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ANALYSIS OF THE IMPLEMENTATION OF REGULATORY SANDBOX AND RISK-BASED SUPERVISION ON FINANCIAL TECHNOLOGIES BY OTORITAS JASA KEUANGAN (OJK)

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ABSTRACT

Financial technology (fintech) is one of the digitalization products that offer convenience for users to make transactions. However, despite its convenience, fintech also contains risks that many parties, such as consumers and regulators can perceive. This study aims to evaluate the implementation of the regulatory sandbox and risk-based supervision of fintech by the Financial Services Authority (Otoritas Jasa Keuangan - OJK) in Indonesia. Implementing regulatory sandbox and risk-based supervision towards registered fintech is intended to reduce the risk that fintech may impose in the future. OJK conducts risk-based supervision by prioritizing risks consisting of: (1) strategy risk; (2) systemic operational risk; (3) individual operational risk; (4) money laundering and limitation of terrorism risk; (5) consumer data protection risk; (6) the risk of using third party services; (7) cyber risk; and (8) liquidity risk. This study concludes that applying risk-based supervision and regulatory sandbox can reduce the risks faced by fintech. However, OJK needs to develop its own rules and technology to obtain efficiency in regulating and supervising fintech activities and to minimize all types of risks that may impose.

Keywords: *Financial Technology, Risk-Based Supervision, Regulatory Sandbox*.

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1. INTRODUCTION

Financial Technologies or well-known as fintech, is a metamorphosis of the financial sector by utilizing more sophisticated technology in its settings. This phenomenon focuses on the use of communication technology, which is often referred to as network economics. The digital disruption that is happening right now brings significant changes to the global economy. Various traditionally run businesses must follow these developments to maintain their existence (Aljouni & Al-Hakim, 2018). This disruption covers many dimensions, one of which is the financial sector. This expansion in the financial sector resulted in the emergence of various forms or business models similar to the banking sector which is currently a 'competitor' for the banking sector. Fintech has several categories to ease consumers to make transactions, because the most obvious transformation is the reduction of work from what was originally mostly done on paper-based to computer-based.

Fintech companies generally offer products and services that are more customer-friendly (user-friendly), efficient, transparent and automated than existing services (conventional). The presence of fintech is a challenge for conventional banks which target the main core of the banking business, such as credit, where fintech also targets the individual and household level. Services provided by fintech are considered to have greater power in diversifying the modes applied and being more flexible, cost-effective, fewer requirements, and saving time (Aljouni & Al-Hakim, 2018).

The challenges faced by conventional banks are not only faced by the credit sector, but also by marketing strategies. Fintech could easily reach new clients, and not only focusing on customers who have accounts at the bank, but also customers who do not have accounts at the bank. According to Pierrakis and Collins (2013), such innovations can change the remaining industrial order and blur boundaries in related industries, facilitate strategic disintermediation, change the way companies launch products and services, provide new sources for entrepreneurship, expand access to financial services and also creates new challenges to confidentiality, regulation, and law enforcement.

Indonesia has the opportunities for the digital economy that are quite high, considering the economy's potential, population, and the number of smartphone and internet users. According to a report produced by Daily Social Fintech in 2018, as many as 63% of state-owned banks have implemented digital initiatives to increase revenue, compared to private banks with a percentage of 21% and Islamic banks with 14% (Batunanggar, 2019).

Indonesia aims to achieve financial inclusion with several strategies, one of which is fintech. However, according to a survey conducted by the Financial Services Authority (OJK), only 30% of people have financial insight. This certainly causes the potential for moral hazard when many people lack mature financial knowledge. However, behind this relatively resilient fintech growth, Indonesia's financial sector certainly faces fundamental challenges. The first challenge is the low level of financial inclusion. The second challenge is the high gap for financing for Micro, Small and Medium Enterprises. The World Bank and the International Finance Corporation estimate that the credit gap experienced by Indonesian MSMEs is $165 billion (or 19% of GDP), of which

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the available reserves are only $57 billion. The next challenge is human resources still lacking in developing digital products such as fintech.

One form of fintech is fintech Lending/Peer-to-Peer Lending or what is known as 'online loans'. In Indonesia, Fintech Lending is called Technology-Based Borrowing and Borrowing Services (LPMUBTI). In short, LPMUBTI is a financial service that facilitates meetings between lenders and borrowers to enter into contracts or money-borrowing agreements in Rupiah using an electronic system directly. The total Fintech Lending in Indonesia as of October 25 2021 that has been registered and has permits is 104 organizers.

OJK as a financial regulatory institution supports fintech activities in promoting financial literacy as outlined in Article 4 POJK Number 13 of 2018 concerning Digital Financial Innovation in the Financial Services Sector, in which Digital Financial Innovation must have criteria which include: (1) be innovative and oriented towards front; (2) using information and communication technology as the main means of providing services to consumers in the financial services sector; (3) support financial inclusion and literacy; (4) useful and widely used; (5) can be integrated into existing financial services; (6) using a collaborative approach; and (7) paying attention to aspects of consumer protection and data protection (Batunanggar, 2019).

