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The Rise of Innovative Credit Scoring System in Indonesia:

Assessing Risks and Policy Challenges

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GLOSSARY

AFTECH:

Asosiasi Fintech Indonesia/The Indonesia Fintech Association

AI:

Artificial Intelligence

AML/CFT:

Anti-Money Laundering and Counterterrorism Financing

API:

Application Programming Interface

DPA:

Data Protection Authority

DPO:

Data Protection Officer

FCRA:

Fair Credit Reporting Act

GDP:

Gross Domestic Product

GDPR:

General Data Protection Regulation

ICS:

Innovative Credit Scoring

KPPU:

Komisi Pengawas Persaingan Usaha/Commission for the Supervision of Business Competition

MOCI:

Ministry of Communications and Informatics

MSME:

Micro, Small, and Medium Enterprise

OJK:

Otoritas Jasa Keuangan/Financial Services Authority

OTD:

Originate-to-distribute

P2P:

Peer-to-peer

PDP:

Personal Data Protection

PDPL:

Personal Data Protection Law

SKKNI:

*Standar Kompetensi Kerja Nasional Indonesia/*Indonesian National Work Competency Standard

SLIK:

Sistem Layanan Informasi Keuangan/ Financial Information Services System

EXECUTIVE SUMMARY

Strategies to monetize personal data have created opportunities for business innovation, including companies for credit ranking, marketing strategies, public health surveillance, and even penalty and reward mechanisms. Innovative credit scoring (ICS), which uses non-traditional personal data to estimate the creditworthiness of potential borrowers, is one such business innovation. There are about 19 ICS operators in Indonesia that help traditional and non-traditional lenders to estimate the capacity and willingness of potential borrowers to repay loans. Using non-traditional data to generate a credit score facilitates financial inclusion, especially for previously unbanked households. Despite this substantial benefit, the business model also carries inherent risks to data privacy, artificial intelligence and machine learning, and market monopolies.

To address inherent risks in ICS, the Indonesian Financial Services Authority (OJK) as the regulator pursued a co-regulatory approach with the establishment of a regulatory sandbox. The Indonesian Fintech Association (AFTECH) also collaborates with OJK as the ICS umbrella organization. The self-regulatory function of AFTECH complements the supervision of fintech entities through the enforcement of a code of ethics among ICS operators. In addition, the Personal Data Protection Law (PDPL) aims to provide legal clarity for the personal data management of ICS companies.

However, relevant articles in the law are not aligned with existing practices because of the complexity of each of these risks. Opaque decision-making must be addressed and responsibilities between the self-regulatory organization and government authorities must be clarified.

Procedural and substantive policy reforms would help to address these risks and uncertainties. OJK should reassess the effectiveness of the sandbox programs and provide sufficient regulatory clarity whether business models have been cleared to enter the market. An independent Data Protection Authority (DPA) needs to perform regular checks on the data used and shared by data controllers and ICS companies as data processors. Risk-based co-regulation should be adopted in the process of developing derivatives and implementation guidelines of the PDPL. OJK should clarify regulations regarding types of data, data use, and data protection officers, and specify how liability falls on data controllers and data processors. Finally, OJK should actively collaborate and coordinate their actions with the Commission for the Supervision of Business Competition (*Komisi Pengawas Persaingan Usaha* / 'KPPU') to optimize the benefits of ICS for digital consumers.

UNDERSTANDING THE BUSINESS MODEL OF INNOVATIVE CREDIT SCORING AND ITS SCOPE OF WORK IN INDONESIA

Digitalization has facilitated a proliferation of non-peer-to-peer fintech startups, companies, and investors leveraging data to improve and automate the delivery and use of financial services. Fintech startups are joining forces with e-wallet players and e-commerce platforms, linking digital platforms and providers through a wide range of data-driven business models and innovations (Sutrisno, 2022). As part of this trend, a proliferation of innovative credit scoring (ICS) companies has been recorded by the Indonesian Financial Services Authority (OJK) tracking Digital Financial Innovation (*Inovasi Keuangan Digital*). “Digital Financial Innovation” refers to any type of activity to revamp business processes, business models, and financial instruments to provide new added value in the financial services sector and ultimately boost the digital ecosystem (AdIns, 2022).

Innovative credit scoring assesses customers’ creditworthiness by using artificial intelligence (AI), machine learning, and unconventional data (such as on-time utility payments, cellphone bill payments, social media use, online behavior, and e-commerce transaction history) to help provide access to credit for customers without more traditional records and resources. As shown in Table 1, ICS players in Indonesia have varying business scales, valuation, and ownership.

The majority of ICS firms are independent local companies, such as CekSkor and Skorfin, or subsidiaries of larger fintech or well-established e-commerce companies, such as TokoScore and VICI, which are owned by the country’s e-commerce behemoths, Tokopedia and Blibli. Some ICS platforms are also part of foreign (mainly Chinese and Singaporean) tech companies, such as Experian and Tongdun. Despite the severe economic impact of the pandemic, in the second half of 2022, ICS platforms continued to account for a significant share of venture capital funding. Among others, SkorLife raised \$2.2 million in pre-seed funding (Fidinillah, 2022), while Trusting Social, in one of the largest deals in Q1 2022, raised \$65 million in series C funding (Sri, 2022).

Table 1.
The List of ICS Companies in Indonesia

No	ICS Name	Origin of Country	Status in OJK	Funding Stage	Investors/ Stakeholders
1	Acura Labs (PT Acura Labs Indonesia)	Indonesia	Registered	Undisclosed	N/A
2	Aiforesee (PT Aiforesee Inovasi Skor)	Indonesia	Registered	Undisclosed	Investree
3	Aiskor (PT Aiskor Teknologi Indonesia)	Indonesia	Registered	Pre-seed	N/A
4	Avatec (PT Avatec Services Indonesia)	Singapore	Registered	Series A	United Overseas Bank, Pintec Technology Holdings
5	BPS (PT Bangun Percaya Sosial)	Indonesia	Registered	Undisclosed	Advance Intelligence Indonesia
6	CekSkor (PT Puncak Akses Finansial)	Indonesia	Registered	Series C	Experian, responsAbility Investments AG, DEG, InterVest, FengHe Fund Management, Pelago Capital, Fuchsia Venture Capital
7	CredoLab (PT CredoLab Indonesia Scoring)	Singapore	Registered	Series A	GB Group
8	Digiscore (PT Skoring Kredit Inklusif)	Indonesia	Registered	Pre-seed	Undisclosed
9	Eureka (PT Eureka Analytics Indonesia)	Hong Kong	Registered	Series B	Apis Partners, Gobi Partners, Riyad Taqnia Fund, MEC Ventures
10	Fineoz (PT Fineoz Inovasi Teknologi)	Indonesia	Registered	Undisclosed	N/A
11	Finscore (PT Tongdun Technology Indonesia)	China	Registered	Series E	Avic Capital, GF Securities, ZheShang Venture Capital
12	Izidata (PT Izi Data Indonesia)	Indonesia	Registered	Pre-seed	N/A
13	OLDI (PT Oranye Layanan Digital Indonesia)	Indonesia	Registered	Pre-seed	Undisclosed
14	PYXIS (PT Digital Synergy Technology)	Indonesia	Registered	Undisclosed	N/A
15	Scoring Teknologi Indonesia (PT Scoring Teknologi Indonesia)	Indonesia	Registered	Undisclosed	N/A

16	SkorFin (PT Finantier Teknologi Indonesia)	Indonesia	Registered	Seed	East Ventures, Global Founders Capital, AC Ventures, Y Combinator, Genesis Ventures, Two Culture Capital
17	SkorLife (PT Skortech Karya Indonesia) ¹	Indonesia	Registered	Pre-seed	AC Ventures, Saison Angel Capital, CLIK, VIDA
18	Toko Score (PT Semangat Digital Bangsa)	Indonesia	Registered	Undisclosed	Tokopedia
19	TSI (PT Trusting Social Indonesia)	Singapore	Registered	Series C	Masan Group, Sequoia Capital, Beenext, 500 Startups Vietnam, Tanglin Ventures Partners
20	VICI (PT Verifikasi Informasi Credit Indonesia)	Indonesia	Registered	Undisclosed	Blibli, GDP Ventures

Source: Compiled from Sutrisno (2022); OJK (2022)

Innovative credit scoring services are distinct from credit and information bureaus in Indonesia (*Lembaga Pengelola Informasi Perkreditan*). Credit and information bureaus are private-owned credit registries with access to the Financial Information Services System (SLIK). At its core, the SLIK resembles an aggregator lenders' credit information, facilitating online links to relevant data sources from approximately 1,600 licensed financial institutions in Indonesia (OJK, 2017). Among the licensed credit and information bureaus in Indonesia are PT Pemeringkat Efek Indonesia (PEFINDO) and PT Biro Kredit Indonesia Jaya (BKIJ).

