance and promote innovation”<sup>109</sup>. Afterwards, the Office of the Comptroller of the Currency (OCC) announced to accept applications for national bank charters from non-depository FinTech firms engaged in banking business<sup>110</sup>. In other words, a FinTech charter was introduced to regulate non-bankers requiring capital adequacy, financial inclusion plans and resolution plans<sup>111</sup>. It would actually expand the OCC’s current banking rules, rather than regulatory belief, failing to attract such leading players as Google and PayPal.<sup>112</sup>

Based on some early days’ experience, the sandbox didn’t stand out of other facilities, including innovation hubs and alike, which are less resource-intense but might exert a larger impact to support more firms<sup>113</sup>. For example, Commodity Futures Trading Commission approved a Lab to promote innovation and fair competition. Earlier on, the Project Catalyst under the Consumer Financial Protection Bureau (CFPB), viewed as the predecessor of the sandbox, was launched under the post-crisis Dodd-Frank Act in 2012 to cultivate consumer-friendly innovations by developing foundational policies<sup>114</sup>. Financial services providers were allowed to conduct trail disclosure program to “facilitate access and innovation”<sup>115</sup>. To reduce uncertainty, the NALs have been gradually modified to streamline the review process of risks associated with new innovative products or services<sup>116</sup>. Additionally, a research pilot program was excised to collaboratively test financial technologies and innovations with the firms so that first-hand insights can be gained into how consumers make financial decisions and use those products. So, the Project Catalyst has engaged closely with companies, entrepreneurs, and other stakeholders to be better aware of market developments in innovation. However, the NALs alone cannot guarantee sufficient regulatory certainty given that the sector-based oversight paradigm has placed institutions under dispersed surveillance from a variety of responsible authorities<sup>117</sup>. What is more, the CFPB requires a high standard of consumer protections, deferring startups to apply. From this point of view, the idea of the sandbox is viewed as a harmful regulatory approach to consumers<sup>118</sup>.

More critically, as for the applicant, getting approved by one sandbox cannot guarantee its legitimacy in another jurisdiction. To address this, the FCA launched Global Financial Innovation Network (GFIN) to build a “global sandbox”, aiming to benefit the “triangle” of the regulator, regulated and customers<sup>119</sup>. But its first cross-border testing pilot failed, due to challenges arising from market entry and expansion across jurisdictions<sup>120</sup>. Being less ambi-

<sup>109</sup> TREASURY REPORT (2018).

<sup>110</sup> OCC (2018).

<sup>111</sup> LAWRENCE and others (2017) p. 194.

<sup>112</sup> WITKOWSKI (2019).

<sup>113</sup> UNSGSA (2019).

<sup>114</sup> COCHRAN (2017) pp. 80-83.

<sup>115</sup> CFPB (2013).

<sup>116</sup> CFPB (2016).

<sup>117</sup> LOO (2018) pp. 255-269.

<sup>118</sup> NYS ATTORNEY GENERAL (2019).

<sup>119</sup> Terms of Reference for Membership and Governance of the Global Financial Innovation Network (GFIN), Section 1.2.

<sup>120</sup> GFIN (2020a).

tious, it is still in doubt whether the sandbox can be introduced at the EU level<sup>121</sup>. To say the least, the lack of a cross-jurisdiction approval networking has badly reduced the adaptability of the sandbox, as the financial market has been closely linked and interconnected.

The FCA therefore conceded that FinTech firms still require a transformative shift from start-up to scale-up so that innovation-enabled technologies will be at scale beneficial for the public. Regulators could make use of the sandbox as a "test-and-learn" program to have first-hand insights into market dynamics<sup>122</sup>. As in the US, the sandbox is argued to sunset if regulators are competent in dealing with changed financial markets and infrastructures<sup>123</sup>.

