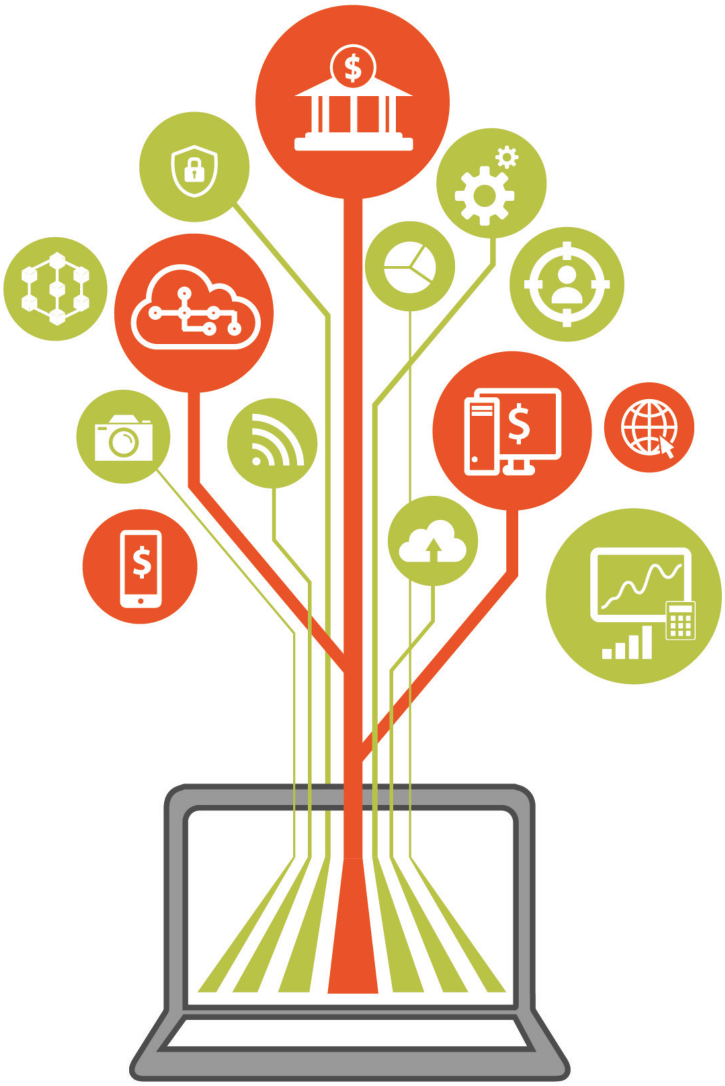

DIGITAL FINANCE INNOVATION ROAD MAP AND ACTION PLAN 2020-2024

OTORITAS JASA KEUANGAN

Supported by Asian Development Bank (ADB)

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ABBREVIATIONS

ADBI	Asian Development Bank Institute
AFTECH	Asosiasi Fintec Indonesia (Indonesia Fintech Association)
AML	anti-money-laundering
API	application programming interface
ASEAN	Association of Southeast Asian Nations
BNM	Bank Negara Malaysia (Central Bank of Malaysia)
CFT	combatting the financing of terrorism
e-KYC	electronic know your customer
fintech	financial technology
GIKD	Group Inovasi Keuangan Digital (Digital Financial Innovation Group)
IT	information technology
MAS	Monetary Authority of Singapore
MSMEs	micro, small, and medium-sized enterprises
OJK	Otoritas Jasa Keuangan (Indonesia Financial Services Authority)
QR	quick response (code)
SMEs	small and medium-sized enterprises
P2P	peer-to-peer (lending)

GLOSSARY

Artificial intelligence—information technology (IT) systems that perform functions requiring human capabilities, such as asking questions, discovering and testing hypotheses, and making decisions automatically based on advanced analytics operating on extensive data sets

Application programming interfaces—a set of rules and specifications followed by software programs to communicate with each other, forming an interface between different software programs that facilitates their interaction

Big data—the massive volume of data that is generated by the increasing use of digital tools and information systems

BigTech—technology companies with an established presence in the market for digital services

Biometrics—automated recognition of individuals based on their biological attributes and/or behavioral characteristics, such as a fingerprint, handprint, voice, or signature, which is used for identification and authentication purposes

Blockchain—a type of distributed ledger that uses independent computers (referred to as nodes) to record, share, and synchronize transactions in their respective electronic ledgers (instead of keeping data centralized as in a traditional ledger); blockchain organizes data into blocks, which are chained together in an append only mode

Cloud computing—the practice of using a network of remote servers to store, manage, and process data

Crowdfunding—an activity whereby investors provide capital to private companies in the form of grants, equity investments, or loans, with intermediation between investors and companies seeking capital taking place on digital platforms in exchange for a percentage of the capital placed or a fee

Crypto assets—a broad term designating all assets stored on distributed ledgers, including cryptocurrencies and non-currency assets such as security tokens and utility tokens

Cyberattack—when a computer system or component is the object of a crime (hacking, phishing, spamming) or facilitates the perpetration of a crime (such as theft of information or money)

Cyber resilience—a financial market infrastructure's ability to anticipate, withstand, contain, and rapidly recover from a cyberattack

Digital banks—deposit-taking institutions that are members of a deposit insurance scheme and deliver banking services primarily through electronic channels instead of physical branches

Digital identity—an amalgamation of all information available online that bind a persona to a physical person, including social network profiles, device information, location, and search history

Digital ID system—a system that encompasses the process of identity proofing and enrollment, which may be digital or physical (documentary), or a combination; and authentication thereof, which must be conducted digitally

Digital payment services—services that use technology to facilitate payment transactions by transferring money, and clearing or settling balances digitally, without the use of physical money

Distributed ledger—technology that uses independent computers ("nodes") to record, share, and synchronize transactions in their respective electronic ledgers, instead of keeping data centralized as in a traditional ledger

E-know your customer—a process by which approved entities access a digital and usually a national ID system to authenticate or verify a customer's identity

E-money—monetary value that is stored electronically as a receipt of funds and is used for payment transactions

E-waqf—Muslims' donation in the form of cash that is transacted via electronic means (e.g., internet banking facilities); if it is offered through internet banking facilities, online waqf is therefore viewed as one of the services provided by Islamic banks

E-zakat—all Muslims who possess more than a certain level of wealth should contribute about 2.5% of their disposable income to eight beneficiary groups defined in the Qur'an; these transactions may also be done electronically

Fintech balance sheet lending—a credit activity facilitated by internet-based platforms (not operated by commercial banks) that use their own balance sheet in the ordinary course of business to intermediate borrowers and lenders

Fintech platform financing—a funding activity facilitated by internet-based platforms (not operated by commercial banks), including balance sheet lending, loan crowdfunding, and equity crowdfunding

Initial coin offering—the first sale of a cryptocurrency to the public conducted for the purpose of raising funds

Innovation accelerator—a partnership between fintech companies and central banks and/or supervisory agencies to develop use cases that may involve funding support and/or authorities' endorsement and approval for future use in central banking operations, or in the conduct of supervisory tasks

Innovation hub—a facility established by supervisory bodies designed to support, advise, or guide regulated or unregulated firms in navigating the regulatory framework, or identifying supervisory policy or legal issues and concerns

Insurtech—technology-enabled innovations in the insurance industry that are designed to improve underwriting practices, lower costs, and improve the consumer experience

Machine learning—a method of designing problem-solving rules that improve automatically through experience through the use of machine learning algorithms that give computers the ability to learn without specifying all the knowledge a computer would need to perform a desired task

Open banking—any initiative by a bank to open its application programming interfaces to third parties providing access to data of the bank or access to functionality

Peer-to-peer lending—a form of direct lending whereby investors make loans to individuals or businesses without the direct participation of a commercial lending institution using a digital platform that takes a percentage of the loan or a fee for its services

Regtech—a subset of fintech that uses innovative and integrated technology to facilitate the delivery of regulatory requirements more efficiently than existing capabilities

Regulatory sandbox—a controlled testing environment, sometimes involving regulatory forbearance and use of discretion by the supervisory agency, which may include establishment of parameters (e.g., time restrictions) and guidelines that firms must follow

Robo-advisor—an automated or algorithm-driven tool that provides information on financial products or services to consumers with little to no human interaction by the service provider

Smart contract—a computer code that can automatically monitor, execute, and enforce a legal agreement, and whereby contractual clauses and functional outcomes are mapped as code on the distributed ledger such that transaction costs can be reduced, and contract execution will only occur when specific performance is realized

Suptech—the use of innovative technology by supervisory agencies to facilitate supervision, which aids in the digitization of reporting and regulatory processes, resulting in more efficient monitoring of risk and compliance of financial institutions

OJK CHAIRMAN'S STATEMENT

Wimboh Santoso
Chairman of the Indonesia Financial Services Authority

In recent times, there has been an extraordinary development of information and communication technology, which has led to a rapid increase in internet and smartphone penetration. These phenomena have changed how consumers behave and expect to conduct various financial and nonfinancial activities. Technological innovation will fulfil consumers' demand with the best comfort, speed, accuracy, ease of access, and efficiency when conducting each of their activities. This is an indication that we are living in the early stages of the digital revolution. This revolution is moving rapidly and changing the economic structure and financial system globally, including in Indonesia.

A decade ago, traditional financial services institutions, such as banks and financing companies, dominated financial services. Technology's power to increase speed and transparency, reduce cost, and provide access for financially underserved communities has created a digital revolution in the finance sector. It is causing fundamental changes in the financial services sector, which are reflected in financial activities such as payment, financing, investment, financial planning, which came to be known as digital financial innovation.

The rapid development of financial digitalization is a necessity. The traditional financial industry has been challenged to increase its capacity to adapt to the new wave of digital innovation. Digital transformation in the traditional financial industry is spurred not only by efficiency, but also the desire to avoid an exodus of existing customers who demand a more convenient and more efficient financial transaction process. The development of this technology also gave rise to new business models in the finance sector with an increase in start-ups and technology companies providing financial services.

With its rapidly growing population of digital customers and high internet penetration, Indonesia is on the brink of becoming one of the largest digital economy markets in Asia. Indonesia is now home to over 100 fintech companies. The exponential growth of investment and number of players are signs that digital finance innovators, including fintech companies, play a key role in driving the digital revolution.

The fintech players are have made financial services an engine for economic growth. They have been opening financial access and becoming catalysts for the rapid growth of the digital economy by providing a wide range of innovative and interconnected financial services. The wide scope of innovation includes banking and financing products, such as digital lending and payments; insurtech in the insurance industry; and robo-advisors and crowdfunding in the capital market industry. The increased availability of open banking platforms and the wider use of artificial intelligence across the financial services ecosystem have been driving the development of the fintech industry.

The next question is how we utilize innovative technology for the benefit of the greater community, while mitigating the risks posed to the economy and the national financial system. In the current context, the fintech industry is also expected to play a significant role in tackling social and economic challenges resulting from the coronavirus disease (COVID-19) by providing innovative solutions and technologies to individuals and businesses.

Therefore, it is necessary to continuously develop the digital financial innovation ecosystem to strike the right balance between facilitating digital financial innovation and ensuring strong financial consumer protection and supervisory frameworks. Digital innovation thrives in a robust ecosystem where investment, accelerator, and talent connect with regulation and customer protection. Regulating technology-driven financial innovation benefits from a collaboration between stakeholders and strategic industry partners.

In response, the Indonesia Financial Services Authority (OJK) has issued The Digital Finance Innovation Action Plan, 2020–2024, which focuses on developing a supportive and comprehensive digital financial ecosystem to create a financial services industry that is competitive, resilient to change, and fit for the future. In this action plan, we have set out the objectives and commensurate actions to achieve them.

The regulatory framework at the heart of the action plan aims to keep pace with technological change, mitigate technology-associated risks, protect consumers' interests, and promote competition.

Research will be the backbone of developing the regulatory framework and encouraging innovation. Collaboration with various stakeholders, such as government institutions, technology companies, and universities, is needed to produce research-driven regulation and improved digital capabilities.

The action plan also provides several new initiatives to create a digital-ready workforce with the requisite skills and capabilities to flourish in an increasingly digital economy and financial industry; including similar initiatives to establish a more technology-literate society.

These initiatives are in place to ensure the overall digital financial ecosystem will be able to fulfil its potential to increase economic capacity and promote financial inclusion. The plans and framework outlined in this strategy will deliver a thriving, inclusive, and forward-looking financial digital economy in Indonesia.

By combining each of the elements in the ecosystem, we will ensure the impact of digital financial innovation is not confined to one place but benefits everyone in the Indonesian archipelago from Sabang to Merauke and from Miangas to Pulau Rote.

I. EXECUTIVE SUMMARY

Financial services in Indonesia have evolved rapidly because of the expansion in internet access and mobile phone penetration, especially smartphones. Big data analytics and a range of new financial service providers from e-money and mobile payments to alternative finance platforms, especially peer-to-peer (P2P) and other digital lending models, have also contributed to the growth of the sector. Indonesia's fintech sector is not only helping banks, but also creating new financial players that are rapidly reaching more unbanked and underbanked customers than before.

