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Empowering public-private data partnership for data on digital economy: case of Bank Indonesia¹

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Empowering Public-Private Data Partnership for Data on Digital Economy: Case of Bank Indonesia

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In this post-pandemic and digitalized environment of great uncertainty, new data sources are needed to support policymaking. Meanwhile, abundance of data created as by-product of digital services opens up opportunities for policymakers to improve insights on digital economic activity as well as serving as proxy for the broader economy. However, these valuable data are usually kept in by private sector. To address this, Bank Indonesia (BI) has practised data partnerships using a new set of principles and collection methodology. In this paper, we document our lessons learned in establishing and maintaining public-private data partnerships as collaborative effort to improve statistical information.

Keywords: Business-to-Government Data Partnership, Data Collection, Digital Economy

JEL Classification: C81

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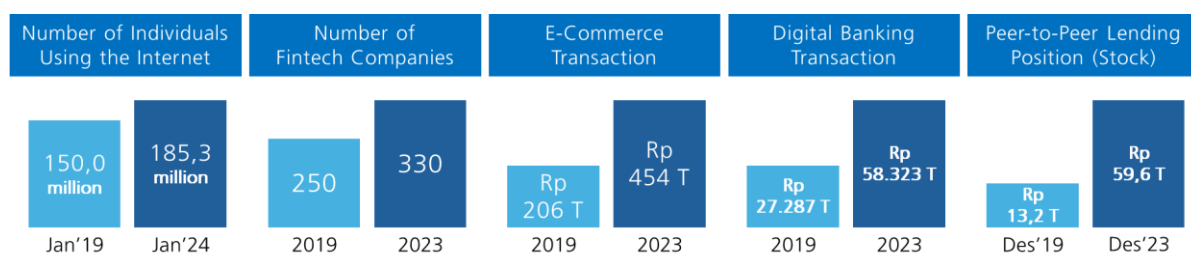
1. Introduction

1.1. Indonesia's Digital Economy

Digitalization has been increasingly prominent in recent years. Utilization of internet and various advanced technologies continues to disrupt multiple aspects of life, becoming an integral part of the activities of society. This includes the economic and financial sectors, where digital transactions are starting to replace (or at least complement) conventional ones. The presence of digital platforms (e.g. e-commerce), digital innovations in banking, and financial technology (fintech) companies act as catalysts for the digitalization of the economy and finance in Indonesia (Figure 1).

The Development of Indonesia's Digital Economy

Figure 1

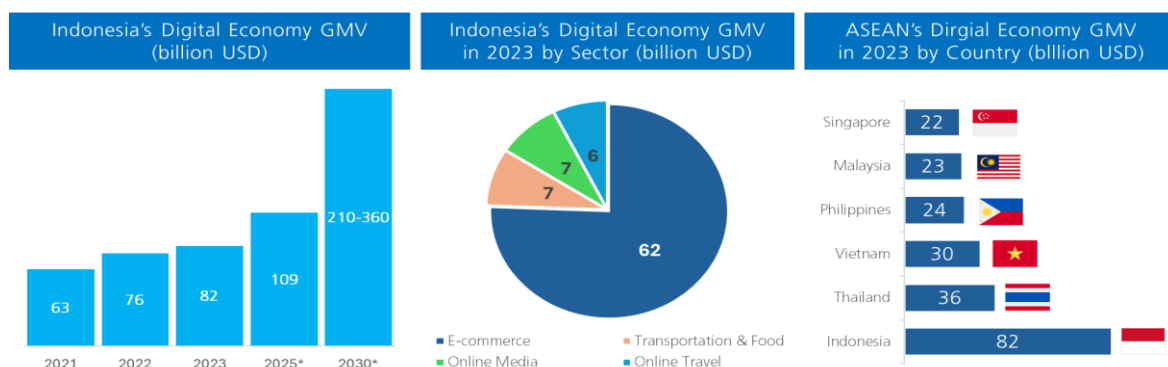


Sources: BI, Indonesia Financial Services Authority (OJK), Indonesia Fintech Association (AFTECH), We are social

Indonesia's digital economy has consistently grown positive. Indonesia has become the most prominent digital economy in Southeast Asia, with a market share of 37.6% (Google et al., 2023) (Figure 2). In 2023, Indonesia's digital economy was estimated to reach USD82 billion (8% y-o-y) in terms of gross merchandise value (GMV) and is projected to reach USD109 billion by 2025 and USD210-360 billion by 2030. Currently, the primary contributor to Indonesia's digital economy is the e-commerce sector, with a share of 75.6% (USD62 billion), followed by the transportation and food sector and online media, each with a share of 8.5% (USD 7 billion), and the online travel sector with a share of 7.3% (USD 6 billion). Indonesia is still expected to grow faster than regional average and drive a significant portion of digital economy growth.

