How to design a better model for China's enhanced Fintech regulatory sandbox?

Yuan Yiwei[1*] , Li Shuhan[2] , Ding Shengran[3] , Qian Yunkai[4] , Liu Sitong[5] , Zhang Yiwen[6]

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1 School of Finance, Shanghai University Of Finance and Economics, Shanghai 200433, China
2 School of Business, East China University of Science and Technology, Shanghai 200237, China
3 International School of Law and Finance, East China University of Political Science and Law, Shanghai 201620, China
4 SILC Business School, Shanghai University, Shanghai 201103, China
5 International College, Huaqiao University, Quanzhou 362011, China
6 School of Business, East China University of Science and Technology, Shanghai 200237, China
* Correspondence: yuanyiwei@163.sufe.edu.cn; Tel.:+86-18930402909

1 Abstract

Recent years have seen the rapid development of the world's financial technology industry (Fintech). Because of the innovation and risk controllability of the Fintech "regulatory sandbox", it has become an effective model for financial technology regulation. This article firstly introduces the background and mechanism of China's regulatory sandbox and summarizes the drawbacks. Then we analyze the mechanism and operation process of the Fintech regulatory sandbox in the UK and Singapore, where we sum up the experience that China can refer to. Finally, our project points out the positive significance of our newly-created model and its possible limitations.

Keywords: fintech, regulatory, sandbox, China

2 Introduction

2.1 What is a regulatory sandbox?

A regulatory sandbox is an environment where firms can test new innovations under the supervision of a regulator. The aim is simple: to facilitate innovation in a safe and responsible manner. Innovations that can be tested include new products, services, solutions, technologies, business models, and even policies. Often, regulation is relaxed or rules are adapted to create a more conducive environment for experimentation. As new innovations can change industry landscapes, sandboxes also help regulatory bodies to:

- reduce the time and, potentially, the cost of getting innovative ideas to market.
- enable greater access to finance for innovators, by reducing regulatory uncertainty.
- enable more products to be tested and, thus, potentially introduced to the market.

2.2 Background

After more than a decade of development, fintech has become a new engine for China to promote financial transformation and upgrading, and a new way for financial services to serve the real economy.

At this stage, how to balance the relationship between innovation and regulation has become a key issue for the healthy development of fintech in the future.

The regulatory sandbox, officially implemented in the United Kingdom in March 2016, provides inspiration for China to balance innovation and regulation.

3 Division of roles & responsibilities

NAME	Role	RESPONSIBILITY
Yuan Yiwei	Leader	Data collecting and analysis
Li Shuhan	Technical support	Technology research and implementation
Ding Shengran	Sandbox expert	Regulatory sandbox research and application
Qian Yunkai	Teamworker	Legal and compliance research
Liu Sitong	Analyst	Literature and data analysis
Zhang Yiwen	Coordinator	Data collecting and evaluation coordination

4 Overview of sandboxes examined

4.1 Chinese situation

According to the statistics from the People's Bank of China, as of the end of April 2022, a total of seven innovative application projects in Beijing, Shenzhen, and Chongqing have passed the test and have been successfully "out of the box". Among them, three innovative applications have successfully passed the test in Beijing, namely, "Item Traceability Authentication Management and Supply Chain Finance based on IoT" of ICBC, "Blockchain-based Industrial Financial Services" of Bank of China, and "AIBank Financial Services" of CITIC Bank of China. Financial services" and "AIBanklnside products" of CITIC Bank. The innovative application "out of the box" in Shenzhen is the "Credit Inclusion Service of Baxin Credit Collection" of the Baxin Credit Collection Company. Three projects in Chongqing came successfully "out of the box", comprising the "Credit Inclusion Service of Chongqing Rural Commercial Bank" of Chongqing Rural Commercial Bank. The three projects that came out of the box were the "Intelligent Banking Service Supporting Chongqing Local Dialect" of Chongqing Rural Commercial Bank, the "Blockchain-Based Digital Correspondence Platform" jointly launched by Xiamen Bank, Chongqing Fumin Bank, Boya Zhengchain (Beijing) Science and Technology Co. Ltd. and Everbright Bank Chongqing Branch's "Granite Intelligent Risk Control Product".

"Out of the box" means that the application of the pilot projects in the field of fintech innovation and regulation has matured, can gradually enter into the landing stage, and can play a greater value in specific business processes and scenarios. Among the seven "out-of-the-box" projects, the participation of the banks reached 100%.

And among them the innovation of the "Item Traceability Authentication Management and Supply Chain Finance based on IoT" project lies in the use of Internet of Things Blockchain technology to provide article traceability authentication services, combine traditional payment, financing and other banking financial services with the enterprise upstream and downstream and the whole chain of production and marketing of commodities, and integrate the supply chain financial services into the production and marketing of commodities scenarios, which is easy for enterprises and individual customers to choose on their own. This integrates supply chain financial services into commodity production and marketing scenarios, facilitates the independent selection of enterprises and individual customers, and provides financial services at any time, at any place, and at pace, so as to build an industrial ecosystem.

