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Regulation Paths of Regulatory Sandbox Entry Mechanism in China

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Abstract: With the rapid development of Fintech, in the end of 2019, China introduced the “regulatory sandbox” mechanism which had developed very fast in recent years. Although some relevant regulations and policies have been issued, there is no mature and applicable regulation relating to the regulatory sandbox in China. Risks in the regulatory sandbox might spread to the whole financial market, therefore it is significant to establish an unambiguous entry standard rule for regulatory sandboxes. In China, there are some problems in the formulation of regulatory sandbox entry standards in projects and applicants reviewing and consumers protection. Through studying the operation of regulatory sandboxes in other countries and regions, it is found that the scope of regulatory sandbox applicants in China is not extensive and diversified enough. Also, there is a high possibility of power rent-seeking in the review of sandbox projects, which would increase the potential risks faced by consumers. Therefore, it is necessary to issue a special regulation regarding the regulatory sandbox clarifying the entry standard in China. This legislation should expand the scope and diversity of sandbox applicants, increase the transparency of projects review process, introduce independent experts to review the innovativeness of projects, and strengthen consumer protection in several aspects.

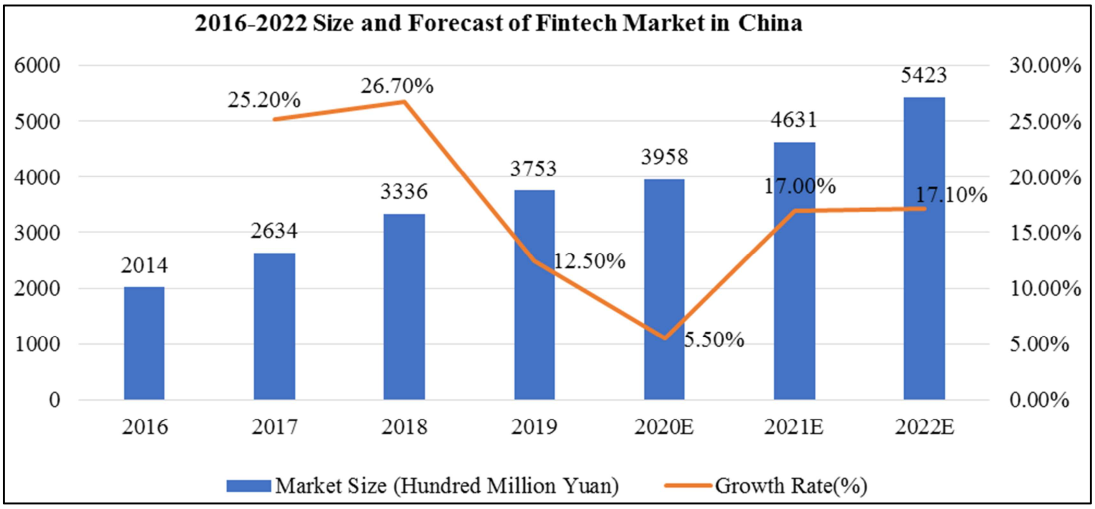
Keywords: Regulatory Sandbox, Fintech, Entry Mechanism, Transparency

1. Introduction

The COVID-19 pandemic has boosted demand for access to digital financial services and the power of challenger banks to increase market penetration. [1] As the pace of financial innovation appears to be growing, financial regulators must also reconsider their regulatory techniques in order to become more proactive and responsive. [24] In the Fintech era, with transformative evolution involving crypto-assets, machine learning applications and data-driven finance models, various regulatory issues are emerging. [1] Financial Stability Board (FSB, 2022) defines “FinTech” as technologically enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services. [12] Fintech innovations are affecting many different areas of financial services. Fintech has gradually become a new driving force for global economic development, and new technologies such as big data, artificial intelligence, biometrics, and blockchain have promoted the transformation of the traditional financial industry. Fintech has developed rapidly in the financial market of China in recent years. According to the below Figure 1, it is known that the market size of Fintech has increased fast in China from 2014 hundred million Yuan in 2016 to the expected 5423 hundred million Yuan in 2022. Although the growth rate has fluctuated, the market size of Fintech in China has been growing continuously and the growth rate is anticipated to continue increasing.

The huge amount of information brought by Fintech and the use of high technology have brought great challenges to government financial supervision. Traditional "command-type" regulatory means might be unable to effectively supervise the financial market, and it is necessary to look for a more inclusive and conciliatory regulatory model. To improve effectiveness of supervision regulations in the context of Fintech, the UK first launched the "regulatory sandbox" model exploring new regulatory paths, [11] which has attracted great attention from scholars all over the world. Sandbox mechanism is a regulatory answer to the challenges brought by financial technologies to finance and social relations, and instead of containing fintech, the sandbox is designed in a way that advances risk-washing of

Fintech. [8] Empirical study has proved that the regulatory sandbox could play a crucial role in increasing the influx of venture capital into the fintech venture ecosystem by eliminating regulatory uncertainty. [15]



Source: From Foresight Industry Research Institute.

Figure 1. *2016-2022 Size and Forecast Market in China.*

The regulatory sandbox was implemented in the United Kingdom in 2015, followed quickly by other countries, including Australia, Canada, Russia, Switzerland, and Singapore. [27] A "regulatory sandbox" refers to a secure testing space in which participants will temporarily enjoy a certain degree of exemption from liability to test new business models, innovative products, services, etc. [15] The regulatory sandbox can attract investment sources from banks, private equity, and venture capital funds, etc. The UK regulatory sandbox, where 80% of participating companies passed the test and participants received a total of £135 million in investment, accelerated financial innovation in the UK, and around 50% of startups reached deeper collaborations with large companies. [5] In the UK, 30% of venture companies that graduated from the regulatory sandbox received venture investment, and the average investment amount increased 6.6 times. [15] Following the UK, many countries and regions around the world have implemented regulatory sandboxes, until now, 57 countries all over the world have introduced the regulatory sandbox, which has become an important policy tool for the government to support the emergence of the Fintech industry. [16] Although the diversity of existing regulatory sandboxes in different countries, the majority of sandboxes share two key characteristics. The first character is that, if successfully implemented, regulatory sandboxes could lower regulatory barriers and help to speed up the introduction of a wide range of new services in the market. [13] The second character is that, the gathered information and valuable insights during the sandbox test period might assist regulators to gain better understanding of risks and how to adapt current and future regulations to Fintech without harming innovation. [13] Regulatory sandbox can promote the equal communication and cooperation between participants and regulators, while enhancing financial innovation. Regulators can discover potential financial risks and problems in advance and find feasible solutions, which can serve as a reference for future regulatory authorities and legislators to revise or formulate regulatory regulations regarding Fintech. [17] In general, the regulatory sandbox can serve as a positive catalyst for investments in the Fintech market. [15]