Digital Economy in Indonesia and ASEAN

Figure 2



Source: Google et al. (2023)

1.2. Data Revolution

In the digital era, data has become the most valuable asset ("data is the new oil"). Every click and swipe has produced digital footprints down to the individual level, as a by-product of the provided digital services. This data offers valuable insights (e.g. consumer behaviour), thereby serving as a key competitive advantage for many industry players (IEAGDRSD, 2014).

However, the extensive but exclusive control of consumer data obtained from digital networks can lead to market concentration and dominance by a few players, evolving into what is known as big techs. This condition enhances their bargaining power and creates barrier to entry for other companies (Bank Indonesia, 2019). This contradicts the non-rivalry nature of data, where society benefits most from data when it is widely used, as more users can utilize it to innovate and improve (Haksar et al., 2019).

On the other hand, data technology has seen marked developments, particularly cloud computing, big data analysis, artificial intelligence, and machine learning. By leveraging these advanced tools, organizations can uncover patterns within their data and extract actionable insights which in turn supports more informed decision-making, including central banks who have been early adopters of these advances for statistics, macro analysis, payment systems oversight, and supervision.

Recent developments in the area of data collection have also transformed central banks' operations. For example, BI implemented BI-ANTASENA in 2022, a comprehensive regulatory reporting designed to streamline and enhance the reporting processes of banks to BI, Financial Services Authority (OJK), and Deposit Insurance Corporation (LPS). This system integrates 6 existing bank reportings into a single cohesive framework, providing various reporting channels e.g. application programming interface (API), managed file transfer, and conventional web portal, tailored to technological capabilities for each bank. BI-ANTASENA's primary goal is to increase operational efficiency and ensure accurate, timely, and complete data submission, which is critical for decision-making and regulatory compliance.

1.3. Policy Needs as a Driver for New Forms of Data Partnership

The complexity and uncertainty faced by central banks will continue to evolve along with various changes in their strategic environment. The current global economic conditions are more volatile amidst a state of uncertainty, with increasingly complex and unpredictable problems and challenges, and heightened ambiguity, often referred to as VUCA (Volatility, Uncertainty, Complexity, and Ambiguity). Consequently, the policy directions undertaken by economic actors, including authorities and market participants, become more uncertain (Warjiyo & Juhro, 2021). The resulting acceleration of economic and financial activities requires central banks to continually innovate in policy formulation, implementation, and supervision. Navigating this digital era is a highly challenging task that requires central banks' ability to adopt and optimize the use of data to support policy.

To support this vision, it is necessary to provide central banks with strong authority in data-related area. Since the enactment of the Financial Sector Development and Strengthening Act (UU P2SK) in early 2023, BI's authority in data has been strengthened to support the execution of its mandates. Revision to Article 14 of the Bank Indonesia Act includes the following empowerments: (i) expansion of

authority related to data collection, which was previously limited to surveys, now encompasses surveys, data acquisition, and reporting from relevant entities, and data exchange partnerships with other authorities; and (ii) explicit authority related to data processing and dissemination, in line with the Personal Data Protection Act (UU PDP).

1.4. G20 Data Gaps Initiatives (DGI)

In October 2022, the G20 Finance Ministers and Central Bank Governors (FMCBGs) welcomed the workplan for the third phase of the Data Gaps Initiative (DGI-3). DGI-3 includes 14 recommendations addressing four statistical areas: (i) climate change; (ii) household distributional information; (iii) fintech and financial inclusion; and (iv) access to private sources of data and administrative data, and data sharing (IMF, 2022).

Over the last years, the statistical community has been striving to address these gaps and to provide policymakers with an enhanced toolkit to develop policy in these critical areas. Amongst many challenges, they noted that statistics are still largely based on data collected by surveys and reports, leading to a gap between what and when events are recorded in official statistics and what happens in the real economy. Therefore, DGI-3 aims to expand earlier effort and ambition on promoting data sharing for closing data gaps. More specifically, Recommendation 13 of DGI-3 recognized that “improving data availability and provision, including on environmental issues, and harnessing the wealth of data produced by digitalisation, while ensuring compliance with legal frameworks on data protection and privacy, will be critical to better inform decisions.”

2. Literature Review

2.1. Definition of Data Partnership

The data revolution brings about an explosion of data that can be owned by a variety of entities, including individual, companies, and public sector, with data related to digital economic activities owned mostly by private organizations. By accessing and combining various data sources, including those outside the public domain, we can provide insights for policy-makers that cannot be produced with conventional data sources alone. This fosters new collaborations among public, private, and nongovernmental entities, aiming to utilize diverse data sources for policymaking.