Financial regulators such as Bank Indonesia and OJK face a big challenge in regulating financial traffic in Indonesia: balancing innovation with financial market conditions and consumer protection. Regulation of fintech should guide these innovations to become more responsible. As explained by the President of Indonesia, Joko Widodo, at the Bali Fintech Agenda 2018 forum, that management of fintech must be addressed with the principles of 'soft touch' (light touch) and 'comfortable environment' (safe harbour) (Wirayani, 2018). The enforced regulations must be friendly and accommodative to prevent excessive government intervention. In other words, regulations must be open to allow creators to not be afraid to innovate.

Responding to this, OJK adopted 5 strategies to support digital financial innovation in Indonesia. The first is a holistic and balanced strategy, in which the OJK guarantees the safety of fintech and supports innovation and competition between startup companies developing in Indonesia. In this case, fintech must cooperate with regulators to ensure consumer protection and confidence. Second, building a dynamic regulatory framework by establishing principle-based regulations for digital innovation and understanding that the digital finance industry is flexible and dynamic. Third, monitoring the market by forming a Fintech Association to see the development of fintech, whether it has good governance, risk management, and compliance levels. Fourth, developing a Regulatory Sandbox (RS) It is a testing method created for start-ups or financial institutions that have been established for a long time to prepare innovations in business processes, business models, and financial instruments to enter the market. . This makes it easier for OJK to understand the business model and risks of fintech itself. The last strategy is digital innovation. OJK built a fintech center called “OJK Infinity—OJK Innovation Center for Digital Financial Technology” which was launched on 20 August 2018 which acts as a learning and innovation center, media for coordination and collaboration between stakeholders, and as a “laboratory” for the regulatory sandbox (Batunanggar, 2019).

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OJK conducts risk-based supervision (RBS) by using technology to prevent financial risks from occurring. Risk-Based Supervision uses a risk-based methodology that allows supervisors to detect significant risks and then arrange preventive plans to minimize the occurrence of the risks. OJK regulations regarding Fintech in Indonesia are stated in several regulations, including the Financial Services Authority Regulation Number 13/POJK.02/2018 concerning Digital Financial Innovation in the Financial Services Sector. Neither RS nor risk-based surveillance eliminates the risks inherent in fintech.

Based on this background, this study attempts to answer the question: How is the implementation of Regulatory Sandbox and Risk-Based Supervision of Fintech in Indonesia by the Financial Services Authority (OJK)?

The objective to be achieved through this research topic is to improve supervision and implementation of better risk management by the OJK for Fintech operating in Indonesia and improve customer protection.

The writing of this research uses an evaluation-based case study strategy. According to Ellet (2018), evaluation is an assessment of the effectiveness of a performance, action, value, and result of the action taken. Evaluation for case studies is not necessarily related to the pros and cons or the strengths and weaknesses of an activity or action. To be actionable, an evaluation must draw a concise and right on target conclusion. Evaluation case studies also have several elements, including: (1) criteria; (2) provisions; (3) evaluative analysis; (4) based assessment; (5) qualifications; (6) action.

This evaluation case study discusses the effectiveness of implementing the regulatory sandbox policy and risk-based supervision applied by OJK to fintech tarising from fintech operations registered with OJK. What distinguishes this research from previous research is that previous research did not discuss the role of the regulatory sandbox in creating fintech and how the OJK carried out the risk assessment on the fintech.

The data and information was obtained by conducting interviews with sources with much experience in their fields and collecting secondary data from various regulations established by the Government of Indonesia. The author collected and did research for the topic related to regulations, websites, news, and/ or other publications issued by related agencies. The interviews conducted with the Digital Financial Innovation Group and the Directorate for Regulation, Licensing and Supervision at the Financial Services Authority as regulators or policy makers who regulate and oversee the operation of fintech in Indonesia. The objective of the interview is to strengthen the overview and analysis of the topic.

2. LITERATURE REVIEW

2.1 RISK-BASED SUPERVISION

Digital transformation shows considerable potential for the emergence of innovation, effectiveness and efficiency, and the competitive level of all business lines, one of which is in the financial sector. After the financial crisis that hit the world in 2008-2010, financial institutions began to adjust to various regulatory changes and the condition of declining profits due to the crisis.

Up until now, consumers are starting to feel the benefits offered by technological advances through digitization which are marked by more consumer-friendly products, friendly prices, and more inclusive financial

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services. However, all the convenience and friendliness offered by this technological advancement certainly brings with it risks that can be faced by consumers, such as security issues, consumer protection which is still minimal, and digital financial literacy for consumers which is also still low. Facing this issue, supervisory institutions or authorities identify low compliance of digital financial service providers with the regulations in force, such as money laundering and counter-terrorist financing (Toronto Center, 2018). In Indonesia, the government also identifies that as the digital era continues to advance, such potential risks may impose on the financial sector.