Credit and information bureaus are not examples of digital financial innovation and are instead tightly regulated under OJK Regulation No. 5/POJK 03/2022 on Credit Information Management Agency (OJK, 2022). The regulation governs independence, risk management, compliance, internal audits, and assessment of controlling shareholders and management in the credit and information bureau sector.

¹ While credit scoring is SkorLife's main business, its parent company is registered under the Financial Planner cluster by OJK.

Digital financial innovators, including ICS operators, do not have access to the SLIK and operate in the 'safe regulatory haven' — in other words, exempted from certain regulations — of the regulatory sandbox processes of OJK. In a regulatory sandbox, OJK allows companies to experiment with their innovative financial products or services as long as they comply with a 'minimum efficient regulatory fulfillment'². OJK relaxes legal and regulatory requirements typically needed in this regulatory space in order to support new innovations, as stipulated in the Regulation No. 13/POJK.02/2018 concerning Digital Financial Innovation for Financial Services Sector ("POJK 13/2018"), which came into force on August 16, 2018. The relaxed regulatory environment of the OJK sandboxes have allowed ICS startups to proliferate in Indonesia.

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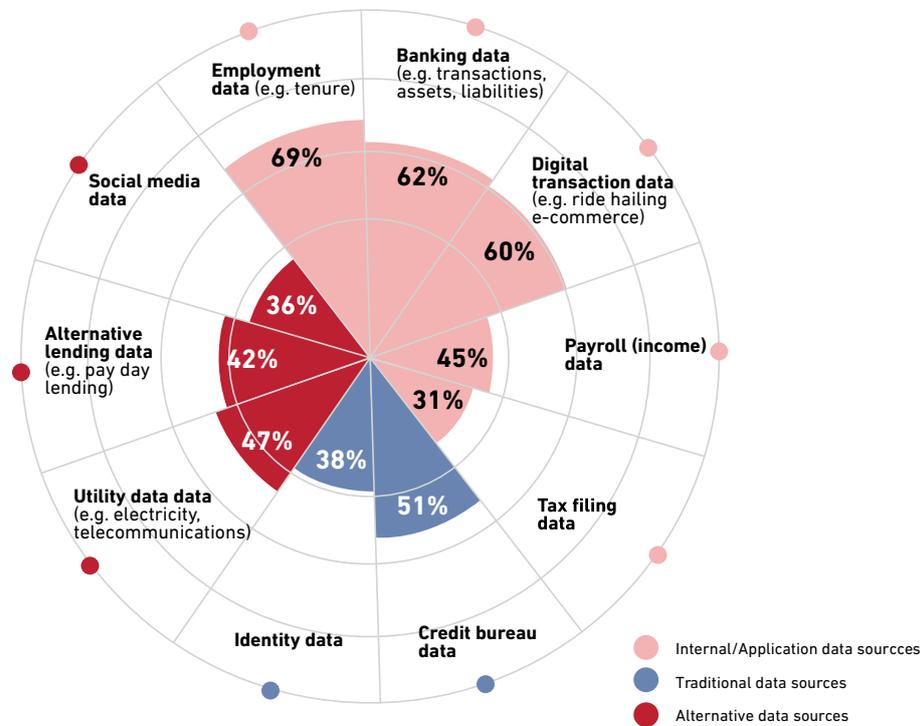
Data is the backbone of innovative credit scoring. Figure 1 illustrates some of the unconventional data sources used, in concert with assessment using AI and machine learning, to assess creditworthiness under an ICS model. These alternative data are marketed to lenders looking to assess potential borrowers. For example, a top fintech lending companies, Investree, launched AIForesee, a score engine which utilizes data from micro-, small-, and medium-sized businesses (MSMEs) (AIForesee, n.d.) to inform the lending decisions of digital banks and other online lenders. Cellular customer data is utilized to assess creditworthiness by the ICS service Finantier Score (Finantier, 2021). It also helps lenders to make a sound lending decision by incorporating electronic know your customer (e-KYC) system to the assessment in aims to reduce default and avoid fraud and potential crimes.

Household e-commerce platforms such as Tokopedia and BliBli are diversifying by entering the ICS space. Tokopedia has developed its own credit-scoring platform called Semangat Digital Bangsa (SDB) which assesses customer risk profiles through e-commerce transactions. BliBli's Vici Score offers a similar service that combines credit scoring and behavior scoring³ based on e-commerce data and data from Directorate General of Population and Civil Registration of the Ministry of Home Affairs.

² Based on POJK 13, there are some conditions that need to be met by ICS operators, among others: (1) demonstrate innovation in their business models; (2) use information and communication technology as a key means to serve customers in the financial sector; (3) support financial inclusion and literacy; (4) their business models can be incorporated to existing financial services; (4) take collaborative approaches and; (5) take customer and data protection into account.

³ Behavioral credit scoring is a holistic view of the personal attributes an individual brings to the transaction to determine their likelihood to default.

Figure 1.
Data Sources for Credit Scoring



Source: Sutrisno (2022), modified by authors.

In addition to helping financial institutions to make credit decisions, innovative credit scoring can provide a quick soft credit check⁴ that supports “buy now pay later” transactions without credit cards or formal lines of credit. Such transactions add sales volume for merchants and enable young people and daily wage workers with limited credit access to make immediate purchases (Fenwick & Vermeulen, 2020).

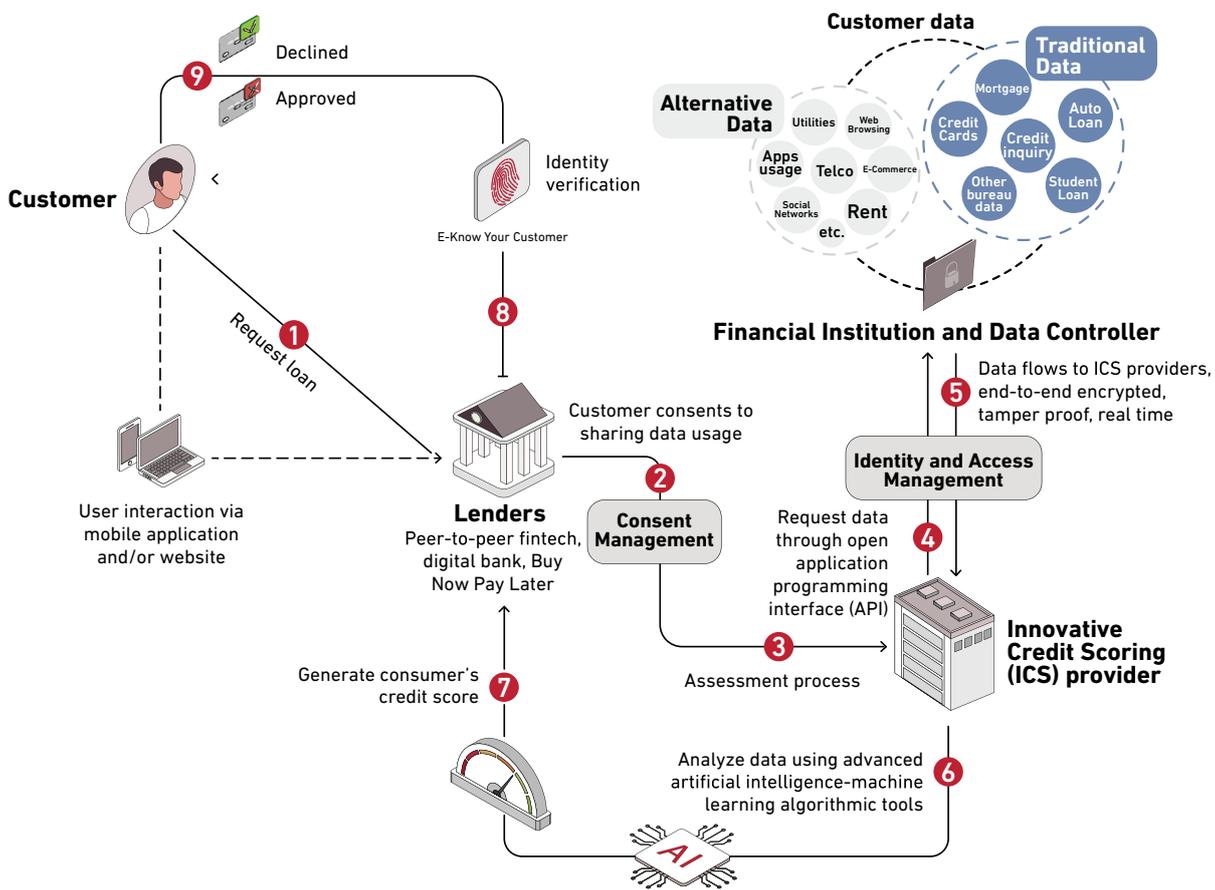
Data sharing is a core pillar of the ICS business model and is governed by contracts. ICS providers contract with financial institutions (fintech or traditional) as clients and with data controllers who store the data and control the purposes and means by which personal data are processed. In this sense, ICS resembles a third-party data processing application that assesses data using anonymity methods⁵. The contracts used in ICS are completely different from how banks use data. Banks have long played a stewardship role, holding customer data as something to be protected rather than as an asset to be shared and traded. In most cases, most customers are not even aware of innovative credit scoring, let alone the fact that their data is being used, shared, and assessed.