4.1.1 Chinese drawbacks

China's current fintech regulatory sandbox has the following problems.

1. The scope and standards of sandbox regulation are not clear.

The scope and standards of sandbox regulation are not clear at present, which makes it difficult for fintech companies to determine whether they comply with sandbox regulatory requirements in practice.

2. The rules and mechanisms of sandbox regulation are not perfect.

Although China has introduced some fintech regulatory policies, there are still some shortcomings in these policies, such as the formulation of rules and mechanisms, and the implementation and enforcement of regulations.

3. Poor information sharing and communication in sandbox regulation.

Poor information sharing and communication between fintech companies and regulators makes it difficult for companies to get timely help and guidance when they encounter problems in practice.

4. The risk prevention and disposal mechanism of sandbox supervision is not sound.

Although the purpose of sandbox supervision is to better promote the development of financial technology, it also needs to establish a sound risk prevention and disposal mechanism to ensure that the rights and interests of enterprises and investors in the sandbox are effectively protected.

4.2 UK Situation

4.2.1 Eligibility Criteria

Criteria	Key question	Positive indicators	Negative indicators
In scope	Are you doing something that is within ou r remit? Will your customers be in the UK?	Your innovation is intended for the UK market	Your innovation doesn `t appear to be intended for use in the UK
Consumer benefit	How does your proposal help consumers?risk protection?	Your innovation is likely to lead to a better deal for consumers (eg through lower prices, higher quality, better security etc)	Potential detrimental impact on consumers, markets or the financial system
Genuine innovation	Are you doing something that ' s groundbreaking or significantly different?	Desk research produces few or no comparable examples of innovation in the market	There are numerous examples of similar innovations to yours
Readiness	Have you thought about how your model works with our rules?	You have clearly done background research, have sought to understand obligations , and have a clear, defined business proposal	You have made little or no effort to understand relevant regulations
Need for support	Do you have a genuine need to test in our Sandbox?	You have no alternative means of engaging with the FCA	You already have a dedicated supervisor who could answer the query

Figure 1: The UK's eligibility criteria

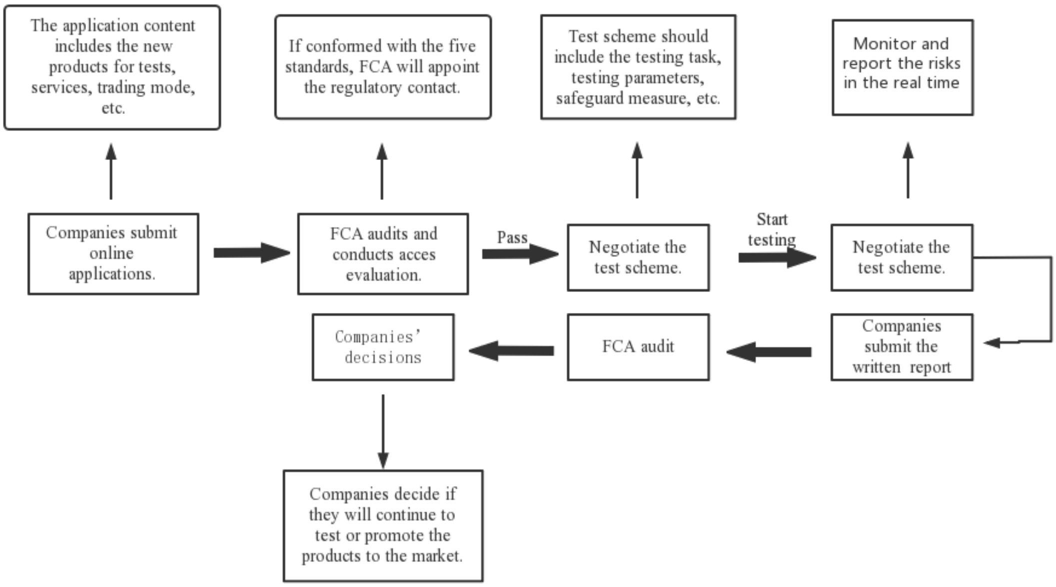


Figure 2: Process of regulatory sandbox in the UK

cohort	Time	applications received	applications accepted	firms tested	range of areas
1	July 2016	69	24	18	sectors,locations,sizes
2	January 2017	77	31	24	sectors,locations,sizes
3	June 2017	61	no data	18	blockchain, RegTech, insurance, AMLcontrols, biometric digital ID
4	July 2018	69	no data	29	consumer credit,automated advice,environment
5	April 2019	99	no data	29	wholesale,digital identity,financial services for vulnerable consumers
6	July 2020	68	no data	22	"innovation": finance proposition, safekeeping and transacting of digital assets using DLT and a sustainable finance investment platform
7	July 2021	58	no data	13	SMEs, retail investments, safekeeping
8	Augest 2021	94	no data	20	retail lending, retail investments, retail banking, payments and wholesale