The development and implementation of new financial technologies can go together with regulatory and supervisory decisions being enacted, so regulatory bodies should already have adopted legal and supervisory frameworks to ensure supervised entities comply with the rules. One way of proper supervision in dealing with the development of financial technology is through Risk-Based Supervision (RBS). The RBS system can increase the effectiveness of supervision in line with an increase in the allocation of resources including to larger sources of risk and the monitoring process. Risks cannot be completely eliminated through RBS, but regulatory agencies can reduce and address these risks in a more effective and efficient way to achieve their objectives(Toronto Center, 2018)

Fundamentally, RBS is based on principles and outcomes, which is different from the compliance-based approach which focuses on company compliance with fairly rigid rules, conditions and directives. RBS is carried out by assessing risks using a long-term perspective in which the company can manage and bear these risks. Some of the characteristics possessed by RBS are quite different from other approaches (Toronto Center, 2017).

The first characteristic is that risks are prevented systematically and the institution will determine the top priority, which will have the potential to disrupt the institution's goals and lead to systemic impact on the national economy. The table below briefly explains the level of the probability and impact of the risks imposed on the institution.

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Table 1.1 Probability and Impact

	Likelihood – ***How likely will the risk (to the firm or the supervisory body's objectives) crystallize?***				
Impact - ***How much would it matter (to the firm or the supervisory body's objectives) if the risk crystallized?***		Low (very unlikely)	Medium Low (unlikely)	Medium High (quite likely)	High (very likely)
	High (great deal)				
	Medium high (quite a lot)				
	Medium low (not much)				
	Low (hardly at all)				

Source: Toronto Center (2018).

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Second, RBS has characteristics for conducting assessments and having grading or levels for certain issues, such as matrices. This is useful in comparing risks between institutions, groups, markets, or other sectors. Third, RBS can identify the availability of risks that can come from various sources, so a broader perspective is needed. Various risks that arise from the macroeconomic level must also be viewed from a micro perspective or at the company level where companies cannot control issues or risks at a higher level, but they have large implications. Thus, companies also need to identify risks and manage the consequences of the risks they face.

2.2 PREVIOUS RESEARCH

In strengthening the research, this section will describe the findings of the literature and previous research (prior research) that are relevant to the problem in this research object, namely the effect of implementing a regulatory sandbox and risk-based supervision of fintech in Indonesia. Some authors, such as Pakpahan et al., (2020), and Dhidhin and Nasrulloh (2019), wrote literature.

2.3 ROLE OF OJK IN SUPERVISING FINTECH

The first literature is adapted from the writings of Pakpahan et al., (2020) entitled "The Role of the Financial Services Authority (OJK) in Supervising the Rise of Financial Technology Services (Fintech) in Indonesia". This research aims to understand the role of OJK in supervising fintech services in Indonesia and provide legal protection from the perspective of business operators and consumers. This research uses a normative juridical legal method with a statutory approach, such as Law Number 21 of 2011 concerning the Financial Services Authority, PBI No. 19/12/2017, and OJK Regulation No. 77/POJK.01/2016 concerning Information Technology-Based Money Lending Services.

OJK has the authority to regulate and supervise fintech and protect consumers. The objectives of implementing OJK's management and supervision of fintech are: (1) fintech companies can carry out the agreed plans, both in terms of systems, processes and results; (2) preventing irregularities, both from the management and the fintech employees themselves; (3) facilitate prevention; (4) cost control; (5) realizing the achievement of company goals. In addition, technology-based supervision and management is carried out by registering with the supervisory body, ensuring that the supervisory agency records the fintech registration, and conducting a feasibility test with a system called the Regulatory Sandbox. This system has a legal basis written in POJK No. 13/POJK.02/2018 concerning digital financial innovation in the financial services sector.

OJK inspection procedures for fintech in Information Technology-based money-lending services (P2P Lending) are regulated in POJK No. 77/POJK.01/2016 and is divided into 2, namely pre-operational business and during business operations. In the pre-operational stage, fintech companies will arrange registration and operating permits for the Chief Executive for Supervision of Insurance, Financing Institutions, Pension Funds, and other Financial Services Institutions. OJK will review registration applications submitted by fintech companies and determine approval of registration applications within a maximum period of 10 working days from receipt of application documents.

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Then, during business operations, there are two types of supervision carried out by OJK: submission of reports by companies or administrators (self-assessment system) and inspections by OJK (officer supervisory system). Submission of reports by the company consists of oversight of finances and business activities and implementation of oversight of the articles of association carried out through periodic reports. Reports can be submitted periodically provided that they are done every 3 (three) months for the period ending March 31, June 30, September 30 and December 31 or for 4 quarters. Reports are submitted quarterly to OJK no later than 10 (ten) working days from the due date of reporting. This periodic report lasts 1 (one) year until the application permit application deadline expires.

In the second type of supervision, OJK is obliged to collect, search, process, evaluate data and information related to fintech service business activities. In addition to supervising periodic reports, OJK also conducts inspections to gain confidence in the correctness of reports and applicable compliance. OJK conducts an inspection once a month to see the correctness of the substance of the periodic report on compliance with laws and regulations and may request additional information if necessary.