Therefore, it is necessary to promote the regulatory box in China, which could stimulate the Fintech development. Due to the different financial systems, financial technologies, and market scales, it is not reasonable for China to directly copy the regulatory sandbox mechanisms of other countries and regions. China should explore a suitable regulatory sandbox mechanism based on China's national conditions. There are some specific problems of entry mechanism of regulatory sandboxes in China, but there is no mature or applicable legislation of regulatory sandbox. [26] Risks in the regulatory sandbox might spread to the board financial market. [31] Therefore, to protect consumers and reduce potential systematic financial risks, it is necessary to issue a special Fintech Regulatory Sandbox Regulation in China to solve problems and improve the entry mechanism of China's regulatory sandboxes. In generally, this legislation can should particularly pay attention to three aspects including sandbox applicants review, projects review and consumer protection.

2. Literature Review

Scholars mainly focus on the review principles in regulatory sandboxes, regulatory bodies, advantages and disadvantages of regulatory sandboxes, etc.

Chinese academics mainly analyze the principle and models of the regulatory sandbox in China from the perspective of economic efficiency. The intrinsic principle of the regulatory sandbox is the transformation of the identity status between financial regulators, financial consumers, and financial institutions, from the traditional state of supervision confrontation to the state of co-governance based on equal consultations (Liu Sheng, 2021). [23] The trial implementation of the regulatory sandbox has brought benefits to China's economy, expanding the scope of banking business and risk control technologies, optimizing the bank credit business model, reducing costs, and improving the security of third-party payments (Ying Shangjun and Zhang Jing, 2021). [33] However, some scholars believe that the regulatory sandbox test is only a single financial product, and there also exists subjective influence of people in the testing process (Li Muhan, 2021), [20] and the test scope is too narrow (Wang Jian and Zhao Bingyuan, 2021), [30] so it is difficult to judge whether the new project which passes the regulatory sandbox test can be implemented in the market for a long time. As far as regulators are concerned, the relevant policies of the regulatory sandbox are currently issued by People's Bank of China, but the subject of regulatory responsibility is unclear (Ying Shangjun and Zhang Jing, 2021). [33] Some scholars believe that the Financial Stability and Development Committee of the State Council and the People's Bank of China should be responsible for the sandbox implementation (Shen Yan and Gong Qiang, 2021). [28] However, some scholars oppose this multi-institution supervision model, believing that it will bring the fragmentation of sandbox supervision (Chen Wei, 2020). [6] Hong Kong adopts a model in which the HKMA, the SFC and the CBIRC independently supervises each industry and independently conducts operational processes (Zheng, 2021). [36] The author believes that it is reasonable to adopt the Hong Kong model, with the demarcation of powers in advance, the division of supervision between regulators could improve supervision efficiency and benefit overall coordination.

Western academics have studied the influence and principles of implementing the regulatory sandbox. Goo & Heo studied regulatory sandboxes from 9 countries (regions) with similar financial backgrounds, using regression analysis and comparative methods, it was known that the regulatory sandbox promoted the increase of the total and average investment volume, which increased by 37.7% and 86.4% respectively (Goo & Heo, 2020). [15] Also, it has been proved that frontline regulatory interactions in sandboxes play a positive role in motivating innovative firms to collaborate with regulatory agencies (Fahy LA, 2022). [9] However, the regulatory sandbox mechanism also brings some risks. Although the regulatory sandbox can help legislators to acknowledge some financial risks in advance, there is social stratification effect of the data-driven economy with a socially disruptive potential, which is facilitated by the regulatory sandbox mechanism (Brown and Piroska, 2022). [8] Also, the implementation of the regulatory sandbox requires enormous financial investment and the formulation of new regulations, but there still exits regulatory risks from sandboxes (Buckley, Amer, Veidt & Zetzsche, 2021). [4] So, some scholars believe that it is the "innovation hub" which can promote the development of Fintech in the longer term than the regulatory sandbox (Buckley, Amer, Veidt & Zetzsche, 2021). [4] However, some scholars object, arguing that the "innovation subsidy" is only the early part of the enforcement of the regulatory sandbox, and cannot replace the role of the regulatory sandbox (Gerlach & Rugilo 2019). [13] The author agrees with the latter view that the government should also provide preferential policies like innovation subsidies in the trial of regulatory sandboxes to stimulate enterprises' enthusiasm for innovation. In principle, some scholars believe that consumer protection and project innovation are the two main principles regarding the regulatory sandbox (Buckley, Amer, Veidt & Zetzsche, 2021) [4], but some scholars believe that the principle of protecting fiscal stability should also be emphasized (Allen, 2019), [2] and others believe that anti-money laundering and counter-financing principles should be included (Gerlach & Rugilo, 2019). [13] World Bank has explored how to build a regulatory sandbox to achieve the stable development of the financial market and sustainable supervision (Jeník, Ivo Duff, Schan, 2021). [18] Therefore, it is necessary to be consciously when considering this issue. Even if the participating enterprises have temporary immunity, the implementation of the regulatory sandbox must not conflict with legal norms or endanger social security.