Figure 3: Eight cohorts of accepted firms

We want to focus on the first two cohorts. Of the first two cohorts, the FCA received applications from 146 applicant firms and supported 50 of those towards designing, implementing, and supervising their tests. Not all have progressed to test their solutions in the sandbox. Nine firms were unable to test their solutions for a variety of reasons, including not being able to secure necessary partnership agreements.

1. Figure 4 shows that the UK's sandbox encourages applications from all sectors. How-

ever, a majority of firms testing in the first two cohorts have come from the retail banking sector.

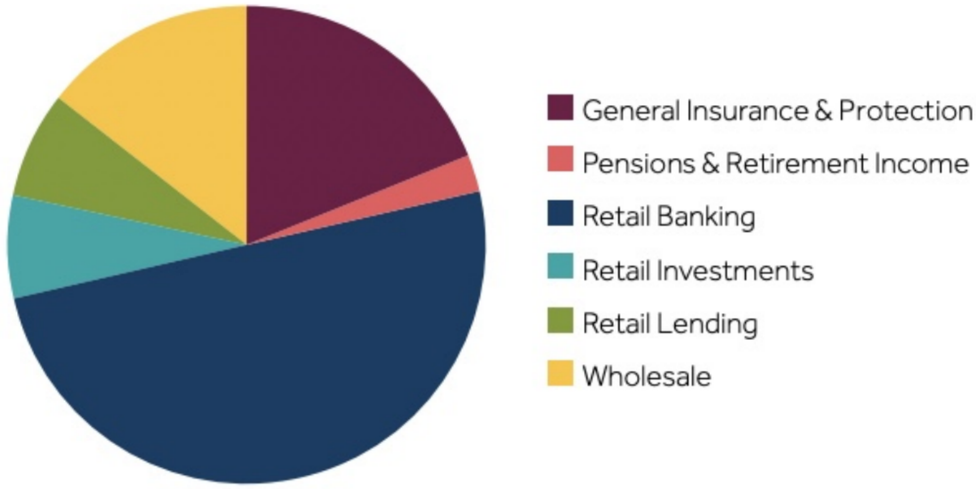


Figure 4: Sandbox firms by sector

2. Figure 5 shows that a majority of sandbox firms in the first two cohorts are based in Greater London. However, this trend does appear to be changing. Approximately 35% of firms testing in the second cohort are based outside London, representing a marked increase when compared to the 25% of firms in the first cohort.

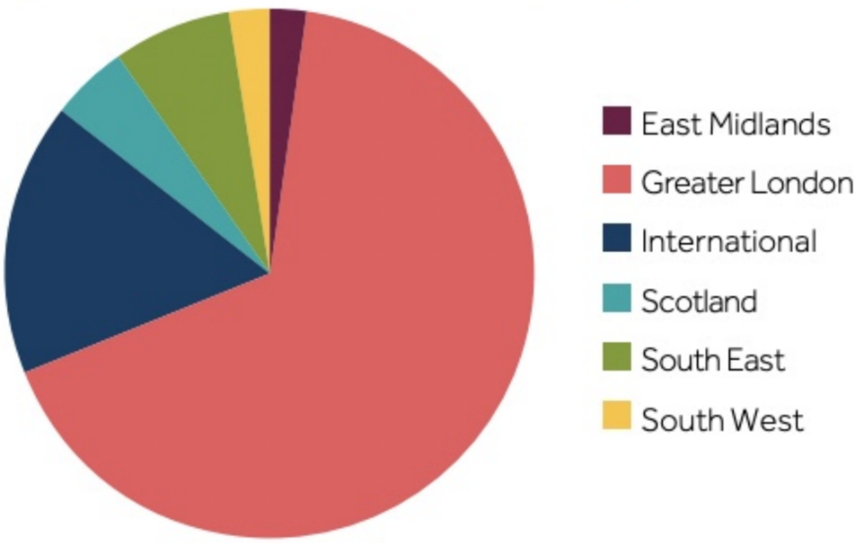


Figure 5: Sandbox firms by region

3. Figure 6 shows that the sandbox provides support to innovative firms regardless of their size or maturity. However, it is clear that the sandbox has been most popular with start-up companies and those that are not yet authorized by the FCA.