The second literature comes from Dhidhin and Nasrulloh (2019) article entitled "Risk and Regulation: Fintech for a Financial Stability System". This research discusses risk mitigation by measuring how much influence this financial industrialization has on the financial system and seeing which risks will occur due to the influence of fintech. The research analysis results reveal that fintech has two main risks: financial and technological. Responding to these risks, countermeasures can be carried out in the following ways: (1) it is better to avoid them; (2) can be detained; (3) diversification; (4) transferred; (5) controlled; (6) funded.

The third literature is about regulatory sandbox of peer-to-peer landing fintech in Indonesia written by Nababan et al (2019). The literature discusses the analysis of implementation of regulatory sandbox and the scoring system of peer-to-peer landing fintech. They identified that in Indonesia, many fintechs are not registered and never gone through regulatory sandbox system. Another issue faced by OJK is that some registered fintechs that have been assessed through regulatory sandbox system are also problematic in practice. They also recommend OJK to complete their regulatory sandbox system for fintech innovator to submit, such as: (1) Fintech innovator has to have data correctness statement form and business activity guarantee; (2) form that declare that the related fintech company is not affiliated with a bad track record company; (3) proof of company capital.

3. RESEARCH METHODOLOGY

3.1 RESEARCH STRATEGY

The writing of this research uses an evaluation-based case study strategy. According to William Ellet (2018), evaluation is an assessment of the effectiveness of a performance, action, value, and result of the action taken. Evaluation for case studies is not necessarily related to the pros and cons or the strengths and weaknesses of an activity or action. To be actionable, an evaluation must be able to draw a concise and right on target conclusion. Evaluation case studies also have several elements, including: (1) criteria; (2) provisions; (3) evaluative analysis; (4) based assessment; (5) qualifications; (6) action.

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This evaluation case study discusses the effectiveness of implementing the regulatory sandbox policy and risk-based supervision applied by OJK to fintech to reduce the risks arising from fintech operations registered with OJK (OJK, 2019).

3.2 RESEARCH METHOD

In answering the formulation of the problems raised in this study, the qualitative method is used. Adapting the writings of John W. Creswell (2016), qualitative research is a research method that explores and understands the meaning resulting from social phenomena or events. Qualitative research uses several techniques, such as collecting participant data or interviews.

After being collected, the data were analyzed inductively, i.e., departing from a specific theme to a general theme and then interpreting it. The characteristics of qualitative research are as follows: (1) it is carried out where the participants experience problems; (2) researchers are important instruments; (3) the method of data collection carried out by researchers is quite diverse, such as interviews, observations, and through document review; (4) understand the meaning of the problems faced by the participants; (5) a new and dynamic design; (6) researchers position themselves in qualitative studies; (7) the researcher develops a complete picture of the problem under study (holistically).

3.3 DATA COLLECTION METHOD

The collection of the data and information is carried out by conducting interviews with sources who have many experiences in their fields as well as the process of collecting secondary data from various regulations established by the Government of Indonesia

3.4 DATA ANALYSIS

Data analysis technique is a method used to generate conclusions from the data that has been collected and used descriptive analysis. In this study, the data collection results from interviews and observations of supporting documents were then analyzed which could be used to develop the information obtained to enrich the research results. The first stage in the research data analysis is to reduce or simplify data to obtain information that is only relevant to research. The second stage is presenting data systematically. The third stage is concluding.

4. ORGANIZATION PROFILE

The Financial Services Authority (OJK) is a state institution whose function is to organize integrated regulation and supervision of all activities in the financial services sector. OJK was established on 16 July 2012 with the aim that all financial services sectors can operate in a transparent, fair, orderly, and accountable manner in accordance with Article 4 of Law Number 21 of 2011. The function of banking supervision and regulation which was originally carried out by Bank Indonesia, as well as supervision and regulation in non-banking services run by the Capital Market and Financial Institution Supervisory Agency (which has now been disbanded) to be transferred to the OJK.

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OJK implements several strategic values that support its performance, such as: (1) integrity, namely implementing objective, fair, honest and consistent behavior in accordance with the code of ethics and organizational policies; (2) professionalism, namely doing work responsibly with high competence to achieve good performance; (3) synergy, namely collaboration with all stakeholders, both internally and externally in a productive and quality manner; (4) inclusive, namely having an open attitude and accepting the diversity of stakeholders and expanding public opportunities and access to the financial industry; (5) visionary, namely having broad insight and being able to look forward (forward looking) and think outside the box (thinking out of the box).

OJK has a fairly complex organizational structure, one of which is the department that supervises the Non-Bank Financial Industry (IKNB), which is divided into 4 sub-departments, namely the IKNB Supervision Department 1A, 1B, 2A, and 2B. This field implements an integrated regulatory and supervisory system for the IKNB sector for all financial services sectors. The main tasks of this field include: (1) compiling regulations in the IKNB sector; (2) enforce regulations in the field of IKNB; (3) implementing crisis management protocols at IKNB; (4) formulate policies, standards, norms, guideline criteria, and procedures in the field of NBFIs; (5) provide technical guidance and evaluation in the field of IKNB; (6) provide guidance to parties who obtain business licenses, approvals, and registration from OJK; (7) implementing IKNB policies in accordance with laws and regulations; (8) carry out other duties and responsibilities given by the Board of Commissioners.