Recognizing a need to support innovation, the Indonesia Financial Services Authority (OJK) established the Digital Financial Innovation Group (GIKD) to support the growing fintech sector. This Digital Finance and Innovation Road Map complements the government's existing financial inclusion strategies by:

(i) ensuring stable digital financial services that are safe and have appropriate risk management practices in place;
(ii) enabling contributive digital financial services that focus on empowering people and expanding financing to micro, small, and medium-sized enterprises (MSMEs);
(iii) ensuring inclusive digital financial services that are affordable, convenient, and scalable; and
(iv) supporting sustainable digital finance that is responsible and aligned with the Sustainable Development Goals.

OJK sees its role as an accelerator, facilitator, and incubator of fintech in Indonesia with five key approaches:

1. Policy and regulatory framework (research, policy, and regulation)
2. Regulatory sandbox (review of business models and business governance, and prototypes)
3. Capacity building (workshops, seminars, and fintech summits)
4. Facilitation (coworking spaces and consultations)
5. Collaboration (other regulators, fintech hub, and international organizations)

OJK understands the importance of balance in providing an enabling regulatory framework to support innovation in the fintech sector; while also ensuring the safety and soundness of the financial sector and consumer protection.

OJK has therefore adopted three regulatory and supervisory strategies to support digital financial innovations in Indonesia:

1. **An enabling but balanced framework**. OJK will ensure the safety and soundness of fintech development while also prompting innovation and competition.

2. **Agile regulations**. OJK will follow a principles-based approach to regulations for digital financial innovation; including harnessing new regulatory technologies (regtech) to enhance compliance.

3. **Market-conduct supervision**. OJK is accountable for regulation and supervision of fintech. Meanwhile, the fintech industry is responsible for managing their operations through the use of sound corporate governance practices, risk management, compliance, and—most importantly—an industry code of conduct to complement OJK's market-conduct regulations.

Pursuant to the road map, OJK will:

- enhance consumer protection in the digital age, including digital financial literacy and complaint management practices;
- collaborate with policy makers to ensure that digital data privacy policies and protection of same are adopted;
- enhance regulation and supervision of fintech, including the use of regtech and supervisory technologies (suptech) to improve and facilitate regulatory compliance and supervisory oversight;
- improve dialogue and support for innovation through the innovation hub, knowledge-sharing sessions and dialogue, a regulatory sandbox, and regional collaboration with the Association of Southeast Asian Nations (ASEAN), Financial Innovation Network and coordination with the Global Financial Innovation Network;
- improve safety and ensuring sound practices in the emerging fintech industry including cybersecurity and fraud prevention, and risk management;
- support the fintech ecosystem investment climate;
- provide training in the fintech sector; and
- enhance digital access infrastructure and policies related to digital identities (IDs), electronic know your customer (e-KYC), and open banking.

II. OVERVIEW

Financial services in Indonesia have evolved rapidly since the global financial crisis of 2008, harnessing innovation and new financial technologies (fintech) to expand outreach and provide new customer services.

Fintech has developed rapidly because of the expansion in internet access; mobile phone penetration, especially smartphones; big data analytics; and a range of new financial service providers from e-money and mobile payments to alternative finance platforms, including peer-to-peer (P2P) and other digital lending models. Fintech complements traditional financial institutions and is viewed as evolutionary, rather than disruptive.

The Indonesia fintech sector is not only helping banks, but also creating new financial players that are rapidly connecting with more unbanked and underbanked customers than in the past. If it is done properly, responsible fintech has the potential to close the financial inclusion gap more rapidly than conventional financial services. This is important because of the low banking penetration rate in Indonesia, which was 48.9% in 2017.[1] Another major challenge in Indonesia is the MSME financing gap. The International Finance Corporation and the World Bank estimate that the demand for credit by MSMEs in Indonesia was $165 billion (or 19% of gross domestic product), while only $57 billion is currently available.[2]

Recognizing the need for innovation, OJK formed the Digital Financial Innovation Group (GIKD) to support the growing fintech sector. The GIKD accommodates fintech industries by providing a "digital financial innovation" registration process before fintechs apply for specific types of financial service providers' licenses.

The Digital Finance and Innovation Road Map will support the government's financial inclusion strategies by developing a framework that (i) ensures digital financial services are stable and safe, and have appropriate risk management practices in place; (ii) enables contributions by digital financial services that empower people and expand MSME financing; (iii) ensures inclusive digital financial services are affordable,

1 World Bank Findex report 2017.

2 ADBI Working Paper Series (Oct 2019) Fintech Development and Regulatory Frameworks In Indonesia No. 1014.

convenient, and scalable; and (iv) supports sustainable digital finance that is responsible and helps achieve the Sustainable Development Goals. The underlying regulatory framework will ensure that appropriate consumer protection, data privacy, and appropriate governance principles are in place.

OJK will also focus on enhancing interagency and inter-regulatory collaboration as well as improving dialogue with the fintech sector, especially the Indonesia Fintech Association (AFTECH), sharia-compliant P2P lenders, and the banking and insurance industry. OJK will also (i) promote social marketing and fintech-enabled financial literacy and education efforts to encourage the uptake of digital financial services; (ii) support efforts to fast-track the improvement of talent within the fintech sector; and (iii) engage with the government and the private sector to further expand priority infrastructure needs. In particular, OJK has supported the development of a fintech curriculum with two universities and engaged with the industry on governance training. OJK is also active in regular knowledge-sharing dialogue events with the industry. The Innovation Centre for Digital Financial Technology (OJK Infinity Centre) also hosted the innovative, experiential financial education and career exploration pilot program for Indonesian Youth, called Y-Bank (www.Y-Bank.Asia).

OJK's focus on the contributive aspects of the fintech sector prioritizes the following issues: small and medium-sized enterprise (SME) financing, social empowerment, and fostering competition in the sector.

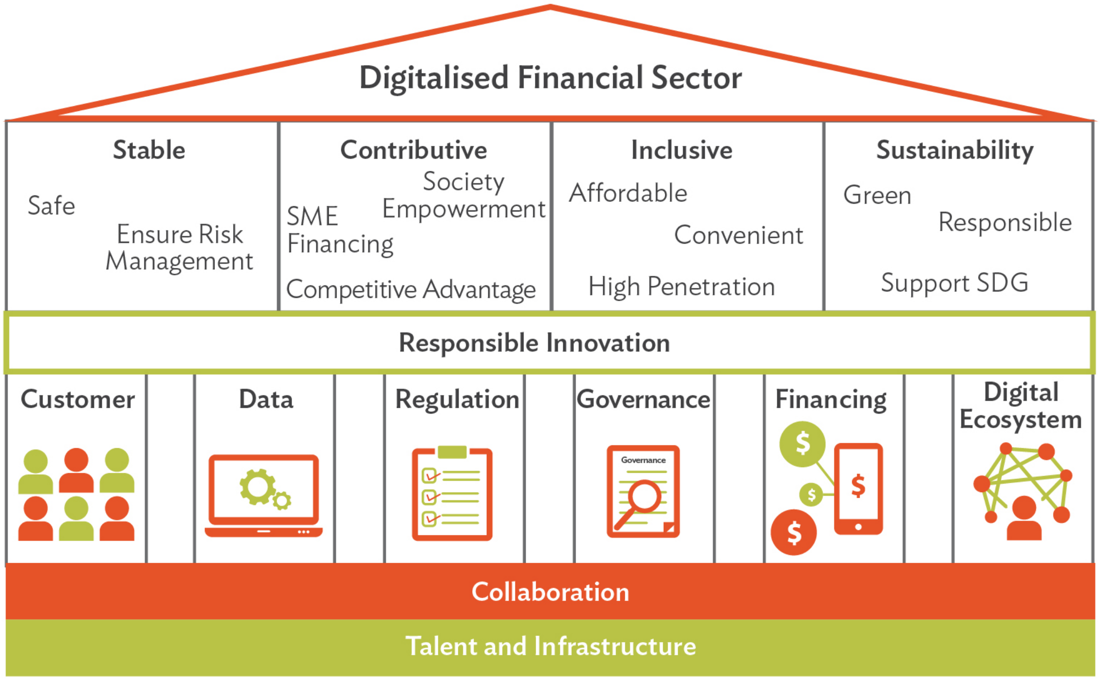
OJK's vision of a digital finance sector in Indonesia rests on four main factors: fintech that is stable, contributive, inclusive, and sustainable (Figure 1). **Stable** means the platform, technology, business process, and standard operating procedures used in the digital financial products are safe for consumers to use and the regulations overseeing them ensure all risk management measures are in place and implemented. It also means that the technology and platform is reliable and resistant to hacking, security breaches, and systemic disruption during natural disasters or other operational risks. **Contributive** refers to the contribution that the digital financial service has on increasing access to financing for SMEs, as well as empowering consumers to improve their financial health by offering more suitable and beneficial financial products and services. The sector should also be competitive by offering services that are affordable and take advantage of new technologies to reduce costs and expand outreach. **Inclusive** ensures the products and services developed by the industry reach out to as many underserved communities as possible. **Sustainability** focuses on ensuring that the technology and business processes are responsible, environmentally friendly, and support the achievement of the Sustainable Development Goals.

OJK wishes to foster the development of a responsible digital finance sector that builds in consumer protection practices, including the responsible use of client data, while ensuring the highest data privacy standards, appropriate levels of good governance, and compliance with for anti-money-laundering (AML) and combatting the financing of terrorism (CFT) requirements.

OJK also sees the key role that collaboration plays not only with new fintech players, but also between traditional financial institutions and new fintech providers that focus on outreach to new sectors; expanding access to agricultural finance and value chain payments, as well as facilitating access to insurance, health, education, and other sectors.

The building blocks for supporting the development of this sector are ensuring

Figure 1: Vision of Indonesia's Digital Finance Road Map



SDG = Sustainable Development Goal, SME = small and medium-size enterprise.
Source: Indonesia Financial Services Authority.

sufficient digital infrastructure, and ensuring there is an adequate pool of talent to build the sector.

Impact of the Coronavirus Disease Pandemic

Moving beyond the coronavirus disease (COVID-19) pandemic, there may be continued consequences from a prolonged economic shutdown, which could create opportunities and challenges. The cashless economy will receive a boost. But, regarding challenges, the pandemic will directly affect the capacity of most borrowers, especially smaller individual and micro-borrowers with limited disposable income.

Comprehensive analysis and flexible restructuring of loans will be necessary for an indefinite period. This will require OJK to work with the P2P marketplace and online balance sheet lending sector, as well as the entire banking sector. Extensive regulatory–private sector dialogue will be necessary to assess and support the digital lending sector in 2020 and into early 2021. In line with the latest guidance from the Financial Stability Institute of the Bank of International Settlements, OJK plans to introduce operational resilience standards for the fintech industry, including:

- reviewing guidance for critical and essential employees—identifying the critical functions and employees that support important business services, ensuring employees' safety, and making sure they can safely resume their duties, remotely if necessary;

3 R. Coelho and J. Prielo. 2020. Covid-19 and Operational Resilience: Addressing Financial Institutions' Challenges in a Pandemic. FSI Briefs. No. 2. https://www.bis.org/fsi/fsibriefs2.pdf.

- reviewing the information technology (IT) infrastructure—ensuring that IT infrastructure can support a sharp increase in usage over an extended period and taking steps to safeguard information security;
- ensuring that third-party service providers and/or critical suppliers are taking adequate measures and are sufficiently prepared for a scenario in which there will be heavy reliance on their services; and
- remaining vigilant about cyber resilience to identify and protect vulnerable systems and detect, respond to, and recover from cyberattacks.

III. DIGITAL FINANCE INDUSTRY DEVELOPMENT AND REGULATORY APPROACHES ACROSS THE WORLD

The digital finance industry is expanding rapidly around the world and regulators and policy makers are balancing the need to provide an appropriate regulatory and legal environment with the need to ensure safety and soundness of the financial markets.

The chair of the Financial Stability Institute of the Bank of International Settlements described the task as follows.

> On the one hand, authorities need to help bring the potential benefits of technological developments to fruition, for the good of the economy and financial system. Fintech promises to increase efficiency in delivering financial services, widen their range, increase competition and promote financial inclusion. On the other hand, policymakers must address a set of risks that could merit public intervention. In particular, increasing reliance on technology and unregulated third-party providers throws operational risks into sharper relief; new payment systems and instruments could compromise market integrity and, ultimately, the monetary system; new products may be mis-sold to consumers who do not understand their risks or cannot afford to bear them; and the business opportunities created by new technologies may erode privacy and encourage unethical conduct.[4]

Among regulators and policy makers, there are three approaches to fintech policies and regulatory environments: (i) those that directly regulate fintech activities, (ii) those that focus on the use of new technologies in the provision of financial services, and (iii) those that promote digital financial services more specifically.[5]

4 Speech by Fernando Restoy, chair of the Financial Stability Institute, Bank for International Settlements, at the ASBA-BID-FELABAN XVI Banking public–private sector regional policy dialogue "Challenges and Opportunities in the New Financial Ecosystem." Washington, DC. 16 October 2019. https://www.bis.org/speeches/sp191017a.htm.