Chinese and western scholars both analyzed the practice of regulatory sandbox in other countries or regions. The regulatory sandbox can establish a platform for equal communication and facilitate communication between government supervisors and supervised enterprises (Ying Shangjun and Zhang Jing, 2021; Marjosola, 2021). [33, 24] Secondly, the implementation of the regulatory sandbox can reduce the asymmetry of market information, changing from the original passive information disclosure to active disclosure, because participating enterprises want to reduce the risks after entering the real market through sufficient information disclosure (Liu Sheng, 2021). [23] However, some western scholars worry that the lack of statutory standards will reduce the transparency and certainty of the regulatory sandbox (Buckley, Amer, Veidt & Zetzsche, 2021). [4] It is reasonable to believe that clear rules should be established as soon as possible, and information should be disclosed through project publicity and other means to enhance transparency. In addition, some scholars believe that the regulatory sandbox can only conduct for a limited time, and even if the project passes the sandbox test, it is uncertain whether it can be truly implemented in the real market (Zhang Long, 2021; Buckley, Amer, Veidt & Zetzsche, 2021). [4, 34]

Both Chinese and western scholars agree that protecting consumer interests is the main principle in the entire operation process of regulatory sandboxes (Ying Shangjun and Zhang Jing, 2021; Chen Wei, 2020; Buckley, Amer, Veidt & Zetzsche, 2021), [33, 6, 4] and it is crucial to formulate reasonable entry standards (Li Ying, 2021; Ahern, 2021). [21, 1] Due to the late implementation of China's regulatory sandbox, a clear entry regulation system has not yet been introduced, thus, it is necessary to explore the entry rule of China’s regulatory sandboxes. This paper does not study the operation and exit mechanism of the regulatory sandbox but focuses on analyzing the entry mechanism and puts forward some suggestions for improving the entry mechanism based on current regulatory sandbox development situations in China.

3. Development of the Regulatory Sandbox in China

In China, the regulatory sandbox firstly be introduced in the end of 2019, and it developed rapidly from 2019 to 2022. The following Table 1 lists the most significant events regarding the development of the regulatory sandbox in China.

Table 1. *Table of Significant Regulatory Sandbox Events in China.*

Time	Events
End of 2019	Announce the start of Fintech innovation supervision pilot
December 2019	The first regulatory pilot being launched in Beijing
March 2020	The first batch of sandboxes projects being launched in Beijing
November 2020	Sixty innovative sandbox projects being launched
November 2021	CSRC conducted the first batch of sandbox projects in capital market
April 2022	The fourth batch of regulatory sandbox pilots (total 113) being launched

Source: From Chinese national and regional government reports.

China firstly announced the implementation of Fintech innovation supervision pilot at the end of 2019. The "regulatory pilot", first launched in Beijing in December 2019, is known as the China's "regulatory sandbox", which aimed to guide licensed financial institutions to stimulate scientific and technological innovation, optimize financial services, and create a favorable environment for the development of Fintech under the premise of legal compliance and protection of consumer rights and interests. [29] In March 2020, Beijing announced the first batch of sandbox projects where the regulatory sandbox officially entered into the pilot application stage in China. [32]

In November 2020, in 9 pilot cities, China has announced 60 innovative projects applied by more than 60 financial institutions and more than 30 Technology companies, some of which have entered the real market. [28] Six projects, including the micro-quick loan project of Agricultural Bank of China, the AI-Bank Inside project of Biaxin Bank, the POS innovation project launched by China UnionPay and Xiaomi Technology company, and Jindong Technology company, have been fully and effectively tested in regulatory sandboxes. [21]

China Securities Regulatory Commission (CSRC) conducted the first batch of regulatory sandbox pilot projects in the capital market in November 2021, with a total of fifteen institutions, including four core market institutions, four securities companies, five funds management companies, one credit rating agency and one regional equity trading market operator, and some joint applicant units including a few core financial market institutions and technology enterprises. [32] The application of technology involves a new generation of information technology such as big data, cloud computing, artificial intelligence, and blockchain, as well as composite cross-technology applications such as secure multi-party computing, federated learning, cloud native, and information creation. It can be applied to various business scenarios such as intelligent investment advisory, intelligent operation, intelligent transaction, intelligent risk control, and intelligent marketing. [32]

In China, until April 2022, the fourth batch of regulatory sandbox pilots has been carried out, of which a total of 113 pilot projects have been declared and approved, 43 pilot projects (excluding municipalities directly under the central government) have been declared and approved by provinces and autonomous regions (excluding municipalities directly under the central government), and a total of seven projects have successfully passed the regulatory sandbox test. [32] A total of 218 institutions participated in the four batches of fintech innovation supervision pilots. Among them, there are 121 banking financial institutions, (accounting for 55.5%), 52 technology companies (accounting for 23.9%), and the rest mainly are payment companies, credit investigation companies, and financial service companies. The top four kinds of participating institutions totaled 191 (accounting for 87.6%). [32] Although there are many types of participating institutions in the pilot application, the majority of institutions are financial institutions and technology companies.

3.1. Chinese Rules and Policies Regarding the Regulatory Sandbox

Chinese government has issued some regulations relating to regulatory sandbox and most regulations and policies were issued by Chinese central bank (People’s Bank of China). The following Table 2 list most important rules and policy documents relating to the regulatory sandbox in China.

Table 2. *Table of Chinese Regulations Regarding Regulatory Sandbox.*

Time	Issuing Party	Document Name
November 2018	Beijing Financial Work Bureau etc.	Beijing Plan for Promoting the Development of Fintech (2018-2022)
August 2019	People's Bank of China	Fintech Development Plan (2019-2021)
January 2020	People's Bank of China	Announcement of Fintech Innovation Regulatory Pilot Application (First Batch in 2020)
October 2020	People's Bank of China	White Paper "China Fintech Innovation Regulatory Tools"
January 2022	People's Bank of China	Fintech Development Plan (2022-2025)

Source: From Chinese People’s Bank of China (Chinese Central Bank), Beijing Government.