The following table shows some related regulations obtained by OJK in conducting RS & supervision.

Table 4.1 Regulations of Fintech in Indonesia

No.	Regulation	Contents
1.	*Peraturan Otoritas Jasa Keuangan Nomor 77 /POJK.01/2016 Tentang Layanan Pinjam Meminjam Uang Berbasis Teknologi Informasi*	• Regulates information technology-based money lending service providers which must conduct registration and licensing before operating with the OJK; • Regulates the limits on lending funds; • Administrators are required to have qualified human resources with a background in information technology; • Regulating lenders and loan recipients based on an agreement to implement Information Technology-Based Borrowing and Borrowing Services; • Users and Administrators are required to carry out risk mitigation

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No.	Regulation	Contents
2.	*Peraturan Otoritas Jasa Keuangan Nomor 13 /POJK.02/2018 Tentang Inovasi Keuangan Digital Di Sektor Jasa Keuangan*	• Regulates the objectives, scope and criteria of IKD; • Explaining the Regulatory Sandbox to ensure IKD meets the criteria; • Regulates registration, monitoring, reporting, governance, data protection and confidentiality, consumer education and protection, and sanctions if IKD commits violations.
3.	*Peraturan Otoritas Jasa Keuangan Nomor 4 /POJK.05/2021 Tentang Penerapan Manajemen Risiko Dalam Penggunaan Teknologi Informasi Oleh Lembaga Jasa Keuangan Nonbank*	• Explaining the types of non-bank financial institutions in Indonesia; • Regulating the scope of information technology risk management; • Active supervisory involvement by the board of directors and commissioners.
4.	*Peraturan Otoritas Jasa Keuangan Nomor 1/ POJK.05/ 2015 Tentang Penerapan Manajemen Risiko Bagi Lembaga Jasa Keuangan Non-Bank*	• Explain the types of risks that non-bank financial institutions can face, such as strategic, operational, asset, liability, management, governance, fund support, insurance, and financing risks.
5.	*Salinan Surat Edaran Otoritas Jasa Keuangan Republik Indonesia Nomor 21/ SEOJK.02/2019 Tentang Regulatory Sandbox*	• Explaining Digital Financial Innovation that is an activity to innovate business processes, business models, and financial instruments which can add value in the financial sector, especially by involving digital ecosystems; • Regulatory sandbox is a testing mechanism to assess the reliability of business processes, business models, financial instruments, and governance of IKD organizers proclaimed by the OJK; • The purpose of organizing the Regulatory Sandbox is to ensure that the IKD

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No.	Regulation	Contents
		meets the criteria set by the OJK;

Source: Proceed by Author.

5. ANALYSIS
5.1 THE ROLE OF OJK IN SUPERVISING FINTECH IN INDONESIA

As an institution established through Law Number 21 of 2011, the Financial Services Authority (OJK) has the function of structuring the regulatory and supervisory system for all financial services sectors, both in the banking sector, capital market, non-bank financial sector such as insurance, pension funds, financial institutions, and other financial service institutions. Specifically, the supervisory duties of the OJK for the non-bank sector and the capital market were transferred from the Ministry of Finance and Bapepam-LK on 31 December 2012 (OJK, 2017). OJK is expected to support the financial services sector as a whole to increase the competitiveness of the Indonesian economy.

In this case, OJK monitors fintech registered and registered with OJK by receiving self-assessment reports by the fintech itself, on-site monitoring, and/or other monitoring methods. In independent monitoring, fintech must apply several principles, such as: (1) information and communication technology governance; (2) consumer protection; (3) education and socialization for consumers; (4) data confidentiality; (5) risk management; (6) anti-money laundering and prevention of the financing of terrorism; (7) information disclosure (OJK, 2018).

Referring to the results of interviews with GIKD OJK, self-assessment is not only based on reports provided by fintech to OJK, but there are several options, including interview-based and onsite-based. Such approaches are taken because fintech is not yet required to audit its financial statements and fintech only provides reports from directors and commissioners regarding the correctness of the data. In this case, the OJK will recheck the reports submitted by fintech. If there are irregularities in the report, OJK will confirm or clarify.

5.2 FINDINGS
5.2.1 THE IMPLEMENTATION OF REGULATORY TECHNOLOGY (REGTECH) AND SUPERVISORY TECHNOLOGY (SUPTECH) BY OJK

Regtech implementation aims to build a system that can prevent violations committed by fintech and other financial services industries. One of the violations that may be committed is related to money laundering and financing of terrorism, so that the use of regtech can monitor the quality of fintech in conducting anti-money laundering and financing of terrorism programs. The implementation of regtech by the OJK is evidenced by the establishment of the Fintech Lending Data Center (Pusdafil) which is used to load information related to problem loans from users with problem loans. This can be used by fintech to overcome problems faced internally.