#### IV. SANDBOXES IN CHINA: REVIEW AND REVISIT

##### 4.1. FINTECH ACTIVITIES AND REGULATION IN CHINA

In China, applying technologies to the financial market was first interpreted as "internet-based finance". It highlighted the role played by computing and internet technologies, generating a plentiful source of data<sup>124</sup>. The year of 2016 saw 281 FinTech investments, taking up 56% of the total amount across the globe<sup>125</sup>. Especially, mobile payment and P2P lending have improved the accessibility to financial services and the diversity of products<sup>126</sup>. With the full "built-for-digital" platforms, FinTech firms have accounted for a significant share of Chinese banking services, compared with only 0.5% of the total new credit in the world between 2013 and 2017<sup>127</sup>. Leading BigTech firms, such as Baidu, Alibaba and Tencent (known as BAT), have made further innovations and expanded overseas<sup>128</sup>.

The active FinTech market is attributed to China's comparative limited loss from the GFC, and a welcome regulatory atmosphere. Initially, regulators and policy makers had the "lightest touch" to encourage the development of new technologies, including blockchain and big data<sup>129</sup>. Innovations are particularly welcomed to help alleviate financial exclusion<sup>130</sup>, which has continued to deteriorate with lasting financial depression during the re-

<sup>121</sup> Under the EU Action Plan on FinTech of 2018, European Supervision Authorities (ESAs) were mandated to carry out an analysis of innovation facilitators and best practice of the sandboxes. The "guided sandbox" left the implement and enforcement to Member States but with endorsement, support, and monitoring by EU institutions. Guidelines, high-level principles, and recommendations are undertaken by the ESAs, especially European Securities and Markets Authority. When the FCA introduced its sandbox, such an approach had also been suggested by Olivier Guersent, Director-General for Financial Stability, Financial Services and Capital Markets Union, but little progress has been made at the EU level.

<sup>122</sup> WORLD BANK and CCAF (2019).

<sup>123</sup> ALLEN (2019).

<sup>124</sup> CHEN and others (2018).

<sup>125</sup> NBD (2017).

<sup>126</sup> PBoC (2018) pp. 19-27.

<sup>127</sup> FROST and others (2019).

<sup>128</sup> KPMG (2019).

<sup>129</sup> This has made China known as a sandbox for most radical innovative ideas in the financial sector, ARNER and others (2017) pp. 51-54. On the contrary, it is argued that Chinese regulators conducted principles-like oversight between 2013 and 2015, XU (2018a) pp. 73-74.

<sup>130</sup> PBoC (2018) pp. 35-100.

form<sup>131</sup>. Activities that provide easy accessibility to credit had all bloomed, including digital banking, equity crowd-funding, funding and insurance sales on internet, online fund management and P2P lending. The rapid growth has quickly accumulated risks, triggering regulators to tighten their direct controls. A series of campaign-style regulation, including temporary orders and legislations, have targeted at a selection of FinTech activities<sup>132</sup>. P2P lending is intensely condemned after having thrived from 2011 to 2015<sup>133</sup>. In 2016, a report from China Banking Regulatory Commission (CBRC) pointed out that at least 40% of such platforms were Ponzi schemes, causing massive shutdowns until late 2020. China's Internet Financial Risk Special Rectification Work Leadership Team Office, a task force to eliminate risks in online lending, claimed to have transformed existing platforms to meet new capital and regulatory standards within two years.

Macro-prudential regulation has been strengthened from both aspects of institutional re-settings and policy instruments<sup>134</sup>. People's Bank of China (PBoC) introduced Macro Prudential Assessment in 2016<sup>135</sup>, and stress testing has covered a wide range of commercial banks, requiring consolidated capital adequacy. Systemic stability was further emphasized by establishing Financial Stability and Development Committee (FSDC) accountable to the State Council but located within the PBoC, aimed to achieve the cooperation among financial regulators<sup>136</sup>. Sooner, sector-based regulators were reformed towards an objective-based model<sup>137</sup>: China Banking and Insurance Regulatory Commission (CBIRC) controls prudential regulation, whilst China Securities Regulatory Commission (CSRC) maintains its surveillance over the capital market; the PBoC took over further legislative and rule-making authorities.

At the local level, Financial Work Bureaus (FWB) replaced financial work offices in most provinces, municipalities, and counties<sup>138</sup>. By centralizing tasks previously undertaken by various authorities, FWBs are charged to control day-to-day monitoring of financial activities in their respective jurisdictions<sup>139</sup>. They mainly carry two goals: oversee local finan-

<sup>131</sup> Financial repression refers to a policy regime that creates a wedge between actual return rates to financial assets and normal return rates to investors, LI (2001). It has been employed to benefit the SOCBs and also the government, which is resistant to deep financial liberalization, LU and YAO (2009).