In November 2018, the *Beijing Plan for Promoting the Development of Fintech (2018-2022)* proposed to explore and promote the implementation of the pilot project of Fintech regulatory innovation with the 'regulatory sandbox' as the core. [37] In August 2019, People's Bank of China issued the *Fintech Development Plan (2019-2021)* which proposed the usage of flexible supervision methods such as information disclosure, product disclosure, public participation, and joint supervision. [38] Also, according to this 2019-2021 Plan, it is determined that the financial supervision model will change from ex-post supervision to ex-ante and in-process supervision, and it is aimed to effectively solve the problem of information asymmetry, eliminate information barriers, alleviate regulatory lag, and improve the efficiency of financial supervision. [38] Furthermore, it is required to give full play to the role of Fintech, enhance the real economic capacity of financial services, resolutely prevent the occurrence of systemic financial risks, provide supports to the real economy, prevent and control financial risks, deepen financial reform, and promote the high-quality development of China's financial industry. [38] In January 2020, the People's Bank of China issued the *Announcement of Fintech Innovation Regulatory Pilot Application (First Batch in 2020)*, announcing the first batch of 6 Fintech innovation supervision pilots, which marked that China's regulatory sandbox has officially entered into the pilot application stage. [39]

In October 2020, People's Bank of China issued the White Paper "China Fintech Innovation Regulatory Tools" (the White Paper 2020), officially launching the Fintech innovation regulatory tools of China based on Chinese characteristics with reference to international experience. [40] The white paper put forward the regulatory framework and principles of licensed operation, legal compliance, rights protection, inclusiveness, and prudence, which also explained the qualification requirements of licensed institutions and the access requirements of inclusive business in China's "regulatory pilots". [40]

In January 2022, People's Bank of China issued the *Fintech Development Plan (2022-2025)*. Although the regulatory sandbox is not explicitly mentioned in the 2022-2025 Plan, it highlights that, regarding China's future Fintech development, one of most important tasks is to improve the safe and efficient Fintech innovation system, build an integrated operation platform that integrates business, technology and data, establish an intelligent risk control mechanism, and fully activate the new momentum of digital operation. [41] It also mentions that it is required to accelerate the all-round application of regulatory technologies, strengthen the capacity of digital supervision, implement penetrating supervision of Fintech innovation, and build a risk firewall for finance and technologies. [41] Through analyzing this (2022-2025) Plan, it is reasonable to believe that the regulatory sandbox would continue playing an important role in the Chinese Fintech market.

Although there are certain regulatory sandbox regulations in China, they are still normative documents without specific operating rules, and it is necessary to include various detailed rules. [26] For instance, the White Paper 2020 stipulates that, during the regulatory sandbox operation, financial management departments should provide "one-to-one" professional regulatory guidance [39], but does not clearly regulate the detailed rules regarding specific departments, methods, frequencies, and other aspects of the content, and does not provide the mechanism of multi-subject information interaction. [26] Generally, there should be a regulation clarifying information disclosure and exchange mechanism before the sandbox operation, as well as the the discretion of regulators, consumer protection mechanisms, and specific detailed rules such as the responsible entity, implementation methods, and the safeguard system should also be legally clarified in China. [26] Nevertheless, the rulemaking of regulatory sandbox operation cannot be finished once and for all, and various systems need to be revisited during and after the sandbox operation. Considering the heterogeneity of financial resources in different regions of China, different rules can be piloted under a unified framework, which can be tried in different regional sandboxes, and then modified according to the practice results. [26]

3.2. The Characteristics of Regulatory Sandbox in China

There are three main models of Fintech supervision in the world including the functional supervision (adopted by United States), the active supervision model (adopted by the United Kingdom), and the passive supervision adopted by China during its early stage of Internet finance development. [25] In that early period, Chinese government adopted relaxed regulatory supervision policies regarding Fintech, which initially encouraged Fintech development, and gradually strengthened supervision after the innovation endangers financial security. [25] Based on this passive regulatory model, Chinese government introduced the regulatory sandbox mechanism with some special characteristics.

In general, there mainly are four characteristics of China’s regulatory sandbox mechanism. Firstly, the majorities of applicants and approved applicants entering regulatory sandboxes are banks, but technology companies have not yet become the main applicants. [25] As discussed before, in China, until April 2022, a total of 218 institutions participated in regulatory sandboxes, and among them, 55.5% of them are banking financial institutions, and only 23.9% of them are technology companies. [32] This might be due to the lack of unambiguous legal authorization to technology companies. The White Paper 2020 explained the qualification requirements of licensed institutions, [40] but it did not clarify the entry standard of technology companies. Secondly, in regulatory sandboxes, basic technologies for testing are relatively not diversified, with big data, blockchain and artificial intelligence technology ranking in the top three, and there are not many innovative technologies.[25] Thirdly, the application scenarios in the regulatory sandbox are mainly concentrated in the fields of SME financing, risk management and supply chain finance. [25] In the contrary, the regulatory sandbox in Guangzhou China is more flexible and innovative which creatively carried out the sandbox in local financial formats such as microcredit and financing guarantees, and allowed qualified local financial institutions to voluntarily declare financial innovation activities that have not been popularized or applied as test projects. [25] Finally, China's regulatory sandbox system introduces a special public supervision mechanism in entry period. In China, it is required that the project publication and public supervision procedures must be complied before all pre-applied projects enter the sandbox. [28] If the public believe that there are problems with a pre-applied project, they can complain to regulators and this project might be disqualified from participating sandbox tests later. Only when specific conditions are met, and no conclusive whistleblowing information is available, applicants can enter the sandbox. [28]

Through analyzing the characteristics of sandbox mechanism in China, it can be found that there are some problems of China's regulatory sandbox. Many of these problems could be solved through improving entry mechanism of the sandboxes. It is necessary analyze the current regulatory sandbox entry rule and its problems in China.

4. Entry Mechanism of the Regulatory Sandbox and Its Problems in China

Designing the parameters rule regarding sandbox eligibility is a pivotal threshold issue for regulators in China. There is fierce competition in the Fintech market, and it is aware that an unduly restricted approach to eligibility may doom regulatory sandboxes by generating poor levels of early-stage interest and terrible conversion to actual regulatory sandbox applications. [1] Also, the regulatory sandbox must develop on this basis that it does not contradict any of the supervisors' statutory duties and would create a level playing field for market participants, which is clearly distinctive from a mere economic promotion of young start-ups. [13] Therefore, it is significant to consciously design the entry mechanism of China's regulatory sandboxes.