⁴ Soft credit check is a credit history check that does not affect credit scores

⁵ Anonymization is the process of making personal data into anonymized data from which individuals cannot be identified.

As the below graphic demonstrates, based on prior agreement, ICS can access particular data from a data controller, such as a telco or e-commerce platform, which stores all alternative data, through an application programming interface (API), that only gives access to the queried and permitted data. In turn, clients of the ICS provider, such as a peer-to-peer (P2P) lender, would link ICS and customers through a consent management framework within which detailed data protection requirements and strict restrictions for access and sharing are prescribed. This includes relying on user credentials and even on the reflexive clicking of “I Agree” on an unread set of terms and conditions. Once clicked, algorithms of ICS would rate customer risk of default and automate lending decisions.

Figure 2.
ICS Data Flow through API



Source: Compiled from various sources, prepared by CIPS.

BENEFITS OF ICS FOR FINANCIAL INCLUSION

In Indonesia, lower-income households and MSMEs have faced challenges accessing credit from banks and other financial institutions because there is limited data on their credit history, collateral, and official proof of income.

The traditional method for assessing the creditworthiness of potential borrowers is through an evaluation mechanism known as 5Cs of credit. The 5Cs stands for: (1) character, represented by the applicant's credit history; (2) capacity, or the applicant's debt-to-income ratio; (3) capital, the amount of money an applicant has in his/her bank accounts; (4) collateral, an asset that can serve as guarantee for the loan and; (5) conditions, the purpose of the loan, the amount involved, and prevailing interest rates (Baiden, 2011). To assess the first 3Cs, banks refer to the SLIK, that by no means covers thin-file customers.

There are 92 million adults in Indonesia who have never participated in financial services and so are not represented in the SLIK, making it difficult to assess creditworthiness with the traditional method (Kusnandar, 2019). Risk assessment lumps customers without credit history in with customers who have demonstrated poor financial decisions. This is one reason that there is an unbanked and underbanked population. Allowing populations without formal financial records to access credit while supporting lenders' ability to assess risk is one problem that innovative credit scoring seeks to address⁶. Lower-income households and MSMEs are also likely to be seeking small loans, increasing the cost of providing financing services to this population, further deterring banks from proactively providing these services.

Innovative credit scoring is too new for there to be robust empirical evidence for its success in increasing financial inclusion. However, related studies suggest that there is an opportunity. Tok & Heng (2022) found that fintech startups leveraging technology and cloud-based data have helped expand access to financing by offering a cost-effective solution for P2P fintech, through which unbanked SMEs and borrowers are better served. This has evidently narrowed the class divide and rural divide, improving financial inclusion. Many other studies suggest that ICS offers potential benefits for financial inclusion that far outweigh its associated risks (see Huang et al., 2020; Siddiqi, 2016; World Bank, 2020; Njuguna & Sowon, 2021; World Bank, 2022).

With these limitations in mind, the following section attempts to address the risks and challenges facing innovative credit scoring in Indonesia.

⁶ Respondent 5: OJK representative, 3 November, 2022, online interview.

SIGNIFICANT RISKS IN ICS

There are two types of risk in the ICS ecosystem: systematic risk and specific risk. Systemic risk refers to risks inherent to the entire digital ecosystem, including but not limited to market risks and data privacy risks. Specific risk refers to risks not shared by the wider industry, instead often specific to individual companies. Specific risks include financial risk, technology risk, and regulatory risk and are often related to poor entrepreneurial foresight, competition, regulatory changes, biases in the AI system, and legal procedural consequences .

Safeguards are needed to mitigate the risks associated with innovative credit scoring while preserving its potential benefits for financial inclusion.

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Data Protection

ICS harnesses big data through data sharing and assessment. This creates a risk of privacy breaches. Indonesia's existing data protection strategy largely involves deploying security measures such as real-time anomaly detection, user authentication, and API⁷ throttling⁸. Despite these safeguards, security concerns about consumer data use, collection, and storage remain (Prove, 2021). This is especially true in the case of ICS, which depends largely on the entire system, including but not limited to data controllers. Because ICS depends on the whole system, a small vulnerability can lead to massive data breach (Aggarwal, 2020). Data breaches exposing information such as location histories, online behavior, and mobile phone activities represent significant potential harm to the users whose data is accessed.

These risks are not specific to Indonesia. A single data heist in 2022 exposed the when data of one billion Chinese residents. In this case, the data were allegedly siphoned from a Shanghai police database stored in Alibaba's cloud and a data leak from Alibaba's Taobao shopping platform in 2021 (Lahiri 2021). Taobao is one of the data controllers from which Ant Group — Alibaba's credit scoring firm — pulls data to assess a customer's creditworthiness. Meanwhile, Indonesians experienced five data breaches in August 2022 alone, two of which are linked with state-owned electricity firm, PLN and telecom firm, PT Telkom Indonesia, which hold the data of millions of customers, which have been widely used in ICS.

⁷ Application programming interface, which allows multiple programs to interact with one another.

⁸ Real-time anomaly detection involves identifying anomalies or deviations from the normal or expected pattern in data streaming (e.g. identifying fraudulent credit card transactions). User authentication is a process of verifying a user's identity before they are granted access to a network or device to prevent unauthorized access and potential harm. API throttling is a process of limiting the amount of API requests a user can make within a specific time frame—an important tool for business to prevent malicious attacks in which an individual sends excessive requests to disrupt the operation of a website or application.

Implementing effective data protection regulation is itself quite tricky. In China, for example, data controllers' relationship with the Chinese state that put data privacy at risk. Claims are often made that poor data privacy rules are "a tool for totalitarian surveillance" and "an invention of the digital totalitarian state" (Ohlberg et al., 2017, p. 12; Mac Síthigh & Siems, 2019, p. 21). Yet, this is not necessarily a problem particular to authoritarian governance, but one that can affect any country. It is a result of insufficient clarity about or commitment to who will be held responsible for data privacy violations. For example, no sanction was imposed on the Indonesian state-affiliated entities involved in the August 2022 data breaches, which the Indonesian government is still investigating (MOCI, 2022).

Artificial Intelligence/Machine Learning Bias

The problem of "fairness" in AI and machine learning is a live issue with implications for ICS. Critics warn that AI-driven analytics might perpetuate existing structural biases, excluding underserved prospective borrowers (Blattner & Nelson 2021). In the realm of ICS, fairness is linked with probability of default in credit operations.

Biases might include:

- Sampling bias: one population is underrepresented or overrepresented in a training data set⁹, such as men are more likely than women to have smartphones or customers from Java and Bali have more valuable real-time data.
- Labeling bias: data scientists annotate and classify certain properties and characteristics of a data point in order to make it searchable by an algorithm. For example, in Indonesia, if data related to utility bills is analyzed, women especially may have lower scores as household bills are typically registered under men's name as the "head of family".
- Outcome proxy bias: bias which occurs when the machine-learning assignment is not well-defined, for example default is identified in an individual living in lower incomes neighborhoods while it is not always necessarily the case.

The problem of "fairness" in AI and machine learning is a live issue with implications for ICS. Critics warn that AI-driven analytics might perpetuate existing structural biases, excluding underserved prospective borrowers (Blattner & Nelson 2021). In the realm of ICS, fairness is linked with probability of default in credit operations.