Based on POJK Number 13 of 2018, the scope of regtech implemented by OJK consists of several aspects, such as: (1) compliance that provides automatic notification of changes to rules, both at the national and global levels; (2) identity control and management to apply know your customer principles as well as anti-money laundering and to prevent terrorism financing; (3) risk management is a risk reporting tool based on transactions, consolidated risk, and risk internal reporting;

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(4) reporting that is automatically integrated in an efficient, simple and accurate; (5) transaction monitoring that can monitor and audit transactions to prevent fraud and risk violations; and (6) a transaction automation system that includes the calculation of margins, costs, returns, and does not violate business conduct.

Apart from regtech, OJK also implements technology-based supervision called supervisory technology (suptech). This is the use of innovative technology to support the performance of authorities in a data-driven direction by considering the size, level of complexity, and readiness for the development of the supervised financial services industry. The infrastructure of supervisory technology developed by OJK is quite diverse, from artificial intelligence (AI) to virtual assistance such as chatbots (OJK, 2021).

5.2.2 THE IMPLEMENTATION OF REGULATORY SANDBOX FOR FINTECH IN INDONESIA

Regulatory Sandbox (RS) is a testing method created for start-ups or financial institutions that have been established for a long time to prepare innovations in business processes, business models, and financial instruments to enter the market. Before entering implementation of RS, there is a recording process. Recording is an initial identification regarding the business model to be proposed and checking its institutional form. After registering under the OJK as organizers of digital financial innovation, they will enter the trial process, the RS process. In the RS process 6 aspects have to be conducted. The first aspect is legal and compliance. This process looks at the use of data sources from several data partners, whether the data is accessed legally or not, and whether all partners cooperate. The second aspect is the business model. The business model aspect is seen from how feasible this business model is to operate in Indonesia. Then, it can be useful or not, both for consumers and with financial service institutions that cooperate.

Then the third, the aspect of information technology. OJK assesses the platform used in the RS because it relates to digital finance. Until now, fintech has conducted the assessment mechanism itself (self-assessment) in terms of infrastructure and vulnerability-assessment. Then the fourth, related to risk management. The mechanism is the same, namely self-assessment, where the OJK conveys in advance that based on the POJK several risks need to be reviewed by the organizer.

The fifth aspect is the aspect of the business plan that is tested. The form of start-up institutions is different from conventional financial institutions. Fintech generally comes to the OJK with a mock up and then conducts a feasibility study or presentation of a business plan that can be proven. For example, projected profit and loss. When presentation is conducted, fintech said it would make a profit in the third year, but it turns out that in the third year, the number of users is still very minimal. Or in terms of sustainability to operate in Indonesia, after being declared recommended it turns out that it has not been operating for two years.

The last aspect is the aspect of data and consumer protection. OJK assesses whether all the data used in the business platform is safe or not, whether it is in accordance with the provisions on data, or whether there is sensitive data or not. Then, how was the data obtained, whether it was official or not because fintech could get data without the user's permission, or maybe there was consent, but the data taken was not in accordance with the agreed consent. From the data taken, then how does fintech process the data; whether the data is stored in the system or not, the data is

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forwarded anywhere, whether the consumer is aware of it or not, and how the data is deleted or removed, there must be a mechanism from the consumer's fintech side.

The mechanism for organizing RS is carried out with two mechanisms: the determination of the organizer as a prototype and evaluation and experimentation. Some of the requirements that need to be fulfilled by start-ups wishing to enter RS include: (1) having been registered as an IKD at the OJK based on the application submitted; (2) new business models; (3) has a business scale with a fairly broad scope; (4) has been registered with the organizing association. Then, organizers designated as prototypes can present their business models and innovations to OJK and provide supporting information such as organizer profiles and products being marketed.

Afterward, the organizers will manually enter the scenario testing stage or through an electronic system. Both those that enter the prototype category and do not have the opportunity to make improvements to the testing aspects. The implementation of the RS for the organizers will be assessed and the results will be stated as recommended, improved or not recommended status. Organizers who are declared not recommended must stop their business activities.

Based on the interview conducted with OJK, regulatory sandbox can measure the maturity of the fintech. As far as it is being implemented, RS can detect what risks could the fintech bring. This will lead to OJK's decision whether the fintech will be imposed on some sanctions or it has to stop operating. However, OJK encounters problems in handling RS, such as the technology advancement, human resources, and also policy adjustment. Since the technology used in building new fintechs advances rapidly, OJK has to adjust their technology and human resources to support the innovation and limit the risks that may impose.

5.2.3 THE IMPLEMENTATION OF RISK-BASED SUPERVISION BY ANALYZING THE RISKS OF FINTECH IN INDONESIA

As previously explained, fintech conducts self-assessments or self-assessments of the implementation of risk management in their respective companies and reports regularly to the OJK. This section will explain the risk assessment faced by fintech or IKD providers based on POJK Number 13/POJK.02/2018 Concerning Digital Financial Innovation in the Financial Services Sector using Risk-Based Supervision analysis and Regulatory Sandbox. This analysis will assess the level of risk.