4.1. Review of Applicants

Through learning from applicants review practice in other countries, it is known that different countries or regions adopt different methods in reviewing applicants for regulatory sandboxes. In general, the scope and diversity of applicants for sandboxes are too narrow in China, which might discourage the development of Fintech. It is a difficult task for governments all over the world to control financial risks while improving the accuracy of test result in the regulatory sandboxes.

4.1.1. Scope and Diversity of Sandbox Participants in Other Countries

In many jurisdictions, the early entry stage of the regulatory sandbox process involves an unscientific selection of the institutions that can use the sandbox. [2] Each country or region has different standards on the applicant qualification test. The regulatory sandboxes in Denmark,

Hungary, Lithuania, Poland, and the Netherlands adopt an "open arms" policy, which welcomes innovation and relies on applying risks and benefits assessment criteria to determine suitability of applications. [1] Hong Kong adopts a strict supervision method, requiring only authorized institutions to apply for a regulatory sandbox. [4] Brunei, Netherlands and Mauritius only permit new firms to enter regulatory sandboxes. [4] Non-financial institutions in the UK, Australia and Singapore can independently apply to join the regulatory sandbox. [35] The UK's sandboxes allow all financial institutions and non-financial institutions to provide financial services. [5] Singapore's applicants, including authorized financial institutions, fintech innovators and cooperative companies, are eligible to apply, and Australia focuses on the development of non-financial enterprises, and only fintech innovation institutions (non-financial institutions) can enter the regulatory sandbox.

4.1.2. Scope and Diversity of Sandbox Participants in China

In terms of entry mechanism, the scope of testing participants in China's regulatory sandbox is too small with low diversity. The actual number of Internet finance users in China is huge, far exceeding the number of users participating in the regulatory sandbox test, so the sandbox testing result is limited, and it is difficult to make accurate judgments on the financial risks after officially entering the market in the future. [30] However, some scholars oppose expanding the scope of the test, arguing that the current Chinese people do not fully trust in the financial market, so the scope of the test should not be too large. [28] A strict entry mechanism should be established, but it should not be limited to the extent that only licensed financial institutions could apply to enter into sandboxes. [28] In addition to the scope of the test, the diversity of test applicants is too low. [34] According to the *Announcement of the Pilot Application of Fintech Innovation Supervision (First Batch in 2020)*, the majorities of applicants are licensed financial institution. [39] Although, in 2022, some technology companies participated in regulatory sandboxes, [32] there is no document unambiguously clarifying the qualifications of non-licensed institutions applying independently. Also, independent applicants for China's regulatory sandbox must be licensed financial institutions, non-licensed financial institutions can only enter the regulatory sandbox following licensed financial institutions. [28] Furthermore, non-licensed institutions are prohibited from independently providing services to consumers in sandboxes, which hinders the diversification of sandboxes in China. [28] At present, in China, in terms of the application qualification of the regulatory sandbox, it is unclear whether non-licensed financial institutions and Fintech enterprises can apply to enter the sandbox. [33] How to determine the number and variety of participants in order to limit financial risks to a durable range while improving the accuracy of sandbox test results, has become a difficult problem for regulatory authorities around the world.

4.2. Review of Sandbox Projects

Through learning from sandboxes practice in other countries, it is found that there are some problems in reviewing sandbox boxes in China. China's reviewing authorities do not focus on the innovativeness of projects, and there is a high possibility of power rent-seeking. Furthermore, the public supervision in regulatory sandbox entry mechanism might cause some potential risks.

4.2.1. Projects Review in Other Countries

For projects applying for entry into the regulatory sandbox, UK censors are mainly concerned with whether the project is sufficiently innovative, mature enough to be entered into the sandbox for testing, whether it is beneficial to consumers, and whether the participants are fully prepared for the implementation of the project, such as whether risk management measures are in place. [4] Malaysia focuses on projects that serve domestic financial markets. ASIC in Australia expressly chose not to undertake the innovation test since it believes that this task is arguably beyond the skillset of regulators and the assessment standard is debatable. [4] Also, the Australian government intends to expand the scope of the regulatory sandbox and remove as much barriers as possible for fintech companies to test their new products and services, therefore regulators do not test the innovativeness of applications. [19] However, the structure of Australian regulatory sandboxes might trade-off consumer protection and expose vulnerable customers to risks. [17] Chinese financial market is huge with an enormous amount of customers, Australian approach is not suitable for China, otherwise it would give rise to systematically important risks.

Most countries have strict requirements for the preparation of sandbox projects and applicants are required to provide commercial documents. For instance, in UK, the readiness to test must be conducted which requires applicants to provide a business plan. [1] However, there is debate regarding whether applicants should be forced to provide a complete business plan containing financial plans, risk analysis, risk control plans, etc. at the entry stage. Some people believe that requirements for "a comprehensive proposed business plan, including the bank's financial projections, analysis of risk, and planned risk management systems and controls" could prove prohibitive for a startup, and therefore approval authorities may choose to be flexible in terms of the business planning documentation requirement. [2] Regulators may negotiate with participants during the operation stage to flexibly adjust and improve relevant plans. [2] Nevertheless, China has a huge financial market, to prevent the risks in the sandbox from being contagious in the real market on a large scale and protect the legitimate rights and interests of consumers, Chinese regulatory authorities should adopt a comparatively rigorous attitude. Therefore, it is reasonable to require applicants to provide a complete business plan at the entry stage and focus on risk prevention and customers protection. [28]

4.2.2. Problems of Sandbox Projects Review in China

When reviewing projects applied to enter sandboxes, China's approval authorities do not focus on the innovation potential of these projects, and there is a high possibility of power rent-seeking. Also, there are potential risks of the public supervision in regulatory sandbox entry mechanism.