5 See J. Ehrentraud et al. 2020. Regulating Fintech: A Cross-Country Analysis. FSI Insights on Policy Implementation. No. 23. https://www.bis.org/fsi/publ/insights23.pdf.

The first group of measures relates to the regulation of specific activities such as digital banking, P2P lending or equity raising, robo-advice, and payment services. The second group includes new rules or guidelines on market participants' use of technologies such as cloud computing, biometrics, or artificial intelligence. The third group covers enabling policy initiatives such as those related to digital identities; data sharing; and the establishment of innovation hubs, sandboxes, or accelerators (footnote 4). Since 2016 most jurisdictions have applied policy measures in some or all of these three areas. OJK has covered all three approaches.

Regulating Specific Fintech Activities

- Banking licenses are still required for any activity entailing a substantial risk related to use of funds raised from the public. However, when nonbank financial institutions are allowed to source cash from the public—typically for payment services—they face restrictions related to safeguarding customers' funds. Examples include maximum volumes or ample liquidity coverage such as the 100% reserve requirements for outstanding client balances (the float) in most countries, including Indonesia, that oversee e-money providers.
- Digital banking and the development of open banking is a relatively new area with rapid developments across Asia especially in Hong Kong, China;[6] Malaysia,[7] and Singapore. [8]
- For developments in the area of investment advice (robo-advice) or insurance services (insurtech) regulators are increasingly issuing specific supervisory guidance,[9] although most ASEAN members still regulate insurtech using preexisting regulations and laws, except Singapore, which has imposed specific measures on insurtech companies.[10]
- Specific licensing and conduct-of-business requirements have been established for activities such as issuance of e-money; provision of payment services, equity crowdfunding, P2P, and marketplace lending; and the use of bank and nonbank agents, especially across Indonesia and Malaysia.[11] In most cases, regulatory requirements focus on consumer and investor protection, in particular the safeguarding of customers' funds, AML and CFT, and operational resilience.
- Regulations on cryptoassets differs markedly across jurisdictions. In general, approaches depend on the nature of the issuer (whether regulated or unregulated); the function performed (e.g., the means of payment, investment opportunity, or access to services); and the existence and nature of underlying assets (e.g., securities or commodities). Authorities have often issued warnings—mostly referring to the use of cryptoassets for investment purposes—and clarifications on the regulation applied to issuers, holders, and

6 Hong Kong Monetary Authority. 2018. *Guide to Authorization*. Hong Kong, China; and Hong Kong Monetary Authority. 2018. *Authorization of Virtual Banks*. Hong Kong, China.

7 See Bank Negara Malaysia (BNM). 2020. *Licensing Framework for Digital Bank: Exposure Draft.* Kuala Lumpur. https://www.bnm.gov.my/index.php?ch=57&pg=137&ac=924&bb=file.

8 See Monetary Authority of Singapore (MAS). 2018. Eligibility Criteria and Requirements for Digital Banks. https://www.mas.gov.sg/-/media/Digital-Bank-Licence/Eligibility-Criteria-and-Requirements-for-Digital-Banks.pdf.

9 For example, guidance on elements specific to robo-advice has been issued in Australia; Canada; Colombia; Hong Kong, China; the Netherlands; the People's Republic of China; Singapore; South Africa; Sweden; the United Kingdom; and the United States. For insurance providers, the Hong Kong Insurance Authority has issued guidelines for regulating the use of internet distribution that consider the differences between online and conventional distribution channels (footnote 4).

10 See W. Yeong. 2017. Breakdown of InsurTech Regulations in Singapore. https://learn.asialawnetwork.com/2017/08/30/insurtech-regulations-singapore/.

11 See Consultative Group to Assist the Poor. 2020. The Use of Agents by Digital Financial Services Providers. https://www.cgap.org/research/publication/use-agents-digital-financial-services-providers.

intermediaries. In Malaysia, Singapore, and Thailand, there has been an increase in the use of cryptoassets, especially initial coin offerings. This has required regulators to introduce bespoke regulation or retrofit current regulation to oversee these activities.

Regulating the Use of Enabling Technologies

- Several jurisdictions have moved to address both the positive implications and the risks arising from the use of specific innovations. An example of a supporting policy is the use of application programming interfaces (APIs), which has been explicitly promoted to facilitate open banking, especially in Hong Kong, China; and Singapore. Open banking standards are now being developed in Indonesia, Malaysia, and the Philippines.
- In the area of distributed ledger technology, regulators in Hong Kong, China; Malaysia; and Singapore are taking action to provide legal certainty for the settlement of transactions, especially in the use of smart contracts.[12]
- Another area that regulators in Malaysia, Singapore, and Thailand are focusing on is providing legal certainty for new technologies such as the use of biometrics and electronic know your customer (e-KYC) to identify customers in regulated transactions (such as opening a bank account).[13]
- Malaysia, the Philippines, Singapore, and Thailand have allowed the use of cloud computing by banks and other regulated financial institutions with specific recommendations to control and manage technology risks.[14]
- Some authorities are also beginning to take action to address the risks posed by the misuse of artificial intelligence and machine learning algorithms, for instance, in credit or insurance underwriting. The Monetary Authority of Singapore (MAS) has published guidance listing underlying risks arising from the inadequate handling of personal data, poor governance, lack of transparency, and unethical behavior. MAS has also issued high-level principles for firms to follow in controlling these risks.[15]

Enabling Fintech Policies

- Most jurisdictions have adopted policies to create the infrastructure for digital services. These include reforms to allow financial institutions to use digital technologies to identify and verify customers without their physical presence.
- In some jurisdictions (such as Hong Kong, China; and Singapore), authorities have put in place a centralized platform that provides residents with a unique electronic key that can be used for verifying their identity in all types of transaction, with both the public

12 See. MAS. Blockchain/Distributed Ledger Technology. https://www.mas.gov.sg/development/fintech/technologies---blockchain-and-dlt; MyGovernment. Blockchain and Distributed Ledger Technology Initiatives in Malaysia 2019. https://www.malaysia.gov.my/portal/content/30633; and Hong Kong Monetary Authority. Distributed Ledger Technology. https://www.hkma.gov.hk/eng/key-functions/international-financial-centre/fintech/research-and-applications/distributed-ledger-technology-dlt/.

13 See P. Bhunia. 2018. MAS Issues Guidance to Allow Use of Innovative Solutions for Customer On-Boarding. https://www.opengovasia.com/mas-issues-guidance-to-allow-use-of-innovative-technology-solutions-for-customer-on-boarding/; BNM. 2019. Electronic Know-Your-Customer (e-KYC): Exposure Draft. https://www.bnm.gov.my/index.php?ch=57&pg=543&ac=867&bb=file; and S. Banchongduang. 2020. BoC Carves out KYC Path for Banking. *Bangkok Post*. 8 February. https://www.bangkokpost.com/business/1853114/bot-carves-out-e-kyc-path-for-banking

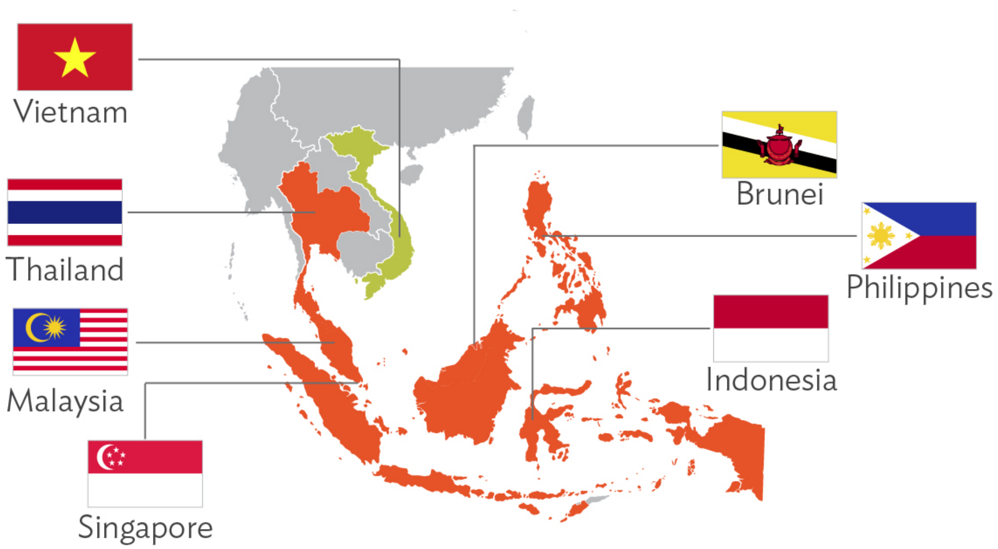
14 See MAS. Cloud. https://www.mas.gov.sg/development/fintech/technologies---cloud; BNM. Risk Management in Technology (RMiT). https://www.bnm.gov.my/index.php?ch=57&pg=543&ac=816&bb=file; Bangko Central ng Pilipinas. 2017. Enhanced Guidelines on Information Security Management. http://www.bsp.gov.ph/downloads/regulations/attachments/2017/c982.pdf; and Bank of Thailand. Regulations on IT Outsourcing for Business Operations of Financial Institutions. https://www.bot.or.th/Thai/FIPCS/Documents/FPG/2560/EngPDF/25600035.pdf.

15 See MAS. 2018. Principles to Promote Fairness, Ethics, Accountability and Transparency in the Use of Artificial Intelligence and Data Analytics in Singapore's Financial Sector. *Monographs and Information Papers*. 12 November.

and the private sectors.

- Hong Kong, China; Malaysia; and Singapore have regulated the exchange of customers' information between different players.
- In addition, most advanced and emerging market economies have set up various types of arrangements to promote an orderly application of new technologies in the financial industry. These arrangements take the form of innovation hubs, regulatory sandboxes, and accelerators. (Hong Kong, China; Indonesia; Singapore; and Thailand support all three approaches.)
- Innovation hubs are the most widespread of these facilitators. They provide support and guidance to fintech providers to facilitate a better understanding of regulatory requirements. Several jurisdictions have also created regulatory sandboxes that allow the risks associated with new business models to be assessed in a controlled environment. So far, sandboxes have been used to assess whether consumers would be adequately protected while using new applications, products, or services. Approaches vary in terms of criteria for accepting projects, testing parameters, application process, and exit strategy. In some cases, the final outcome is simply an authorization to continue offering the tested products or services, while in others it may also include an adjustment or a formal clarification of existing regulatory requirements. It is important to note, however, that financial regulators should be cautious about too much direct involvement in supporting individual fintech firms or services to avoid any potential conflict of interest. Almost all the regulators across ASEAN have active innovation hubs and regulatory sandboxes (Figure 2).
- The emergence of BigTech—large nonbank technology firms that offer a wide range of financial services (such as Amazon Inc.,

Figure 2: Regulatory Sandbox Initiatives Across ASEAN



Sources: UNSGSA FinTech Working Group and CCAF. Early Lessons on Regulatory Innovations to Enable Inclusive FinTech (2019) and CCAF (2019).

Alibaba Group Holdings Ltd., Tencent Holdings Ltd., Facebook Inc., Gojek, and Grab Holdings Inc.)—raises concerns among regulators about the potential to create new sources of systemic risk, which may require regional and global policy and regulatory coordination to address, especially given that standard prudential instruments such as capital or liquidity requirements may prove inadequate. In addition, market dominance may also lead to anticompetitive, or monopolistic practices that should be carefully managed.

Another global trend is for fintech policy actions to aim to minimize the scope for regulatory arbitrage. This is especially important in markets with multiple financial regulatory agencies. Most policy makers recognize that new technologies can help new players perform activities that were traditionally conducted only by tightly regulated institutions. Fintech regulation should therefore be adjusted to prevent risk-generating business activities from migrating between regulatory authorities in search of lighter regulatory controls. In this regard, the concept of same activity, same regulation is often seen as a reference for sound policy to promote equal treatment and prevent regulatory arbitrage following the emergence of fintech firms and especially of BigTech. The general consensus is that all entities involved in a specific regulated activity should be subject to the same rules, regardless of their nature or legal status (footnote 4). Table 1 compares the fintech regulations across selected ASEAN members.