<sup>132</sup> Campaign-style regulation can be understood as short-term but compulsory regulatory instruments to deal with specific problems or emerging issues. It is not confined to financial sector but prevail throughout China's reform for decades. Recently, it has been criticized to harm the future of innovations among others, XU and TANG (2017).

<sup>133</sup> YOU (2018). P2P has gained a global popularity. It has experienced a sharp increase as an alternative finance in China, where the SOCBs-dominated financial market have drawbacks and investors have fewer options. Market scandals and regulatory vacuum have made it under the spotlight, SHEN (2015).

<sup>134</sup> MILNE (2009).

<sup>135</sup> ZHENG (2018).

<sup>136</sup> DONG and others (2017); YANG (2019).

<sup>137</sup> HAN (2017).

<sup>138</sup> Titles coexist in many areas. The first financial work office was set in Shanghai in 2002 to promote local economic growth whilst implementing policies from the PBoC and sector-based regulators, PAN and LV (2014).

<sup>139</sup> Huge differences laid in institutional settings and specific tasks across locations, leading to different reform approaches, CHEN (2016). The division, alongside regulatory arbitrage and competition, might continue with the FWBs, LI and KE (2018).

cial market and promote further development; the former is argued to be more urgent due to growing risks associated with FinTech activities, prioritizing seven types of institutions with four major business areas<sup>140</sup>. Their legal resource is still not clear<sup>141</sup>, but a two-tier oversight regime is argued to emerge with compartmentalized responsibilities between the central and local regulators<sup>142</sup>.

The last few years have seen China’s leap in FinTech investments, and also massive regulatory reforms. But it is very late to launch a systemic design. Not until mid-2019 did the PBoC release a three-year plan, and then the State Council approved sandboxes in selected locations.

#### 4.2. SANDBOXES IN CHINA: REVIEW

The first sandbox was settled in Beijing in the end of 2019. Afterwards, more have been introduced as shown in the following table:

TABLE 3  
 Sandboxes in China (until October 2021)

Pilot	Location	Regulator(s)	Applicants	Testing
1st	Beijing	PBoC; Beijing FWB	3 cohorts	IoT, big data, AI, blockchain, API Anti-pandemic applications IoT and Blockchain
2nd	Shanghai	PBoC Shanghai Headquarter	inc. Tencent	Big data, DLT, Blockchain
	Chongqing	PBoC Opera- tions Office		Financial inclusion
	Shenzhen	PBoC Sub-branch	inc. PBoC sub- branch	For foreigners
	Xiongan	PBoC Sub-branch		Specialized funds for relocation
	Hangzhou	PBoC Sub-branch		Risk controls
	Suzhou	PBoC Nanjing Branch	inc. PBoC sub-branch	Cloud computing and big data

<sup>140</sup> It is called as “7 plus 4” mode, LU and OUYANG (2020).

<sup>141</sup> At National Finance Work Conference of 2020, the PBoC announced a series of legislative plans, including the provisional rule about local financial regulation. The Provisional about Local Financial Regulation in Shanghai came into force on 1 July 2020.

<sup>142</sup> Given China’s size and geographic complexity, it is very challengeable for local governments to deal with financial markets in their respective jurisdictions, TANG (2017); WANG (2017).

Pilot	Location	Regulator(s)	Applicants	Testing
3rd	Chengdu	PBoC Branch		Financial inclusion
	Guangzhou	PBoC Branch		Cross-border settlement
	Shandong	PBoC Branch	Only banks	Financial inclusion

Source: Own elaboration.

Sandboxes can be found from East to West, including both financial center and less developed areas. Some are set in experimental zones. Needs are localized, though they are not explicitly titled. For instance, innovations for risk controls are prioritized in Hangzhou, where e-commerce has bloomed. Cross-border issues are highlighted with testing for foreigners in Shenzhen, and Renminbi settlement in Guangzhou.