On the one hand, in China, sandbox entry approval authorities do not focus on the creativity of sandbox projects. It is true that current Chinese legal system regarding regulatory sandboxes is not mature. However, rather than focusing on the problems presented by the inadequacy of legal frameworks when presented with new technological interfaces, the focus of the regulatory sandbox should be instead on recognizing innovation potential. [1] Therefore, regulatory sandbox should enable both licensed and unlicensed institutions to benefit equally if they seek to develop innovative products or services. [4] Nevertheless, in the project entry review stage, China's approval authorities are unable to objectively evaluate the innovativeness of projects, which would hinder the development of Fintech and discourage innovation. [20]

On the other hand, without regulatory limitations, the right to review projects may lead to the possibility of power rent-seeking. The innovativeness of a project is a key factor in its entry into the sandbox, but the judgment of innovation itself is subject to the subjective mind of the censorship authority. [20] The reviewing authority lacks the professional ability to assess whether the project is innovative or not, so the innovativeness judgment of the project is likely to reflect the irrational preference of the review authority. [20] This can give rise to the possibility of power rent-seeking, which may discourage applicants and cause the loss of confidence among the public in the regulatory sandbox. [20]

Also, as discussed before, China's regulatory sandbox system introduces a special public supervision mechanism in pre-entry period, which adds a new element of social supervision to the traditional regulatory framework. [28] However, this may cause new potential risks. If the public are reasonable people, the right authorized to the public by the regulators to supervise and complain can give full play. Nevertheless, the public are not professional, and they may make mistakes, such as wrongly "killing" honest innovative projects, or being confused by the appearance of a fraudulent innovation project and regarding it as an honest innovation project. [28] Therefore, there is potential risk of the public supervision mechanism.

4.3. Consumers Protection

Consumers protection is the essence of regulatory sandboxes of different countries all over the world. However, in the entry period of regulatory sandboxes, there are some problems in consumers protection in China. On the one hand, the method of selecting consumers for sandboxes is not reasonable in China. On the other hand, the special public supervision adopted by China may bring some risks to consumers.

4.3.1. Consumer Protection in Other Countries

Protecting the interests of consumers is an important principle of the regulatory sandbox system of various countries (regions), and regulators should safeguard the interests of financial consumers as the core and establish corresponding protection mechanisms. To strengthen risk prevention, a risk prevention mechanism should be established in advance at the entry stage to reduce the risk of consumer loss. One of the UK criteria of selection is whether the project is beneficial to consumers, either direct or indirect. [2] In UK, the type of customers should be appropriate for the type of innovation and the intended market, but also to the type of risks they are exposed. [4] The UK has set up adequate protection mechanisms for consumer damages, the right to know and project disclosure, including a separate information disclosure mechanism and compensation scheme for each project to help consumers understand the test items, and also gives participants certain policy preferences on the basis of establishing a consumer protection mechanism. [33] To protect consumer rights, Australia has set client-side restrictions on classification, although there is no limit to the number of "institutional consumers", but it is required to be no more than 100 "retail consumers" and a maximum risk exposure (US$5 million) limitation being applied to enhance consumers' ability to resist risks. [33]

4.3.2. Consumer Protection in China and Some Problems

Compared with common international consumer protection measures, China has adopted the special model of "social supervision". [28] Before entering the sandbox, the relevant institutions in China will publicize the potential sandbox projects, and if the public finds problems and reports them, they will refuse the project to enter the regulatory sandbox trial. [28] Through this form of social supervision, potential consumers can understand the project in advance and reduce future risks, but the social supervision model also has its own shortcomings. [28] However, as discussed before, the public might not be professionals, so they may be fooled by the performance of innovation and fail to see the risks inherent in it. [28] Some companies may even use improper means to manipulate public reviews or malicious attack projects.

On the other hand, the current Chinese method of selecting customers for participating in sandboxes is not reasonable. To protect the interests of consumers and more accurately predict potential financial risks, regulators should diversify their choices when selecting consumers to participate in the test, testing representative consumers. Due to the different development levels in different regions of China, China's regulatory sandbox test sites are distributed in different 9 cities, but China selects consumers for testing by recruiting and signing agreements, rather than random sampling selection. [33] This would lead to the lack of representativeness of the test results, thus affecting the judgment of financial risks and being unable to accurately identify the potential risks faced by consumers. [33]

5. Improvement of the Regulatory Sandbox Entry Mechanism in China

In general, for improving the regulatory sandbox mechanism in China, it is suggested to set up a regulatory sandbox working group under the Chinese Financial Stability and Development Commission of the State Council, which should be responsible for certain works regarding the entry mechanism of regulatory sandboxes including the design of legal system, basic principles, and the promotion of regulatory sandboxes in pilots. [32] Specifically, it is necessary to issue a regulation clarifying entry standard of sandboxes and improving relevant problems. Also, other Chinese rules of regulatory sandboxes should improve to be more applicable.

The public are concerned that unselected regulatory institutions would pick winners amongst financial firms. Acceptance into a regulatory sandbox lends a certain regulatory imprimatur to a participating firm, which may enable that firm to attract customers and investors that it may not otherwise have. [2] Therefore, it is necessary to issue a regulation regarding formal criteria of selecting sandbox firms, explaining how the selection criteria relate to the sandbox's overarching regulatory goals. [2] Also, World Bank indicates that sandboxes are not appropriate in all circumstances since sandboxes require a considerable investment of time and resources to set up and run. As such, they may risk distracting regulators with limited capacity from pursuing more fundamental tasks. [18] At present, China's regulatory sandbox is still in the initial stage of development, and no specific clear entry rules have been introduced, but vague entry standards may discourage enterprises from applying to join these regulatory sandbox, thereby hindering enterprises with real innovation capabilities but lack of development channels to enter the sandbox and lose development opportunities. [26] Therefore, it is necessary to issue a legislation relating to the regulatory sandbox, which would provide greater certainty to applicants, while also providing a standard for regulators to justify its selection of any fintech firm that ultimately causes consumer or systemic harm. [2]

In US, the Consumer Protection Act is the most important law that still applies to sandbox participants, and the Consumer Protection Act applies to all participants, and consumer fraud protection laws will be enforced even without regulatory sandbox-related legislations. [10] Although, there are legislations regarding customers protection in China, they are not sufficient to prevent risks brought by Fintech. Also, as discussed before, in Table 2, there are some Chinese regulations regarding Fintech and regulatory sandboxes. However, these regulatory sandbox regulations are only normative documents without specific operating rules. [26] Therefore, it is reasonable to issue the Fintech Sandbox Regulation, which can be the manifestation of the sandbox legal system, [22] including various detailed rules and clarifying a feasible entry mechanism to avoid wasting government funds, curl power rent-seeking, improve review procedures, and reduce financial risks faced by customers. This Fintech Sandbox Regulation should improve entry mechanism to expand the scope and diversity of applicants and optimize the projects review process.