Strategic Risk of Fintech in Indonesia

Hereby explained the assessment of the strategic risks faced by fintech as IKD organizers in Indonesia.

Table 2.1 Strategic Risk Assessment of Fintech in Indonesia

Risk	Risk Cause	Risk Level	Risk Control
Strategic Risk	Competition with similar businesses	*Medium Low*	Developing an innovative business with an unprecedented strategy
	Uncertain business climate	*High*	Expand business in accordance with the current economic conditions

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	The company's ability to take advantage of business opportunities	*Medium Low*	Conduct an analysis of competitors' business

Source: Proceed by Author.

Based on the strategic risk assessment, the risks and causes have reduced because in general, the application of a regulatory sandbox that assesses the reliability of IKD in conducting business models and processes that are conducted for one year. Not only through business models and processes, cash flow resilience, capital raising, investment management, financial service activities, financial service support are also assessed by the RS process. According to OJK Circular Letter Number 21/SEOJK.02/2019 concerning Regulatory Sandbox, the purpose of convening the RS is to ensure that technology-based start-ups or known at the OJK as Digital Financial Innovation (IKD) can meet the following criteria: (1) be innovative and have forward orientation; (2) provide services to consumers by utilizing information and communication technology; (3) support increased financial literacy and inclusion; (4) has benefits and can be used by all general public; (5) able to be integrated with other financial innovations; (6) apply a collaborative approach; and (7) uphold consumer and data protection (OJK, 2019).

OJK will provide an assessment of the results of the RS on fintech, including: recommended, improved and not recommended. In the event that IKD is recommended, the fintech concerned can proceed to the registration process in accordance with its business activities. If there is an IKD that is suggested to make improvements, OJK will give an extension of time for a maximum of six months from the date of determination of status. However, if there is an IKD that the OJK does not recommend, it will no longer be recorded as an IKD organizer and cannot apply for the same IKD.

Systemic Operational Risk of Fintech in Indonesia

Following is an assessment of systemic operational risk faced by fintech as IKD organizers in Indonesia.

Risk	Risk Cause	Risk Level	Risk Control
Systemic Operational Risk	Defaults that occur on loan recipients	*High*	Strengthen the validity of the examination through credit scoring

Table 2.2 Systemic Operational Risk Assessment of Fintech in Indonesia

Source: Proceed by Author.

In systemic risk, OJK must cooperate with BI and the Deposit Insurance Corporation (LPS) through the Financial System Stability Committee (KSSK) to monitor and maintain financial system stability. OJK also supervises and encourages fintech to be transparent in reporting every report, including its financial reports.

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Individual Operational Risk of Fintech in Indonesia

Following is an individual operational risk assessment faced by fintech as IKD organizers in Indonesia.

Table 2.3 Individual Operational Risk Assessment of Fintech in Indonesia

Risk	Risk Cause	Risk Level	Risk Control
Individual Operational Risk	*Moral hazard*	*Medium Low*	Create a code of conduct for each fintech that refers to POJK
	The use of technology	*High*	Using technology that international standards have assessed

Source: Proceed by Author.

Through the implementation of the RS technology and the human resources that operate it are tested for feasibility and monitored regularly by the OJK. However, the monitoring and supervision carried out by OJK with existing technology is also not very advanced. Based on interviews conducted with the Digital Financial Innovation Group, the use of technology by OJK in the monitoring process requires further study and development.

Money Laundering and Terrorism Financing Risk of Fintech in Indonesia

Following is an assessment of the risks of money laundering and terrorism financing faced by fintech as IKD organizers in Indonesia.

Table 2.4 Money Laundering and Terrorism Financing Risk of Fintech Assessment in Indonesia

Risk	Risk Cause	Risk Level	Risk Control
Money Laundering and Terrorism Financing Risk of Fintech	Profile of prospective customers or customers	*High*	Categorizing or classifying customers based on profiles or track records, can use the Know Your Customer (KYC) principle, which consists of Customer Due Diligence and Enhanced Due Diligence; conduct supervision, especially for the intensity of loan funds that exceed reasonable limits; determine risk scale (risk ranking) for prospective customers through the use of regulatory technology, such as

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			big data analytics, machine learning, and robo advisors.
	Geographical location	*Medium Low*	Mapping geographical areas with high terrorism potential and identifying loan recipients.
	Products/ Services/ Transactions	*Low*	Periodic observation of the infrastructure used by fintech.
	Distribution network	*Medium Low*	Have a sophisticated recording or documentation system capable of detecting suspicious transactions.

Source: Proceed by Author.

Consumer Data Protection Risk of Fintech in Indonesia

Following is an assessment of consumer data protection risks faced by fintech as IKD organizers in Indonesia.