As of the regulator, the PBoC, alongside the FWB, lead the Beijing sandbox with its headquarter in Shanghai playing a similar role. In other locations, its branches and sub-branches are responsible based on the hierarchy<sup>143</sup>. It is similar to the designs in Singapore and Hong Kong, where the monetary authority is also the banking regulator. Under the twin-peak oversight, it is questioned how regulatory responsibilities are divided between the PBoC and the CBIRC in facilitating beneficial innovations and beyond<sup>144</sup>. The other peak is the capital market regulator, which operates their respective sandboxes in Australia and the UK. In China, the sandboxes are initiated in both Shanghai and Shenzhen, where the stock exchanges have run since 1990. Regulated by the CSRC, Shanghai Stock Exchange (SSE) is the frontline regulator and has gained first-hand insights into the capital market and its predominant participants. It is also active in applying innovation-enabled technologies to supervision. For instance, the system of company portrait based upon big data is employed to provide detailed and dynamic information about applicants and listed companies. Involving the SSE in the sandbox testing will contribute to next-step reforms especially in terms of market conduct rules. Regulation in this regard emphasizes transparency, disclosure, suitability, investor protection and protection for consumers<sup>145</sup>. As claimed, the ASIC would “never pursue innovations at the cost of abandoned consumer protections”<sup>146</sup>. In a word, as the central banking system controls the sandboxes, its duty and coordination with the twin-peak regulators need to be clarified.

Under China’s current legal system, only licensed financial institutions are eligible with 7 applications submitted by non-bank institutions. In Suzhou and Shenzhen, the

<sup>143</sup> Besides Beijing and Shanghai, the PBoC has nine branches, 25 sub-branches and Operations Office in Chongqing.

<sup>144</sup> A draft was released to amend the Act of the PBoC, suggesting that it should guide innovations developments whilst being responsible for collaboration.

<sup>145</sup> HERRING and CARNASSIAL (2008). The phrase “financial consumer” has not been officially defined until 27 December 2019 when the Draft was released for consultation. It is aimed to place down a systemic legal framework to protect the consumers, who “have purchased and used financial products and services offered by financial institutions”. Previously, consumer protection in financial sector is covered by the Law on the Protection of Consumer Rights and Interests of 2014, as well as two administrative rules enacted by the PBoC.

<sup>146</sup> ASIC (2017).

PBoC sub-branches joined banks in applying<sup>147</sup>. It is significantly different from the UK and Australia, where the unlicensed are allowed to test under stricter requirements. Shanghai's sandbox has recently accepted the application from Tencent, jointly with Bank of Communications Co., Ltd. The role played by such BigTech firms was first viewed negative but nowadays, regulators have shifted to support their partnership with incumbents. For instance, the HK FFS accepts applications made directly by BigTech firms without a banking institution as a bridge. In China, they did not attract much attention from regulators until summer 2019, when the PBoC published a consultation paper to monitor financial holding companies<sup>148</sup>. It is not too early to consider whether and if so, how to set the criteria for BigTech firms.

As calculated, 119 testings have been made. Most are banking-related, and digitalized lending takes a significant part of 90%. They are majorly new technologies applied to improve existing products and services, especially financial inclusion. For example, applications in dialect are tested in Chongqing and Chengdu. It is doubted, as facing the FCA, whether such are genuine innovations. Meanwhile, innovations are viewed beneficial to promote the professionalism of financial services, including the governance of banking institutions, but none of tests are directly linked to this area.

There is little publicly available information about the criteria of testing and the internal arrangement, except applications are being taken by cohorts<sup>149</sup>. It is far from clear how the regulator will communicate with applicants prior to and during the testing. Last, either a clarified time limit or a pre-set exit plan has been announced by regulators when open to apply in most cases. But Chinese regulators seem very hesitant to announce how to end the sandboxes testing. Recently, 7 items are officially named to finish testing, but the follow-up is unclear. A fixed term is easy to apply whilst increasing regulatory certainty and predictability, facilitating firms to make the decision.

#### 4.3. SANDBOXES IN CHINA: REVISIT

With positive effects, sandboxes have exposed critical limitations, which might face extra challenges in China, where FinTech investments have bloomed in a less sophisticated financial market with ongoing regulatory reforms.