Most studies on data-driven collaboration for social good use different terminology, but they share common concepts. These include public-private partnerships, data sharing, data collaboration, data philanthropy, and data donation. For example, data collaboratives may be referred to as a data philanthropy projects, and vice versa (Susha et al., 2019). Data collaborative is “a new form of collaboration, beyond the classic public-private partnership model, in which participants from different sectors – in particular companies – exchange their data to create public value” (Verhulst & Sangokoya, 2015). While the term is relatively new, data sharing is well-established concepts in central bank research and practice.

Data donation is voluntary act of individuals contributing or sharing their personal data for public goods e.g. research, scientific or social purpose. (Skatova et

al., 2014) It is said that data donation holds promise as a useful tool in digital economy, providing value to third sector and well-being researchers as well as marketing and the private sector. The term “data philanthropy” has also been used to describe the sharing of private sector data for social purposes, such as academic research and humanitarian aid. In other legal word, data philanthropy is a practice in which (1) privately held data or proprietary data-driven insights, (2) are shared or given access to, (3) for the public good (Lev-Aretz, 2019).

For this paper we choose to use definition from (Susha et al., 2019) and combine it with our focus in this paper which is **public-private or business to government (B2G) data partnership**. Thus, the definition we use is, data-driven partnership between actors from public and private sectors to leverage data from different parties, at any stage of its lifecycle for public benefit in policy and science.

2.2. Principles of Data Partnership

Based on our literature review, there are some key principles to guide or establish public-private data partnerships.

a. Building trust

According to McKinsey (2019), public-private data partnership offers several benefits, including the discovery new insights, more accurate and faster decision-making, increased prediction accuracy, and optimized process efficiency. However, it also faces many challenges like security, privacy, commercial risks, and regulatory uncertainty which hinder progress. Therefore, it is crucial to build and strengthen trust as a solid foundation for public-private data partnerships.

World Economic Forum (2019) has established an evidence-based framework that highlights five key areas for strengthening trust and driving action: **stakeholder alignment, responsible data governance, insight generation and validation, insight adoption**, and **economic sustainability and scalability**.

Effective data collaboration begins with stakeholder alignment, where all parties agree on a shared value statement and ensure long-term commitment. Trust is strengthened through due diligence, balancing incentives, clear use cases, and an operational plan with auditing and ethical oversight. The next step is responsible data governance, which addresses privacy, data protection, individual agency, and preventing group harms with demographically identifiable information (DII).

Delivering accurate, unbiased, and explainable insights is also crucial for building trust. This involves ensuring algorithm explainability, establishing feedback loops, and providing decision-makers with the necessary tools, processes, and support to act on the insights. Lastly, ensuring long-term economic sustainability requires evaluating funding mechanisms, identifying opportunities for expansion, and encouraging commercial opportunities.

b. Data responsibility

Data responsibility is crucial in today's data-driven world. It ensures that data is managed ethically, securely, and in compliance with regulations, which helps to build and establish these public-private data partnerships. According to OCHA (2020), there are 5 data responsibility challenges most common in public-private data partnerships:

reputational risk, inappropriate technology, data sensitivity and use, uncertainty about new data sources, and intellectual property.

To ensure this, organizations should implement comprehensive data governance frameworks that include clear policies and procedures for data handling. This involves e.g. conducting audits and risk assessments, ensuring data encryption and access controls, and maintaining transparency with stakeholders about data practices. Additionally, organizations should stay updated on relevant laws, provide training for employees on data protection and ethics, and establish mechanisms for addressing data breaches promptly. By fostering a culture of responsibility, organizations can safeguard data integrity and build trust with stakeholders.

c. Legal basis and ethical compliance

Formalizing the partnership agreement is crucial for maintaining continuity in public-private data partnerships. This step serves as a foundational principle in public-private data partnerships. A solid partnership needs a strong legal foundation to ensure transparency and trust between parties. Ethical compliance is equally important, safeguarding individuals' privacy rights by ensuring data is collected, processed, and used responsibly, respecting consent and confidentiality, and preventing misuse.

2.3. Designed Data vs Organic Data

Digitalization is transforming lives, production, and jobs, posing new challenges for central banks in data gathering and analysis. Traditional indicators may not fully capture digitalization's impact, necessitating new data sources and methodologies. Central banks traditionally rely on **designed data**, collected for specific purposes through planned processes. However, the rise of digital platforms offers abundant **organic data**, naturally generated from everyday activities. While organic data provides rich insights, it also presents challenges in storage, processing, and analysis.