⁹ Training data set is a collection of data used to train or build a model in machine learning

The rule of thumb is that an algorithm functions as optimally as possible while also treating people 'fairly', for example ensuring that whether an applicant is male or female does not negatively affect their credit score. The already complicated problem of producing fair outcomes is complicated further by the fact that AI and machine learning systems are built by humans, who are not only imperfect in their own understandings of fairness and bias, but may also unconsciously bias decisions in ways that affect credit assessment (Brotcke, 2022, p. 7; Kelly & Mirpourian, 2021, p. 12; Mehrabi et al., 2021). In addition, without a robust risk management framework, AI-driven assessments might increase default risks. They can be more harmful and insidious because they are based, at least in part, on lifestyles as proxies for whether a person will repay a debt (Hiller & Jones, 2022).

This is an issue about which ICS operators in Indonesia are already concerned. In an interview, an executive member of an ICS startup told us they see self-regulation as an integral part of their ethical obligations. This is because the domain of AI and machine learning is so dynamic that rigid, rules-based approaches to regulation will often be inappropriate. Companies opt to tailor their risk management framework based on their unique circumstances. As she noted¹⁰:

“AI systems which ensure fairness are prerequisite for our sustained businesses. Likewise, to minimize AI bias, the company has put a greater emphasis on applying techniques that enable equitable statistical representation in the legacy datasets. It is important for them to not miss out on an important consumer segment and continue to untap potential markets”.

A majority ICS representatives with whom we spoke denied that biases can creep into AI systems. Instead, they believe that each ICS operator targets different segments of customers based on the type of dataset that they have, and this improves accuracy and reduces the technology risk.

“There is no such data that provides a one-size-fits-all formula. Rather than a race to the bottom, each ICS has a different competitive edge and data 'assets' which are in fact complementary to each other. For example, X operator is equipped with mobile phone use data that suits consumers in the younger age cohort, while Y operators sourced with e-commerce and utility bills, can help improve credit prospects for older consumers”.¹¹

¹⁰ Respondent 3: An ICS representative, 31 October, 2022, online interview.

¹¹ Respondent 2: An ICS representative, 25 October, 2022, online interview.

Dissenting, another startup leader believes that risk may arise in part from incomplete sources including the data used to train the AI system. This has its roots in the digital divide. For example, testing for scenarios and combinations of available data across the country—urban vs rural areas, Java vs outer Java—may not be possible, leading to potential gaps in coverage¹².

Taking concrete steps to mitigate this kind of technology risk is not easy. There is no standardized approach to data mining and assessment in ICS, and companies are entitled to protect trade secrets. In mature ICS markets like the United States and China, companies often advertise their alternative databases but do not provide information about how this data is acquired. This secrecy prevents competitors from copying the protected AI formulas and prevents individuals from manipulating their scores.

As a case in point, since the 1970s, the US has enacted Fair Credit Reporting Act (FCRA). It aims to ensure fairness in consumer credit reporting and to safeguard consumers' privacy through limitations on how consumer credit information can be disclosed or used (Robinson & Yu, 2014). FCRA puts more emphasis on the responsibility and accountability of credit scoring platforms in ensuring consumer data protection and a fair and transparent assessment of data. FCRA also grants consumers the right to access information about how their personal and credit data are being used by third parties such as alternative credit scoring companies, the common name of ICS operators in the United States (Yu et al., 2014; FTC, 2022).

However, FCRA barely keeps pace with the ever-evolving alternative credit scoring landscape (Li, 2021). Although FCRA limits use of information in consumer reports and provides procedural safeguards to correct mistakes, it does not limit the types of information that can be used to score credit, aside from certain forms of outdated criminal records and financial records (US Code, 2022, Wezel & Horn, 2022). Since not all alternative data are created equal, relevance, accuracy, and clarity of credit scoring models and their variables remain contestable.

What is more problematic is that without a robust risk management framework, AI-driven assessments might increase default risks. They can be more harmful and insidious because they are based, at least in part, on lifestyles as proxies for whether a person will repay a debt, which might result in false positive assessments (Hiller & Jones, 2022). To illustrate, one of China's biggest ICS operators, Alibaba's Ant Group, mainly assesses data from Taobao, an Alibaba e-commerce platform and Alipay, an Alibaba-run application that handles about 50% of mobile payment transactions in China. This scheme has allowed many consumers to improve their credit prospects when they submit loan applications to Ant's consumer loan platform, Huabei and small business loan platform, Jiebei. Together, these platforms handled about one-sixth of the loan volume generated by China's commercial banking sector, equivalent to 60% of the real economy's total financing.

¹² Respondent 1: An ICS representative, 28 October, 2022, online interview.

Ant collected 39% of its revenue from a combination of predatory lending, monopolistic coercion, and originate-to-distribute (OTD) lending models¹³ (Yu and McMorrow 2021; Nan 2023). Individuals and businesses can submit the Ant-generated credit scoring report to other lending platforms, making it easy for them to accumulate debt across multiple platforms. The vicious cycle of lending has led to an annual increase of around 20% in unsecured consumer lending over the past decade, resulting in household debt reaching over 50% of gross domestic product (GDP) (Hamlin, 2019). This has been accompanied by a dramatic rise in the number of individuals deemed “untrustworthy” by the Chinese Government, which has doubled since 2015, reaching 7.5 million by 2022 (Jiang, 2022). One Chinese senior regulator revealed in a media interview, “When defaults happen, they (smaller banks) have to shoulder most of the losses because neither end-users (customers) nor clients (banks / other institutions) know exactly to what extent algorithms used really generate a good predicted credit score” (Zhu, 2021a).

Market Monopolies/Oligopolies

Companies can offer more precise products and services if they have more capacity to process data and access to a wider range of data. This creates a perverse incentive: As companies work to acquire more and more alternative data to improve their offerings, they tend also to seek a bigger share of the market to maintain control over the data. This potentially leads to restrictive business practices and unfair competition in the market, such as monopoly or oligopoly.

Although ICS operators in Indonesia operate on relatively equal footing, mature ICS markets like China and the United States have experienced this. Three national U.S. credit reporting agencies, Equifax, Experian, and Transunion, dominate the industry, and have evolved into large-scale information oligopolists. While their status resembles those of Indonesian private credit bureaus, such as PEFINDO, U.S. alternative credit scoring oligopolists have a much larger database, covering more than 200 million U.S. citizens. They store not only traditional data, but also alternative data such as phone bills, tax data, and rent payments by bringing small credit bureaus into their systems to access their data and by purchasing data from independent agencies (Kiviat, 2019; Rosenblatt, 2020). There is even evidence that their control over consumer data has resulted in their credit reports producing macroeconomic impacts (Ramcharan et al., 2014; Bernanke 2018).

“Although ICS operators in Indonesia operate on relatively equal footing, mature ICS markets like China and the United States have experienced this.”

These companies occupy a long-held oligopolist position. They jointly developed VantageScore to counterbalance an emerging competitor, FICO¹⁴ by leveraging hybrid traditional and alternative data. Its latest model, VantageScore 4.0, was released in 2017 and runs on the same 300 to 850 scale as FICO. Its main selling point is that VantageScore 4.0 uses machine learning and “more granular and trended credit data” in its scoring method (Schwahn, 2022).

¹³ OTD is a model of lending employed by banks and non-bank lending institutions with the intention of selling the loan to various third parties, as opposed to holding the loans through maturity. Accumulation of low-quality OTD loans risk high charge off and borrower defaults.

¹⁴ FICO is a U.S.-based data analytics company renowned for its three-digit scoring scale—so-called FICO Score. The company has developed more than 20 credit scoring products and gained 11.67% shares of the market as of Q4 2022.

In addition to their joint initiatives, the major three credit bureaus have also respectively launched their alternative scoring models: CreditVision (2013) by TransUnion, NeuroDecision (2018) by Equifax, and Experian Boost (2019) by Experian. Experian Boost offers a particular model that somehow increases their competitor's dependence on their system. For example, Boost scoring generates alternative data which can be used to raise an applicant's FICO score on average by 13 points (Li & Koo, 2019).

Meanwhile, in China, since it was established in 2015, the growth of Alibaba's Ant has outweighed state-owned banks and institutions. Thanks to its multi-industry linkage platforms, it has gained an upper hand in using and even controlling the data. Zhu (2021b) documents that, using proprietary algorithms and methodology, the company scores data subjects, many of whom are young and internet-savvy users without credit cards or sufficient credit records with banks, as well as 80 million merchants, based on their use of Ant-linked services.