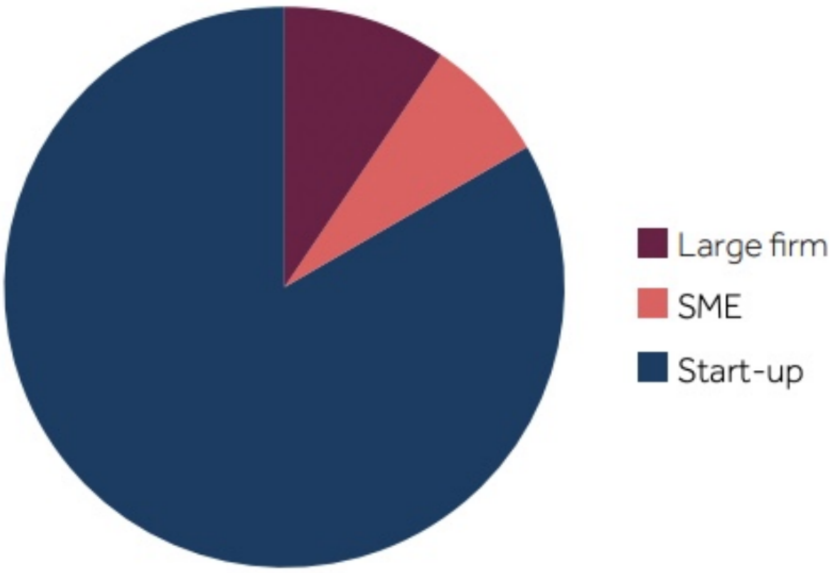


Figure 6: Sandbox firms by size

4.2.2 UK advantages

1. Encourage Innovation

A regulatory sandbox's primary advantage is providing a safe space for start-ups to innovate and test their products without full regulatory compliance concerns, thereby fostering creativity and risk-taking. Firms do not need to worry about full regulatory compliance encouraging start-ups to be more creative and take risks that they might not be able to take in a more controlled, regulated environment.

2. Consumer Protection

Regulatory sandboxes ensure that consumer protection is maintained. Full consumer protection requirements mean that consumers can feel more secure when using their products and services.

3. Faster Time-to-Market

Regulatory sandboxes expedite time-to-market for FinTech start-ups by lowering regulatory compliance time and costs, enabling quicker product testing and subsequent market release.

4. Competitive Advantage

Start-ups that successfully complete the regulatory sandbox program may gain a competitive advantage by demonstrating to customers, investors, and regulators that their products and services have been rigorously tested and comply with regulatory requirements.

4.2.3 UK drawbacks

1. Eligibility Criteria

Defining eligibility for regulatory sandboxes is challenging. Strict criteria could exclude innovative start-ups not meeting standards, while lax criteria could allow non-serious start-ups to participate, wasting resources and undermining the sandbox's purpose.

2. Limited Scale

Regulatory sandboxes typically operate on a small scale, meaning they may not be able to test the full potential of a finTech innovation. Start-ups may face challenges in scaling their products and services beyond the sandbox, which may limit the sandbox's impact on the FinTech industry.

3. Short Duration

The limited duration of regulatory sandboxes can challenge start-ups that need more time for testing and refining their innovations. This time constraint may also cause rushed, sub-optimal testing processes.