To understand the advantages vs disadvantages between designed and organic data, we can refer to table below.

Advantages and Disadvantages		Table 1
	Designed Data	Organic Data
Structure	Geographic & Socio-economic	Behaviour
Representative	Yes	No
Sample Selection	Response rates deteriorating	Extreme
Intrusive	Extremely intrusive	Non-intrusive
Cost	Large	Small
Curation	Well Studied	Unclear
Privacy	Well Protected	Large violations of privacy

Sources: Rigobon (2018)

Rigobon (2018) said that the relative advantages of organic data (i.e. big data) compared to designed data are that: (i) they reduce the cost of collecting and providing information; and (ii) the ability to collect events accurately to provide clearer depiction of behaviour. But to collect this organic data, we need to design properly the data collection methods and prepare Big Data infrastructure which can handle large volume of data.

3. Methods of Data Collection

BI is empowered by law to perform data collection, data processing, and data dissemination, which need to be directly tied to the fulfilment BI's mandates on monetary, payment systems, and macroprudential policy.

Based on this legal basis, several options are available and have been employed by Bank Indonesia to collect data⁴, including:

- Data collection (i.e. integration) from internal systems⁵
- Regulatory reportings⁶
- Surveys
- Direct requests to external parties
- Data partnerships
- Data purchases/subscriptions
- Other methods such as web scraping and public APIs

There are no strict criteria in determining which method(s) to use for collecting a certain data. If possible, using internally available data is prioritized in order to minimize data provision burden by external parties. Data partnership with other government institutions (G2G) is also favoured with the same reasoning.

Methods of data collection

Table 2

Internal data	External data				
	Voluntary	Mandatory	Commercial	Publicly accessible	
Data integration from internal systems	Data partnership (G2G, B2G, B2Gs)	Survey	Regulatory reporting	Data purchase / subscription	Public API
		Direct request			Web scraping

Surveys and direct requests can be voluntary or mandatory, depending on the context.

Currently, public-private data partnership (B2G) is not our preferred method for data collection. The main hindrance is data sustainability risk, which will be explained in Section 4. For this reason, most of the data from external parties are collected through surveys, regulatory reporting, and G2G data partnerships.

When might B2G data partnership be the most suitable method for data collection? We posit the following conditions:

⁴ One major constraint is if the data is, by law, exclusively available to some other competent authorities. For example, in Indonesia the Capital Market Law prohibits sharing of information on securities account except to parties stated in the Law.

⁵ Systems built not primarily for data collection. Examples include payment systems such as BI-RTGS and BI-FAST.

⁶ Some references term this as "cooperation by coercion", e.g. (Hassler, 2019).

- **No alternative data collection is available**

The primary factor to establish B2G data partnership is the opportunity for authorities to access unique dataset available only to private firms. In BI's case, for example, we have data partnerships with several largest e-commerce players. This provides us with a rich and timely view of digital economic activity, which is difficult to obtain or integrate from other data sources⁷, and of household consumption and prices. Since the pandemic, this dataset saw increased demand due to the notion that some economic activity moved to the digital space because of mobility restrictions.

An alternative would be to obtain private data indirectly through partnership with the corresponding authority (G2G). In the e-commerce data example, the central bank could exchange data with the ministry of trade and/or other authority that issues license for e-commerce activities. This approach has the drawback of more complex data governance process due to the data being transferred to another institution (in this case the central bank). In addition, depending on the terms of data provision to the competent authority, the central bank may not be able to acquire data in the format and/or frequency as needed.

- **Private data serves as a proxy and validation of existing indicators**

In addition to enabling a new set of indicators, another use case of private data is as a high-frequency proxy and/or explanatory of existing indicators. In some jurisdictions, for example, credit card payment data is not available through regulatory reporting and central banks obtain the data through partnerships with credit card companies or data aggregators. These data are processed into a reliable, high-frequency indicator of economic activity (Bodas et al., 2019). Another prominent example is mobility data for nowcasting service and manufacturing activities (Matsumura et al., 2021).

- **Data provider is outside of direct authority of the central bank**

While BI is empowered to collect data from virtually any external parties, utilizing a more stringent method, such as regulatory reporting, for routine data collection may not be warranted. Such method can imply significant cost, both in terms of infrastructure and manpower, and both at the outset and in maintaining the collection process. This is especially true if the data provider is not accustomed to delivering data to authorities in a routine manner and with possible sanctions for non-compliance (unlike the case with e.g. banks).