China's reform is well known of gradualist approach with pilot programs to introduce selected market principles<sup>150</sup>. As named, the sandbox is a pilot program, carrying features of China's experimentalism. By and large, the government is relocated as the maker of the market. The monopoly of the state is not simply removed, but the state-owned, planned economy has been utilized as the base for launching a new non-state, market-based sector<sup>151</sup>. Experimental tools and legislations, a majority of which are linked to financial services regulation, have been tried out in a growing number of free trade zones (FTZs). Before regula-

<sup>147</sup> YE (2020).

<sup>148</sup> The law came into effect on 1 November 2020. PBOC (2020) N° 4.

<sup>149</sup> It is implicit: most sandbox regulators announced additional calls for applications without timetables.

<sup>150</sup> HEILMANN (2008a) pp. 3-9.

<sup>151</sup> KOTZ (2000); LIEBMAN and MILHAUPT (2015) pp. 73-80.

tors formalized their policy standing of FinTech investments, temporary rules, and provisional laws from a wide range of authorities have been issued with quick updates.

It is argued that most pilot reform programs are proved effective, as primarily evidenced by China's lasting economic growth. It is more striking in the case of crises: extraordinary politics are quickly utilized to control threat and instabilities<sup>152</sup>. But the over-dependence on pilots might hinder the birth of systemic designs. Besides, shortcomings cannot be ignored. First, experimentation is largely initiated and revised from inside the government and implemented without referring to the limitations set by laws, named as "experimentation under implementation"<sup>153</sup>. Reform regime attempts to achieve political legitimacy through legal reform, and the dignity of the Party is thereby ensured by reinforcing the relationship between codification and politics<sup>154</sup>. Legal reform is conducted through pre-existing political organs, prioritizing the Party's superior position of administrative bureaucracies. Moreover, under the party-state hierarchy, the central government defines the goals for reform and growth, while local governments control resources to trial specified innovative policies and instruments. They are encouraged to meet those pre-set targets by employing financial institutions in their jurisdictions<sup>155</sup>. Meanwhile, legislative powers are divided between central and local government bodies, reinforcing the overly extensive authority of administrative power<sup>156</sup>. As explained, the FWBs are taking over regulatory responsibilities from the central regulators, requiring clarifying their role in running sandbox testing and beyond. Furthermore, due to the top-down cadre appointment, local governments pursue overstated positive results of pilot programs. Fake or wrong models might be covered or manipulated, and even failures are likely to be abandoned silently at a high expense of social and/or budgetary costs. It is argued that economic inefficiencies are the necessary prices to maintain political control and stability in China<sup>157</sup>. It has made it further unreliable to assess the true effects of the sandbox testing in different areas.

When the financial market is concerned, the reform is primarily aimed to replace the role of the government in allocating credit whilst overseeing the state sector by well-functioning financial disciplines, including an independent central bank, flexible interest rates, and efficient revenue systems<sup>158</sup>. So far, liberalization has yet been completed with various constraints upon exchange rates, market-entry for foreign financial institutions and direct controls from the central bank and other authorities.

To begin with, China has continued to rely on indirect financing via banks, which have long been dominated by state-owned commercial banks (SOCBs). Due to monetary expansion and fiscal stimulus during the crisis, Chinese banking industry has assumed a large amount of risk, becoming "too big to fail"<sup>159</sup>. Banks have actively engaged in deliver-

<sup>152</sup> It is named as "institutional reserve capacity", BALCEROWICZ (1994).

<sup>153</sup> HEILMANN (2008b).

<sup>154</sup> POTTER (1994) pp. 325-358.

<sup>155</sup> LIEW (1995) pp. 883-895; SACHS and WOO (2001).

<sup>156</sup> LAMPTON (1992) pp. 33-58.

<sup>157</sup> QI and HAN (2006) p. 107.

<sup>158</sup> CHEN, JEFFERSON and SINGH (1992).

<sup>159</sup> YAO and WU (2011) pp. 794-802.

ing products and services via electronic platforms. As they will continue to be favored by the sandbox regulator, their risks should be carefully assessed when clarifying the market-entry criteria. On the other hand, the capital market has been underdeveloped with a low level of concentration, being ineffective in allocating resources<sup>160</sup>. Apparently, there lies a mismatch between innovations accepted into the sandbox and what should be supported. Meanwhile, China has a typical financial recession market, highlighting the role of innovations in financial inclusion<sup>161</sup>. RegTech solutions are required to assist regulators in protecting customers, including disadvantage groups, whilst maintaining systemic stability<sup>162</sup>. But RegTech solutions are absent from the sandbox testing, resulting in another mismatch.