4.3 Singapore situation

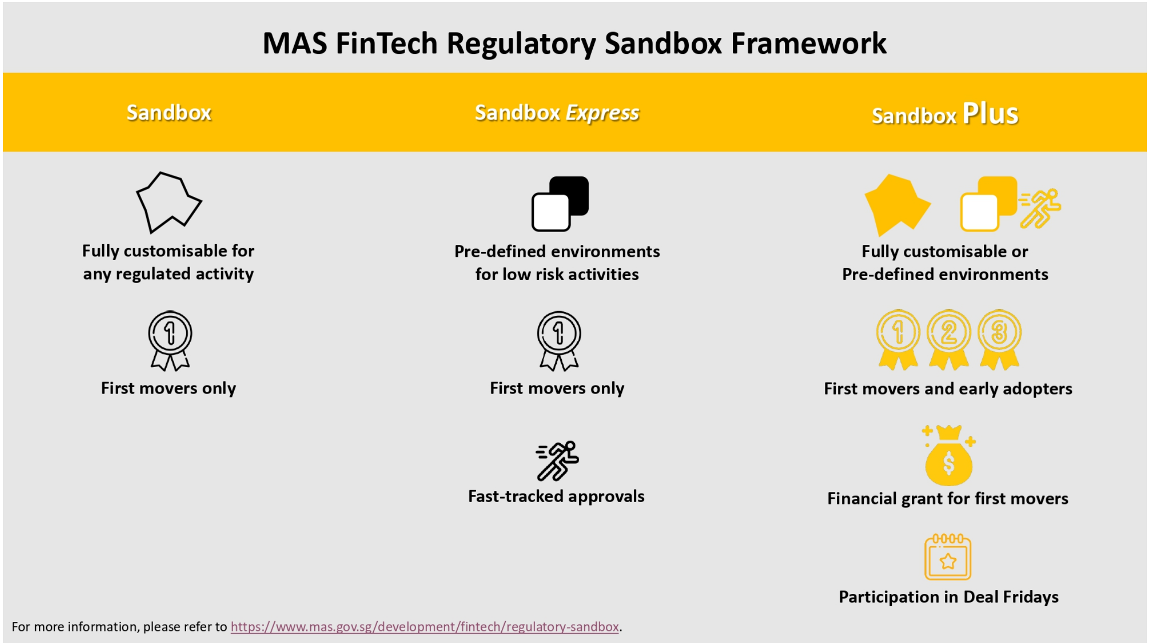
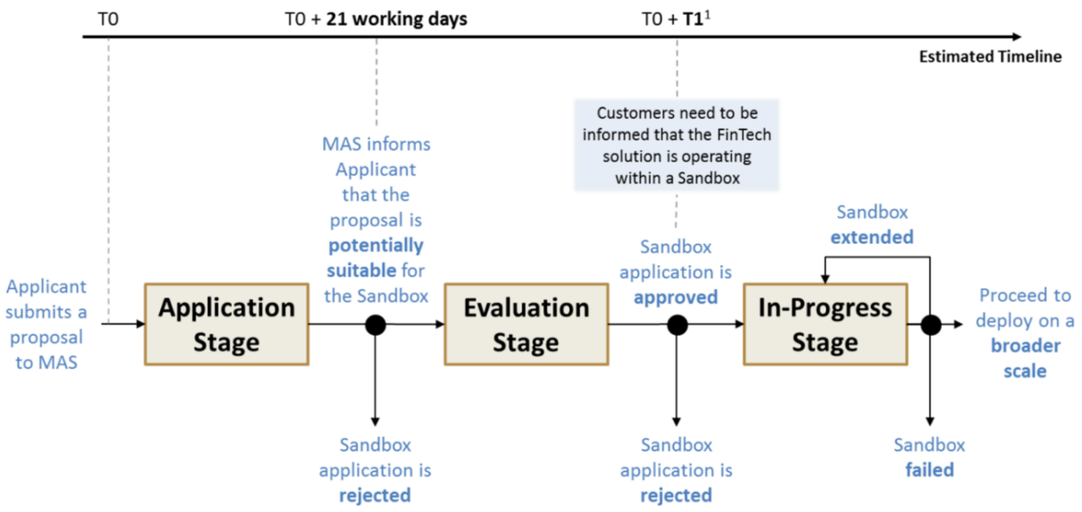


Figure 7: MAS FinTech Regulatory Sandbox Framework

The Monetary Authority of Singapore (MAS) does not predetermine the industry sectors or areas in which fintech services may be applied. When reviewing a sandbox application, the MAS considers whether the application includes new technology or uses existing tools in an innovative way, whether the application addresses a problem or offers benefits to the customer/industry, whether the applicant intends to deploy the service in Singapore on a broader scale after the sandbox (or otherwise contribute to Singapore in other ways), whether the test outcome or boundary conditions are clearly defined and reported to the MAS, whether significant risk has to be addressed, and whether the applicant has acceptable exit and transition strategies.[4]

After the sandbox period expires, if the MAS is satisfied with the results and the company is able to comply with legal and regulatory requirements, the applicant is expected to continue providing services on a larger scale, where the firm is able to comply with the legal and regulatory requirements.



4.3.1 Singapore advantages

In emerging markets, a main motivation may be to promote financial inclusivity, as sandboxes can "achieve innovation that may benefit excluded and underserved customers".

In order to avoid conflicts of legal application and existing regulatory irrationality, sandboxes will only appear as a buffer zone. At the same time, the regulatory sandbox led by the MAS will provide security guarantees and legal advice, so that finTech can successfully land in Singapore without resistance.

In November 2016, the MAS published the Fintech Regulatory Sandbox Guidelines, which state that the MAS will provide support to increase efficiency, manage risks better, create new opportunities, and improve people's lives.[4]

Singapore's progressive and open-minded approach towards new financial products and services has laid the foundation for a thriving fintech ecosystem. Since 2016, Singapore has seen its number of fintech companies quintuple to 1,400, and its fintech investments multiply 31 times to $5.3 billion.[5]

It might help to improve the interaction between the financial regulator and the industry, especially for firms within the technology sphere, if the experimental period can enable regulators to gain a greater understanding of particular fintech applications and assess the innovation and risks of such applications[1] before determining the appropriate regulatory actions or strategies, instead of implementing a one-size-fits-all approach.[5]

4.3.2 Example

BondEvalue: Democratising Bond Markets

Established in 2016 by experienced individuals from the international banking sector, BondEvalue introduced BondbloX as the largest and pioneering fractional bond exchange globally. With its product charters and business development teams firmly rooted in Singapore, the company has made significant progress.