Table 1: Comparative Matrix of Fintech Regulations across Selected Members of the Association of Southeast Asian Nations

Regulatory Approaches	Subtopic	Singapore	Malaysia	Philippines
Regulating specific fintech activities	Licensing e-money	Expanded e-money licensing under Payment Services Act has increased the number of nonbank fintech e-money providers, increased competition, and lowered costs resulting in increasing customer usage.[a]	Bank Negara Malaysia (BNM) has issued more than 50 e-money licenses and has witnessed substantial growth in e-payments with increased competition and growing consumer adoption.[b] E-money is now seen as a sharia-compliant payment instrument.[c]	Bangko Sentral ng Pilipinas (BSP) was one of the first in the region to allow e-money services by nonbanks, in 2004. E-money was formally licensed by the BSP in September 2009 under Circular 649.[d]

a Deloitte. Understanding the Regulatory Requirements of the MAS Payment Services Act. https://www2.deloitte.com/content/dam/Deloitte/sg/Documents/financial-services/sg-fsi-payment-services-act-2019-wns.pdf.

b R. Yunis. 2020. E-Money Hits Near RM40b in 5 Years. https://themalaysianreserve.com/2019/08/27/e-money-hits-near-rm40b-in-5-years/; and Cultivate Trends. 2020. Key Developments in Mobile eWallets Payments in Malaysia. https://cultivatetrends.com/key-developments-in-mobile-ewallets-payments-in-malaysia/.

c Sharia Advisory Council. 2020. The Sharia Advisory Council of Bank Negara Malaysia Ruling on E-Money as a Sharia Compliant Instrument. 201st SAC Meeting. 29 and 30 January https://www.bnm.gov.my/documents/SAC/03_SAC201_Statement_eMoney_en.pdf.

d BSP. 2009 BSP Circular 649. http://www.bsp.gov.ph/downloads/Regulations/attachments/2009/c649.pdf

	Digital Banking	The Monetary Authority of Singapore (MAS) launched new digital bank license offerings in 2019 and received 21 applications by 31 December 2019	BNM is finalizing its digital bank policy document and will open the application process in mid-2020. Up to five licenses are expected to be issued in 2020.	BSP granted the first two virtual bank licenses in 2019, and more are planned for 2020
	Open Banking	To support open banking, MAS published an application programming interface (API) playbook in 2018. To date Singapore's API Register has logged 121 transactional and 192 informational APIs.	Malaysia has established a voluntary framework for open banking. BNM also set up an open API implementation group in 2018, with a focus on developing standards on open data, security, access rights, and oversight arrangements for third-party payment providers, and to review existing customer information regulations.	BSP has recently conducted a survey to gauge the interest and willingness of banks to engage in open banking and plans to develop an open banking framework in 2020.
	Peer-to-peer (P2P) and marketplace lending	Singapore has no direct regulations on P2P lending, but Singapore's principles of promoting fairness, ethics, accountability, and transparency govern all lenders including P2P platforms.	P2P lending is governed by the Capital Markets and Services Act, 2007 and regulated by the Securities Commission Malaysia (SCM). On 13 April 2016, the SCM issued the Guidelines on Recognized Markets to regulate	P2P platforms must register with the Securities and Exchange Commission (SEC). While the BSP does not directly regulate P2P lenders, the Truth in Lending Act does apply to all lenders and the Data Privacy Act is

e SEC. 2019 SEC Approves Rules on Crowdfunding. http://www.sec.gov.ph/wp-content/uploads/2019/07/2019PressRelease_SEC-approves-rules-on-crowdfunding.pdf

			the practice of P2P in Malaysia. Where an Islamic investment note is executed on a P2P platform, the P2P operator must ensure that the trust account is sharia compliant.	being utilized to protect fintech lending consumers.
	Equity crowdfunding	MAS administers equity-based crowdfunding the same way it governs debt-based crowdfunding. For both cases, the crowdfunding platform must have a capital markets service license. If a platform also offers financial advice on investment, it should hold a license to act as a financial advisor; see Financial Advisers Act (Cap. 110).	Equity crowdfunding is supervised by the SCM. In April 2020, the SCM lifted fundraising limits on equity crowdfunding (ECF) platforms, and allowed ECF and P2P financing schemes to operationalize secondary trading with immediate effect because of micro, small, and medium-sized enterprises interest to tap alternative fundraising channels to expand access to alternative capital and financing for small and medium-sized enterprises.	In 2019, the SEC issued rules and regulations on crowdfunding with a focus on small and medium-sized enterprise finance.[e]

f MAS. 2019. Proposed Regulatory Approach for Derivatives Contracts on Payment Tokens. https://www.crowdfundinsider.com/wp-content/uploads/2020/05/MAS-Consultation-Paper-on-Proposed-Regulatory-Approach-for-Derivatives-Contracts-on-Payment-Tokens-November-2019.pdf

g SCM. Digital Assets. https://www.sc.com.my/development/digital/digitalassets

h BSP. http://www.bsp.gov.ph/downloads/regulations/attachments/2017/c944.pdf

i MAS. Financial Industry API Register. https://www.mas.gov.sg/development/fintech/financial-industry-api-register

j BNM. Procurement Notices: Open Application Programing Interface Platform. https://www.bnm.gov.my/index.php?ch=en_tender&pg=en_tender_rfp&ac=5845&lang=en

k MAS. Blockchain/Distributed Ledger Technology. https://www.mas.gov.sg/development/ fintech/technologies---blockchain-and-dlt

l MyGovernment. Blockchain and Distributed Ledger Technology (DLT) Initiatives in Malaysia 2019. https://www.malaysia.gov.my/portal/content/30633

m BSP. 2018. Providing an Enabling Environment at the Crossroads of Digital Transformation. Speech delivered at the Annual Convention of the Association of Philippine Correspondent Bank Officers. Puerto Princesa. 30 June 2018. http://www.bsp.gov.ph/publications/speeches.asp?id=616

	Electronic know your customer (e-KYC)	MAS is working with the Smart National Digital Government Office and the Government Technology Agency to develop the National Digital Identity platform that will provide Singapore residents with a nationally available means to prove their identity and sign documents digitally so they can transact conveniently and securely online.[n]	BNM issued an exposure draft in December 2019 that sets out the proposed requirements and guidance in implementing e-KYC for the onboarding of individuals to the finance sector.[o]	Even though the Philippines is still working on the implementation of a national ID system, the BSP has been developing various e-KYC approaches to onboard new customers.[p]
	Cloud computing	Cloud computing is seen as a form of outsourcing and is openly allowed and encouraged by MAS.[q]	Financial institutions using cloud computing must follow the new policy guidance on risk management in technology.[r]	Cloud computing is allowed by the BSP under the Enhanced Guidelines on Information Security Management.s With support from the Asian Development Bank, the BSP has also experimented with and used cloud computing to expand financial inclusion in the Philippines.[t]

n MAS. Digital ID and e-KYC. https://www.mas.gov.sg/development/fintech/technologies---digital-id-and-e-kyc

o BNM. 2019. Exposure Draft on Electronic Know You Customer (e-KYC) https://www.bnm.gov.my/index.php?ch=57&pg=543&ac=867&bb=file

p ePay Pilipinas. 2017. BSP Crafts Rules for Electronic KYC Procedures. http://www.epaypilipinas.com/bsp-crafts-rules-electronic-kyc-procedures/

q MAS. Cloud. https://www.mas.gov.sg/development/fintech/technologies---cloud

r BNM. 2020. Risk Management in Technology (RMiT). https://www.bnm.gov.my/ index.php?ch=57&pg=543&ac=816&bb=file

s BSP. 2017. Enhanced Guidelines on Information Security Management. http://www.bsp.gov.ph/downloads/regulations/attachments/2017/c982.pdf

t M. Valenzuela and J. Izaguirre. 2019. Cloud Computing for Financial Inclusion: Lessons from the Philippines. https://www.cgap.org/blog/cloud-computing-financial-inclusion-lessons-philippines

	Artificial intelligence and algorithms	MAS' Principles to Promote Fairness, Ethics, Accountability and Transparency in the Use of Artificial Intelligence and Data Analytics is seen as one of the most extensive guidelines in the region.[u]	Guidance on artificial intelligence and machine learning algorithms is covered under the e-KYC exposure draft.[v]	The BSP has not issued any guidance on this topic.
Enabling Fintech policies	National digital IDs that enable and support financial services	MAS is working with the Smart National Digital Government Office and the Government Technology Agency to develop the National Digital Identity Platform.	The Digital Identity Verification Platform is for the use of government and private service sectors, mainly to meet the need verify the identity of individuals who have accessed electronic services, perform transactions, and provide digital signatures.[w]	As part of its financial inclusion initiatives, the BSP has reached a government-to-government deal with the Philippine Statistics Authority to provide the country's biometric national identification card. However, implementation is still ongoing.[x]
	Data sharing, privacy, and protection	MAS-issued regulatory instruments that are relevant to data protection include the Notices and Guidelines on	BNM issued guidance to the finance sector under its "Management of Customer Information	Data sharing, privacy, and protection are governed by the Data Privacy Act and implemented

u Principles to Promote Fairness, Ethics, Accountability and Transparency (FEAT) in the Use of Artificial Intelligence and Data Analytics in Singapore's Financial Sector. https://www.mas.gov.sg/~/media/MAS/News%20and%20Publications/Monographs%20and%20Information%20Papers/FEAT%20Principles%20Final.pdf

v

w My Government. National Digital Identity Initiative. https://www.malaysia.gov.my/portal/ content/30592.

x BSP. 2019. Financial Inclusion Initiatives. http://www.bsp.gov.ph/downloads/Publications /2019/microfinance_2019.pdf

		Technology Risk Management, MAS Notices and Guidelines on Prevention of Money Laundering and Countering the Financing of Terrorism (AML and CFT), and the MAS Guidelines on Outsourcing. Broadly, these guidelines make clear that financial institutions may continue the existing practice of collecting, using, and disclosing personal data without customer consent for the purposes of meeting the AML and CFT requirements, and acknowledge customers' rights under the Personal Data Protection Act, 2012 to access and correct personal data that is in the possession or under the control of the financial institutions.[y]	and Permitted Disclosures."[z]	by the Data Privacy Commission.[aa] The commission enforced violations of more than 48 fintech lenders in 2019.

y Drew & Napier LLC. Data Protection and Privacy in Singapore. https://www.lexology.com/library/ detail.aspx?g=44345885-c855-478f-b782-578996c4bba4

z BNM. 2017. Management of Customer Information and Permitted Disclosures. https://www.bnm.gov.my/index.php?ch=57&pg=144&ac=632&bb=file

aa National Privacy Commission. 2012. Republic Act 10173—Data Privacy Act of 2012. https://www.privacy.gov.ph/data-privacy-act/

	Innovation hubs, accelerators, and regulatory sandboxes	MAS operates an innovation hub and an active regulatory sandbox.[bb]	BNM's regulatory sandbox serves as a platform to enable innovative solutions to be deployed and tested in a live environment, but within specified parameters and time frames.[cc]	The BSP was one of the earliest innovators, launching one of the first regulatory sandboxes, called the "test-and-learn approach" in 2004, which allowed the BSP to permit e-money issuers under a letter of no-objection. Since then, the BSP has strengthened its fintech initiatives by launching a dedicated financial technology subsector unit as well the Technology Risk and Innovation Supervision Department, which is primarily responsible for conducting onsite and offsite information technology supervision of regulated entities, and maintaining a comprehensive and flexible regulatory framework relating to information technology supervision. The Technology Risk and Innovation Supervision Department is

bb MAS. Overview of Regulatory Sandbox. https://www.mas.gov.sg/development/fintech/regulatory-sandbox

cc BBNM. 2020 Annual Report 2019. Unlocking the Potential of Innovation: Preparing for a Digital Future. https://www.bnm.gov.my/ar2019/files/ar2019_en_box3.pdf

				also in charge of cybersecurity surveillance and promoting digital or fintech innovation through the BSP's regulatory sandbox.[dd]

dd B. Diokno. 2019. Inclusion and Digital Transformation—A Collaborative Approach to Regulating Fintech. Speech delivered at the Finance Executives Breakfast Roundtable. Manila, 11 October. https://www.bis.org/review/r191023g.htm

IV. DIGITAL FINANCE INDUSTRY DEVELOPMENT IN INDONESIA

Development of Digital Finance Innovation

The fintech industry in Indonesia sees its role as providing improved access to, and promoting greater and easier usage of, financial services that are convenient and affordable. OJK has taken an interactive and collaboration approach to providing a proportionate regulatory environment.

To provide a balanced regulatory approach, OJK supports the application of new technologies that accelerate exponential growth in a responsible manner. To better enable the sector, OJK seeks to closely follow technology developments without creating barriers that may slow responsible innovation. It also seeks to ensure a competitive digital finance industry by enforcing rules that avoid any potential monopolistic practices.

The combination of above-mentioned factors creates a balanced regulatory approach that supports responsible financial innovation that is safe and ensures adequate consumer protection. Under regulation, OJK No.13/POJK.02/ 2018, on digital finance innovation in the finance sector, OJK has set forth an appropriate fintech regulatory framework.

In April 2020, OJK recorded 83 digital financial innovation providers. These providers are divided into 18 clusters and business models: aggregator, claim service handling, credit scoring, property investment management, financial planners, financing agents, funding agents, online distress solution, online gold depository, project financing, social network and robo-advisor, blockchain-based, tax and accounting, electronic know your customer (e-KYC), customer due diligence verification, insurtech, regtech, and insurance broker marketplace, which will all follow the review process of the regulatory sandbox at OJK.

Through the regulatory sandbox, considering the risks generated by certain use cases, or any other specific issues that need special attention, OJK may also formulate specific regulations on specific subject matter. As the purpose of this regulation is very specific, it should be more detailed and in-depth. To avoid regulatory overload, the issuance of such regulations should be very selective and based on a strong market case. The main purpose of this regulation is to maintain the integrity and stability of the market, while accommodating the potential for market growth.

The four major clusters of digital finance innovation in Indonesia are digital payments, digital banking, peer-to-peer (P2P) lending, and crowdfunding.