In turn, Alibaba monetized the data by selling them to about 100 banks and incur additional fees called "technology-service fee", a 30–40% cut, on average, of the interest on loans it facilitates. On top of data security issues, this tacit business-to-business scheme has left customers without a say about which companies can access and exploit their data. Though it involves some measure of consent, consumers do not have a choice about which company can be used to provide their credit report as Alibaba's Ant Group technically has agreements that have effectively formed an oligopoly with other digital platforms and government agencies.

For example, a high Sesame rating — Ant Group's credit scoring report — may mean that such users do not need to pay a deposit for renting a flat through a particular website that has previously inked a deal with Alibaba. They are also eligible for "buy now pay later" that allows them to purchase over time. Ultimately, such tacit monopoly/oligopoly practices can harm consumer interests in that there is no suitable competition to encourage more innovations and offer more options with a fairer price.

INDONESIAN GOVERNMENT RESPONSE TO DATA PROTECTION AND TECHNOLOGICAL RISKS

Procedural Mechanisms

Regulatory sandbox

There are no ICS-specific regulations because ICS is a new and developing industry in Indonesia. OJK as the regulator is still using regulatory sandboxes¹⁵, meant to foster digital financial innovations by allowing experimentation that might otherwise be hampered by rigid regulation but still keeping it under the regulator's supervision.

Regulatory change is another objective of the sandbox and findings and evaluations from the sandbox can be considered if there is a need to formulate new regulations. In addition to allowing firms to innovate, sandboxes help OJK to test and develop innovation-friendly regulation.

The OJK has the authority to determine which companies are eligible to operate in a regulatory sandbox¹⁶. Through its Digital Financial Innovation Panel Forum, OJK selects a number of recorded (tercatat) digital financial innovation operators as a prototype representing respective digital financial innovation clusters.

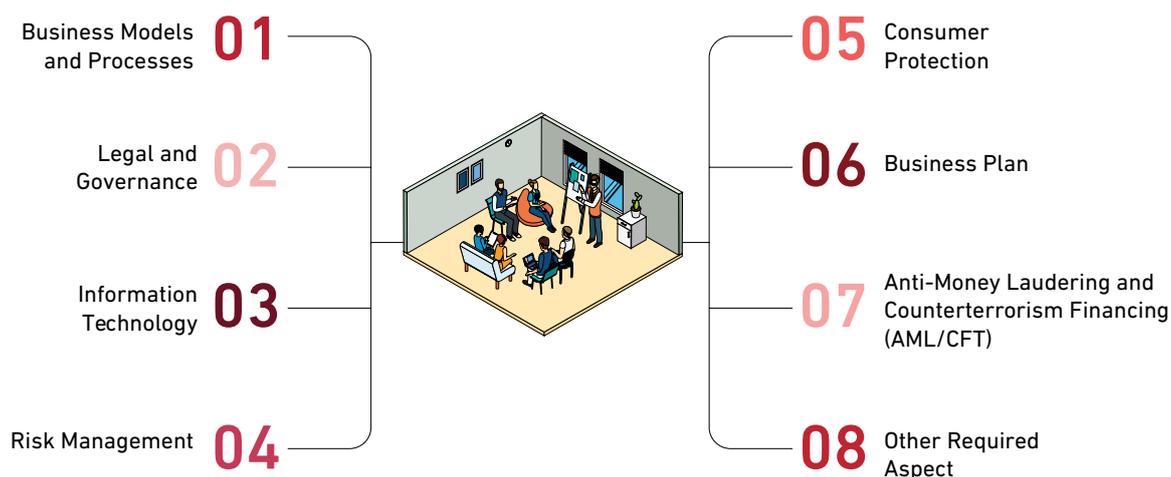
As with other digital financial innovation operators, an ICS company must first apply to OJK by submitting a copy of the deed of the company establishment, a written brief explanation of their products, business plan, and other information related to their activities. If OJK designates a given ICS company as a prototype, the company will be trialed in the sandbox for a maximum period of one year and extendable for another six months.

¹⁵ This sandbox requirement is regulated under POJK 13/2018.

¹⁶ As detailed in OJK Circular Letter No. 21/SEOJK.02/2019 on Regulatory Sandbox, the criteria for being a prototype in the Digital Financial Innovation regulatory sandbox include: (1) recorded as a Digital Financial Innovation operator with the OJK; (2) have the most innovative business model and a business scale with broad market coverage and; (3) be registered with the fintech association (AFTECH). As another implementing rule for POJK No. 13/POJK.02/2018, it stipulates the process and mechanism of regulatory sandbox for digital financial innovations starting from the registration of sandbox applicants to the exiting process of sandbox.

During the trial phase, the prototype would be evaluated and tested by OJK on a regular basis based on several aspects, as shown in Figure 3.

Figure 3.
Aspects of Assessment and Evaluation in OJK Regulatory Sandbox



Source: OJK Circular Letter No. 21/SEOJK.02/2019

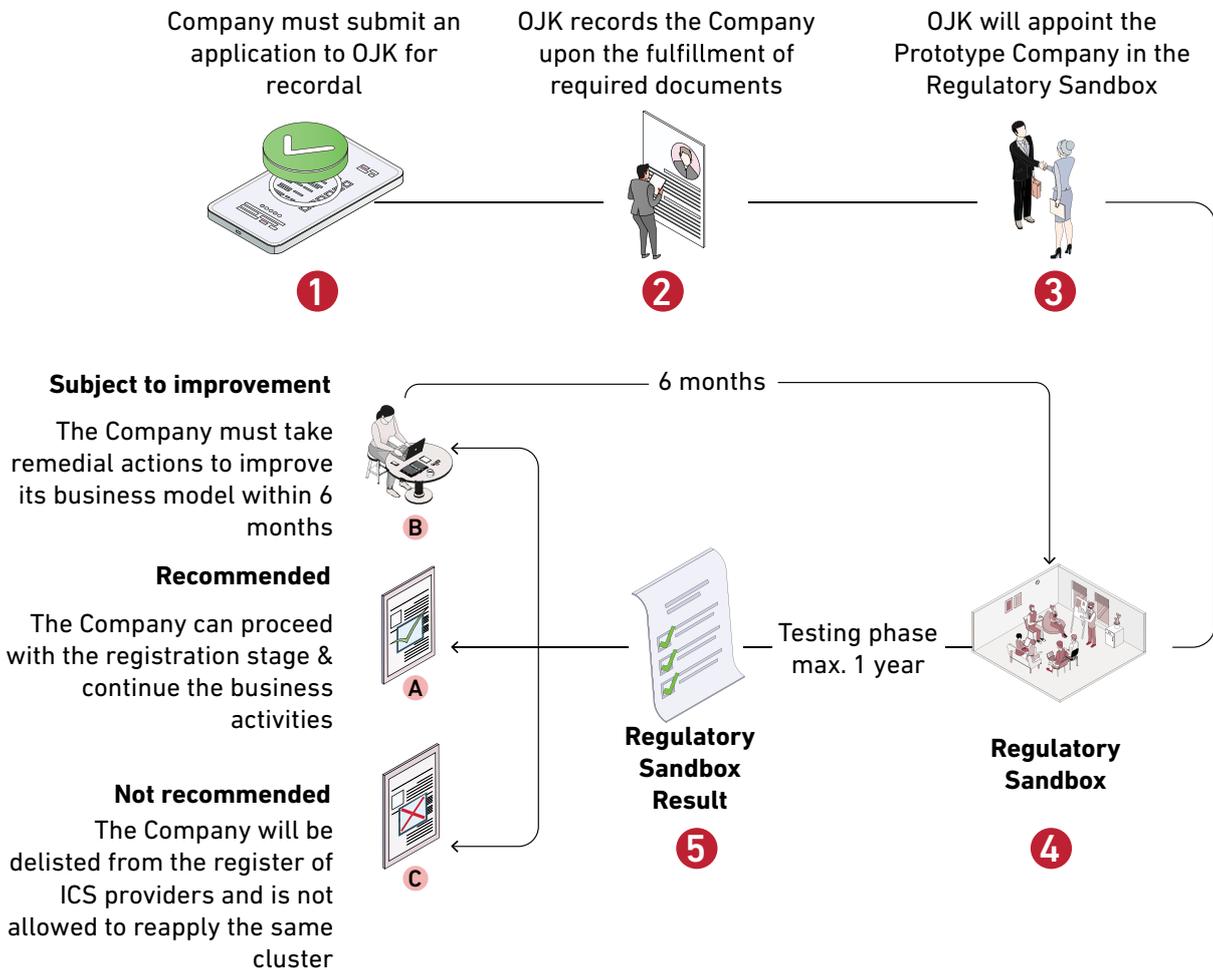
Input provided by the OJK to prototypes would be also applicable to ICS companies that are not selected in the trial process. While several adjustments would be made, non-prototype companies are still required to submit periodical reports to the OJK, including a self-assessment risk report that is benchmarked against the testing result.