5.1. Expand the Scope and Diversity of Applicants

Based on prudential supervision, it is reasonable to expand the scope and diversity of applicants through diversifying the participants, introducing important financial institutions for testing, applying grading testing. [29] Also, it is necessary to optimize the applicant projects review process by improving the transparency of project review process, establishing a negative list, and improving consumer protection in regulatory sandboxes.

5.1.1. Diversify the Participants for Regulatory Sandbox

The Fintech Sandbox Regulation should improve the entry mechanism by diversifying the participants of the sandbox. With the optimization and improvement of the sandbox mechanism, the focus of test can be gradually shifted from large financial institutions to small and medium-sized financial institutions, and more technical enterprises should be allowed to independently apply to enter sandboxes. [32] It is necessary to fully include participants regulatory sandboxes. Although the scope of institutions applying for regulatory pilots in China has gradually expanded, at present, large commercial banks, large financial institutions, and state-owned enterprises are still the mainstay. [29] It is necessary to provide more chanced to small and micro enterprises, start-ups, innovative projects or products. [29]

At present, many countries and regions in the world support and encourage non-licensed institutions to enter into the regulatory sandbox, such as UK, both authorized and unauthorized entities may apply to the sandbox. [5] Regulatory sandboxes should be applicable to licensed and unlicensed companies, and start-ups and incumbents companies that intend to provide financial services or products under the Fintech. [13] China should pay more attention to the innovative project itself rather than the nature of the applicant subject, which is conducive to promoting the innovative development of Fintech. In fact, compared with traditional licensed financial institutions, technology enterprises and non-licensed financial institutions rely less on the original business model, their operation methods are more flexible, and their thinking is more creative and dynamic. Therefore, to better achieve the purpose of Fintech innovation, China's regulators should not restrict the entry of non-licensed financial institutions and technology companies to the regulatory sandbox. [34] However, in order to protect consumers and reduce financial risks, regulators cannot arbitrarily expand the scope of testing, and China can gradually increase the diversity of testing subjects step by step, but non-licensed financial institutions and science and technology enterprises should be encouraged to participate in the research and development of projects. [34]

5.1.2. Regulatory Sandbox Participants Should Include Important Financial Institutions

At present, the entities participating in the regulatory sandbox test in China's Internet field include users, enterprises and supervisory institutions, but no “systemically important financial institutions” have been introduced for testing, which lays the groundwork for the occurrence of financial risks in the future. [30] Systematically important financial institutions refer to financial institutions with large scale, complex business structure, strong correlation with other financial institutions, irreplaceable key services in the financial system, and once a major risk event occurs that they cannot continue to operate, they will have a significant adverse impact on the real economy and the financial system, causing systemic risks. [42] In the Internet field, systemically important financial institutions play a vital role, and once systemically important financial institutions collapse, the risk will spread to the entire financial market, which might cause consumers losing confidence in the digital world, businesses losing massive amounts of money, e-government initiatives becoming ineffective and even national security being put at stake. [2] When the regulatory sandbox is applicable to Internet financial products and services, macro-prudential supervision must be introduced to strengthen the prevention of systemic risks. [30] Therefore, the test subjects of the regulatory sandbox should introduce "systemically important financial institutions" for testing, so as to strengthen the prevention of systemic risks and facilitate prudent supervision. [30] However, for the sake of national fiscal stability, it might be not reasonable to allow large enterprises to enter into the regulatory sandbox, otherwise the failure of large enterprises could make the public lose confidence in the financial market. [2] In general, financial security should be maintained on the basis of consumer protection and financial innovation, and different countries and regions should control financial risks under their national circumstances. In China, even if it introduces systemically important financial institutions to the regulatory sandbox, the degree of their participation should be cautiously determined to ensure that systematic risks will not be transmitted to the financial market outside the sandbox. [20]

5.1.3. Introduce the Grading Test

To prevent the financial risks in the regulatory sandbox from being transmitted to the whole financial market, regulators should control the risks when deciding on the scope of test subjects and limit the capacity and variety of participants. However, if the test range is too narrow, the accuracy of the test results would not be reliable and the real financial risks might be unpredictable after these projects enter into the real financial market in the future. [30] In this regard, different situations should be treated differently, and a grading test model should be adopted to increase the scope and diversity of the test as well as improve the accuracy of the results. [30] On the one hand, China has conducted the pilots of regulatory sandboxes in 9 cities, and the test scope of participants should be determined according to the population size and development degree of different regions. [33] On the other hand, the regulatory entity should also improve the grading system of financial services and products with the help of experts, assess the market influence of these projects according to relevant factors such as product type, service category, scale, total assets, project value and other relevant factors of the applicant institution. [30] It is necessary to divide the risk levels and scales, and determine the test scope and the qualifications of participants on this basis. [30] The grading testing model can help regulators limit risks within a manageable range while ensuring the rationality of sample size. However, the differences in the applicable standards in different regions and enterprises may increase the ambiguity of the regulatory sandbox and reduce the public's trust in the regulatory sandbox. Therefore, it is important to disclose the grading test standard to the public and increase the transparency of process which would be discussed later.

5.2. Optimize the Projects Review Process

The Fintech Sandbox Regulation should optimize the projects review in regulatory sandboxes. It is reasonable to improve the transparency of projects review process and introduce independent third-party experts to review these projects. Also, for reducing potential financial risks, the negative list of prohibited institutions should be issued. Finally, it is required to improve customers protection in regulatory sandboxes.

5.2.1. Improve the Transparency of Project Review Process

Lack of transparency is the nature of the regulatory sandbox if the relevant criteria are not set down in legislations or formally adopted rules. The lack of formally set out rules can lead to uncertainty among regulatory participants on regulatory sandbox criteria. It may also cast doubt on the objective nature of rules and their application in decision-making on sandbox admission. [1] In Canada, rather than issuing admission guideline of regulatory sandboxes, Canadian Securities Administrators show a strong level of transparency to regulatory actors through providing online public access to previous decisions including the terms and conditions imposed on sandbox users. [7] Under the basis of not involving trade secrets, China can refer to Canada's project publicity model to improve the transparency of project review.