In terms of regulators, recent institutional re-settings have moved towards a more functions-oriented oversight model, which is argued to underpin the MPBR to deal effectively with market risks and dynamics<sup>163</sup>. But it is still in doubt whether regulators are equipped to oversee market activities rather than providers as under the sector-based regime<sup>164</sup>. In the case of P2P lending, Chinese regulators are putting it under the arms of formal banking<sup>165</sup>. Information asymmetry is the major barrier for lenders to reduce default risks, and regulator would be better to set useful indicators, covering the borrower's credit scores, demographic information and social network<sup>166</sup>. Generally, various accesses to credit have attracted massive FinTech investments, which is largely attributed to China's financial repression, requiring a more comprehensive regulatory approach<sup>167</sup>.

Legal reforms have occurred piecemeal with the revision of old rules and the drafting of new ones, but gaps have co-existed with overlapping<sup>168</sup>. In spite of active digital banking business, traditional banking law still applies, requiring the approval from the PBoC<sup>169</sup>. Since 2014, four digital-only banks have been licensed: WeBank backed by Tencent, MY-bank by Aligroup, AiBank by Baidu and China Citic Bank<sup>170</sup>. Amongst, Alibaba's Ant Financial, as well as AMTD Group<sup>171</sup>, applied for the DWB license issued by the MAS in January 2020. In Australia and the UK, twin-peak regulators have jointly initiated to facilitate the establishment of new banks under their own mandates, providing valued assistance for China to introduce a regime for digital banking licensing. It is reported that China

<sup>160</sup> ALLEN and others (2012) pp. 63-145.

<sup>161</sup> SHEN and ZHANG (2020) pp. 192-195 & 199-200.

<sup>162</sup> XU (2018b) pp. 10-13.

<sup>163</sup> MICHAEL (2020).

<sup>164</sup> SHEN (2022) pp. 188-190 & 195.

<sup>165</sup> It is still questioned how the platforms will repay, so investors are likely to suffer massive losses. As explained, P2P have important benefits as alternative finance in China by offering credit to private sectors and the small-and-medium enterprises in particular, SHEN (2018).

<sup>166</sup> XU and TANG (2018); YAN, YU and ZHAO (2015).

<sup>167</sup> SHEN (2017) pp. 71-73.

<sup>168</sup> YANG and TAN (2017).

<sup>169</sup> Arts. 12 - 15, Law of the People's Republic of China on Commercial Banks (2015 Amendment).

<sup>170</sup> CHINA'S DIGITAL BANKING (2019).

<sup>171</sup> AMTD is Asia's largest independent investment banking firm headquartered in Hong Kong, including Chinese electronic company Xiaomi financial arm, Xiaomi Finance, energy company SP Group, and South East Asia' online lending company Funding Societies.

is finalizing its first rule for online-only banks<sup>172</sup>. The rule is expected to reduce financial jeopardy and lure portal participants, and remove bias against foreign financial institutions when providing online banking services to Chinese citizens<sup>173</sup>. As long as enacted, regulators should clarify whether foreign entities are eligible to apply for the sandbox.

A special FinTech license, like in Australia, seems too radical for the time being given that Chinese regulators have become alert to certain risks associated with selected FinTech activities. Comparatively, it would be more workable to offer individual guidance by appointing a case officer or via a fixed arrangement. It is argued that, under the MPBR, the regulator's call center will outweigh a case-by-case officer so as not to inhibit the firms' willingness to develop their own solutions to comply with the principles<sup>174</sup>. Just as in HK, through the Chatroom, the firms have access, via face-to-face meetings, emails and video conferences, to both Fintech Facilitation Office and Banking Department of the HKMA at an early stage. In China, any further organizational reforms would add excessive uncertainty whilst increasing burden on the market. It is thus important to improve the sandbox by restructuring the existing arrangement, rather than introducing new agents<sup>175</sup>. Joint meetings have been widely favored after the State Council guided previous sector-based regulators to manage domestic instability in August 2013. Without a clarified definition, it refers to a temporary arrangement to manage specific issues or urgent problems by bringing together different government and non-government organs<sup>176</sup>. Based on the practice that is already in place, a call center can be formalized by institutionalizing the joint meeting via granting clarified goals and regulatory responsibilities regarding FinTech activities.