Digital Payments

The Bank of Indonesia oversees Indonesia's Payment Systems Blueprint, 2025.[16] The payment system infrastructure is critical to promoting a digital economy and ensures the smooth processing of cash (currency-based payment) and noncash (deposit accounts based payment and non-deposit account based payment) circulation to the public inclusively and equitably. Bank Indonesia is also building BI-FAST, a fast payment infrastructure that serves all types of payment transactions, including card-based transactions. BI-FAST will clear with the Bank Indonesia National Clearing System and the National Payment Gateway as the retail infrastructure on the back-end. BI-FAST is expected to encourage industry competitiveness, provide more extensive payment options for the public, improve transaction efficiency, and strengthen the reliability of retail payment systems in Indonesia. To further enhance Bi-FAST, the Bank Indonesia National Clearing System will focus on clearing and checks settlement, and demand deposits. In addition, Bank Indonesia, together with industry, plans to develop an integrated payment interface to ensure interoperability and interconnectivity between various payment service providers and traditional financial institutions. The goal is to facilitate innovation by the service providers while reducing the barriers to entry.

Bank Indonesia is also working to enhance standardization in the payments sector and has launched a quick response (QR) code standard for Indonesia to encourage interoperability and economic efficiency. Additional activities include standardization under the National Payment Gateway, the National Standard Indonesian Chip Card Specification, and the Garuda Card will also continue to be expanded under Indonesia's Payment System Blueprint Strategy. In addition, domestic credit card standards are to be further developed to reduce the high interchange fees imposed by global credit card schemes.

Digital Banking

OJK issued Regulation No.12/POJK.03/2018 on the Implementation of Digital Banking Services by Commercial Banks.[17] This regulation aims to encourage efficiency in banking operations through the use of responsible-IT innovation, and to improve the quality of service so that it is faster, easier, and better suits customers' needs. All banks offering digital banking services must be approved by OJK. Several banks in Indonesia have already provided digital onboarding through bank applications, collaborating with financial service and/or nonfinancial service suppliers that enable customers to transact faster by using an open API connection, and providing payment authorization alternatives; such as the use of QR code payments.

OJK notes a trend within the banking sector to expand financial services through the development of IT capacities so as to become full-fledged, digital banks. OJK also has observed that IT companies have an interest to participate in the Indonesian digital banking landscape by expanding their services to include digital banking. While the existing digital banking regulation has not yet covered the institution

16 Bank Indonesia. 2019. *Indonesia Payment Systems Blueprint 2025*. Jakarta.

17 OJK. 2018. *Regulation No.12/POJK.03/2018: Digital Banking Service by Commercial Bank*. 8 August. Jakarta.

and licensing aspects for a full digital bank, OJK is conducting research to see how full digital banking maybe adopted in the future. OJK will carefully monitor and support this trend over the next few years.

Nonbank Fintech or Peer-to-Peer Lending

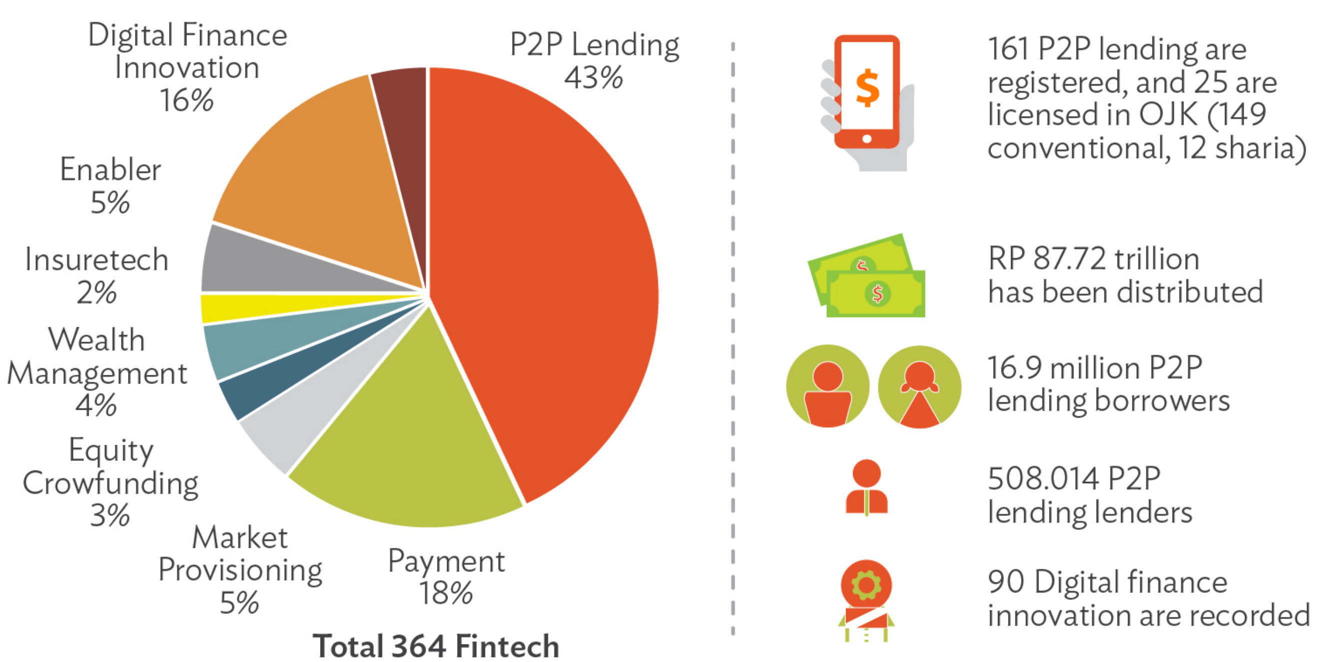
Indonesia's largest fintech sector is the digital nonbank lenders. These include balance sheet lenders that operate platforms using their own funds for businesses and consumers, P2P business and consumer online lending platforms where people and other institutions provide loans to businesses or consumers, and factoring or invoice online lending platforms that provide businesses with purchase invoices, or accounts payable from other businesses or clients to receive credit.

In April 2020, there were 364 fintech companies in Indonesia. They represent business models such as P2P, payment provision, Digital Financial Innovation platforms and tools for personal and wealth management, and insurtech (Figure 3).

The two fastest-growing fintech categories in Indonesia are P2P (both marketplace, and balance sheet lenders); and payment service providers. OJK's March 2020 data documents the rapid growth and outreach of these providers.

At the end of March 2020, there were 161 P2P lending providers in Indonesia, 136 of them registered and 25 licensed by OJK. Of these, 149 fintech lenders are conventional, while 12 are Sharia lenders. Disbursed P2P loans totaled Rp 87.72 trillion in Java and Rp14.81 trillion outside Java; with the total outstanding P2P loan

Figure 3: Fintech Market in Indonesia by Category, April 2020



Source: Indonesia Finance Services Authority and Aftech. 2020
OJK = Indonesia Financial Services Authority, P2P = peer to peer.

portfolio at Rp12.62 trillion in Java and Rp2.17 trillion outside Java. This was an increase of almost 86% since March 2019.

About 70% of P2P borrowers are in the 19–34 age bracket, and almost 28% are aged 25–54. Women represent 49.29% of fintech customers and men account for 50.59%. Most borrowers are individuals or smaller MSMEs, and only 0.13% are companies.

There are 528,441 P2P lenders in Java and 107,966 lenders outside of Java. The number of lenders increased by 157% in Java and 66% outside Java compared with the previous year. Larger corporate investors are also increasingly interested in providing financing via P2P lending platforms, and the number of lenders in this category increased by 72.5% between 2019 and 2020.

The significant increases in loans, and the new individual and corporate lenders, requires increased attention to financial consumer protection.

Although there continues to be a rapid growth in fintech lending, the number of borrowers from outside Java, where the majority of Indonesians live is considerably smaller than those within Java. The uneven growth rates have been attributed to Java's larger economy and higher financial literacy levels (footnote 2).

Equity Crowdfunding

There are two main challenges in developing economies. First, from the funding side, the power to invest is limited and they can only afford retail investment schemes, which are small ticket-size investments. Second, from the debtor side, most MSMEs cannot obtain funds from commercial investors because of the limitations they have in terms of formal requirements to raise funds from the capital markets.
Another challenge is that investors consider MSME investment to be high-risk. Thus, most MSMEs opt for loan-based crowdfunding, which provides certainty through interest payments to the investors, and the guarantee of receiving the invested funds at the end of the contract. MSME start-ups may also lack sound financial capacity at the early stages of operations. Some may prefer to obtain equity participation, which is not subject to interest payments and allows the business to grow.

Because MSMEs may not be able to obtain funds from the capital market, equity crowdfunding is a viable solution for MSMEs. Equity crowdfunding is also expected to support financial inclusion. Through an appropriate principles-based regulatory framework, OJK sees the opportunity to develop this sector and increase the ability of equity crowdfunding to be incorporated within the broader financial services sector.

Equity Crowdfunding Regulation

IT has been crucial for enabling the financial industry to generate financing alternatives for businesses, including MSMEs, and enhancing financial inclusion across the country. Given the challenges associated with small investments in MSMEs, especially start-ups, equity crowdfunding ventures are seen as an alternative funding source for these businesses.

More than 2 years after the release of its P2P lending regulation in 2016, OJK issued POJK No. 37/POJK.04/2018, on equity crowdfunding.[18] OJK has since licensed three equity crowdfunding companies: Bizhare, CrowdDana, and Santara.[19]

18 OJK. 2018. *Regulation No. 37/POJK.04/2018: Equity Crowdfunding*. 31 December. Jakarta.

19 www.bizhare.id; www.crowddana.id; and www.santara.co.id.

Pursuant to this regulation, OJK acknowledges the need to support start-ups through the provision of alternative fund sources via IT so that these businesses can contribute to the national economy. The regulation is intended to provide legal certainty and protection to all stakeholders involved in the crowdfunding from the investor to the platform provider, to the investee. It also lays the framework for equity crowdfunding licensing.

The promotion of equity crowdfunding in Indonesia has been slowed by low levels of digital financial literacy, and lack of awareness among SMEs, who have not understood what equity crowdfunding entails. Therefore, SMEs still rely on conventional sources of finance, such as loans or credit facilities from banks, multifinance companies, or P2P providers. It should be noted, however, that other factors, such as lack of capital and collateral mean that not everyone is bankable. This is especially true of SMEs, which are obliged to pay the interest and the principal from their uncertain cash flow. In equity crowdfunding, the investor could receive returns from profit sharing. If an investor wishes to exit from his investment, he can sell a portion or the whole on the equity crowdfunding secondary market, and potentially make a profit.

While the COVID-19 lockdown temporarily affected the issuance of new licenses for equity crowdfunding, licensing is expected to resume in the second half of 2020.

V. DIGITAL FINANCE ECOSYSTEM

OJK as an Accelerator, Facilitator, and Incubator

As an accelerator, facilitator, and incubator of fintech in Indonesia, OJK has the following five main initiatives.

1. Policy and regulatory framework: research, policy, regulation

In the area of research, OJK has developed reports on several topics that it will further scrutinize and apply during the road map period. These areas include (i) uses of alternative data in credit scoring, (ii) the roles and functions of digital finance aggregators, (iii) e-licensing using blockchain, (iv) financial planning tools, and (v) project financing.

OJK has also worked with universities to better understand the role of fintech in supporting MSMEs. The research included interactions with MSMEs from various sectors to better understand the opportunities to further enable access to finance via digital credit and equity crowdfunding. The results of this research will also help to guide areas that OJK can support during this road map.

2. Regulatory sandbox: review of business models and business governance, prototypes

Eighteen different fintech models participate in OJK's regulatory sandbox, and the number is expected to expand during the implementation of this road map with more attention to topics including e-KYC and AML practices (Figure 4).

3. Capacity building: workshops and seminars, fintech summits

OJK has been coordinating and facilitating annual fintech summits that share current and futures developments in the Indonesian fintech industry. These events will continue to be held in close collaboration with the fintech industry as a key part of OJK's capacity building role.

OJK has also held quarterly seminars and webinars on the latest trends and most important topics. The COVID-19 situation has highlighted the important role that digital webinars can play in effective capacity building efforts for OJK, other regulators and policy makers, the fintech industry, and the public at large.

4. Facilitation: coworking space, consultations

Figure 4: Eighteen Business Models in the Regulatory Sandbox

CDD = customer due diligence, E-KYC = electronic know your client.
Source: Indonesia Financial Services Authority.

An important part of OJK's role is to provide a gateway to the fintech industry to better understand the regulations and authorization process. OJK has provided consultancy facilitation with fintech firms in the OJK Infinity Centre since August 2018.[20]

During the COVID-19 pandemic, OJK has expanded its online consultation facilities and recognizes that this an efficient way to greatly increase the volume of consultations with industry.

5. Collaboration: other regulators, fintech hub, international organizations

The OJK Infinity Centre is the key fintech hub working on international collaboration with a number of financial regulators, including MAS to better collaborate on developing better interaction and facilitation with the fintech industry and investment community. OJK also works closely with international organizations such as the Asian Development Bank, the Asian Development Bank Institute (ADBI), the Australian Centre for Financial Studies, the State of Victoria, and the United Nations Development Programme.