- **Few large players**

Finally, public-private data partnership works best if the market for which the activity's data is being collected is composed of a few majority players. This means that establishing data partnership with the largest players should be sufficient in depicting the development of the overall market. For example, in Indonesia there are only a handful of websites for selling properties, which makes it a good candidate for B2G data partnership. Otherwise, the central bank must maintain data partnership with numerous parties, adding to cost.

⁷ The data comprises information such as the transaction value, items bought, payment instrument used, and city-level location of the sellers and buyers.

4. Building Public-Private Data Partnership

The Statistics Department of BI has established 21 data partnership agreements with various public and private institutions. These include 6 agreements with public entities (G2G data partnerships), such as the NSO and the Ministry of Finance, and 15 agreements with private organizations (B2G data partnerships). While G2G data partnerships have been longstanding, the initiative to form B2G data partnerships commenced in 2015.

This initiative coincided with BI's exploration of Big Data Analytics to enhance its decision-making processes. The primary objective is to foster collaborations that enable BI to leverage external data sources, thereby providing valuable insights for policy formulation. This section outlines BI's experiences in establishing B2G data partnerships, highlighting our approach to ensuring mutual benefits and sustainable collaboration.

4.1. Data Partnership Arrangement Process

We divide the data partnership arrangement process into 4 stages: **agreeing**, **processing**, **protecting**, and **sustaining**.

a. Agreeing the partnership

The foundation of a successful B2G data partnership lies in the agreement phase, where the groundwork for collaboration is laid. This stage involves several steps:

Identification of needs vs identification of what might be needed

Referring to the General Statistics Business Process Model (GSBPM), like any new development of statistics, we always start from the "Identification of needs" phase. This phase is crucial for understanding and defining the requirements for statistical information, especially as we are asking businesses to provide data voluntarily. This phase involves identifying the data needs of users, establishing clear output objectives, and clarifying the concepts from the users' perspective, ensuring the statistical products can meet the users' needs effectively. In today's data-driven world, it is still crucial to first identify the needs before exploring the possibilities of data usage.

Alternatively, we can pro-actively explore the possibilities of what kind of data are collected by the businesses. On the case of identifying data on digital economy activity in Indonesia, first, we analysed the business process of the digital economy activity (e.g. e-commerce business in Indonesia). Second, we explored the possibilities of data produced from by the business; by understanding the business process it helped us to conceptualize the structured data that could be generated and utilized for our policymaking process.

Identifying potential partners

The next step is identifying potential partners. BI looks for companies with relevant data by researching and evaluating their business processes, potential data availability, and also company size. After identifying potential partners, it is important to define the partnership's objectives and scope. Clear goals help determine what the organization aims to achieve, ensuring alignment between both parties. The scope of

data sharing should be outlined, specifying the type and amount of data to be exchanged, with a draft model data typically prepared at this stage.

Once objectives and scope are defined, BI reaches out to potential partners to explore data partnerships through bilateral meetings. These meetings, which may occur multiple times, follow an iterative process to finalize the data partnership agreement. Initial meetings focus on understanding the potential partnership, typically involving Statistics Department and the business user department, while subsequent meetings address specifics and draft the agreement, involving also Legal Department and IT Department and/or Data Department.

Developing formal agreements

Developing formal agreements is crucial to define the roles, responsibilities, and expectations of each partner. These agreements should also incorporate e.g. purpose, objectives and scope of agreement; obligations of each party; mechanism of implementation; maintenance and disclosure of confidential information; and mechanisms for conflict resolution. Additionally, a formal data sharing agreement should be drafted, outlining the terms of data usage, privacy, security, and compliance with relevant regulations.

This agreement serves as a safeguard, ensuring that both parties adhere to legal requirements and ethical standards. Protecting sensitive information and maintaining transparency with stakeholders are critical aspects of this framework. Clear and transparent agreements foster trust and accountability.

b. Processing the data

Once the partnership is established, the next stage involves processing the data. Key steps include:

Developing technical infrastructure

Effective data partnerships require robust technical infrastructure to enable seamless data exchange. Developing technical infrastructure for a partnership involves several steps. First, it's essential to assess the current technological capabilities and identify any gaps that need to be addressed. This includes evaluating hardware, software, network capabilities, and data storage solutions. Once the assessment is complete, the next step is to design a robust and scalable infrastructure that can support the partnership's goals. This might involve upgrading existing systems, implementing new technologies, or integrating various platforms to ensure seamless data flow and communication.