Table 2.2 Consumer Data Protection Risk Assessment of Fintech in Indonesia

Risk	**Risk Cause**	**Risk Level**	**Risk Control**
Consumer Data Protection Risk of Fintech	Leakage of user data due to hacking of the security system	*High*	Encrypt data on consumer-related data; data access management; transparency in the use of user data to the users themselves.
	Abuse of service sites (phishing)	*High*	Develop a very strong information technology infrastructure management system to support a good transaction process.

Source: Proceed by Author.

Consumer protection is one of OJK's main focuses that needs to be paid close attention to by financial service businesses. In terms of maturity, the majority of fintech are not very mature in their planning and operations, especially in developing technology that can ensure the security of customer data.

The main risks in consumer protection issues are customer data leakage and phishing which allows hackers to take user data and misuse it. Fintech must be responsible for managing these risks.

The Use of Third Party by Fintech Risk in Indonesia

Following is a risk assessment of the use of third-party services faced by fintech as IKD organizers in Indonesia.

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Table 2.6 The Use of Third Party by Fintech Risk Assessment

Risk	Risk Cause	Risk Level	Risk Control
The Use of Third Party by Fintech Risk	Third parties do not have strong enough legality to operate in Indonesia	*Medium Low*	Choose the credible third parties and never serve companies, especially illegal fintech.

Source: Proceed by Author.

The use of third party services is often considered to be able to help the operator to have a business continuity plan and can reduce the risk burden borne by the operator because some of the risk is transferred to the third party. However, if the fintech does not evaluate the appointed third party, it will create risks that can impact the fintech's operations.

Cyber Risk of Fintech in Indonesia

Following is an assessment of cyber risk faced by fintech as IKD organizers in Indonesia.

Table 2.7 Cyber Risk of Fintech Assessment in Indonesia

Risk	Risk Cause	Risk Level	Risk Control
Cyber Risk	The level of literacy in information technology is still low	*High*	Preparing human resources that are adaptive to technological developments through the provision of various trainings
	Information technology infrastructure development in Indonesia is still low	*High*	Developing infrastructure that strengthens cybersecurity in companies by implementing cyber risk management that fintech can report to OJK regularly.

Source: Proceed by Author

In the event of RS, fintech must provide IKD quarterly reports, including a cyber risk report. The report must answer several questions: (1) how often does the system fail? (2) how often is the IKD exposed to cyber-attacks?; (3) how many consumers are victims of cyber-attacks?; (4) what is the total nominal loss consumers suffer from cyber-attacks?

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Liquidity Risk of Fintech in Indonesia

Following is an assessment of the liquidity risk faced by fintech as IKD organizers in Indonesia.

Table 2.8 Liquidity Risk of Fintech Assessment in Indonesia

Risk	Risk Cause	Risk Level	Risk Control
Liquidity Risk	Dependence on short-term liquidity and lack of access to a central bank	*High*	Strict monitoring of information on prospective borrowers, especially fintech peer-to-peer lending; provide credit insurance facilities to lenders

Source: Proceed by Author.

Liquidity risk has a high potential to occur in fintech, especially in peer-to-peer lending (P2P). P2P fintech depends on short-term liquidity and has no access to credit from central banks as a last resort. If short-term liquidity is congested, the impact is default or default.

6. CONCLUSION

Based on the analysis described before, it can be concluded that the development of fintech in Indonesia is currently quite rapid, accompanied by advances in technology that are increasingly sophisticated and resilient. Fintech companies offer products and services that are more customer-friendly (user-friendly), efficient, transparent and automated than existing services (conventional). Services provided by fintech are considered to have greater power in diversifying the modes applied and being more flexible, cost-effective, fewer requirements, and saving time.

OJK has implemented risk management for fintech through risk-based supervision, in which OJK prioritizes any risks that fintech might face which also needs to be assessed independently by each fintech itself to get a broader view of these risks. This risk prioritization is contained in POJK Number 13/POJK.02/2018 Concerning Digital Financial Innovation in the Financial Services Sector, which states that there are at least 8 (eight) main risks faced by Digital Financial Innovation (IKD) organizers, including: (1) risks strategic; (2) systemic operational risk; (3) individual operational risk; (4) risks of money laundering and financing of terrorism; (5) consumer data protection risk; (6) the risk of using third party services; (7) cyber risk; and (8) liquidity risk.

The eight risks have a high probability of occurrence and the resulting impact is quite high. However, by implementing a regulatory sandbox, these risks can be reduced. As explained in the interview session with the OJK Digital Financial Innovation Group, the output from the RS not only talks about risk management, but also evaluations, which are used as guidelines that fintech can use to improve its processes and business models. Indirectly, the maturity level of fintech will increase due to the monitoring and evaluation carried out by the OJK.

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7. RECOMMENDATION

Based on the analysis that has been conducted, several recommendations can be addressed to OJK, namely:

1. Strengthening supervision of fintech by utilizing technology equal or better than that used by the fintech itself to reduce risk gaps.
2. Regulatory Sandbox (RS), which is a new mechanism in Indonesia, also requires updating so that it can operate optimally.
3. Issue policies that follow adjustments to fintech developments in the field so as not to pose systemic risks.