20 OJK conducted 827 consultations with the fintech industry between August 2018 and April 2020.

Regulation and Supervision

OJK appreciates the importance of its balancing role of providing an enabling regulatory framework to support innovation in the fintech sector while also ensuring the safety and soundness of the finance sector and the protection of consumers. This strategy is consistent with President Joko Widodo's keynote address at the International Monetary Fund–World Bank Group annual meetings in 2018 during the Bali Fintech Agenda, where he stated that to create an enabling regulatory environment, there should be *a light touch while ensuring safe harbor.*[21]

OJK has therefore adopted three regulatory and supervisory strategies to support digital financial innovations in Indonesia:

1. Enabling but applying a balanced framework. OJK will ensure the safety and soundness of fintech development while prompting innovation and competition.
2. Agile regulations. OJK will follow a principles-based approach to regulating digital financial innovation, including harnessing the use of new regulatory technologies (regtech) to enhance compliance.
3. Market conduct supervision. OJK is accountable for fintech regulation and supervision. The fintech industry is responsible for managing their business by applying sound corporate governance; risk management; compliance; and, an industry code of conduct to complement OJK's market-conduct regulations.

OJK regulates all fintech providers in areas such as digital banking; P2P, marketplace, and balance sheet lending; crowdfunding platforms; insurtech; investment and personal financial management providers; and market aggregators. It also shares oversight of the fintech sector with Bank Indonesia, which regulates payments and e-money.

The existing regulations are summarized as follows (footnote 2).

OJK Regulation No.77/POJK.01/2016 on Information Technology-based Lending

This regulation provides oversight for the fintech P2P lending sector (including marketplace platforms and balance sheet lenders).

OJK Regulation No.12/POJK.03/2018 on the Implementation of Digital Services by Commercial Banks

This regulates the use of information technology for digital banking. All banks that wish to issue electronic and/or digital products must request permission from OJK. Banks must emphasize product innovation, cooperation with partners, and digital processes to ensure better services for customers and effective risk management.

OJK Regulation No.13/POJK.02/2018 on Digital Financial Innovation in the Financial Services Sector

This is an umbrella regulation for fintech. It is designed as a principles-based regulation for the fintech industry and aims to create responsible digital finance innovation. Any fintech company that is not yet regulated by other authorities must apply to OJK to go through the regulatory sandbox process and obtain a license. The key dimensions of this regulation are responsible finance innovation, adoption of a robust security system, the use of high levels of good

21 Government of Indonesia, Ministry of Finance. 2018. The President Opened Bali Fintech Seminar on AM2018Bali. *News release.* 11 October. https://www.kemenkeu.go.id/en/publications/news/the-president-opened-bali-fintech-seminar-on-am2018bali/.

governance, and compliance with customer protection and rules for AML and combatting the financing of terrorism (CFT). According to this regulation, the scope of fintech includes the following:

1. settlement of transactions;
2. raising of capital (equity crowdfunding, virtual exchange and smart contracts, and alternative due diligence);
3. management of investment (advance algorithm, cloud computing, capabilities sharing, open source information technology, automated advice and management, social trading, and retail algorithmic trading);
4. raising and distribution funds (P2P lending, alternative adjudication, virtual technologies, mobile 3.0, and third-party application programming interface);
5. insurance (sharing economy, autonomous vehicle, digital distribution and securitization, and hedge funds);
6. market support (artificial intelligence or machine learning, machine readable news, social sentiment, big data, market information platform, and automated data collection and analysis);
7. support of other digital finance (social or eco crowdfunding, Islamic digital financing, e-waqf, e-zakat, robo-advice, and credit scoring); and
8. other financial services activity (invoice trading, voucher, token, and blockchain-based products).

OJK Regulation No.37/POJK.04/2018 on Equity Crowdfunding

This regulation focuses on regulating equity crowdfunding. It aims to boost economic growth in Indonesia by providing access to capital for start-ups and SMEs raising funds electronically for the development of their businesses.

Bank of Indonesia Regulation No.19/10/PBI/2017 on Fintech Companies

The regulation is intended to support the fintech ecosystem and the Indonesian economy, in particular, payment system providers. Payment system providers are obliged to register at Bank Indonesia and cannot offer cryptocurrency. They are all required to be tested in the regulatory sandbox for about a year before they apply for a license.

Bank of Indonesia Regulation No.20/6/PBI/2018 on Electronic Money (E-money)

The regulation is intended to accommodate the development of the e-money business model by enhancing the institutional capacity of e-money issuers, including capital and ownership composition.

Strategic Issues in the Digital Finance Industry

Fintech improves financial inclusion by responsibly and sustainably providing individuals—especially those in underserved sectors, including people living in rural areas, the unbanked and underbanked, women, and MSMEs—with greater access to financial products and services such as payments, savings, credit, and insurance. Fintech-enabled services can also increase efficiencies, widen outreach, and increase competition. However, new technologies and unregulated fintech providers (including third-party operators) can increase operational risks, as well as risks to consumers who may not understand the risks associated with the products offered, especially in populations where financial literacy is low. In 2019, OJK released survey data showing that 38% of Indonesians were financially literate. However, the financial literacy rate is sharply lower for youth, possibly because of lack of experience with financial services. Similarly, it is typically lower in older populations as mental acuity begins to decline with age. New technologies may also lead to data privacy issues and unethical market conduct.

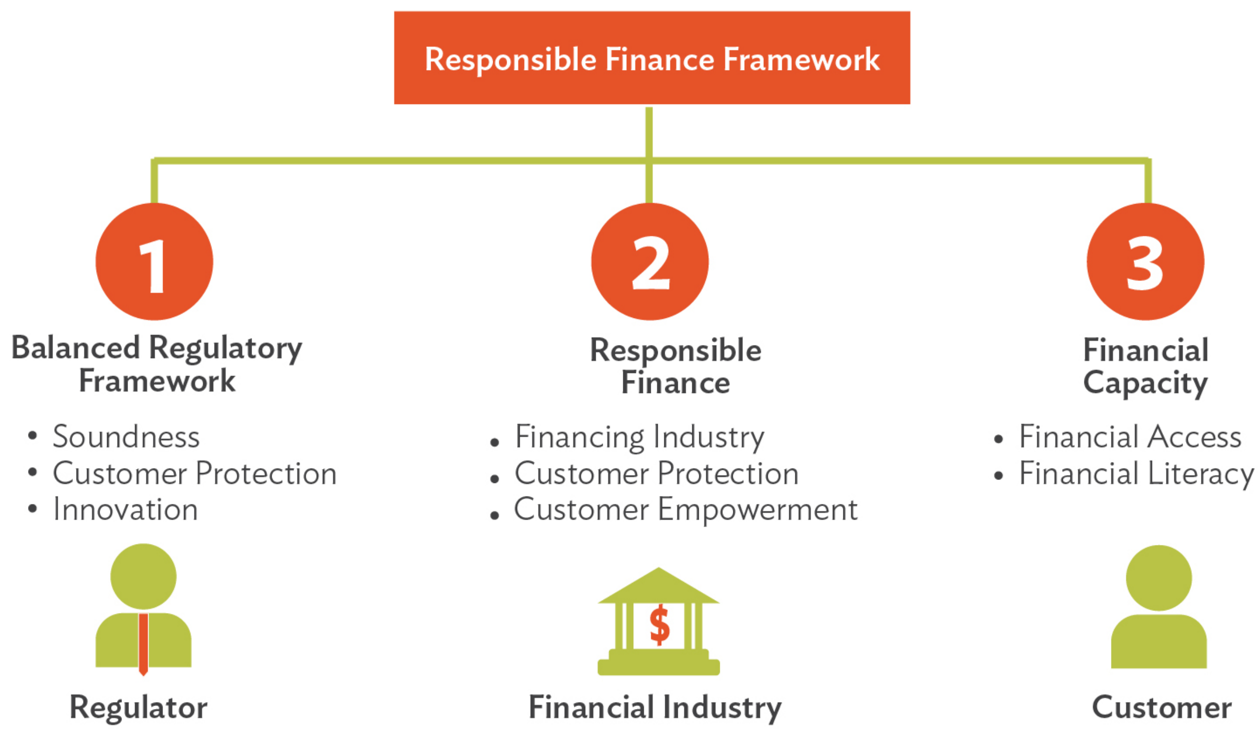
OJK's Responsible Digital Finance Framework (Figure 5) supports the overall goals of financial inclusion and sustainability of the fintech ecosystem based on a balanced regulatory framework, responsible development of the industry, and improving overall financial capability of consumers to make use of digital financial services through increased financial access and literacy.

The strategic issues in the digital finance industry in Indonesia can be classified into four main categories: (i) direct regulation of fintech activities, such as digital banking, P2P lending, crowdfunding, and insurtech; (ii) use of new technologies in the provision of financial services, such as cloud computing, biometrics, algorithms, and artificial intelligence; (iii) policy initiatives to enable digital financial services, such as those related to digital identities, data privacy and protection, and the establishment of innovation hubs and regulatory sandboxes; and (iv) new financial literacy and consumer protection in the digital age.

Regulating New Fintech Players

New technologies and players also require new regulatory approaches. Indonesia was one of the first countries in the region to regulate P2P lending and crowdfunding, and it continues to adjust these regulations to meet the new challenges and risks that develop. In the area of digital banks, OJK issued a digital banking

Figure 5: Responsible Finance Framework



Source: Indonesia Financial Services Authority.

regulation that distinguishes between electronic banking services and digital banking services. Electronic banking services are those provided by banks to obtain information, communicate, and conduct banking transactions through electronic media. Digital banking services are electronic banking services developed by optimizing customer data with the purpose of serving customers in a faster, easier, and more efficient manner. They are designed to be carried out by customers safely and securely in a fully digital manner. As new fintech players continue to enter the marketplace, including unlicensed P2P lenders, OJK will continue to enhance its ability to provide appropriate oversight and supervision.

Regulating New Technologies

OJK also recognizes that new opportunities as well as risks arise from the use of specific innovations. To support new fintech opportunities, OJK will work closely with Bank Indonesia to develop standards for the use of application programming interfaces (APIs) to facilitate open banking. OJK also sees the need to provide legal certainty for the effective application of fintech innovations. For example, distributed ledger technology, such as smart contracts, should be accepted as providing finality in the settlement of secure transactions. This is also true for regulations on the use of biometrics to identify customers in regulated transactions, such as opening a bank account. OJK will also review cloud computing regulations during the road map period as the situation evolves.

OJK will issue regulations that support the safe and sound development of artificial intelligence and machine learning algorithms and better manage the risks arising from the handling of personal data, while ensuring transparency, ethical behavior, and nondiscriminatory impact of algorithms and analytics in financial services provision.

Enabling Policies

OJK continues to adopt policies to better facilitate the underlying framework to support digital services, including those that allow financial institutions to use digital technologies to identify and verify customers without their physical presence.

The model for e-KYC under development in Indonesia focuses on leveraging the national ID, through a government database, for bank account opening. In addition, OJK will work closely with Bank Indonesia on promoting an open banking environment in Indonesia.

To better support these enabling policies, OJK's regulatory sandbox plays a key role. Registering a fintech product with OJK is straightforward. The applicant only needs to follow three steps: registration, regulatory sandbox, and licensing.

The first step is to list the fintech application with OJK. After the application is submitted, OJK will schedule a meeting to discuss whether the product is a permissible fintech. If it is, the applicant will be invited to make a presentation. Based on the presentation, OJK will determine whether the product should go through the regulatory sandbox process.

The second step is to test the fintech product in the regulatory sandbox for 1 year, with a 6-month extension if necessary. During this period, the applicant is obliged to regularly update OJK on the fintech's performance and any relevant changes. After the testing phase, OJK will decide whether the product is approved, needs modifications, or is not approved. If approved, the fintech product will receive a registration certificate issued by OJK as a fully licensed fintech product or service.

After the fintech product or service is registered by OJK, the fintech operator is required to conduct a risk-assessment analysis and submit monthly reports to OJK. The risk assessment includes technological management, consumer protection, consumer education and socialization, risk management, AML and CFT requirements, and information transparency.

OJK also works closely with fintech associations that provide complementary monitoring of the industry through industry codes of conduct that reinforce OJK regulations.