Furthermore, Chinese regulators have long relied on administrative tools and orders to control the firms, which should be replaced by more indirect policies<sup>177</sup>. As explained, the MPBR requires a truly dialogic relationship based on mutual trust, as well as a series of checks and balances; those are far beyond the contributions which can be achieved by a sandbox. First, well-clarified and consistently pursued goals are primary for principles-based regulators to communicate with firms. To support innovations is the shared understanding among regulators to set up the sandbox. Both customers protection and fair competition are addressed, though the latter might be beyond the conventional mandates

<sup>172</sup> REUTERS (2020).

<sup>173</sup> COMPETITION POLICY INTERNATIONAL (2020).

<sup>174</sup> BLACK, HOPPER and BAND (2017).

<sup>175</sup> Based on existing cases study, it can cost from \$25,000 to \$1 million to set a new sandbox. Mostly such existing authorities as payment departments and financial sector regulators are granted with new responsibilities for operating innovation facilitators, including the sandbox when appropriate. It is usual to tap internal resources rather than new hires, APPAYA and JENIK (2019).

<sup>176</sup> It is hard to track the origin of the joint meeting. In most cases, they can only commence after being approved by the head office of responsible agencies within the State Council to communicate timely across departments to reach agreements. In the financial regulatory context, the first joint meeting was launched by the PBoC to deal with money laundry in 2002. The CBRC had led to manage illegal fund-raising on a quarterly basis without much information accessible. It was reported to halt in 2013, and several proposals to institutionalize it had all failed, ZHANG and CAI (2013).

<sup>177</sup> LU and XU (2020) pp. 62-67; YANG (2018).

of such regulators as the MAS and HKMA<sup>178</sup>. In theory, it is questioned whether "to facilitate FinTech activities" can be an appropriate regulatory goal; different answers have led to varying attitudes and approaches across jurisdictions. In the UK, regulatory goals are only listed in the FCA's websites without being explicitly legitimated<sup>179</sup>. But it could be thorny in such rules-based regimes as the US, where the legitimacy of promoting innovation being a regulatory objective, among others, has hindered the set-up of the sandbox<sup>180</sup>. However, it is not the focus of discussions in China: innovation boost, especially its role in improving financial inclusion, seems a tacit belief. Even so, from lightest touch to campaign-style controls, regulatory uncertainty has been the top concern for the market. It is argued that the biggest value of the sandbox is attributed to its signaling functions to communicate regulators' flexibility towards innovation firms and their activities<sup>181</sup>.

The core to the MPBR is the dialogic relationship arising from mutual trust between the regulator and the regulated. In China, how local regulators communicate with the central government is still under doubt, which has rarely been addressed by institutional resetting<sup>182</sup>. Under the top-down cadre appointment, local governments have to seek support and advocacy from the higher-level patrons<sup>183</sup>. The central government has maintained, to a certain extent, its control of the personnel system in the banking industry<sup>184</sup>. For example, the PBoC's governor is at a higher political rank than the chairpersons of the SOCBs, who are mostly appointed by Organization Department of the Party's Central Committee. When appointing bankers, some senior officials are selected from the PBoC and regulatory commissions; *vice versa*<sup>185</sup>. Due to such an intensely politicized process, regulatory conversation might continue to run throughout a rigid political hierarchy rather than mutual trust.

Broadly, reform progress in other areas would affect financial liberalization and regulation in China. For one, how local authorities manage financial oversight has been interwoven with reforms about the fiscal and tax policies<sup>186</sup>. For another, the SOEs have continued to be privileged with cheaper credit guaranteed by the government, increasing non-performing loans to the SOCBs. But without a functional capital market, flawed institutions cannot accomplish the market-oriented reform<sup>187</sup>. Local governments have also employed local financial institutions to support local SOEs, becoming a new channel of bad

<sup>178</sup> CGAP-WORLD BANK (2019).