During the implementation stage, OJK supervises the compliance of prototypes especially in terms of data privacy, anti-money laundering, and customer protection. As detailed in OJK Circular Letter No. 21/SEOJK.02/2019, a prototype must disclose all important and relevant information. This information disclosure improves the regulator's understanding of innovative credit scoring. ICS entities are not required to disclose their proprietary credit-scoring mathematical algorithms, which are an essential part of business competitiveness in the industry.

Based on the experience of the entity in the regulatory sandbox, OJK will decide the status of the recorded ICS as:

- **Recommended:** The company can proceed with the registration stage and continue its business activities.
- **Subject to improvement:** The company must take remedial actions to improve its business model within six months.
- **Not recommended:** The company will be delisted from the register of ICS providers and is not allowed to reapply the same cluster.

Figure 4.
OJK Regulatory Sandbox Process



Source: OJK Regulation No. 13/2018

The status of "recommended ICS" in the OJK system remains unclear. There is no information available to the public regarding the next stages recommended ICS operators can take to scale up their businesses. In interviews, industry stakeholders lamented that they lack clarity about whether they are still under trial period or not and from what rules they are still exempt.

Self-regulation through AFTECH

To ensure compliance with best practices, OJK delegates a monitoring function to AFTECH (Association of Financial Technology), a fintech association affiliated with the ICS industry. This also installs AFTECH into procedures for consumer complaints and redress—the association plays an intermediary role between consumers and ICS entities.

AFTECH's supervision of ICS entities complements its supervision of fintech entities (Aprilianti 2020). It is allowed to make binding regulations related to ICS activities. As AFTECH membership becomes mandatory for ICS providers, it will give AFTECH significant latitude to develop self-regulatory instruments, monitor compliance, and ensure enforcement towards their members (Suleiman et al., 2022).

AFTECH lays the groundwork for compliance in ICS through two main policy instruments: (1) the Code of Ethics on Personal Data Protection and Data Confidentiality in the Financial Technology Sector and (2) the Code of Ethics for ICS fintech.

Code of ethics

In December 2021, AFTECH issued a Code of Ethics on Personal Data Protection and Data Confidentiality in the Financial Technology Sector for its members to ensure responsible digital financial innovation (AFTECH, 2021). The Code of Ethics is aimed at addressing common issues surrounding data subject protection, including but not limited to consent management, data retention and the use of data, and access restriction to the user's devices. The development of this Code of Ethics was driven by member concerns about eroding trust and confidence in ICS systems and technology. The Code of Ethics is also intended to provide legal certainty for customers and to improve oversight of business operations, demonstrating AFTECH's commitment to a safe digital environment (Suleiman et al., 2022).

As detailed in Table 2, the Code of Ethics sets customer consent as its cornerstone. All fintech companies, including ICS, must obtain the data subject's consent before processing personal data and this request for consent must be unbundled from other terms and conditions and written in a clear and concise way, using language that can be easily understood by the data subject. Since ICS relies primarily on business-to-business data access, resembling an outsourcing arrangement, relevant consent approaches vary.

Customers mostly provide consent for ICS operators to pull the data from the data controller through the first party, such as the P2P lender or "buy now pay later" vendor, who will make a decision based on the credit report. This consent is also the legal basis for sharing the result of the credit score with the first party.

When ICS takes place as a business-to-consumer service, user consent is requested directly through the ICS application. This means that business-to-consumer services allows for more transparency regarding to which entities a user releases their data. In a business-to-business service, ICS is a third party to the transaction of which the data subject is unlikely to be aware of. Regardless, the consent management framework is lacking, as data subjects may find it inconvenient if they wish to review the terms and amend their decisions.

Table 2.
AFTECH Personal Data Protection Code of Ethics

Code of Ethics for Financial Technology Industry Regulation		
No	Component	General Principles
1	Lawfulness, Fairness, and Transparency	Have a clear legal basis for processing Personal Data and comply with all applicable laws and regulations related to Personal Data.
		Using personal data in accordance with the purpose, appropriately, and not detrimental to the individual concerned.
2	Data Minimization	Only process Personal Data in accordance with the purposes that have been determined and approved by the Personal Data Owner.
3	Accuracy	Personal Data processed by AFTECH members must be kept accurate.
4	Integrity and Data Confidentiality	This PDP Code of Ethics does not specifically present the steps that need to be taken to safeguard Personal Data which is under the control of AFTECH members. However, this PDP Code of Ethics entrusts AFTECH members to take practical and responsible steps to protect Personal Data from the breach, loss, misuse, failure, or accidental alteration or destruction, in accordance with the provisions of the applicable laws and regulations.
5	Accountability	All Personal Data is processed responsibly and based on compliance with the provisions of the applicable laws and regulations. Control and processing of Personal Data is also carried out proportionally according to its purpose, and with a safe and accountable process.
6	Good Intention	The PDP Code of Ethics emphasizes that all Personal Data processing activities by AFTECH members are carried out in accordance with the approval obtained from the Personal Data Owner and in accordance with the provisions of the applicable laws and regulations, and AFTECH members have clarification and resolution mechanisms to address allegations and incidents of violations and /or failure to protect Personal Data.
		The PDP Code of Ethics does not regulate in detail the mechanism for clarification and resolution and entrusts all mechanisms, statements, and notifications regarding the violation of Personal Data owned by AFTECH members in accordance with the provisions of the applicable laws and regulations.

Source: Suleiman et al. (2022)

Besides consent management, the Code of Ethics also promotes “the data minimization principle”, which says that no more data should be collected than is necessary—only what is directly relevant and fits the purpose for which it is being collected. Because of the growing ubiquity and power of data, fintech companies may feel they must collect vast quantities of personal data. But this impulse increases data subjects’ risk from data breaches or unauthorized data access.

No less important is the introduction of data retention policies, which require data controllers to conduct regular reviews of personal data to determine what is no longer needed and delete it. Where ICS operators depend on parent companies’ data controllers, data retention will be the responsibility of that parent company. Independent ICS companies are responsible themselves for both data minimization and data retention practices. They must take into account the legal mandatory retention period, especially for the credit report and personal data collected from sources such as the civil registry, telecommunication services, and social media.

Code of conduct

AFTECH has recognized the importance of an ICS-specific code of conduct to address some shortcomings of the credit scoring system, including but not limited to transparency and fairness issues. The intention is ultimately to ensure a robust risk management framework (AFTECH, 2020). In November 2020, AFTECH launched the Code of Conduct for ICS fintech (Table 3). As shown in the following table, the Code of Conduct addresses four important ICS-related matters: (1) integrity and credible quality of credit scoring; (2) transparency of data sources and data processing; (3) independence and professionalism; and (4) security standards.