Collaboration

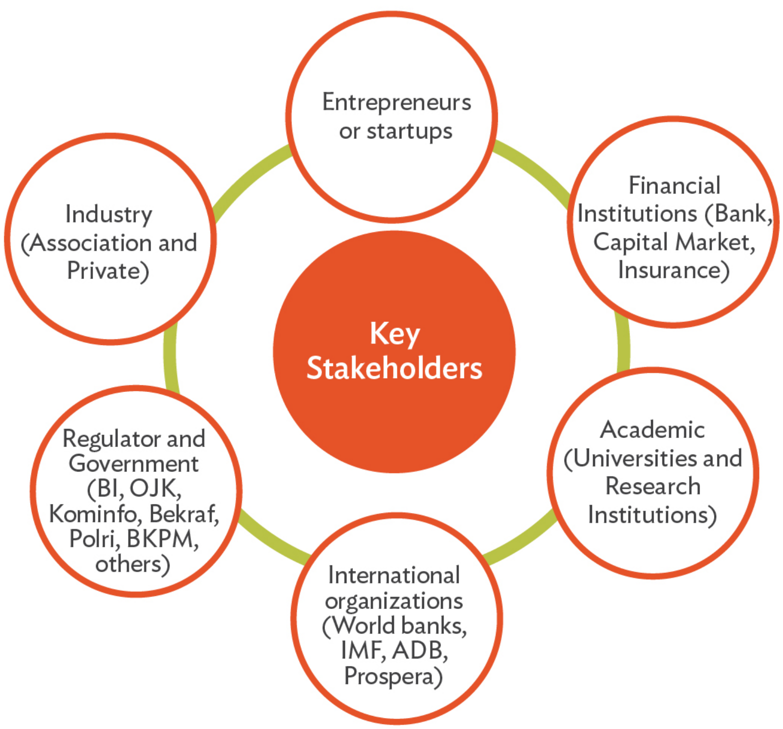
The OJK Infinity Centre also leads coordination and collaboration among all key stakeholders, among departments within OJK, between OJK and other regulators, and with regional and international regulators (Figure 6).

International collaboration has included recently signed memorandums of understanding with several regional regulatory bodies including the Securities Commission Malaysia, the Australian Securities and Investments Commission, and the Monetary Authority of Singapore (MAS). Through these important collaborative memorandums of understanding, the OJK Infinity Centre serves to further promote and support (i) knowledge sharing, (ii) information sharing and exchange, (iii) joint research and projects, and (iv) licensing and supervision of cross-border fintech providers.

Talent

OJK considers talent to be an important part of the development of a sustainable digital finance ecosystem in the country. This is in accordance

Figure 6: Digital Finance Innovation Stakeholder Groups



ADB = Asian Development Bank, BI = Bank Indonesia, BKPM = Indonesia Investment Coordination Board, IMF = International Monetary Fund, OJK = Indonesia Financial Services Authority.
Source: Indonesia Financial Services Authority.

with regulation POJK 13/No.02/2018, on digital financial innovation, which aims to encourage synergy within the digital financial services ecosystem—a community of authorities, providers, consumers, and other parties that interact and support the development of responsible and inclusive fintech products and services.

OJK collaborates with research centers and international organizations to consider international good practices to disseminate knowledge within OJK and to the digital financial services industry at large. OJK also collaborates with leading universities to develop curriculum and create skilled graduates who become part of the talent pool in the digital financial services industry. This also includes collaboration with groups and organizations such as Bandung Institute of Technology, Bandung Techno Park, the Information and Communication Development Institute, Mandiri Capital, Telkom University, and the University of Solo.

Internationally, OJK also works closely with the Asian Development Bank, the ADBI, the Consultative Group to Assist the Poor, the International Finance Corporation, the Toronto Centre, and the World Bank to coordinate and strengthen OJK's own capacity building efforts and to share international best practices with the industry, including for the Indonesia Fintech Association (AFTECH) and the Association of Indonesian Shariah Fintech. The OJK Infinity Centre further supports efforts such as AFTECH's governance training program, and its recent development of the Joint Funding Fintech Association of Indonesia's code of conduct based on international best practices.

Consumer Protection

Financial literacy implies the ability to support healthy financial markets where consumers can better manage their financial lives, and make informed and appropriate choices regarding the responsible use of financial services. In Indonesia, the necessity for financial literacy is even more significant because of the low levels of education and diversity of the population, particularly the presence of underserved groups including the poor and near poor, those in rural and outlying areas, and women. After the COVID-19 pandemic, Indonesians will face added economic hardships.

However, OJK sees an opportunity to work with the fintech sector to support improvements in financial health. OJK will work with fintechs to help people and policy makers better assess and support financial capability. It will aim to establish goals and design programs to help people restore their financial health using new and innovative financial tools such as its mobile app *Sikapi Uangmu*.

While fintech players are seen as central to helping attain Indonesia's financial inclusion goals, numerous financial literacy and consumer protection issues need to be addressed in the digital age. The rapid growth of alternative lenders, especially unlicensed players, has raised concerns among consumers about push-marketing—abusive lending and collection practices that have led to rising complaints as well as concerns about over in debtedness. Therefore, digital financial inclusion will be integrated within financial literacy efforts and updating of consumer protection rules in the digital age as a key part of OJK's road map.

OJK will review its Regulation No. 1 of 2013, on Consumer Protection in the Financial Services Sector, to ensure that new issues relating to consumer protection for digital finance are updated, especially those concerning transparency for digital (particularly mobile) lending practices, data privacy and protection, and digital complaints management.

OJK Regulation No. 13 of 2018 also requires digital financial innovation to be responsible and secure, and prioritize customer protection and governance.

While Indonesia does not yet have a comprehensive data protection law, OJK will build on the Ministry of Communication and Informatics issued Law No. 11 of 2008 on Electronic Information and Transactions Law, and Regulation No. 20 of 2016 on the Protection of Personal Data in Electronic Systems, to ensure that these practices are reinforced and adapted to effectively cover the digital financial services sector.

Support for Women-Owned and/or -Managed Businesses

Within the digital finance industry in Indonesia, digital finance innovations, such as digital payments, peer-to-peer (P2P) lending, and crowdfunding, have helped many businesses, including those owned or managed by women. In particular, digital payments have enabled businesses to accept payments more easily from consumers using QR codes and mobile payments, and this has allowed them to more easily expand their businesses in an affordable and convenient manner.[22]

A recent OJK survey also highlighted support for women-owned businesses. It revealed the following:[23]

1. Most (66.7%) P2P loan recipients are women, and most of them are in the 18–40 age bracket. Only 55.6% are high school graduates.
2. In addition to expanding access to financial services, fintechs are providing technologies that help farmers and fishers improve their production and yields. New technologies are also facilitating better supply chain trading opportunities, including enabling women to engage in export.
3. Financial innovation is also helping cooperatives, which mostly target women business owners and/or operators, to better facilitate financing through enhanced group lending initiatives that minimize the risk of loan default

22 Bank Indonesia. 2019. *Indonesia Payment Systems Blueprint 2025*. Jakarta.

23 OJK and Center for Financial Inclusion, Trisakti University. 2018. *Roles of Fintech to Support Micro and Small Enterprises*. Jakarta.

VI. ACTION PLAN STRATEGY

Challenges and Opportunities for Fintech Industry

The fintech industry in Indonesia faces many challenges, including competition with incumbent banks and BigTech players. The fast pace of technology advancement is both a challenge and an opportunity. The infrastructure required for traditional brick-and-mortar bank branches, the high costs of point-of-sale systems, and the lack of physical credit and/or debit cards by the vast majority of Indonesians are challenges that are viewed as opportunities for new digital fintech players who are able to provide solutions that better meet the growing needs of a digital and mobile-linked population. The long-standing financing gaps of individuals and SMEs is also partially overcome through new fintech lending platforms and technologies.

Vision for Digital Finance Innovation in Indonesia

The future of digital finance innovation in Indonesia is practically limitless. This digital finance road map is a step in the formation of the digital finance sector with the ultimate goal of creating a digital economy. Figure 7 illustrates how OJK sees the future of digital finance developing in Indonesia.

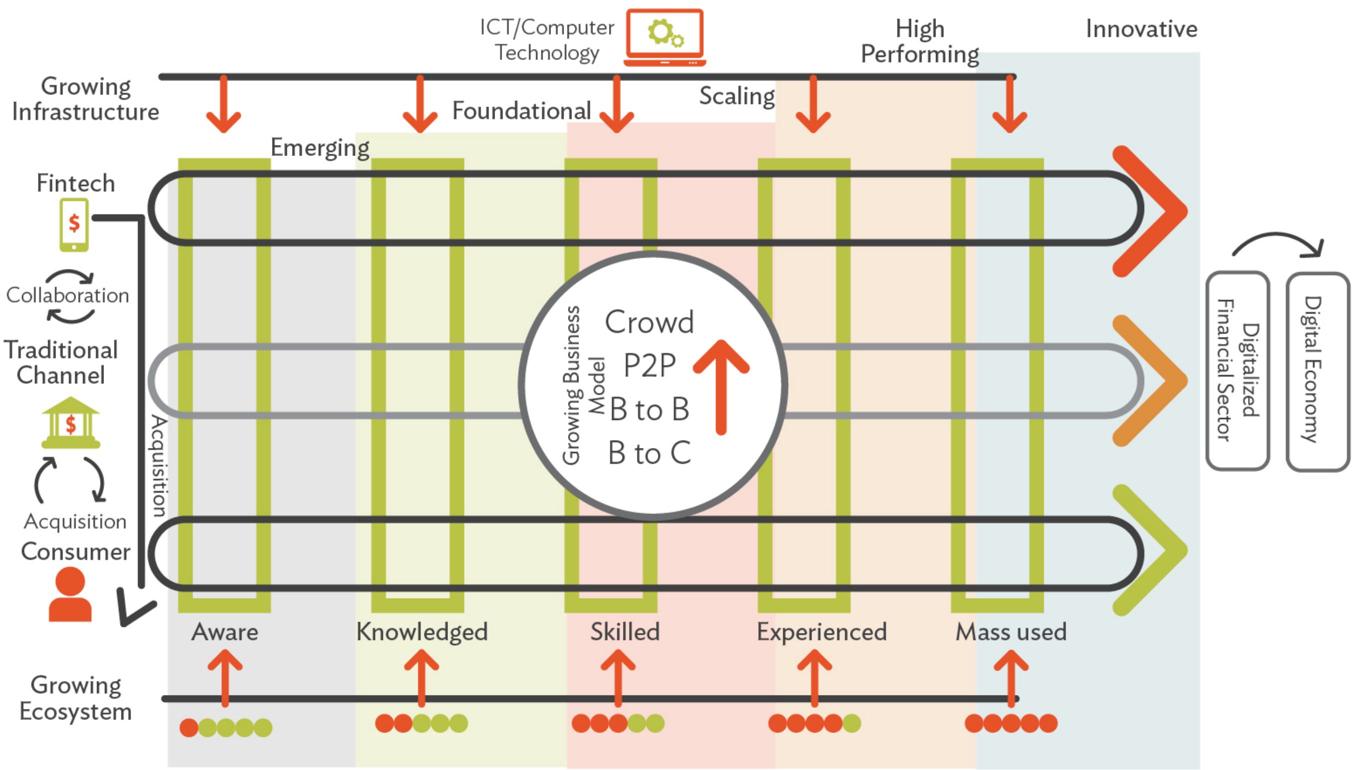
There are several stages of ecosystem development and technology development in the creation of a digital economy. On the digitalization, Indonesia is still in the “awareness” stage, while in the area of technological development, it has progressed to the “emerging” stage.

In the financial services industry, collaboration between fintech and traditional financial services is needed for customer acquisition. Technological advancement and new collaborations between the fintech and financial services industries support the emergence of new business models (innovation), such as business-to-customer, business-to-business, and P2P lending; and crowdfunding.

Key Initiatives

1. Enhanced consumer protection in the digital age, including enhanced digital financial literacy and complaint management practices.

Figure 7: Digital Finance Innovation Road Map



B2B = business-to-business, B2C = business-to-consumer, ICT = information and communication technology, P2P = peer-to-peer.
Source: Indonesia Financial Services Authority.

Enhanced digital financial literacy. Using advances in fintech, firms can educate their customers to heighten their awareness and expand their usage of innovative financial products and services. OJK also sees the importance of using new digital financial literacy tools to enhance consumers' financial health by helping them to make more informed decisions about how to use new products and services responsibly.

Complaint management. OJK also sees the role that fintech can play in improving and better automating consumer complaint management practices using tools that include advances such as chatbots, machine learning, and data analytics. OJK aims to work with the industry to ensure that all players have improved and automated complaint management systems that allow customers to reach them via online and/or mobile apps.

2. Data privacy and protection

OJK will work with other stakeholders to ensure the issuance of the upcoming data protection law also consider the needs of financial industry consumers including clients of fintech providers. To support this, OJK will ensure that regulations and guidelines for data protection for financial service consumers are issued. OJK will also work with the fintech industry to ensure that data protection principles are reinforced in the respective codes of conduct.

3. Enhanced regulation and supervision of fintech, including the use of regulatory technologies (regtech) and supervisory

technologies (suptech) to improve and facilitate regulatory compliance and supervisory oversight

(i) Regtech

Regulatory technologies (regtech) involve the management of regulatory processes within the financial industry through the use of technology. The main functions of regtech include regulatory monitoring, reporting, and compliance. Regtech helps financial institutions and regulators simplify and consolidate complicated regulatory compliance processes. As banks and new financial players have adopted fintech and offered digital products and services, the risks of data breaches, cybersecurity concerns, money laundering, and other fraud have increased. Regtech, which relies largely on the use of big data and machine learning technology, helps mitigate these risks and reduce the number of compliance-related reports that financial industry players need to submit to regulators, thereby helping them operate more efficiently and safely. However, many players still need to invest more in IT infrastructure to make better use of regtech tools. OJK plans to introduce the following regtech initiatives.