<sup>179</sup> The authority of the UK financial regulators used to be constrained by EC provisions, including the FSA's principles-based regulation. After the Brexit, it would not be the main issue facing the twin-peak regulators, which have extensive rule-making powers under the BoE and the HM Treasury.

<sup>180</sup> ALLEN (2019) pp. 600-605 & 637-638.

<sup>181</sup> ZETZSCHE and others (2017a) pp. 64-91.

<sup>182</sup> LIU, CHEN and TAO (2016).

<sup>183</sup> RAWSKI (1995) p. 1155.

<sup>184</sup> HUANG and MIAN (2011).

<sup>185</sup> LAO (2019).

<sup>186</sup> GUI (2017).

<sup>187</sup> QIAN (1999).

loans<sup>188</sup>. Reform of financial markets has thus inextricably entwined with efforts to reform the SOEs with the state retaining ultimate control over them<sup>189</sup>.

In sum, China’s financial sector has developed with strong government intervention, and pilot programs have expanded with severe shortcomings. As a pilot program, the sandbox seems better prepared than previous experimental points: differing themes are designed to fit into local needs, and regulators have modified the testing scale. But all the problems associated with Chinese version of experimentalism will similarly affect FinTech oversight: administrative discretion is placed above policy experimentation, undermining the authority of established rules and legislations, whilst experimentation under the political hierarchy is fundamentally different from mutual trust required by the MPBR. It is such a financial ecosystem that validates the analysis of the sandbox approach to FinTech regulation in China.

So far, the basic elements of the sandboxes have emerged in China. The cases study and the comparative analysis have contributed to a to-reform list as follows:

TABLE 4  
Further Reforms for the Sandboxes in China

Regulatory Goals	Key Elements	Current Arrangements	Problems/Recommendations
Innovation boost; Systemic stability; Consumer’s protection; ...	Regulator	PBoC system; FWBs	Relationship with twin peaks? Role of local financial regulators?
	Applicants	Licensed financial institutions esp. commercial banks	BigTech firms?
			Foreign financial institutions?
	Innovations	No publicly known information	Licensing regime for digital banking
			RegTech solutions?
	Tools	Dialogue: no publicly known information	Call center by institutionalizing joint meeting
		Special FinTech license	X
	Process	Pilots	Shortcomings of gradualist reform
Exit	No publicly known information	Fixed time: easy to apply	
		Clarified reasons: need to pre-set	

Source: Own elaboration.

Obviously, mismatches exist in terms of applicants and tests accepted by the sandboxes in China; dialogue should be enhanced and diversified from an early stage. Due to the lack of essential information, their effects cannot be reliably assessed. Above all, huge efforts are needed from regulators and policy makers to improve transparency and account-

<sup>188</sup> HERD, HILL and PIGOTT (2010).

<sup>189</sup> BRANDT and ZHU (2007) pp. 86-143.

ability. So, the sandbox in China should primarily clarify that regulators are really committed to providing accommodative treatment by improving regulatory certainty.

## V. CONCLUSION

The sandbox, as an innovative policy instrument to facilitate beneficial technologies, has been finally placed down in China after a long preparation. The sharp rise of FinTech activities in a comparatively young financial market has challenged regulators and policy makers to refine the balance between pursuing stability and supporting innovations development. As argued, the sandbox is not the only option or the best-practice solution to accommodate market changes; cases of both successes and failures have been found globally. Even though, it would make contributions if to get it carefully designed and implemented. This article has summed up guiding principles to make it successful in China. Rather than transplanting a certain model, a couple of cases have been compared to provide valued assistance when making further changes. In principle, the sandbox should be based upon recent institutional re-settings, and consider the eligible criteria for BigTech firms and foreign institutions, and meanwhile open the door to RegTech solutions and digital banking among others. For another, this article has expounded on the nature of the sandbox as a form of principles-based regulation, which requires carefully designed regulatory goals, risk-based approaches and a truly dialogic relation in particular. The other way around, a shift towards a more principles-based oversight perimeter requires far more profound reforms.

Above all, this article has clarified that it is overriding to view the sandbox more as a temporary arrangement to improve regulators' competence than a permanent facility towards an innovation-friendly regulatory ecosystem. Besides, testing might not always have a happy result, but the sandbox is leastwise worthy a decent ending.

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