By utilizing transparent and decentralized ledger technology, BondbloX enables individuals from all backgrounds to invest in global bonds, thus allowing them access to one of the most secure asset classes available today. "Although the bond market and our exchange's reach are global, one's home regulator — MAS in our case — is very important" explains Chief Executive

Officer Rahul Banerjee.

Banerjee highlights the utilization of real money, transactions, and clients as pivotal and distinctive aspects of MAS' Sandbox schemes. During its participation in the Sandbox Express program, BondEvalue successfully established connections with prominent financial institutions including UOB Kay Hian, as well as BondbloX's current global custodians, Citi and Northern Trust. Banerjee further explains that the predetermined testing environments provided by the Sandbox Express facilitated BondEvalue's plug-and-play approach and streamlined the licensing process within a shorter timeframe.

5 Discussion & Solutions

5.1 Discussion

The regulatory sandbox model in China is currently not well-established and has faced challenges in its effective implementation. Therefore, after gathering extensive literature and studying the regulatory sandbox models in Singapore and the UK, we have initiated discussions to make adjustments and improvements based on the specific conditions in China.

5.1.1 Sandbox, sandbox express and sandbox plus

In studying the regulatory sandbox model in Singapore, we acknowledge its maturity and successful implementation. The introduction of Sandbox, Sandbox Express, and Sandbox Plus, which cater to different entities, has been particularly effective and aligns well with the specific conditions in China. Therefore, we recommend adopting these three types of regulatory sandbox models in China, allowing companies to choose the most suitable model during the application process.

5.1.2 Exit mechanism and test cycle

The exit mechanism and test cycle of China's regulatory sandbox currently remain relatively flexible, without clear regulations. Companies mainly submit applications autonomously to exit the sandbox. In contrast, the regulatory sandbox in the UK sets a fixed test cycle of six months, after which companies exit automatically. Singapore, on the other hand, has a flexible test cycle and allows for extension requests upon the completion of the initial test cycle. Therefore, we suggest that China's regulatory sandbox should establish explicit time regulations for the regulatory process, while also allowing companies to apply for more flexible time adjustments.

5.1.3 Ethical issues

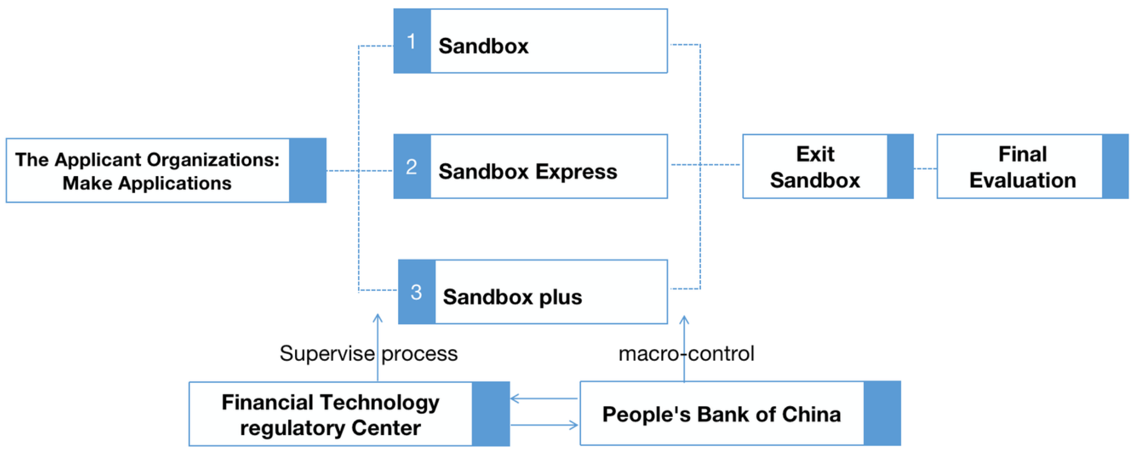
As companies entering the sandbox need to disclose their technologies for testing to the regulatory authorities, most of which are advanced and unique, it is crucial for the regulatory authorities to provide robust intellectual property protection. This ensures the safeguarding of the business secrets and sensitive data of fintech companies, preventing any leakage that could compromise their competitive advantage. The comprehensive protection measures concerning commercial secrets and other data in the UK and Singapore can serve as valuable references for China.

At the same time, we also need to improve consumer protection regulations in the regulatory sandbox, just as the UK and Singapore are doing.