Electronic know-your-customer. Indonesia has initiated a comprehensive national strategy to use a digital national ID to support the advancement of the digital economy. The plan is to utilize the digital ID system to facilitate remote account opening. Under the sandbox initiative, OJK has conducted pilot tests that allow banks and fintech providers to use the citizen and civil registry database to facilitate the opening of bank accounts.

E-regulatory compliance. Technology and digital automation are also seen as methods to facilitate and enhance regulatory compliance. As self-regulatory organizations, fintech firms and associations can develop notification rules as a service for members (e.g., mapping a regulation's requirements for company policies and procedures by type of product, customer base, and geography).

Fraud detection. New technologies are allowing financial service providers to embed fraud detection processes within their KYC procedures to better enable seamless AML compliance. OJK plans to work closely with regtech solution providers during 2020–2021 to test and enhance embedded fraud detection technologies.

E-reporting. OJK plans to work with regtech providers to further enhance e-reporting options for the financial services industry.

E-risk management. To improve risk management practices, OJK will initiate an open discussion to identify obstacles faced by companies that can be overcome through regtech.

(ii) Sptech

Suptech applications are innovative technologies used by financial supervisors to support supervision. Suptech helps supervisors digitize and better analyze regulatory processes, resulting in more efficient and proactive monitoring of risk and compliance. Several financial supervisors, including OJK, are already using innovative ways to effectively implement a risk-based approach to supervision. These new technology tools are allowing supervisors to dramatically strengthen their supervisory processes. OJK plans to focus on the following suptech initiatives.

Data analysis. OJK is considering the creation of a centralized data repository that will allow all divisions and departments to improve their data sharing. To support this, OJK will learn from the United Kingdom's Financial Conduct Authority and others, such as MAS, to improve its internal data sharing.

Text report mining. Natural language processing has potential applications for text analysis for supervisors of financial institutions. It can convert free (unstructured) text into normalized, structured data that can be analyzed. It is also seen as a tool to improve the classification of documents and keywords, and the identification of key phrases.

Customer support tech. The development of consumer complaint tools, such as chatbots, is also seen as a potential breakthrough to improve supervision of the finance sector. OJK will study the experiences of the Central Bank of the Philippines to develop and test appropriate market-conduct chatbots for Indonesia.

Blockchain e-licensing. OJK sees that it can utilize blockchain technology to improve transparency during the licensing procedures for the financial institutions it oversees.

4. Improved dialogue and support for innovation: innovation hub, knowledge-sharing sessions and dialogues, regulatory sandbox, regional and global coordination

OJK has initiated dialogue and cooperates with regulators and other bodies from countries including Australia, Malaysia, the Philippines, and Singapore. It will also explore cross-border sandbox initiatives with other regulators. During the implementation of the road map, OJK will explore regional and global cross-border testing to enable local firms to expand services outside Indonesia and to permit foreign firms to expand into the country. OJK believes that cross-border cooperation will also enable the regional regulatory community to develop increasingly collaborative approaches for the sandbox and to support cross-border regtech and suptech tools.

5. Focus on improving safety and soundness practices in the emerging fintech industry including cybersecurity, fraud prevention, and risk management

Strengthening risk management capacity. OJK will work closely with the fintech industry to improve risk management practices, including by ensuring that each firm has a relevant officer in place and that the industry improves capacity building efforts in this area. Capacity building efforts should also be embedded within corporate governance training to ensure that the fintech's board of directors and executive management understand the organization's critical processes and internal controls, and develop and actively implement and monitor risk management and mitigation plans.

Embedding risk management. OJK will also work with the industry to develop a stronger focus on a risk management framework that aligns with the regulatory and operational risks identified through formal risk assessments. OJK will also encourage the fintech industry to ensure that risk management is embedded into all products and services. This is especially important as new products and services are developed to ensure that all dimensions of risks are considered and incorporated. New regulations will also support the fintech industry's accountability for risk management practices.

6. Support for the fintech ecosystem (investment climate)

OJK understands the need to promote an enabling fintech ecosystem (investment climate). This includes not only investment, but encouraging interoperability and collaboration within the broader financial services industry. OJK wishes to enable a fintech ecosystem that helps fintechs, banks, insurance, and other financial service industry providers to connect, collaborate, and interconnect. Through fintech events and programs, investors, fintech players, and established financial industry providers will all play a significant role in developing a fintech ecosystem that also supports start-ups by providing mentoring, funding, training, networking, and marketing opportunities. OJK also sees the role that banks can play by supporting innovation labs, hackathons, and accelerator programs.

7. Provide and enhance training for the fintech sector, and improve regulatory capacity building

As discussed under the talent section, OJK will work with the industry and local universities to improve training and capacity building efforts for the fintech sector. At the same time, the OJK Infinity Centre will play a lead role in developing and supporting fintech capacity and capability training, focused on the latest developments in fintech across OJK. OJK will also improve supervisory skills, including broadening the use and understanding of suptech tools.

8. Enhance digital access infrastructure—digital identity, electronic know your client, and open banking

OJK will also support enhanced digital financial services infrastructure including for identification, payment, and data sharing. It plans to do this by supporting the use of the national digital ID to support access to financial services especially via the use of e-KYC and digital or e-signature. At the same time, it will work closely with Bank Indonesia to support the digital payment infrastructure as well as data-sharing infrastructure through support for open APIs and open banking. The goal is to enable consumers to readily access financial services and to be empowered to decide how and whether to share their data to obtain financial services that are more affordable, convenient, and easy to use.

ROAD MAP TIMELINE, 2020–2024

The timeline for the road map for 2020–2024 includes initiatives that focus on OJK's roles as an accelerator, enabling regulator and supervisor, collaborator, talent promoter, and financial consumer protection advocate.

2020: During 2020, OJK will focus on accelerating the fintech industry by expanding its innovation hub, the OJK Infinity Centre, and continuing to work closely with the fintech associations and other stakeholders. It will support a digital financial ecosystem and expand the role of the regulatory sandbox.

OJK plans to become a member of the Global Financial Innovation Network in order to learn and share experiences and best practices with global regulators to enhance the value of OJK's innovation hub and regulatory sandbox. It will also continue to focus on research related to advances and developments in the industry while promoting policies that reduce risks.

OJK will strengthen relationships with other regulators and the industry through a formal meeting format that convenes regularly to discuss challenges and opportunities within the industry and devise regulatory responses. This will include a formal process to incorporate inputs from the fintech industry.

As a promoter of talent within the fintech industry, OJK will continue to work with universities to enhance and expand curricula while working closely with the industry to develop ongoing governance training initiatives.

To enhance digital consumer protection practices, digital financial inclusion, and digital financial literacy, OJK will draft new guidelines on responsible digital finance best practices.

2021: In 2021, the OJK Infinity Centre will continue to focus on further expanding its role as one of the top regulatory innovation hubs in Southeast Asia. It will further expand its digital regulatory sandbox and will expand its research into advances in fintech, the related risks, and appropriate regulations and guidelines for the industry.

OJK will work closely with key domestic stakeholders and regional and global regulatory bodies to discuss data sharing, information exchange protocols, and risk management practices. The focus will be on facilitating investment rules to connect start-ups and encourage domestic and international venture capital firms to invest in the fintech ecosystem.

The OJK Infinity Centre will also focus on implementing enhanced guidelines to improve consumer protection in the digital age while supporting greater digital financial inclusion and literacy efforts by the fintech sector.

2022: In 2022, will continue to collaborate with international development partners and with the fintech industry to further support the expansion of the fintech ecosystem, including the start-up community.

OJK will harness the use of regtech and suptech to improve the efficiency of regulatory compliance and ensure that innovations in supervision can be automated and made more efficient. For regtech, this may include e-regulatory compliance, fraud detection, e-reporting (financial and text), and e-risk management. For suptech, it may include customer complaint technical support, the use data analytics, text reporting mining, e-reporting, and e-licensing using blockchain.

This year's focus is expected to improve domestic and regional cross-cutting issues including data-sharing arrangements, information exchange protocols, and domestic and regional risk management practices and fintech-related cross-border trade.

The OJK Infinity Centre will also leverage new technologies to enhance the talent development process. It will also continue to collaborate with key stakeholders to enhance guidelines on digital consumer protection in the digital age while promoting digital financial inclusion and literacy. To promote these guidelines and efforts, the OJK Infinity Centre will work closely with the fintech industry to ensure their proper adoption within existing fintech business models.

2023: During 2023, OJK will continue to focus on the growth of Indonesia's fintech sector and will support efforts to help it expand regionally and globally.

OJK will launch and fully implement additional regtech tools to facilitate compliance reporting and will further enhance suptech tools to support digital market conduct.

OJK will also continue to ensure the adoption of standard guidelines for the cross-cutting issues among domestic stakeholders as well as regional cross-border fintech trade and finance issues.

The OJK Infinity Centre will also strengthen its role as an innovation hub to support external talent development. At the same time, it will work to ensure that fintech firms develop more integrative business models that incorporate consumer protection and financial literacy efforts as a key growth strategy for a responsible and self-driven industry.

2024: During the final year of the road map, the OJK Infinity Centre will initiate a review and plan for the next action plan to further strengthen the role of fintech in driving an inclusive and responsible digital economy. This will also include reviews of collaborative arrangements and the fintech talent development program.

Earlier efforts to make use of regtech and suptech tools during 2021–2023 will be fully implemented to improve regulatory compliance while harnessing technologies to better supervise the financial services industry.

OJK will also review the digital consumer protection challenges, and gaps in financial inclusion and digital financial literacy, and prepare an analysis of lessons learned and next steps for the subsequent road map.

The timeline and action plan are explained in Table 2.

Roadmap Timeline: Digital Finance Innovation Action Plan 2020-2024

	2020	2021	2022	2023	2024
Accelerator	Become a member of the Global Financial Innovation Network to accelerate fintech development in Indonesia.	Develop the OJK Infinity Centre to be to be one of the leading regulatory innovation hubs in Southeast Asia.	Expand the number of fintech start-ups and scale up the business in collaboration with international donors or members.	The OJK Infinity Centre to support the expansion of Indonesia fintech on a regional and global level and actively share Indonesia's fintech experiences globally.	Plan to develop the next action plan that further strengthens the role of fintech in becoming a key element in driving an inclusive and responsible digital economy.
Regulation and Supervision	Enhance research infrastructure to support digital finance in finance sector.	Conduct research related to the new business models in financial services related to digital innovation and the associated risks.	Enhance the research to support in conducting standard guidelines for the cross-cutting issue within domestic stakeholder and cross-border fintech trade and finance issues.	Develop feedback research in implementation of regtech and suptech in the finance sector.	Develop research on future digital consumer protection challenges, and gaps in financial inclusion and digital financial literacy, and prepare an analysis of lessons learned and next steps for the future road map.
	Enhance the existing regulation and conduct research related to advance technology and its associated risks.	Draft regulations and guidelines and expand research related to advances in technoloy and their associated risks. Enhance the role of regulatory sandbox.	Implement the regulation and develop the infrastructure for the use of regtech and suptech.	Start the initial implementation of regtech to facilitate compliance reporting and suptech to enhance market-conduct supervision.	Fully implement regtech to improve the compliance of fintech and financial industry players and suptech to harness technologies to better supervise the industry.

Collaboration	Strengthen collaboration with key domestic stakeholders and international organizations.	Set the collaboration and agenda with key domestic stakeholders, regional regulators (via ASEAN Financial Sector Working Groups) and international organizations to discuss data-sharing agreements, information exchange protocols, risk management, etc.	Ensure that Indonesia works with regional and international groups to strengthen and adopt international standards to address domestic cross-cutting issues and support cross-border fintech-related business opportunities and supervision.	Coordinate work programs in OJK to ensure the adoption of standard guidelines for the cross-cutting issue within domestic stakeholder and cross-border fintech trade and finance issues.	Further strengthen and review collaboration arrangements and the next 5-year collaboration agenda.
Talent	Build a continuous program to develop external and internal talent within the fintech industry.	Implement the continuous program by collaborating with expertise from financial service industry (bank and nonbank) and fintech start-up.	Leverage new technologies to enhance talent development.	Create agile organizations for internal talent and enhance the role of innovation hub to support external talent development.	Review of the fintech talent development program and develop the new 5-year road map plans.
Customer Protection	Draft a standard or guideline to enhance digital consumer protection practices, digital financial inclusion, and digital financial literacy.	Implement the standard or guidelines about digital consumer protection, digital financial inclusion, and digital financial literacy in every aspect of fintech activity.	Ensure the guidelines are adopted into the business models of fintech to enhance consumer protection, digital financial inclusion, and improved ways to promote digital financial literacy.	Ensure the fintech's business model integration leads to improved consumer protection practices and financial literacy efforts as a key growth strategy for a self-driven industry.	Review digital consumer protection challenges, gaps in financial inclusion and digital financial literacy, and prepare an analysis of lessons learned and next steps for the future road map.