Table 3.
AFTECH Code of Conduct (CoC) for Responsible Innovative Credit Scoring (ICS)

Code of Conduct for ICS Fintech		
No	Principles	Regulation
1	Integrity and Credible Quality of Credit Scoring	The company must have a basic standard operating procedure and governance of information technology systems that satisfy eligibility and security standards; apply methods of credit scoring that are systematic, thorough, and standardized; have data sources and ensure that the data is permitted by OJK and fully compliant with applicable regulations; take all reasonable steps to ensure validation testing; and have skilled and competent employees.
		The company and its employees must comply with all laws and legislation in Indonesia; inform the authority (OJK) if there are new developments in the credit scoring industry that can affect the oversight function of OJK; and maintain professionalism, responsibility, and fairness.
		The company must hold the principle of good faith while processing consumer personal data. It is also required to design and organize programs that support the national financial literacy and inclusion agenda. The company can only cooperate with financial institutions that have been registered at OJK while the credit report shared with financial institutions only serves as supporting data instead of a sole determinant to measure creditworthiness. It is prohibited to collaborate with blacklisted third parties.
2	Transparency of Data Sources	The company must ensure information transparency and provide accessible customer services channels such as websites, telephone, chatbot, e-mail, and FAQ.
		The company is obliged to respect individual rights related to data that it manages in accordance with applicable regulations. The data processing must be done in a fair and transparent manner and data collection must be done on a lawful basis, such as consent and compliance with legal obligation.
		The company must provide a mechanism of data deletion request where they remove the irrelevant digital information and documents at the request of consumers, the data owner, or by the court decision. As to data retention, it can only maintain the data related to the credit scoring not more than five years or a period that is determined by legislation.
3	Independence and Professionalism	The company is obliged to maintain independence and to make a professional judgment when running credit scoring assessment. The credit score generated by the system must uphold equality and be freed from discrimination against certain groups. Cooperation must be legal and made in writing which explains the authorities and responsibilities of each party.
4	Security Standard	The company must apply the standard of appropriateness and security of information systems based on applicable regulations set out by authority (OJK), Associations and other authorities. The infrastructure and software used must meet the legality and security standards, and operated by expert staffs with technical competences.

Source: compiled from AFTECH (2020)

Apart from improving clarity on mechanisms surrounding the issues of data retention, consent management, and data minimization, the Code of Conduct addresses technology risks. For example, in pursuing integrity and credible quality of credit scoring, each ICS operator must develop a basic standard operating procedure and Information and Communications Technology (ICT) governance that meets the safety and reliability standard in the use of AI, machine learning, cloud computing, or other processing technologies to generate its credit report. Each operator must also apply a credit scoring assessment method that is systematic, thorough, and based upon verified data to reduce bias and mitigate privacy risks.

The Code of Conduct also addresses issues surrounding consumer rights and complaint resolution. ICS operators must have specific mechanisms that allow customers to file a complaint over allegations of a personal data breach as well as to submit their objection to decisions made by the automated system.

AFTECH has not specified a mechanism for disciplining operators who violate the Code of Conduct beyond imposing sanctions. A clear line is not drawn between the responsibility and liability of ICS operators in the context of processing data, especially when the customer seeking compensation can claim against both the data controller and processor.

The AFTECH Code of Conduct has a stronger effect and direct impact on ICS business sustainability. For example, AFTECH has an Honorary and Independent Ethical Council which oversees the progress and implementation of the Code of Ethics by AFTECH members (AFTECH, 2020; AFTECH, 2019). This Council has the right to investigate complaints and impose sanctions on the members who are deemed to have violated the code of ethics. In a worst-case scenario, a company's membership in AFTECH can be revoked, at which point the OJK might revoke the company's business license or remove its record (*pencatatan*) (OJK, 2018), since OJK requires that fintech companies be registered in the AFTECH.

Substantive Mechanisms

On October 17, 2022, Indonesia's long-awaited personal data protection bill became Law No. 27 of 2022 on Personal Data Protection Law (PDPL), subject to a two-year transition period.

This law is seen as a panacea to the long-standing problem of threats to data privacy in Indonesia and as a legal reference for businesses which must navigate provisions on data protection scattered across more than 30 regulations. Modeled on the EU's General Data Protection Regulation (GDPR), the PDPL consists of 16 chapters and 76 articles, establishing rights, responsibilities for the processing of personal data, and stipulating penalties for violations. It defines personal data, introduces novel categories of 'sensitive data', regulates the consent mechanism and erasure of data, imposes mandatory data protection officers (DPO), and covers the establishment of the Indonesian Data Protection Authority (DPA). PDPL also regulates administrative sanctions and provides enforcement powers for the Agency.

This law is seen as a panacea to the long-standing problem of threats to data privacy in Indonesia and as a legal reference for businesses which must navigate provisions on data protection scattered across more than 30 regulations.

For ICS, the PDPL clarifies the legal rules for processing personal data. However, the focus of the new regulatory regime is still limited to enforcing the promises that businesses make to users, rather than establishing institutional standards and clear-cut obligations. The law is missing standards for consent management, data protection officer standards, clarity about how responsibility is shared between the Data Protection Authority and AFTECH, and the right to refuse automated decision-making.

Consent management and legitimate interests

The Personal Data Protection Law introduces a 'legitimate interest principle' as a basis for processing a user's data without explicit consent. This principle only requires a data controller to balance their own interests with the rights of the user whose data will be processed.

PDPL does not provide adequate clarity about what constitutes a lawful basis for consent. This creates a problem for ICS providers who need guidance about the when personal data can be processed to undertake a credit assessment under the legitimate interest principle. PDPL also does not indicate whether data processors, like ICS providers, have what the law considers a legitimate interest, especially when the ICS operator has a parent company that acts as the data controller.

While the transition period for the law will allow for the development and implementation of derivative regulations that will apply to specific sectors, the lack of clarity in the meantime leaves the industry struggling with uncertainty.

Data protection officer standards

Data Protection Officers (DPO) will play a pivotal role in the data protection ecosystem that the PDPL is trying to establish. The PDPL stipulates that ICS operators must appoint a data protection officer in order to meet conditions to: (i) process personal data for public services, (ii) provide regular and systematic monitoring of personal data on a large scale, and (iii) conduct large-scale processing for specific personal data or data related to criminal offenses.

Data protection officers can be an existing employee or an externally appointed officer who is responsible for overseeing a company's data protection strategy and its implementation to ensure compliance. The PDPL does not specify mandatory qualifications, skills, or educational requirements except that data protection officers must be professional and understand the law.

“The standards for appointing data protection officers in ICS firms and how it affects certification remain unclear.”

The standards for appointing data protection officers in ICS firms and how it affects certification remain unclear. CIPS has proposed (Sulaeiman et al., 2022) that standards, competencies, and certification requirements for potential DPOs can be developed as a sub-sector under the Minister of Communications and Informatics (MOCI) Regulation No. 24 of 2015 on the Enforcement of the Indonesian National Work Competency Standard (Standar Kompetensi Kerja Nasional Indonesia or SKKNI) in the Field of Communications and Informatics. It is preferable because DPO will become a sought-after profession that should have a legal basis.

As of 2021, there are 52 competency standards developed by the MOCI. Feedback from and dialogue with stakeholders can help refine the requirements and standards for data protection officers. Some standards already exist as starting points—the Indonesian Association of Data Protection Practitioners (*Asosiasi Praktisi Perlindungan Data Indonesia*) provides a communication platform for data protection professionals and runs a training program to issue DPO certificates. AFTECH has also set professionalism standards for ICS, although these are still superficial. These associations should be consulted to inform the MOCI while setting ICS-specific standards for data protection officers.

Data protection authority and AFTECH

Article 60 of PDPL provides the president with the authority to appoint a Data Protection Authority that will be responsible for supervising the compliance of data controllers, receiving complaints, and imposing sanctions for violations committed by data controllers and/or data processors. The Data Protection Authority will also be responsible for resolving alleged cross-border violations by collaborating with foreign data protection agencies.

The government has not yet announced who will be appointed to the Data Protection Authority or what types and strength of enforcement powers it will have. Recent debates have instead centered on the independence of the agency. When it comes to ICS, a key question will be what kind of shared-responsibility model will be developed between Data Protection Authority and self-regulatory organizations like AFTECH, especially with regards to complaints investigation and compliance enforcement (Widiatedja & Mishra 2022).

The Head of Digital Financial Innovation of OJK, Triyono Gani, commented in an interview (2021) on the importance of AFTECH's Code of Conduct on Responsible Credit Scoring in 2021, which complements OJK's supervisory approach. OJK tends to apply a "market-conduct based" approach which is barely responsive to the ICS business model. AFTECH's Code of Conduct addresses what OJK calls "4C": compliance, consent, control, and competence.

While the technical guidelines of PDPL and the mandate of the Data Protection Authority are being refined is the time to develop the framework for how AFTECH shares responsibility with the Data Protection Authority. Innovative-credit-scoring-specific compliance standards, including but not limited to rules governing what constitutes 'legitimate purpose' when collecting alternative data and approaches to data processing that might affect privacy, should also be developed.

The right to refuse automated decision-making

The Personal Data Protection Law establishes rights and responsibilities surrounding the collection and processing of personal data in a manner similar to the European General Data Protection Regulation (GDPR). Included is the right to refuse automated decision-making, including profiling. Automated data processing such as that used by ICS operators, in which data is processed without human intervention and the results may have serious consequences for the data subject, is only lawful where the data subject has given consent to the process or if there are suitable safeguards in place.