5.1.4 Liberalize access standards

As a vast economy, China already has a considerable number of fintech companies, with an increasing number of emerging fintech startups due to rapid economic and technological development. Among these enterprises, there are a few large-scale financial groups, rapidly growing companies with advanced technological capabilities and a significant number of small and medium-sized enterprises. Compared to large-scale enterprises with abundant resources, it is the smaller companies that would benefit more from a regulatory sandbox to establish a favorable simulated testing environment, reducing financial risks and fostering growth and profitability. Therefore, we suggest relaxing the entry requirements and encouraging the participation of small and medium-sized enterprises in the sandbox.

5.2 Solutions



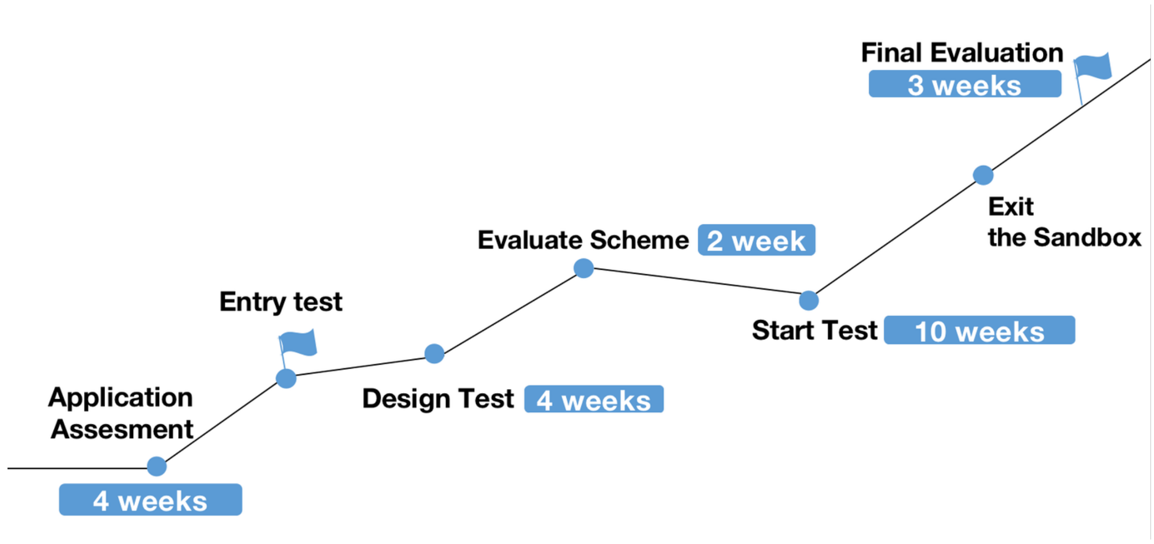
5.2.1 Sandbox & Sandbox Express & Sandbox Plus

Based on the inspiration of the regulatory sandbox in Singapore, we recommend that the Chinese sandbox also adopt three entry box tracks, Sandbox, Sandbox Express, and Sandbox Plus.

The first part of the track is for first movers only. The second one is for first movers too, but in this track, there is a fast track to choose from. What's more it is a pre-defined environment for low-risk activities for express development. The last one is for first movers and early adopters. It provides funding for first movers and provides a financing platform for participating enterprises, which is called "Deal Fridays".

5.2.2 Test cycle

According to the time parameters of other countries, as well as China's national conditions, we recommend that the time cycle be arranged as follows:



5.2.3 Exit mechanism

Our research shows that the current exit system is very unclear. So we have developed an exit system as follows.

1. Exit after the test period expires.
2. Apply in advance and get approved, exit.
3. Apply for an extension if the test period is not fully completed.
4. Test scope beyond the scope of supervision, exit.

5.2.4 Ethical issues

At present, there are credit risks, liquidity risks, market risks, operational risks, legal compliance risks, and reputation risks in the market. Relevant law-making departments should strengthen the construction of a sound innovation knowledge protection system.

5.2.5 Liberalize access standards

Since most of China's financial technology enterprises are in the start-up stage, the government should reduce the scale of financial technology enterprise access requirements, relax the financing conditions for small and medium-sized financial technology enterprises, and encourage innovation and development of financial technology enterprises. The government should promote the connection between fintech enterprises and the banking industry, and establish an open banking system so that fintech companies can access the banking system within the scope of compliance, thus reducing the transaction costs of fintech enterprises. In addition, relevant tax reduction and exemption systems can be formulated to help small and medium-sized fintech enterprises reduce tax pressure, so that they have sufficient funds to carry out technological innovation and reform.[3]

6 Contributions and significance

6.1 Contributions

6.1.1 Expanded Sandbox Categories

By broadening the scope of sandbox categories, our research acknowledges the diverse landscape of financial innovation. Different sectors of the financial industry (e.g., banking, insurance, securities, and fintech) may require tailored regulatory approaches. By categorizing the sandboxes, the research provides a structured framework that enables regulators to manage risks and provide targeted support to innovators. This allows a wider range of financial services to be tested, fostering innovation across the financial sector.