Operational framework

To ensure smooth data partnership operations, we need to develop an operational framework that outlines the processes, procedures, and workflows. Then, create detailed, easy-to-understand documentation for each element, incorporating best practices and industry standards to ensure effectiveness and clarity for all partners. Regular reviews and updates to the framework are necessary to accommodate any changes in the partnership's activities or external factors, ensuring the framework remains relevant and effective over time.

c. Protecting the data

Protecting the partnership is crucial to ensure its longevity and success. This stage involves implementing measures to safeguard the partnership from potential risks and challenges. Key steps include:

Implementing data governance

Data governance is a crucial component of successful data partnerships. Organizations should establish governance policies to oversee data usage, quality, and compliance. Defining roles and responsibilities for data stewardship ensures accountability and proper management of shared data. Regular monitoring and auditing of data usage help maintain adherence to the agreed terms and policies. Effective and robust data governance practices can cultivate a culture of accountability, which in turn builds trust in data partnerships. This trust can serve as a competitive advantage for organizations in protecting data partnership.

Ensuring security measures

Implementing comprehensive security measures, including robust cybersecurity protocols, physical security, and data encryption, is crucial for protecting sensitive information and assets. These measures safeguard the integrity and confidentiality of partnerships, fostering trust and reliability. This holistic approach not only protects valuable assets but also enhances the organization's resilience and reputation.

d. Sustaining the partnership

The final stage involves sustaining the partnership over the long term. This requires continuous effort and commitment from all parties. Fostering a culture of adaptability and innovation within the partnership is vital for responding effectively to changing circumstances and emerging challenges, ensuring the partnership remains relevant and sustainable. To maintain ongoing data cooperation, it is essential that each party continues to receive relevant benefits from the partnership.

Fostering collaboration and communication

Ensuring open and transparent communication among partners is essential. Regular meetings, updates, and feedback mechanisms are key to promptly addressing issues and keeping everyone informed. Clear communication fosters collaboration and trust, which are vital for successful data partnerships.

In our experience, it's also beneficial to use various communication tools, such as video conferencing, emails, and instant messaging platforms, to ensure that all partners can stay connected and informed promptly.

4.2. Use Case: Data Partnership with Digital Economy Players

BI has established data partnership with some of the largest digital economy players in Indonesia, including e-commerce, on-demand delivery service, online travel agents, and online advertisement. The partnership is commenced starting from 2015 through formal agreement between BI and each partner, and has been maintained to the present day.

Through this partnership, the digital economy players provided all data in granular format, but contains no personally-identifiable information (PII) to ensure data protection. Those data are submitted monthly (with 1-2 weeks lag) through secured file-sharing mechanism, agreed by both parties. The granular data are then stored and processed in BI's data lake platform, to produce various indicators to support economic assessment, e.g. prompt indicator of digital economy, private consumption, price of goods and services in digital marketplaces, consumer preferences. The data is not accessible except to persons in Statistics Department and Data Department in charge of processing the data.

To maintain the partnerships, BI routinely gives feedback to the players in the form of aggregated indicators and related assessment (if applicable).

4.3. Challenges of Public-Private Data Partnership

Based on our experiences, here are some challenges we've encountered in establishing B2G data partnerships. Starting with the **cost-benefit analysis**. Establishing and maintaining these partnerships requires approaching each potential partner individually to negotiate agreements. This process can be time-consuming and resource-intensive, as it involves assessing the potential benefits against the costs for BI and for each partner. The complexity increases when partners have different expectations and requirements, necessitating tailored negotiations. Dedicated personnel with expertise in legal, technical, and business domains are essential to navigate these negotiations effectively and ensure that the partnerships are beneficial for all parties involved.

Communication is another critical challenge. Bridging the gap between the needs of one party and the availability of data from another requires clear and effective communication. Defining a value proposition that benefits all data partners can be difficult due to differing objectives and priorities. Effective communication strategies must be employed to align these interests and ensure mutual understanding. This involves not only articulating the benefits of the partnership but also addressing any concerns or reservations that potential partners may have.

Ensuring the continuity and uniformity of data from various partners is also a significant hurdle. Consistent data flow and structure are crucial for the reliability and usability of the shared data. A more pressing challenge is the possibility of termination of the partnership, e.g. because of management or business strategy changes in the partner.

Technology plays a vital role in ensuring the integrity, governance, security, and access of shared data in B2G partnerships. Data partners may use different systems or formats for storing data, leading to inconsistencies when integrating this information into a shared database or platform. Implementing robust technological solutions that safeguard against unauthorized access while allowing seamless integration across diverse platforms is essential for maintaining trust among partners. These solutions must also support compliance with relevant regulations governing privacy and protection of sensitive information. Additionally, technology must facilitate efficient retrieval and utilization of shared datasets, ensuring that the data remains accurate, secure, and accessible to authorized users.