Because innovative credit scoring uses automated processes to generate a credit score from alternative data, rather than human judgement, it suffers from the potential ethical problems affecting AI and machine learning, including perpetuating or intensifying structural biases. This raises questions about whether, how, and with what safeguards human decision-making authority is being transferred to a machine; to what extent credit decisions can be outsourced; and what kinds of rights are established other than the right to object the data processing (Chesterman, 2021).

In order to address concerns about automated processing of personal data, in addition to requiring explicit consent before allowing automated processing of personal data, the EU GDPR expanded both the possibilities for automated processing and the protections available. It includes the right to request "meaningful information about the logic involved" in automated decision making (see GDPR 2016, Article 15 (1)), which, in theory, supports the ability of the data subject to dispute automated decisions.

However, in practice, applications for this "meaningful information" about a specific case often received generic, shallow explanations that may not address the user's concerns¹⁷ (Dexe et al., 2022). Because ICS companies believe their proprietary algorithms are trade secrets, giving very specific information about how data is used might endanger their business. This makes addressing concerns about how users' data is processed without undermining the services users are trying to access difficult. Although the GDPR has been in place since 2018, evaluation and attempts to secure the right to meaningful information across different sectors is ongoing.

¹⁷ For example, a company may give generic examples of the data categories inputted to the system without specifying which categories are used to calculate the score.

China takes a rather different approach. In the event of an individual being blacklisted due to social credit assessments, the State Administration of Taxation has a 'credit repair mechanism' that provides corrective measures under certain circumstances (State Administration of Taxation 2021). Moreover, there is also a right to appeal to the courts, regardless of mounting doubts over the effectiveness of these legal safeguards.

These biases and limitations should not excuse ICS providers from accountability and responsibility for harm caused by their algorithms' decisions. During the introductory transition period of the PDPL, the development of derivatives and practical guidelines should take this ICS-specific regulatory dilemma into consideration.

CONCLUSION AND POLICY RECOMMENDATIONS

Innovative credit scoring offers the potential to extend access to credit to unbanked and underbanked Indonesians and Indonesian businesses by using unconventional data sources to assess the risk of potential borrowers who lack a formal credit history. This is an emerging industry in Indonesia, with much work still to be done to address concerns about personal data protection, the fallout of credit decisions made using artificial intelligence and machine learning, and monopolistic or oligopolistic holders and processors of personal data.

The recently-passed Personal Data Protection Law (PDPL) is in its two-year introduction phase, with many details about its implementation still being developed. Already in place is the regulatory sandbox scheme, overseen by OJK in order to allow innovation both by businesses and regulators, while also requiring firms providing ICS to adopt self-assessment principles and submit regular self-monitoring reports to OJK. ICS providers are also overseen by industry self-regulator AFTECH, which has some disciplinary power through sanctions and membership withdrawal, and which has introduced a Code of Ethics and a Code of Conduct for ICS providers.

Lessons can be drawn from the European Union's General Data Protection Regulation, which was used as a reference document when drafting Indonesia's PDPL. Principles from this document, such as data minimization, which restricts the amount of data that can be collected to only what is needed, and clear chains of accountability in the event of a data breach or data abuse, should inform the implementation of the PDPL. In order to address problems with data security, better rules are needed to govern how ICS firms in particular collect, store, and use personal data. In particular, clarity is needed on what constitutes a minimum functionality for data.

Another concern facing data protection and ICS in Indonesia is the role of state-owned enterprises in gathering data and providing it for alternative credit scoring services. As seen in the August 2022 data breaches in Indonesia, the involvement of state-owned enterprises can mean that no one is held accountable when data privacy violations occur. This illustrates why a clear chain of accountability is key to digital consumer protection, as well as the difficulties that conflicts of interest can pose to personal data protection.

With the three significant risks in ICS—data protection, AI/machine learning, and monopoly power—in mind, we offer three recommendations for policy improvement in the ICS sector:

Procedural mechanism: Updating the regulatory sandbox and creating the Data Protection Authority (DPA)

As ICS service provision in Indonesia continues to scale up, OJK should reassess the effectiveness of the regulatory sandbox programs and increase clarity about how 'recommended' firms exit the sandbox and enter the broader fintech marketplace. The regulatory sandbox has been in

operation for four years, since the POJK 13/2018 was enacted. Compliance assessment of ICS firms regarding managing the service's inherent risks, including in data privacy and technology risks, is conducted through the regulatory sandbox and AFTECH self-regulation. While in the trial phase of the sandbox, ICS firms must adopt self-assessment principles and submit regular self-monitoring reports in order to collaborate with OJK in assessing the business. Despite these complex processes, the sandbox is not keeping up with the regulatory needs of the growing ICS sector.

OJK should develop an integrated data-sharing mechanism between ICS and traditional credit bureau agencies in Indonesia, as well as operational toolkits for data-sharing strategies. ICS providers may operate across multiple sectoral areas, for instance in collaboration with private credit bureau agencies. This activity may not fit easily into the scope of regulatory sandboxes. OJK must develop an overarching strategy for regulatory sandboxes that can handle activities across different sectors. Providing a mechanism and guidelines for data-sharing that is in line with PDPL and all sector-specific regulations can help OJK address the shortcomings of the regulatory sandbox while also enabling businesses to provide a holistic assessment of a customer's credit worthiness.

Prioritize the establishment of the independent Data Protection Authority during the transition period of the Personal Data Protection Law. The Data Protection Authority is needed to perform regular checks on all parties involved in ICS, particularly regarding the data being used and shared by data controllers and ICS data processors. This Agency is meant to help regulate ICS along with OJK and AFTECH. Establishment of the Agency should recognize that there must be clear-cut, well-defined responsibility-sharing between AFTECH's Honorary and Independent Ethical Council, OJK, and DPA. These entities should pursue fair and robust data governance in the ICS sector using knowledge gained from regulatory sandboxes.

Substantive mechanism: Putting forward customer protection and thorough ICS-specific risk assessment

Co-regulation must produce a standardized practical categorization of risks specific to innovative credit scoring that can be expanded from the Code of Conduct on Responsible ICS and other applicable guidelines and codes of conduct. Risk-based co-regulation involves meaningful knowledge sharing and dialogue between the regulator, AFTECH, and other related associations. This standardized categorization of risks would serve as a baseline from which regulators and industrial players can work to elaborate guidelines and standards for ensuring customer protection and compliances.

Increase the involvement of relevant stakeholders in the decision-making process through co-regulation and provide more leeway for general provisions to be implemented in different ways, with a special focus on addressing the challenges specific to AI-backed fintech sectors. Adoption of artificial intelligence and machine learning processes and the innovation that they allow in financial services must be undertaken with due regard to data protection. Co-regulation can help create regulations and practical guidelines that are more effective and closer to address the provision of the PDPL.

OJK should encourage companies to communicate and coordinate with data privacy and consumer protection authorities to develop standards and safeguard measures to address the risks inherent to using big data without undermining its usefulness. OJK should also clarify regulations governing types of data, data use, and data protection officers, and specify how liability falls on data controllers and data processors. Specific techniques for striking a balance between protecting consumers from misuse of their data and eliminating the usefulness of big data—two seemingly opposed objectives—is crucial. One concrete step that could be taken is creating sectoral-specific standards for data minimization in order to enhance credibility and minimize the risks posed to data subjects.

Preventing abuse of market dominance

To prevent market dominance and restrictive business practices to ensure fair competition in the fintech industry, OJK should actively collaborate and coordinate with the Commission for the Supervision of Business Competition (*Komisi Pengawas Persaingan Usaha* 'KPPU'). OJK can start with reviewing all listed ICS operators' business updates, models, and operations. Some of them have even shut down in the last few years, but remain untracked. OJK should collaborate with KPPU and relevant stakeholders to assess barriers to entry in the sector and have regular updates on acquisitions and transfer of productive assets, notifying KPPU of irregularities.

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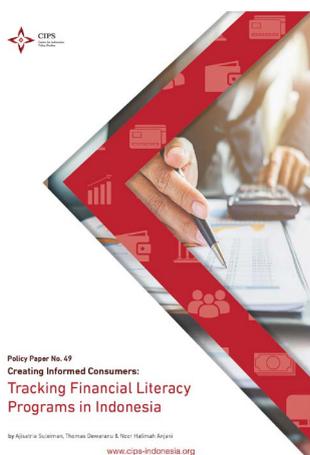
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