6.1.2 Ethical Considerations

Integrating ethical considerations into the sandbox model is a significant step towards responsible innovation. Our research focus on ethical issues such as data privacy, consumer protection, and fairness demonstrates a commitment to preventing potential harms arising from experimental financial services. By doing so, the research seeks to ensure that innovation aligns with societal values and norms, fostering trust between innovators, regulators, and the public.

6.1.3 Enhanced Test Cycle

Promoting a more robust and flexible test cycle in the sandbox model allows for a comprehensive assessment of financial innovations. The research emphasis on iterative testing, feedback loops, and continuous improvement encourages innovators to refine their offerings based on real-world feedback. This leads to better product development and the identification of potential risks early in the innovation process.

6.1.4 Exit Mechanism

The introduction of a well-defined exit mechanism is crucial for a sustainable sandbox model. By setting clear criteria and procedures for transitioning successful innovations into mainstream regulation, the research ensures that viable concepts can thrive beyond the sandbox environment. This contributes to the scalability and long-term impact of innovative financial services.

6.2 Significance

6.2.1 Promoting Innovation

The research significantly contributes to fostering innovation within the Chinese financial sector. By expanding sandbox categories, this accommodate a broader range of ideas, technologies, and business models, encouraging more players to engage in financial innovation.

6.2.2 Risk Mitigation

The incorporation of ethical considerations demonstrates our research commitment to minimizing potential risks and negative consequences associated with financial experimentation. This helps build public trust, while also reducing the likelihood of regulatory backlash.

6.2.3 Adaptive Regulation

An enhanced test cycle allows for real-time adjustments to regulatory requirements based on empirical evidence. This adaptive approach promotes quicker identification of potential issues and more effective responses, ensuring that regulations stay relevant and effective in a rapidly changing financial landscape.

6.2.4 Business Confidence

A well-defined exit mechanism provides clarity and transparency to innovators about the path to mainstream operations. This assurance encourages businesses to invest time and resources in developing innovative solutions, knowing that successful outcomes will be appropriately transitioned.

6.2.5 International Leadership

As financial regulatory sandboxes gain traction globally, this research positions China as a leader in adopting a holistic and forward-thinking approach. Other countries may look to the model as a benchmark for refining their own sandbox frameworks.

In conclusion, this research contributes to an expanded sandbox model, ethical considerations, an enhanced test cycle, and a well-defined exit mechanism to collectively advance financial innovation while addressing potential risks and challenges. This has far-reaching implications for the Chinese financial industry, regulatory authorities, innovators, and the broader global financial ecosystem.

7 Limitations

7.1 Drawbacks of universal banking

Our solutions are designed to build a "universal banking" business model, which tends to apply standardized rules and requirements to all financial institutions. However, this model ignores the specific characteristics and risk profiles of many financial institutions. The model also involves lengthy decision-making processes and bureaucratic procedures, which can lead to delays in responding to rapidly evolving market conditions.

7.2 Necessary cooperation between tech firms & financial firms

Chinese tech companies face challenges in decoupling from state-owned financial firms and require cooperation to enter regulatory sandboxes. This dependence on cooperation limits their ability to operate independently and may stifle competition and market dynamism. State-owned financial institutions often play a significant role in shaping the landscape and regulations of the financial sector. As a result, tech companies seeking to innovate and enter the financial market must navigate complex relationships and seek partnerships with these established institutions.

7.3 Balance between supervision and innovation

The model cannot show us real opportunities to lessen regulatory burdens without weakening standards. The relationship between financial regulation and innovation is a two-way street. Changes in the financial sector can influence regulatory approaches, but regulatory initiatives also shape the trajectory and pace of transformation within the financial industry. [2]

Author Contributions
Background Analysis: Yuan Yiwei; methodology, validation, formal analysis: Ding Shengran, Liu Sitong, Qian Yunkai; investigation, resources, data curation: Ding Shengran, Li Shuhan, Qian Yunkai,
Yuan Yiwei, Zhang Yiwen;writing-original draft preparation: Ding Shengran, Liu Sitong, Qian Yun
kai; visualization: Zhang Yiwen; writing-reviewing&editing: Li Shuhan; project administration&
supervision: Yuan Yiwei. All authors have read and agreed to the published version of the manuscript.
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Not Applicable.
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Please contact the corresponding author(s) for all reasonable requests for access to the data.
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Conflicts of Interest
The authors declare no conflict of interest.
Intellectual Property
The authors attest that copyright belongs to them, the article has not been published elsewhere, and there is no infringement of any intellectual property rights as far as they are aware.

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