Scaling and expanding partnerships present another challenge but also an opportunity for growth. Successful public-private data partnership can be scaled up to involve more data sources or expand the scope of data sharing. Scaling and

expanding partnerships allow organizations to leverage a broader range of data, leading to more comprehensive insights and competitive advantages. However, this requires careful planning and management to ensure that the expanded partnerships remain effective and beneficial for all parties involved.

5. Conclusion

In this paper we start with the development of digital economy and the ensuing data revolution and how they drive a need for policy-makers to collaborate with businesses in collecting new datasets. We explore the definitions and principles of data partnerships, and compare the characteristics of designed data (the most prominent example are surveys) and organic data commonly found in data partnerships.

We argue that, in our current context, public-private data partnership is not the most effective nor efficient way to collect data, unless no alternative method is available. We list some conditions that are more suitable for such partnership.

We have established several successful public-private data partnerships, mostly related to digital economic activity data. The provided data have been regularly used as input to assessment for policy-making. However, in some other cases, sustaining the partnership proved to be challenging. We explain these challenges and our experience in mitigating them, using a 4-stage process necessary in each partnership (Agreeing, Processing, Protecting, and Sustaining).

Nonetheless, going forward we will likely continue to explore more public-private data partnerships, as the data that they offer provide us with unique insights hardly attainable elsewhere.

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BANK INDONESIA
BANK SENTRAL REPUBLIK INDONESIA

EMPOWERING PUBLIC-PRIVATE DATA PARTNERSHIP FOR DATA ON DIGITAL ECONOMY: CASE OF BANK INDONESIA



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Bank Indonesia
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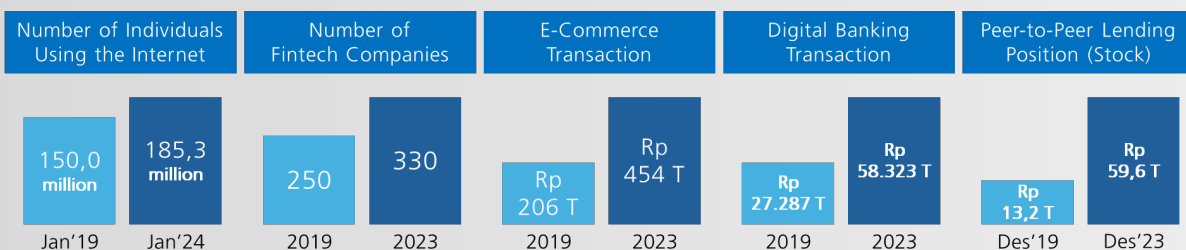
CONCLUSION



WHAT ARE FACTORS THAT DRIVE PUBLIC – PRIVATE DATA PARTNERSHIP?

- In the digital era, **data has become a crucial asset**, offering valuable insights and competitive advantages, but **private sectors** have **exclusive control**.
- Digitalization is transforming various aspects of life, particularly in Indonesia's economic and financial sectors, where digital transactions and innovations in banking and fintech are increasingly replacing or complementing traditional methods.
- **Indonesia's digital economy, led by e-commerce sector, is the largest in Southeast Asia and is projected to grow significantly**, reaching up to USD360 bio by 2030.
- Central banks face increasing complexity and uncertainty in their strategic environment, requiring continuous innovation in policy formulation, implementation, and supervision. **This challenging task requires central banks' ability to adopt and optimize the use of data to support policy including to fulfill the needs of data through public-private partnership.**
- For this paper we choose to use definition from (Susha et al., 2019) and combine it with our focus in this paper which is public-private or business to government (B2G) data partnership. Thus, the definition we use is, **data-driven partnership between actors from public and private sectors to leverage data from different parties, at any stage of its lifecycle for public benefit in policy and science.**

THE DEVELOPMENT OF INDONESIA'S DIGITAL ECONOMY



Sources: BI, Indonesia Financial Services Authority (OJK), Indonesia Fintech Association (AFTECH), We are social

DIGITAL ECONOMY IN INDONESIA AND ASEAN



Sources: Google et al. (2023)

METHODS OF DATA COLLECTION

METHODS OF DATA COLLECTION

Internal data	External data				
	Voluntary		Mandatory	Commercial	Publicly accessible
Data integration from internal systems	Data partnership (G2G, B2G, B2Gs)	Survey	Regulatory reporting	Data purchase / subscription	Public API
		Direct request			Web scraping

Surveys and direct requests can be voluntary or mandatory, depending on the context.

- BI is empowered by law to perform **data collection, data processing, and data dissemination**, which need to be directly tied to the fulfilment BI's mandates on monetary, payment systems, and macroprudential policy.
- Based on this legal basis, several options are available and have been employed by Bank Indonesia to collect data, including: **data collection (i.e. integration) from internal systems , regulatory reportings , surveys, direct requests to external parties, data partnerships, data purchases/subscriptions, other methods such as web scraping and public APIs**

When might B2G Data Partnership be the most suitable method for data collection?