It is also necessary to strengthen data sharing and information disclosure and improve the transparency of regulatory sandboxes. It would not only protect consumers' legitimate rights and interests, but also help improve the compatibility of the internal and external environment of the pilot. [29] Bank for International Settlements (BIS) has proved that the sandbox can facilitate access to capital through two channels including reduced asymmetric information and reduced regulatory costs or uncertainty. [14] Improving transparency of projects review can strengthen information disclosure and decrease regulatory uncertainty, which is significant to improve the functions of regulatory sandboxes.

5.2.2. Introduce Independent Experts to Review Projects

Introducing experts can reduce the potential power rent-seeking and increase the public confidence in regulatory sandboxes, assist authorities to professionally review the projects and improve the special Chinese public supervision mechanism.

On the one hand, independent expert evaluators could reduce the possibility of power rent-seeking. [20] Expert evaluation should be independent and transparent, which is conducive to enhance public confidence in the regulatory sandbox, reduce the distrust of potential applicants in the review process, and thus stimulate more enterprises to enter into the sandbox. [20] On the other hand, the government approval authority lacks professional project inspection capabilities, and the independent experts can more accurately assess the innovativeness and potential risks of these projects for sandbox testing. [20] Based on China’s national conditions, it is reasonable to learn from the practice of foreign regulatory sandboxes, to clarify and standardize the testing process in detail, and introduce professionals in the fields of information technology, law, accounting, and other fields to participate in the project’s evaluation. [29] Also, although China has adopted a social supervision system, as mentioned above, the public lacks professional evaluation ability and is easily used by illegal institutions, and some enterprises may hype praise for projects or to crack down on malicious attacks by competitors. [29] Therefore, the applicants or projects which are complained by the public should be reviewed by independent third-party experts before deciding whether they can enter the sandbox for testing.

5.2.3. Establish a Negative List

For the sustainable development of financial innovation, China's regulatory authorities should consider the current Chinese financial situations, establish a negative list of sandbox projects, and clearly prohibit projects with high financial risks from entering the regulatory sandbox. [34] In this regard, regulators may refer to the risk prevention documents issued by the Chinese Central Bank, China Banking Regulatory Commission, Securities Regulatory Commission and relevant departments to list the financial services or products with high risks. For example, virtual digital currency businesses, which have been repeatedly warned by relevant state departments that they have high financial risks, [43] and therefore should be included in the negative list and be prevented from entering into the regulatory sandbox. [34]

5.3. Improve Consumer Protection in the Regulatory Sandbox

In regulatory sandbox rules, the paramount consideration of regulators should be the protection of the consumers. [17] It is necessary to know that even of protection measures were taken in entry stage, there is the possibility of insufficient protection for customers during the testing period in regulatory sandboxes. [3] Therefore, the Fintech Sandbox Regulation should include the following consumers protection measures.

On the one hand, in the entry stage, China's regulatory authorities should communicate with sandbox applicants to make arrangements on the consumer protection mechanism. Regulators administering sandboxes should pay close attention to the types of clients that the applicant proposes to serve, and judge whether there is possibility to trigger financial systemic risks. [2]

On the one hand, it is required strengthen the information disclosure system and inform consumers of risks. China can even set up an expert group to conduct risk education for selected consumers, ensure that they are fully aware of the content of the project. [33] On the other hand, to improve the accuracy of test results, China needs to change the way of consumers selection. Random selection should be carried out instead of adopting a recruitment model. [33] Customers should be appropriate for the type of innovation and intended markets, but also for the type of potential risks. [4] In addition, applicants should be required to sign a security agreement, provide a business plan and a risk response plan during the entry stage for the protection of customers. In Australia, applicants are required to write a short description of its innovative products and services and explain further on how the products and services shall be provided to the consumers. [17] However, due to customers protection standards of various financial services and products are different, Chinese central bank could issue regulations or guidelines to protect customers in different financial businesses. [34] According to the risk level, scale and total amount of funds of applicants, applicants can also be required to provide a corresponding security deposit to ensure that the loss of consumers can be reasonably compensated. However, the amount should be affordable for start-up enterprises. Also, it is reasonable to consider developing relevant insurance policies regarding regulatory sandboxes. Finally, if the participating entity violates the regulations and maliciously harms the rights and interests of consumers, it must immediately stop the regulatory sandbox experiment and punitive measures should be implemented such as adding it into the credit blacklist.

In China, at the entry stage of the regulatory sandbox, it is also suggested to select a similar number of consumers for the sandbox test from the eastern, western, and central regions with different economic development levels. [33] It is also necessary cultivate consumers' awareness of safeguarding rights. Applicants should take the interests of consumers as the core, protect privacy right of consumers, right to make their own choice, and right to claim and seek help, and should also explain to consumers the potential risks that may arise in the process of supervising the operation of the sandbox. [33]

6. Conclusion

Since 2016, regulators have begun to pursue a balance between the three goals of financial stability, financial consumer protection and the promotion of financial innovation, which has stimulated regulatory innovation, including regulatory technology and financial regulatory sandboxes. [31] In 2018, China introduced the regulatory sandbox for enhancing Fintech development. Regulatory sandbox significantly contributes to creating an open innovative ecosystem for Fintech business by providing collaborating environments between governments and market participants including larger incumbent firms and fintech startups, [15] which can help regulators manage the Fintech market more effectively. Although many countries and regions in the world have implemented the regulatory sandbox, due to the different degrees of financial development and market scale, China cannot directly transplant the practice of other countries or regions and should design a suitable regulatory sandbox based on China's national conditions. There are some problems of the entry system of China's regulatory sandboxes on the review of sandbox applicants and projects, and consumers protection. Learning from other countries, at the entry stage, some measures should be taken. There is no mature and applicable regulation of regulatory sandboxes in China. Therefore, the Fintech Sandbox Regulation should be issued to clarify these measures such as increasing diversity and scope of participants, improving the process of projects review, introducing independent experts, and protecting the interests of consumers.

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