- No alternative data collection is available
- Private data serves as a proxy and validation of existing indicators
- Data private is outside of direct authority of the central bank
- Few large players

The Statistics Department of BI has established **21 data partnership agreements** with various public (G2G) and private (B2G) institutions.

The primary objective is to **foster collaborations** that enable BI to **leverage external data sources**, thereby **providing valuable insights for policy formulation**.

6 G2G Data Partnerships

Ministries/Government Agencies
e.g. National Statistics Office (BPS), Ministry of Finance

15 B2G Data Partnerships

E-commerce, Ride Hailing Services, Online Travel Agents, or Online Portals

BUILDING PUBLIC - PRIVATE DATA PARTNERSHIP



APPS as stages for data partnership
arrangement process..

DATA PARTNERSHIP ARRANGEMENT PROCESS



1 Agreeing the partnership

- Identification of needs
- Identifying potential partner
- Developing formal agreements

2 Processing the data

- Developing technical infrastructure
- Operational framework

3 Protecting the data

- Implementing data governance
- Ensuring security measures

4 Sustaining the partnership

- Fostering collaboration
- Maintaining communication

USE CASE: DATA PARTNERSHIP WITH DIGITAL ECONOMY PLAYERS

E-commerce Indicator

E-commerce & FinTech growth indicators that provides transaction dynamics and prompt indicators of consumption and investments activities, spatial dimension of transactions, structure of consumer preferences, and dynamics of goods and services prices.

Data Sources:
Several largest digital economy
players in Indonesia

Methodology:
Data Mining on granular data
(transaction)

Data Frequency: Monthly



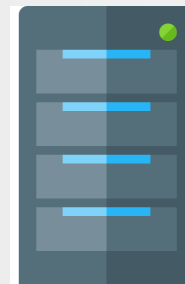
Data Acquisition



File Sharing from
E-Commerce



Virtual Machine



CLUDERA
Data Platform

Pre-Processing

- Data transformation
- Category product mapping
- Location seller & buyer mapping
- Payment method mapping

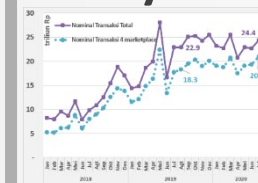


Processing

- ETL table payment
 - ETL table transaction
 - ETL table transaction detail
- ETL: Extract Transform Load*



Analysis



CHALLENGES IN PUBLIC-PRIVATE DATA PARTNERSHIP

COST BENEFIT ANALYSIS

- Establishing and maintaining these partnerships requires approaching each potential partner individually to negotiate agreements.
- This process can be time-consuming and resource-intensive, as it involves assessing the potential benefits against the costs for BI and for each partner.
- Dedicated personnel are essential to navigate these negotiations effectively and ensure that the partnerships are beneficial for all parties involved.

COMMUNICATION

- Clear and effective communication is essential to reconcile the needs of one party with the data available from another.
- Effective communication strategies must be employed to align with **value proposition that benefits all data partners** and ensure mutual understanding.

CONTINUITY AND UNIFORMITY DATA

- Consistent data flow and structure are crucial for the reliability and usability of the shared data.
- The possibility of termination of the partnership, e.g. because of management or business strategy changes in the partner.

TECHNOLOGY

- **Technology** plays a vital role in ensuring the integrity, governance, security, and access of shared data in B2G partnerships.
- Implementing robust technological solutions is essential for maintaining trust among partners.
- These solutions must also support compliance with relevant regulations governing privacy and protection of sensitive information.

SCALING AND EXPANDING PARTNERSHIP

- Successful public-private data partnership can be scaled up to involve more data sources or expand the scope of data sharing.
- This requires careful planning and management to ensure that the expanded partnerships remain effective and beneficial for all parties involved.

This paper discusses the evolution of the digital economy and the data revolution, highlighting the **necessity for policy-makers to collaborate with businesses in gathering new datasets.**

Public-private data partnerships are deemed **inefficient and ineffective for data collection unless no other methods are available**, with specific conditions outlined for their suitability.

We have successfully **established several public-private data partnerships for digital economic activity data**, regularly used for policy-making, but sustaining these partnerships can be challenging. To build this partnership required a **4-stage process: Agreeing, Processing, Protecting, and Sustaining (APPS).**

Going forward we will likely **continue to explore more public-private data partnerships**, as the data that they offer provide us with unique insights hardly attainable elsewhere



Thank You!

